The Output Cost of Inheritance ⋆

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Abstract

We study how inheritance affects labor supply over the life cycle, and we quantify its aggregate impact. Tracking earnings histories around some 135,000 inheritances and 5,000 lottery wins, we exploit the quasi-random timing and size of these events to identify labor supply responses in the same population with high precision. Earnings responses are negative at all ages but peak between ages 55 and 64, largely due to early retirement. Inheritances generate smaller impact responses than comparable lottery wins, consistent with anticipation effects. Our estimates match the predictions of a life-cycle model with endogenous labor supply and early retirement. Aggregating model-based responses across the population, our point estimate of the GDP cost of inheritance is 1.1%. The timing, size, and anticipation of inheritance all contribute to shaping its macroeconomic consequences.

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1 Introduction

Inheritance represents one of the largest and fastest-growing flows in modern economies. It amounts to 10–15 percent of national income in advanced countries—more than total spending on public pensions—and cumulatively accounts for over half of private wealth in Western Europe and the United States (Alvaredo et al., 2017). Inheritance is even overtaking entrepreneurship as the leading source of new billionaires (UBS, 2024). The macroeconomic importance of inheritance is thus beyond dispute; less clear is its impact on labor supply, and hence on aggregate output.

Given its sheer scale, inheritance has first-order implications for both equity and efficiency. The equity dimension has been extensively studied through the lens of intergenerational inequality.[1] In this paper, we focus instead on an aspect of the efficiency dimension, by asking how inherited wealth affects the labor supply of recipients, and thus GDP. Are bequests substitutes for or complements to labor income? How do responses to inheritance vary over the life cycle, and how do they aggregate up when weighted by the age distribution of inheritance receipt? How does the anticipation of inheritance affect labor supply? As life expectancy rises and heirs get older, is there an efficiency case for encouraging transfers to be made earlier in life?

We answer these questions by combining evidence on earnings responses to different-sized wealth shocks with a calibrated life-cycle model. Using administrative tax records for the universe of taxpayers in the second-largest Swiss canton, we track individual earnings trajectories following 135,150 inheritances and 5,340 non-trivial lottery wins. Their quasi-random timing and size allow us to identify plausibly causal age-specific labor supply responses to those two types of shocks within the same population-level dataset.

We find earnings responses to be negative and long-lasting throughout, confirming that income effects dominate irrespective of both the source of wealth shocks and recipient age. Pooled across age categories, the estimated earnings response *subsequent to* inheritance is around half as strong as the response to a comparable lottery win, which points to the partly-anticipated nature of inheritance. The strongest responses are found for individuals who inherit when aged 55–64, which also happens to be the modal bracket in the age distribution of total inheritance flows. Among those aged 60–64, the entire response stems from early retirement. Responses in the 55–64 age bracket are particularly pronounced among male heirs. For female heirs, we observe similarly strong responses at ages 35–44 as at ages 55–64, consistent with traditional gender norms regarding the allocation of childcare work. Summed across age brackets, female heirs' labor supply responses are around twice as strong as those of male heirs.

We then calibrate a life-cycle model on our Swiss data. We find the model to match our estimated earnings elasticities well. The model allows us to bound the *lifetime* marginal propensity to earn (MPE) out of inherited—and thus at least partly anticipated—wealth at -27.4%. To compare, our estimated average lifetime MPE for lottery wins is -14.8%.

Populated by individuals featuring heterogeneous bequest motives, the model is then used to simulate two counterfactual scenarios. In a first exercise, we explore the quantitative implications of taxing some or all of the inheritance away. We consider a linear tax and abstract

[1] See, e.g., Nishiyama (2002), De Nardi (2004), Benhabib et al. (2011), Boserup et al. (2016), Nekoei and Seim (2023), Black et al. (2025) and Morelli et al. (2025).

from indirect effects through the government budget and responses by bequeathers. In this setting, a 100% tax on inheritance would increase total labor supply by between 1.0% and 1.7%. The lower bound applies when we model inheritance as completely unexpected. The upper bound applies when inheritance is assumed to be perfectly expected and can be borrowed against costlessly. Considering that our estimated responses are close to the model prediction for perfectly expected shocks, our point estimate of the associated steady-state increase in GDP is 1.1%. Within the stylized setting of the model and the patterns observed in our data, this is our estimate of the output cost of inheritance.

In a second counterfactual experiment, we shift the age distribution of inheritance flows. With rising life expectancy, the average age of inheritance receipt is increasing as well. Our analysis shows that shifting inheritances towards older heirs lowers the output cost of inheritance. We find for example that an increase in life expectancy of five years, other things equal, would lower the estimated output cost of inheritance by around one-fifth, to 0.9%. This is driven by two mechanisms. Trivially, the larger the share of inheritance that accrues to retirees, the smaller will be the scope for labor supply responses. Less trivially but emerging consistently from our calibrated model, a shift of the inheritance distribution away from younger working-age cohorts would further increase labor supply, as we find wealth received at a later working age to reduce labor supply more on impact but less from a lifetime perspective.

Policymakers might seek to counteract the trend towards later transfers, e.g., by using the tax code to incentivize inter-vivos giving. According to our estimates, such policies would come at the cost of lower aggregate work incentives, i.e., a higher output cost of inheritance. We need to stress, however, that for a welfare analysis, account would also need to be taken (a) of the use of bequest tax revenue, and (b) of the particular nature of inter-vivos gifts, which are typically targeted by donors to the circumstances of donees.

To our knowledge, this is the first study that explores earnings responses to wealth shocks from inheritance and lotteries within the same population. The comparison is interesting because we can use responses to lottery wins as a benchmark for responses to unanticipated shocks, against which we compare responses to inheritance. This allows us to shed light on the unobservable anticipated component of inheritance responses. Our empirical setting is a 20-year panel of individual-level administrative records covering the universe of taxpayers in the canton of Bern. We retain only wealth shocks in excess of approximately USD 10,000, leaving us with a sample of shocks that are large enough to plausibly affect labor supply decisions. The average shock in our data—whether from inheritance or from a lottery win—corresponds to about three times annual earnings (see Appendix Table A1 for details). We can track the earnings histories to those shocks in a total of 1.27 million person-year observations. The size and quality of the dataset allow us to apply a demanding continuous-treatment event-study approach, whereby we identify earnings responses from comparisons among same-age individuals who have experienced different-sized positive wealth shocks in the same calendar year.

Our paper also breaks new ground by using those data to calibrate a life-cycle model, allowing us to perform counterfactual analyses. We develop a life-cycle model with endogenous labor supply, early retirement, and heterogeneous bequest motives.[2] The model shows how

[2]Borrowing model features from De Nardi (2004), we consider a less detailed set-up in terms of heterogeneity—regarding productivity for instance—but focus on endogenous labor supply along the intensive margin (hours worked) and along the extensive margin of early retirement.

the impact of a wealth shock can depend on recipient age, the degree of anticipation, and the existence of an early-retirement option. At the intensive margin, predicted earnings responses are negative at all ages, with larger effects for older cohorts. At the extensive margin, wealth shocks can trigger early retirement among those aged 60–65. Unexpected shocks have stronger contemporaneous effects but smaller lifetime effects than anticipated shocks, because anticipated inheritances affect work effort for longer.[3] Inheritance after retirement no longer affects earnings at all, at least to the extent that it is unexpected. We find that the age-profile of earnings elasticities predicted by the calibrated model corresponds closely to that found in our empirical analysis.

Previous literature. Our paper connects to an active literature exploring labor supply responses to positive wealth shocks. Imbens et al. (2001) first turned to lottery wins as plausibly exogenous and observable shocks to "unearned income".[4] They found that annual earnings on average shrank by some 1.1 dollars per 100 dollars won, up to six years after the win, with a stronger response by workers aged 55–65. The survey-based findings of Imbens et al. (2001) have since been confirmed and extended in more comprehensive administrative data by Cesarini et al. (2017), Picchio et al. (2018), Bulman et al. (2021), and Golosov et al. (2024): on average, sudden wealth is consistently found to have an enduring negative effect on individual earnings. We provide an explicit comparison of our baseline estimates with those reported elsewhere, and find the magnitudes to be broadly consistent.

Lottery wins provide valuable quasi-experimental variation, but they represent a relatively small flow compared to intergenerational wealth transfers. Lottery sales in the United States totaled USD 108bn in 2022 (NASPL, 2026). Assuming that 60% of gross sales were paid out to winners, total prize money corresponded to some 0.25% of U.S. GDP—a flow almost two orders of magnitude smaller than the estimated volume of bequests (Alvaredo et al., 2017). In our data, inheritance is 25 times larger than lottery wins, both in terms of the number of recipients and of total value (see Table 1). Moreover, as pointed out by Kopczuk (2013b), equivalence of inheritance and other exogenous wealth shocks in terms of their effects on labor supply is a "strong assumption" (p. 370). To the best of our knowledge, ours is the first study to subject this assumption to direct scrutiny.

We therefore focus on labor supply responses to wealth shocks arising from inheritance, comparing them directly to responses to lottery wins. This analysis builds on a literature that has sought to quantify the "Carnegie conjecture", whereby the prospect and the realization of a large inheritance can lead the heir "to live a less useful and less worthy life than he otherwise would" (Andrew Carnegie, cited by Holtz-Eakin et al., 1993). Nekoei and Seim (2023) have explored earnings responses to inheritance, finding them to be somewhat larger than responses to lottery wins estimated elsewhere.[5] We expand on this work by directly comparing responses

[3] In principle, inheritance could also act as a complement to labor supply, e.g. by lifting credit constraints on entrepreneurial activities. Our empirical specifications are flexible enough to allow for such a possibility.

[4] Some researchers have exploited stock-market price fluctuations as sources of exogenous wealth shocks, focusing mainly on consumption responses (e.g., Poterba, 2000; Andersen et al., 2024). There is also evidence on earnings responses to discontinuities in disability insurance payments (Gelber et al., 2017).

[5] Other papers reporting earnings trajectories subsequent to receiving an inheritance include Holtz-Eakin et al. (1993), Joulfaian and Wilhelm (1994), Brown et al. (2010), Elinder et al. (2012), Bø et al. (2019), Niizeki and Hori (2019), Doorley and Pestel (2020), and Druedahl and Martinello (2022). This literature consistently documents nonpositive (and mostly negative) earnings responses to inheritance shocks. A majority of these papers rely on sample survey data, all of them consider no or coarser age

to different wealth shocks at different points of the life cycle, and by considering inheritance shocks and lottery wins within the same population-level panel dataset.

The direct comparison of behavioral responses to different types of wealth shocks can also hold clues to the role of anticipation, emphasized by Kindermann et al. (2020). By calibrating a life-cycle model, they conclude that the estimated effects from realized bequests would need to be doubled for an estimate of the total (anticipated + unanticipated) labor supply effect of inheritance. We are able to put this estimate to the test by directly comparing earnings responses to (at least partly anticipated) inheritances with earnings responses to (unanticipated) lottery wins. Moreover, Kindermann et al. (2020) do not consider life-cycle variation in earnings elasticities, and they abstract from early retirement responses. Additionally to what we do, they also consider (ex-post erroneous) anticipation effects by people who end up not inheriting, but they find such effects to be small.

Our analysis has implications for the taxation of wealth transfers. Kopczuk (2013a) shows that heirs' labor supply responses imply a positive fiscal externality of bequest taxation that pushes for higher bequest tax rates in an optimal-tax model.[6] While it has been pointed out that U.S. tax law does not treat inter-vivos gifts and inheritances equally (e.g., Poterba, 2001; Kopczuk, 2013b), we are not aware of prior work on the labor supply and output implications from shifts in the age profile of intergenerational wealth transmission.

Finally, we contribute to a literature that explores optimal age-contingent taxation. Weinzierl (2011) acknowledges that "one of the most direct reasons for the differentiation of taxation by age would be variation in the elasticity of labor supply with age", but notes that "unfortunately, empirical evidence is sparse" (p. 1515). Lacking empirical evidence on age-specific labor supply elasticities, he had to assume them to be constant. Returning to this topic more recently, Heathcote et al. (2020) similarly observed that "evidence on labor supply elasticities around retirement is scarce" (p. 21). Interestingly, these papers rely on contrasting premises. Weinzierl (2011) emphasizes conjectures made elsewhere whereby "younger workers have more elastic labor supply than prime-age workers". Conversely, Heathcote et al. (2020), citing models that feature on-the-job learning by Best and Kleven (2013) and Stantcheva (2017), consider scenarios with labor supply elasticities that rise with age. Our empirical findings are consistent with the latter approach.

Our paper is organized as follows. Section 2 describes our empirical setting and estimation strategy. Section 3 presents our reduced-form estimates of earnings responses to different wealth shocks. In Section 4, we develop a simple life-cycle model to show how labor supply responses to a positive wealth shock can depend on recipient age, anticipation effects and early retirement options/decisions. In Section 5, we simulate the counterfactual scenarios. Section 6 concludes.

groups, and none of them considers lottery wins and inheritance simultaneously. For a graphical summary of existing elasticity estimates, see Appendix Figure A3, based on Nekoei and Seim (2023).

[6] In the seminal model of optimal inheritance taxation by Piketty and Saez (2013), labor supply is affected only indirectly, through the government's budget constraint forcing changes in inheritance tax rates to be offset by changes in labor taxes. Their optimal inheritance tax formula abstracts from labor supply responses to inheritance itself.

2 Data and empirical strategy

2.1 Data

For a fully data-driven approach to the age profile of labor supply responses, we can draw on the universe of annual income and wealth tax returns submitted in the canton of Bern between 2002 and 2019 (Bern Tax Administration, 2025). Bern is Switzerland's second most populated canton. Its 1 million inhabitants make up 12% of the Swiss population. Bern is representative of the country as a whole, as it combines both urban and rural, and German-speaking as well as French-speaking regions.[7] Switzerland, in turn, can be considered as representative of other advanced economies in most relevant respects. Since much of our focus will be on labor supply responses in the run-up to retirement, we note that Swiss statutory and effective pension ages are very close to their respective OECD averages. Replacement rates, however, are somewhat lower in Switzerland than in most of the OECD—closer to those of the United States and the U.K. than to those of the country's European neighbors (OECD, 2023). Early retirement is therefore somewhat costlier in purely financial terms for Swiss workers than for the average OECD worker.

The tax records allow us to track individual-level financial histories. We consider wealth shocks in excess of CHF 10,000 (10,000 Swiss francs ≈ USD 10,000), with the aim of retaining only shocks that are large enough to plausibly affect earnings behavior.[8] We define labor earnings as income from employment plus two-thirds of the amount reported as self-employment income.[9] As married taxpayers file jointly, we adapt the dataset by splitting each married couple into two separate records, allowing us to follow individuals over time as they marry, divorce, or become widowed. Hours worked are not reported, as they are irrelevant for taxation. This means that we cannot decompose earnings responses into changes in hours and changes in wages. However, from a GDP or fiscal perspective, the relevant variable is earnings, which we observe accurately. Wealth and wealth shocks (including inheritances and lottery wins) are declared at the household level. We therefore split them 50–50 between spouses. As we show below, our results are not sensitive to this allocation rule.

Because our goal is to compare wealth received at different ages, we express nominal wealth shocks in "present-value-adjusted" terms in both the empirical analysis and the simulations. To do this, we adjust the nominal amount received at a given age by the recipient's assumed remaining lifetime, by converting the amount received into its equivalent value at age 90 with a constant annual return of 3 percent, the empirically consistent real interest rate.[10] We consider

[7]However, Bern has comparatively low per-capita taxable wealth, representing only 8.9% of the Swiss total (Swiss Federal Tax Administration, 2022). For further details on taxation and tax filing in Bern and Switzerland, see Appendix C1 and Brülhart et al. (2022).

[8]Over our 2002–2019 sample period, the CHF traded between 0.58 USD (in 2002) and 1.38 USD (in 2011). Our threshold value of CHF 10,000 corresponds to around one quarter of average annual earnings in the sample (see Appendix Table A1). Inheritances below CHF 10,000 represent 10.5% of the count of reported inheritances but only 0.2% of the value of inheritances in our sample. Reported lottery wins below CHF 10,000 represent 83.3% of the count of lottery wins but only 2.9% of the value of lottery wins. Focusing only on inheritances and lottery wins above the threshold of CHF 10,000 therefore ensures that the distributions of the two types of wealth shocks are similar. We verify that our results are robust to perturbations of this threshold (see Section 3.2). Appendix Figure A1 shows the distribution of wealth shocks in our data.

[9]This adjustment accounts for the fact that reported self-employment income includes both labor and capital components. Using different scaling factors for self-employment income does not change our results, as self-employment income represents a small share of total labor earnings in our data, and the distribution of such income is not systematically correlated with the size or timing of wealth shocks.

[10]Formally, for each individual i who receives wealth at age $a(i)$, the nominal wealth shock W_i is transformed into its present-value equivalent W_i^{pv} using the formula: $\mathcal{W}_i^{pv} = \mathcal{W}_i(1+0.03)^{90-a(i)}$. We compute the average return on wealth of approximately 3%

only individuals aged 30 and over, as under-30s account for a mere 2% of inheritance receipt in our data, and since earnings trajectories of young adults are strongly affected by education choices, which in turn are correlated with parental wealth.

We restrict our sample to individuals for whom we observe at least one inheritance or lottery win, explicitly declared as such in the tax data. For those individuals, we model shocks as discrete events, as they turn out to be lumpy and infrequent in the data: 84.4% of heirs and winners in our data experience only a single wealth shock within the 2002–2019 period (see Appendix Figure A2). When individuals declare more than one such shock, we consider the largest one. We exclude individuals who experience multiple positive wealth shocks if the second-largest shock amounts to at least half the size of the largest shock. This restriction ensures that behavioral responses can be attributed to a well-defined and dominant wealth shock, minimizing contamination from earlier or subsequent shocks.[11] This leaves us with a sample of 135,150 individuals with an inheritance shock, and 5,340 individuals with a lottery shock, for a total of 1.27 million person-year observations. Lottery wins are expressed post-tax (see Appendix Section C1.2 for details). Given the low or zero taxation of inheritances, no such adjustment is applied to those shocks (see Appendix Section C1.3 for details).

Summary statistics are provided in Appendix Table A1. The sample of lottery winners differs from that of inheritance recipients in terms of demographic composition: lottery winners tend to be younger, more likely to be single, and to have lower pre-shock wealth (for further details on lottery players, see Appendix Section C2). Our data are thus consistent with findings from other countries, whereby the likelihood and size of bequests correlate positively with pre-receipt wealth (e.g., Nekoei & Seim, 2023). Despite these demographic differences, the two samples are remarkably similar in terms of both the nominal size of the wealth shock and average pre-shock earnings. This suggests that, on average, recipients of inheritances and lottery wins face comparable financial incentives at the time of the shock when conditioning on age. In our estimations, we will check that any observed behavioral differences between heirs and lottery winners are not due to differences in the underlying populations.

2.2 Identification strategy

Our goal is to measure how individuals adjust their earnings when they experience a positive wealth shock, be it through inheritance or from a lottery win. The main identification challenge is that heirs and non-heirs (and, likewise, lottery players and non-players) can differ systematically along several dimensions. For instance, heirs may come from wealthier families, with different educational opportunities and intergenerational expectations, while lottery players may differ in risk preferences or socioeconomic background from those who do not participate. These differences imply that direct comparisons between recipients and non-recipients risk confounding labor supply responses with underlying heterogeneity.

To overcome this challenge, we restrict attention to individuals who all receive a wealth shock and exploit variation in the *size* of the shock. Our design compares individuals of the same age who receive their wealth shock in the same calendar year, but who differ in the

per year by constructing portfolio shares from 2002-2017 household balance sheet data for Switzerland and using them to weight real asset returns (see https://data.snb.ch/fr/topics/uvo/cube/frsekgevehup).

[11] Note that we also take account of inter-vivos gifts declared by donees, and analogously exclude all individuals for whom the largest such gift exceeds half the size of the largest inheritance or lottery win observed in the data.

amount received.[12] Formally, we treat the fact of receiving a shock as the treatment, and the monetary (present-value-adjusted) amount received, $\mathcal{W}_i^{pv}$ as the "treatment dose"[13] This difference-in-differences (DiD) design thus captures how outcomes evolve before and after the shock as a function of its size, while flexibly controlling for age- and year-specific effects. By conditioning on age and receipt year, our strategy ensures that comparisons are made only within tight demographic–time cells, eliminating biases from systematic differences between recipients and non-recipients.

Assume that individual i receives a positive wealth shock (through inheritance or a lottery win) in calendar year t, and is assigned to an age cohort $a(i)$ based on her age at the time of the wealth shock. We estimate static DiD specifications of the following form:

$$\ln(y_{i,t}^{w}) = \beta \cdot [Post_{i,t} \cdot \ln(\mathcal{W}_i^{pv})] + \delta_i + \gamma_{t,a(i)} + u_{i,t}, \tag{1}$$

where $\ln(y_{i,t}^{w})$ are log labor earnings of individual i in calendar year t, with the superscript w indicating income from work, as opposed to pension income (denoted y^p in Section 4). δ_i are individual fixed effects, and $\gamma_{t,a(i)}$ are calendar year-by-age fixed effects, with age measured in the year of the wealth shock. We thereby force our identifying variation to come from comparing individuals who not only have the same age, but who also experience the wealth shock in the same calendar year.[14] We assume that the error term $u_{i,t}$ has mean zero and is uncorrelated with the timing and size of the wealth shock, conditional on fixed effects. Throughout the analysis, we cluster standard errors at the individual level.

Our parameter of interest is β, the earnings elasticity to wealth shocks. Its estimation is based on the interaction between a dummy for the post-treatment period, $Post_{i,t}$, and the size of the present-value-adjusted log of the wealth shock, $\ln(\mathcal{W}_i^{pv})$.

Our baseline specification models earnings and wealth shocks in logarithms. This choice is motivated both by economic considerations and by statistical properties of the data (see Figure 1). From an economic perspective, labor supply responses are plausibly concave: the marginal effect of an additional unit of the wealth shock on labor supply decreases as the size of the wealth shock increases. A log–log specification accommodates such non-linearities by allowing proportional responses to scale with wealth, yielding an elasticity interpretation that is natural in this context. From a statistical perspective, the distributions of inheritances and lottery wins exhibit a pronounced right tail, with a small number of very large shocks accounting for a disproportionate share of the variation in levels. In level–level specifications, extreme observations receive substantial weight, causing OLS estimates to be driven by a small number of large shocks and making the estimates sensitive to sample composition. Logarithmic transfor-

[12]The intuition is that, while many heirs may anticipate receiving an inheritance at some point in life, they typically face some uncertainty about its exact timing and magnitude (due, e.g., to differences in estate values at the time of death, the presence of co-heirs, and unforeseen events affecting parental wealth) that introduce quasi-random variation in the realized inheritance size. As a result, even among those who expect to inherit, the realized inheritance amount contains an unanticipated component that can be treated as exogenous.

[13]Considering the treatment in continuous form offers several advantages over a binary treatment (see, e.g., Callaway et al., 2024). Our main motivation is practical: variation in treatment intensity makes it possible to evaluate treatments that lack an evidently suitable control group.

[14]These fixed effects avoid issues of staggered treatment timing that arise in standard DiD settings (see, e.g., Goodman-Bacon, 2021). In our context, negative weights could arise because β is a weighted sum of several DiD estimates, each comparing the evolution of the outcome variable between consecutive time periods across pairs of treatment cohorts. Given the staggered timing of the treatment, the "control" group in some comparisons includes individuals that will be treated later. $\gamma_{a(i),t}$ "turns of" the staggered implementation of the treatment by only comparing individuals who experience heterogeneous wealth shocks at the same time and age.

mations compress the right tail of the wealth distribution and deliver estimates that are closer to an average behavioral response across the population of recipients (Wooldridge, 2010).[15]

The assumption required for interpreting β as a causal treatment effect is that, conditional on age-by-calendar time and on the fact of being an heir/lottery winner, the *size* of the wealth shock is distributed quasi-randomly. We make this assumption transparent by examining pre-trends: if earnings trajectories just prior to the shock do not predict the subsequent size of the wealth receipt, then it is plausible that wealth shock size is as good as randomly assigned among recipients of the same age and receipt year.

Denoting the year of the wealth shock as $t = 0$, and indexing time relative to that year, we study the evolution of earnings as a function of (a) the time distance from the wealth shock and (b) treatment intensity, by running specifications of the following form:

$$\ln(y^{w}_{i,t}) = \sum_{k \neq -1; k=-3}^{5} \beta_k \cdot [\mathbf{1}(K_{i,t} = k) \cdot \ln(\mathcal{W}^{pv}_{i})] + \gamma_{t,a(i)} + \delta_i + u_{i,t}. \tag{2}$$

Here, our coefficients of interest are β_k: the impact of a one-percent increase in the size of the wealth shock on subsequent log earnings. We observe separate effects for each year $k \geqslant 0$ relative to $k = -1$, allowing us to explore dynamic earnings responses by looking at the pattern of β_k for $k \geqslant 0$. The presence of pre-trends can be examined by tacking β_k for $k < 0$. It is important to stress that this test does not imply the absence of anticipation effects. Heirs of large inheritances may have systematically different earnings than heirs of small inheritances even before the wealth transfer occurs, because they anticipate future inheritance (e.g., through educational or occupational choices made before entering the labor market). Such level differences across individuals are absorbed by the individual fixed effects, which control for time-invariant heterogeneity. What matters for identification is that *deviations* from these level differences are not correlated with the eventual size of the wealth shock.

In alternative specifications (presented in Section 3.2), we further refine our empirical strategy in two ways. First, we compare individuals within even more granular cells: not only must they receive their wealth shock in the same year and at the same age, but they are also matched along key pre-shock socio-demographic characteristics such as income quartile, wealth quartile, marital status, and municipality of residence. This adjustment allows the size of the wealth shock to be correlated with such characteristics, ensuring that the identifying variation comes from within-group comparisons of individuals who shared very similar observable pre-shock profiles. Second, we adopt an alternative strategy following Callaway et al. (2024), which rearranges our specifications (1) and (2) into a binary DiD framework. Here, higher-dose recipients are treated as the "treated" group and lower-dose recipients as the "control" group. This provides a complementary test of our identification, since it allows us to examine whether results are robust when relying only on within-recipient comparisons of dose intensity, rather than the full continuous-treatment specification. Together, these robustness checks provide reassuring evidence that our findings are not driven by correlations between wealth shock size and pre-existing socioeconomic characteristics.

[15]Consistent with this rationale, level–level estimations deliver qualitatively comparable results to our log–log baseline (negative wealth effects and larger responses for lottery wins than inheritances; see Appendix Table B1), but the implied magnitudes are attenuated.

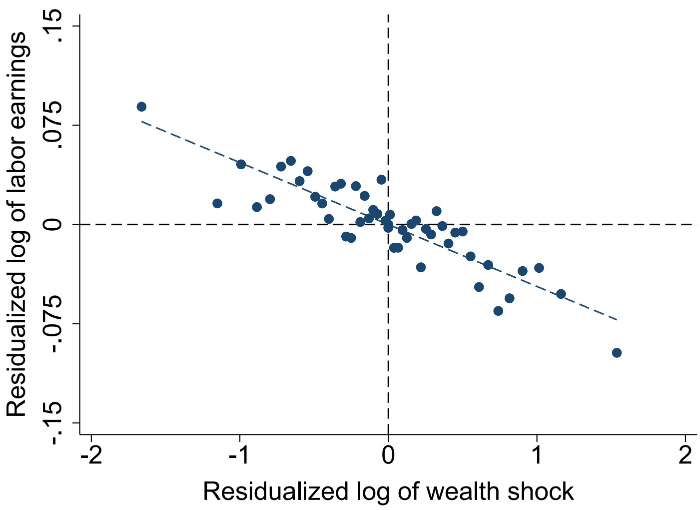
3 Empirical findings

3.1 Baseline results

We begin by quantifying the average effect of positive wealth shocks on subsequent earnings, pooled across age groups. We then document differences by type of wealth shock (inheritances vs. lottery wins), and their life-cycle patterns.

Average earnings responses to wealth shocks. As a preliminary and transparent visualization, Figure 1 shows how labor earnings respond to positive wealth shocks, based on our 1.27 million person-year observations. Each dot represents average residual earnings for individuals binned by the size of their (present-value-adjusted) wealth shock, after controlling for individual and age-by-year fixed effects. The fitted line corresponds to the elasticity estimate from our main regression (the coefficient β of equation 1). The figure reveals a linear-in-logs negative relationship: larger wealth shocks are associated with larger earnings losses. This finding is mirrored in separate visualizations by age group, shown in Appendix Figure A5, where we observe distinctly negative and log-linear earnings responses for individuals aged 50 and above. The log-linear functional form of our baseline empirical model thus fits the data well.

Figure 1: Earnings responses to positive wealth shocks: binned scatterplot



Notes: This figure provides a graphical representation of the labor earnings elasticity with respect to wealth shocks, including both inheritances and lottery wins. It compares the log of labor earnings (vertical axis) with the interaction of the log of the present-value-adjusted wealth shock and the post-treatment dummy (horizontal axis). We depict the residuals obtained by regressing each variable on individual fixed effects and age-at-the-time-of-the-shock-calendar-year fixed effects. The figure plots residuals in 50 equal-sized bins and shows the line of best fit, which corresponds to the β estimate obtained from regressing equation (1), estimated over a time interval spanning -3 to 5 years from the wealth shock. The sample contains 1,266,430 person-year observations.

We present our main implementation of this empirical model in Table 1. The table reports pooled estimates of the earnings elasticity to wealth shocks—i.e., of β in equation (1). Our tightly estimated baseline elasticity of -0.047 (column 1) implies that a CHF 10,000 wealth shock reduces earnings by some CHF 60 annually over the subsequent 5-year period.[16]

[16]Specifically, this is computed by taking the elasticity estimate and scaling it by the ratio of the average earnings to the average wealth shock for each age group. Multiplying this by 10,000 converts the effect into the earnings reduction associated with a CHF 10,000 wealth shock, allowing for comparability across different age groups.

Columns (2) and (3) of Table 1 report separate estimates for wealth shocks from inheritance and lotteries. The pooled elasticity of -0.047 turns out to be almost fully driven by inheritance. This is not surprising given that 96% of wealth shocks in our sample are due to inheritance. If we consider only lottery wins, we obtain an elasticity of -0.082—almost twice as large in absolute value as that associated with inheritance. This difference also has a ready explanation, as it is consistent with the partly anticipated nature of inheritance shocks: while earnings responses to lottery wins materialize in full only after their realization, part of the lifetime response to inheritance already predates its arrival.

Another conceivable reason for larger lottery effects is that lottery playing could be endogenous, with people playing *because* they dream of working less. In that case, earnings of lottery players would be particularly elastic, and the difference compared to heirs would be due to sample selection rather than to anticipation. In one of the robustness checks of Section 3.2, we therefore narrow the inheritance sample to heirs whom we also know to be lottery players. We find that their responses do not differ significantly from those of non-lottery-playing heirs. Hence, anticipation remains the most plausible explanation for the observed difference between responses to inheritance and to lottery wins.

Table 1 also shows how quantitatively important wealth shocks from inheritance are compared to wealth shocks from lotteries. While average amounts are strikingly similar, at CHF 129,038 for inheritances and CHF 123,261 for lotteries, wealth shocks from inheritances are 26 times more frequent in our data than (non-trivial) wealth shocks from lotteries. Finding substantially smaller responses to inheritances than to comparable lottery wins also runs counter to the hypothesis that labor supply reductions following inheritance mainly result from grieving.

We can compare our baseline effects of Table 1 with those found elsewhere in the literature. In Appendix Figure A3, we add our estimates to a comparative illustration borrowed from Nekoei and Seim (2023). The comparison shows that our estimates fall within the range of previous findings for the United States and Sweden. Our estimated responses to inheritance lie approximately mid-way between the low U.S.-based estimates of Holtz-Eakin et al. (1993) and the somewhat larger Swedish estimate of Nekoei and Seim (2023). Our estimated responses to lottery wins are somewhat larger than those reported previously (Imbens et al., 2001, and Golosov et al., 2024, for the United States; Cesarini et al., 2017, for Sweden), but the point estimates of those studies lie within the 95% confidence bounds of our estimate.

Figure 2 reports event-study estimates obtained from running equation (2), pooled across all ages and wealth shocks. Our estimates suggest that the average earnings response takes two years to materialize and remains permanent thereafter. In Appendix Figure A4, we estimate the same model but for a post-shock period of up to 12 years. This analysis confirms that, on average, the initial earnings response is not reversed in later years.

Note that our finding of long-lasting drops in earnings does not necessarily mean that households permanently reduce their supply of labor hours, as our observed earnings effect could also result, at least in part, from lasting wage losses due to career interruptions. This would be consistent, for example, with the finding of Kleven et al. (2019) that the motherhood penalty results from a combination of changes in participation, hours worked, and switching to lower-paying firms. Kleven et al. (2025) show that changes in earnings often lag changes in hours, as earnings tend to progress in discrete steps based on past effort. Our findings are

Table 1: Earnings responses to wealth shocks: pooled estimates

	Sample: All wealth shocks (1)	Inheritances (2)	Lottery wins (3)
Earnings elasticity	-0.047***	-0.046***	-0.082***
	(0.005)	(0.005)	(0.031)
Obs.	1,266,430	1,219,122	47,308
Individuals	140,490	135,150	5,340
Average earnings (CHF)	43,517	43,500	44,029
Avg. wealth shock (CHF, p.v. adjusted)	349,798	349,703	352,662
Avg. wealth shock (CHF, nominal)	128,854	129,038	123,261
On-impact MPE to CHF 1k p.v. adj. (CHF)	-6	-6	-10
Remaining-worklife MPE to CHF 1k p.v. adj. (CHF)	-45	-43	-148

Notes: This table reports the earnings elasticity to wealth shocks, i.e., estimates of β from equation (1), pooled across age groups. Column (1) considers wealth shocks from inheritance and lottery wins; column (2) focuses only on inheritances; column (3) only on lottery wins. The table also reports information on recipients' average earnings, the average nominal wealth shock, and the average present-value-adjusted wealth shock (computed by multiplying the nominal wealth shock by (1+0.03) raised to the power of the number of years from when the wealth is received until age 90: $\mathcal{W}_i^{pv} = \mathcal{W}_i(1+0.03)^{[90-a(i)]}$). *On-impact MPE* (marginal propensity to earn out of unearned income) refers to the average annual earnings loss associated with receiving a present-value adjusted wealth shock of CHF 1,000, over the first five years after treatment. To compute this, we take the elasticity estimate and scale it by the ratio of the average earnings to the average wealth shock for that age group. Multiplying this by 1,000 converts the effect into the earnings reduction associated with a CHF 1,000 wealth shock, allowing for comparability across different age groups. *Remaining-worklife MPE* corresponds to the associated cumulative subsequent earnings loss, computed by multiplying the immediate impact by the average number of years remaining until statutory retirement. This calculation provides an estimate of the total loss in earnings over a career due to the wealth shock, assuming that the immediate effect persists throughout the remaining work years. It does not, however, include earnings reductions due to the anticipation of future wealth shocks.

therefore compatible with recipients using positive wealth shocks to finance career breaks or career changes that have lasting effects on wage progression. Lacking separate information on hours and wages, however, we cannot decompose those responses in the data, and our model of Section 4 will subsume all earnings effects in adjustments to labor hours.

Figure 2 also shows that the β_k estimates in the run-up to the shock ($k < 0$) are essentially zero, suggesting an absence of pre-shock earnings trends that could confound the estimated effect. Put differently, the size of the wealth shock does not systematically correlate with earnings changes in the years immediately preceding the shock, which implies that the precise timing and size of wealth shocks are largely unanticipated even in the case of inheritance.

However, the absence of short-run anticipation effects should not be interpreted as evidence against the existence of anticipation effects over heirs' entire career path up to the arrival of the inheritance. We return to this issue in Section 5.

Age-specific earnings responses to wealth shocks. In Table 2, we decompose the pooled effects of Table 1 into their life-cycle components. We find that all statistically significant estimates of earnings responses are negative. For no age group, therefore, do we observe 'reverse Carnegie effects', whereby positive wealth shocks would trigger statistically significantly higher subsequent earnings. Most importantly for the purpose of this paper, we find negative earnings responses to be strongest for wealth shocks received at ages 55–64. This pattern applies to wealth shocks from inheritance and, even more starkly, to wealth shocks from lottery wins.

Figure 2: Event-study estimate of the pooled earnings response

Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2): each point shows the effect of the wealth shock $k \in [-3, 5]$ years from the realization of the shock relative to $k = -1$. Wealth shocks include both inheritances and lottery wins. Standard errors are clustered by individuals. The sample contains 1,266,430 person-year observations.

We can formally test for different responses to inheritances and lottery wins using a Chow test of coefficient equality, implemented as a Wald test of the null hypothesis that the two elasticities are identical. Pooled across all age groups, we do not have the statistical power to reject that null at conventional probability thresholds (p-value=0.21). However, within the 55–64 age group, where the most pronounced responses are observed, the difference between the estimated inheritance and lottery elasticities is statistically significant (p-value = 0.016). This supports our interpretation of that difference as being economically meaningful, reflecting different anticipation effects.

Figure 3 conveys the central message of our empirical analysis. The graph visualizes elasticity estimates analogous to those of Table 2 but for all wealth shocks combined (blue dots), together with the age distribution of wealth shocks observed in our data (red line). We provide a corresponding illustration of the estimates shown in the two panels of Table 2 in Appendix Figure A6. This illustration highlights how labor supply is at its most elastic exactly in the age range that coincides with the bulk of inheritance-driven wealth shocks. As we will show, the estimated age pattern of earnings responses also corresponds closely to that predicted by our life-cycle model of Section 4.

In Figure 4, we present the event-study evidence separately by age bracket. Those results are consistent with the life-cycle pattern observed through our DiD estimates, shown in Table 2 and Figure 3. We find no evidence of significant pre-trends in any age group, which supports our interpretation of the post-shock effects as being causal. Appendix Figure A7 replicates this analysis using only inheritance shocks. As expected, given that 96% of our sample wealth shocks result from inheritance, the results are very similar.

Early retirement. As individuals approach the statutory retirement age, early retirement options allow for extensive-margin responses that are of particular interest, given the age patterns shown in Table 2. We can explore this mechanism in our data by examining how wealth shocks

Table 2: Age-specific earnings responses to wealth shocks

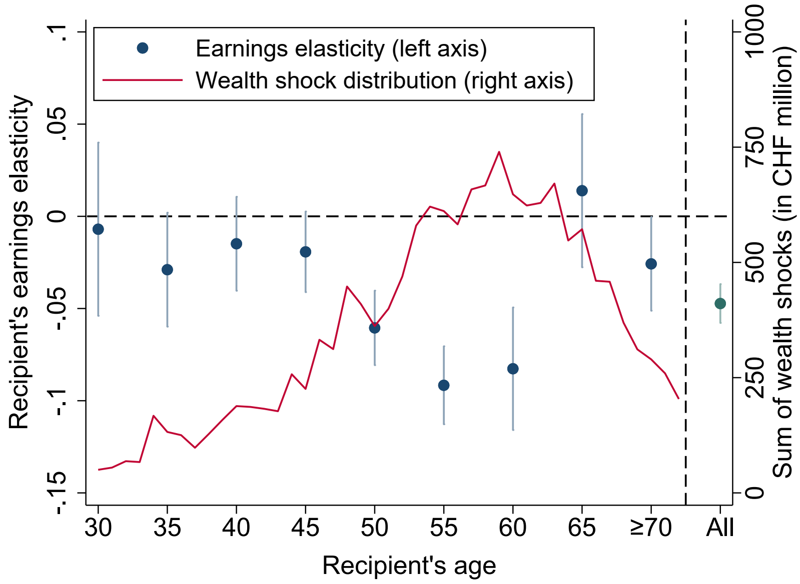
	Recipient's age: 30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	⩾70
	(a) *Sample*: Inheritances								
Earnings elasticity	-0.009	-0.026	-0.015	-0.020*	-0.063***	-0.089***	-0.077***	0.016	-0.026**
	(0.024)	(0.016)	(0.013)	(0.011)	(0.010)	(0.011)	(0.017)	(0.021)	(0.013)
Obs.	35,765	52,901	77,955	119,721	170,892	217,461	214,094	155,878	205,665
Individuals	4,198	6,087	8,598	13,084	18,772	24,134	23,586	17,095	23,541
Pr(recipient)	0.069	0.092	0.123	0.181	0.259	0.349	0.380	0.316	0.203
Average earnings (CHF)	47,398	51,957	55,366	57,683	58,932	57,289	48,866	25,117	4,064
Avg. $\mathcal{W}_i^{pv}$ (CHF, p.v. adj.)	585,634	560,842	473,805	464,215	400,107	361,970	304,728	254,623	191,983
Avg. $\mathcal{W}_i$ (CHF, nominal)	107,165	117,148	115,196	131,238	131,217	136,825	133,025	127,875	134,365
On-impact MPE (CHF)	-1	-2	-2	-3	-9	-14	-12	2	-1
R.-worklife MPE (CHF)	-23	-66	-40	-45	-119	-112	-38	-	-
	(b) *Sample*: Lottery wins								
Earnings elasticity	0.020	-0.098	-0.011	0.007	0.022	-0.168**	-0.346***	-0.065	0.018
	(0.114)	(0.062)	(0.047)	(0.072)	(0.060)	(0.076)	(0.129)	(0.158)	(0.126)
Obs.	4,541	5,360	6,597	6,564	6,630	6,198	5,253	3,337	2,871
Individuals	528	618	748	737	734	693	592	366	330
Pr(recipient)	0.009	0.012	0.011	0.010	0.010	0.010	0.009	0.007	0.002
Average earnings (CHF)	45,636	51,371	50,110	52,851	53,290	49,225	42,323	23,041	3,671
Avg. $\mathcal{W}_i^{pv}$ (CHF, p.v. adj.)	133,364	136,176	533,950	411,632	306,656	457,909	293,200	688,998	157,063
Avg. $\mathcal{W}_i$ (CHF, nominal)	23,783	28,508	126,253	118,591	98,688	176,643	125,301	345,375	105,808
On-impact MPE (CHF)	7	-37	-1	1	4	-18	-50	-2	1
R.-worklife MPE (CHF)	220	-1032	-24	17	50	-146	-156	-	-

Notes: This table reports the earnings elasticity to wealth shocks, corresponding to the estimated value of β in equation (1), by five-year age group. Panel (a) focuses on inheritances, and Panel (b) on lottery wins. For each panel, we also report the number of individuals (i.e., recipients), the probability of being a recipient, information on recipients' average earnings, the average nominal wealth shock, and the average present-value-adjusted wealth shock (computed as: $\mathcal{W}_i^{pv} = \mathcal{W}_i(1+0.03)^{[90-a(i)]}$). *On-impact MPE* (marginal propensity to earn) refers to the average annual earnings loss associated with receiving a present-value adjusted wealth shock of CHF 1,000, over the first five years after treatment. To compute this, we take the elasticity estimate and scale it by the ratio of the average earnings to the average wealth shock for that age group. Multiplying this by 1,000 converts the effect into the earnings reduction associated with a CHF 1,000 wealth shock, allowing for comparability across different age groups. *Remaining-worklife MPE* corresponds to the associated cumulative subsequent earnings loss, computed by multiplying the immediate impact by the average number of years remaining until statutory retirement. This calculation provides an estimate of the total loss in earnings over a career due to the wealth shock, assuming that the immediate effect persists throughout the remaining work years. It does not, however, include earnings reductions due to the anticipation of future wealth shocks.

affect the likelihood of early retirement. We define early retirement as the year in which an individual begins drawing a social security or occupational pension, or cashes out pension entitlements before reaching the statutory retirement age (65 for men, 64 for women). To ensure that these events reflect actual (full or partial) workforce exits, we limit the definition to individuals who were active in the labor market during the previous year. Institutional rules preclude formal early retirement before age 58, and we account for the applicable age thresholds across pension types (see Appendix Section C3 for institutional details). Our definition does not require full labor-market withdrawal: individuals can still earn income while drawing a pension. What we thus capture are instances of formal and irreversible initiations of retirement.

Figure 5 presents an event-study analysis of the effect of wealth shocks on the probability of early retirement. The figure plots the estimated coefficients of a regression analogous to equation (2), where the outcome is a binary variable equal to one in each year following transition into early retirement. In terms of treatment effect, our estimate based on equation (1) implies that a 1% increase in treatment size (corresponding to approximately CHF 3,600 for individu-

Figure 3: Age profile of earnings responses to wealth shocks



Notes: This figure shows age-specific earnings elasticities to wealth shocks, obtained by estimating the DiD equation (1). Each point reflects the estimated elasticity of log labor earnings with respect to log present-value-adjusted wealth shocks, computed separately by age group at the time of receipt (left axis). The estimated values are given in Table 2. The elasticity for "All" corresponds to the pooled estimate across all ages. Each elasticity is estimated over a time interval spanning -3 to 5 years around the realization of the wealth shock. The figure also shows the empirical distribution of wealth transfers (red line; right axis), measured as the sum of wealth shocks received by each age group (in CHF million, pooled over 2002–2019). The sample contains 1,266,430 person-year observations.

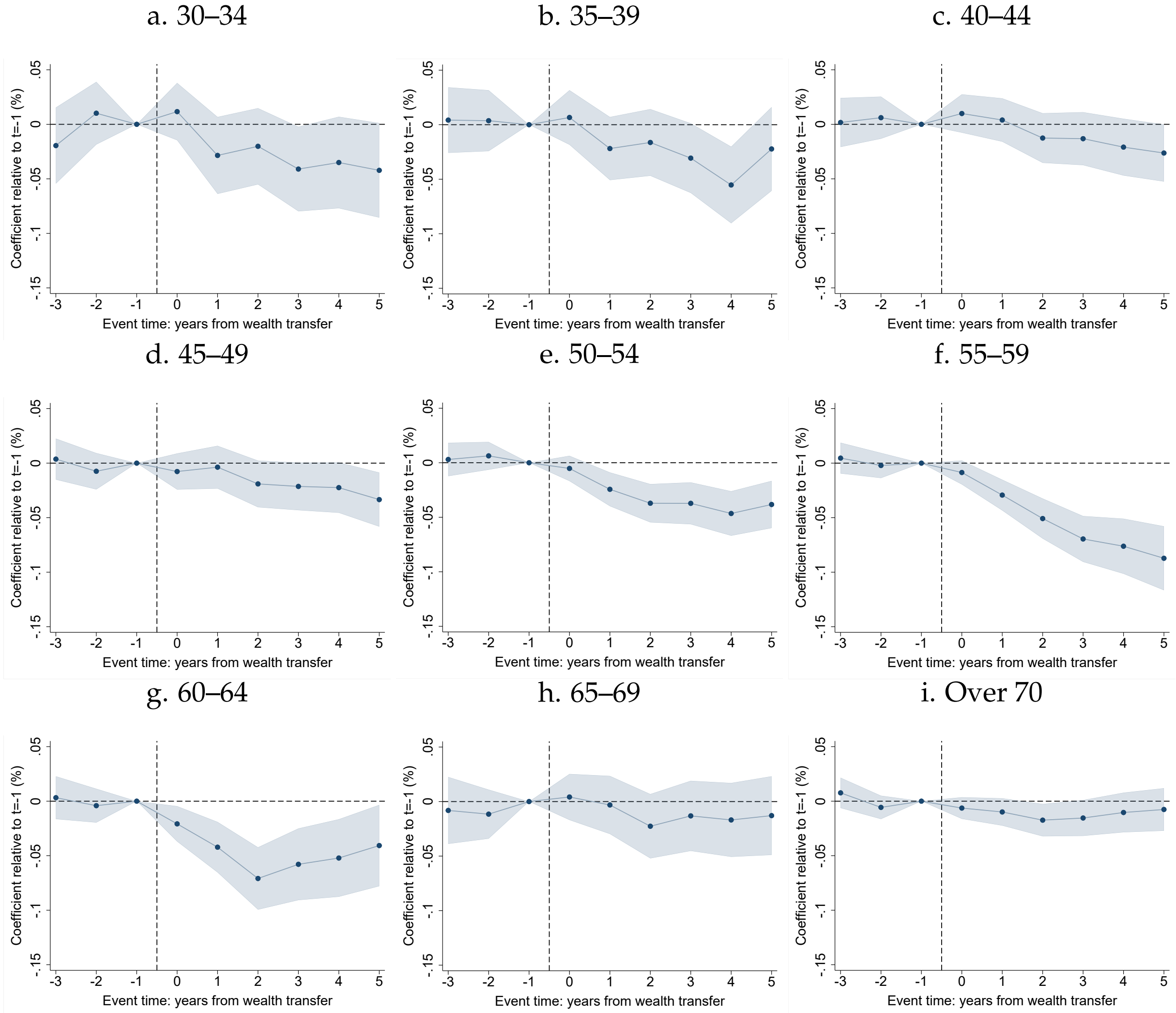
als aged 55–59) raises the probability of early retirement by about 0.5 percentage points, which amounts to roughly 5.7% of the mean early retirement rate in this age group. In other words, a CHF 10,000 wealth shock increases the probability of early retirement by about 16.0% of the mean.

Once again, we find the coefficients for the years prior to the wealth shock to be statistically indistinguishable from zero, indicating the absence of pre-trends. Hence, recipients do not systematically adjust their retirement choices in anticipation of the wealth shock, within the 3-year window preceding it. Second, starting in the year of the shock (event time zero), we observe a statistically significant and increasing trend in the probability of early retirement. This confirms our model's prediction that wealth shocks can induce extensive-margin labor supply reductions via early retirement.

A natural and policy-relevant question is how much of the total response observed among older age groups is driven by early retirement. We can shed light on this question by comparing earnings responses across subsamples that do and do not include early retirees. To the extent that early retirement is an important mechanism driving observed total responses, omitting early retirees should result in attenuated elasticities, particularly at older working ages. Conversely, if earnings responses were primarily driven by adjustments at the intensive margin, then removing early retirees would leave the estimates largely unchanged.

This is what we show in Figure 6, where we plot a replication of the age-specific earnings elasticities of Figure 3 without considering individuals who retire early within our observation window (red squares). We restrict our analysis to individuals receiving a wealth shock at age 50 and older, because we cannot observe retirement choices of younger cohorts, due to the limited time span of our data. It emerges starkly that earnings responses at ages 60–64 are almost

Figure 4: Event-study estimates by age group



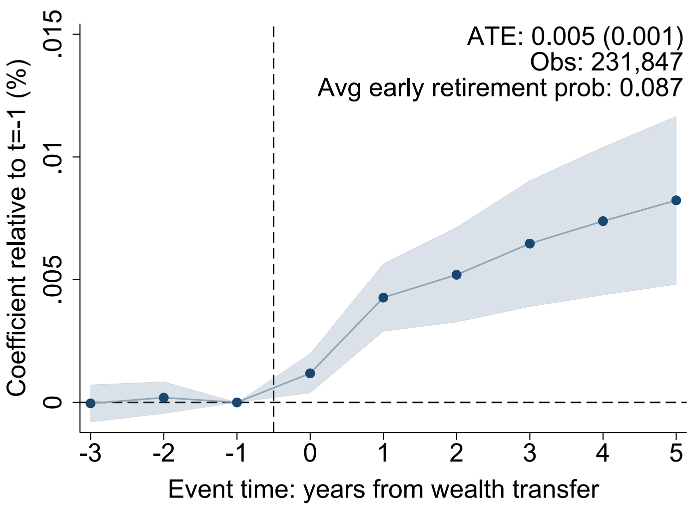
Notes: This figure shows event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings by age group (based on the year when the wealth shock is received). It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2): each point shows the effect of the wealth shock $k \in [-3, 5]$ years from the realization of the shock. Wealth shocks include both inheritances and lottery wins. Standard errors are clustered by individuals. For sample sizes, see Table 2.

entirely driven by early retirement. When early retirees are excluded, the estimated elasticity in this age group drops to essentially zero. In contrast, at ages 55–59, the response is only slightly reduced in magnitude, suggesting that roughly one-fifth of the response in this group is attributable to early retirement, although this is imprecisely estimated. Consistent with this pattern, the pooled elasticity for individuals aged 50–64 declines from –0.080 when early retirees are included to –0.064 when they are excluded. These findings are shaped by institutional features of the Swiss pension system, whereby formal early retirement becomes possible from age 58 onward (see Appendix Section C3 for institutional details). Early retirement thus emerges as an important determinant of the aggregate labor supply response to inheritance.

3.2 Robustness

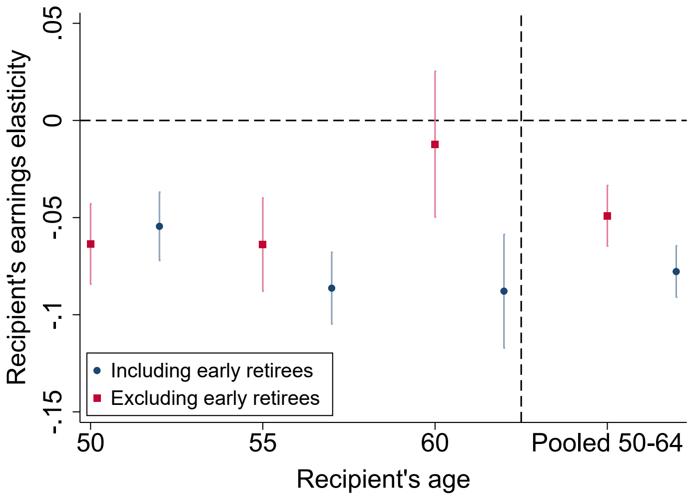
This subsection presents robustness checks along multiple dimensions, including incorporating additional controls, treatment discretization, relative shock size, panel balance, and sample composition, to verify that our main findings are not driven by arbitrary modeling choices or

Figure 5: Early retirement responses



Notes: This figure shows event-study estimates of the impact of wealth shocks on the probability of early retirement. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2): each point shows the effect of the wealth shock $k \in [-3, 5]$ years from the realization of the shock. Wealth shocks include both inheritances and lottery wins. Standard errors are clustered by individuals. The earliest possible age to formally retire early is 58. Hence, we consider individuals who receive a wealth shock at ages 55–59. The upper bound of 59 is imposed in order to avoid mechanical effects from retirement at the statutory age (65 for men, 64 for women). The outcome variable is a binary variable equal to one when the individual starts drawing an occupational or public pension, or cashes out pension savings for retirement, conditional on having been labor-market active in the previous year. The positive and significant post-treatment estimates indicate that receiving a wealth shock at an age close to statutory retirement increases the likelihood of early retirement. The figure also reports the average treatment effect (ATE), corresponding to the estimated value of β in equation (1) when using early retirement as the outcome variable, the number of observations, and the average early retirement in the sample of individuals who receive a wealth shock at ages 55–59.

Figure 6: Earnings responses with and without early retirees



Notes: This figure shows age-specific earnings elasticities to wealth shocks, obtained by estimating equation (1). The model is estimated separately for two samples. Blue circles report the age-specific elasticity estimates from the full sample, identical to those shown in Figure 3. Red squares replicate the same estimation procedure but exclude all individuals who eventually retire early within the 2002–2019 sample period. Early retirees are defined as individuals who begin drawing an occupational or public pension, or who cash out pension entitlements, before reaching the statutory retirement age (65 for men and 64 for women), provided that they were labor-market active in the preceding year. By comparing the two estimates, we qualitatively assess the role of early retirement in shaping labor supply responses to wealth shocks. We restrict our analysis to recipients aged 50 and older because we cannot observe retirement choices of younger cohorts, given the time span of our data. The pooled elasticity with early retirees is -0.080 (SE = 0.007); without early retirees is -0.064 (SE = 0.008).

sample selection.

Additional controls. To strengthen the credibility of our identification strategy, we re-estimate the event-study specification with additional controls aimed at (i) addressing concerns related to possible confounding shocks correlated with both earnings and the wealth shock; (ii) providing a more refined selection of comparison groups. By including these controls, we ensure that heirs are not only of the same age and treated in the same calendar year (as in our baseline specification), but are also matched more finely on observable characteristics such as pre-shock income, wealth, place of residence, and marital status. The wealth and income controls in particular serve to check whether our estimated responses to inheritance may suffer from attenuation bias because large inheritances could be systematically preceded by large inter-vivos gifts—too long in advance of inheritance for our 18-year observation window to pick up.

Specifically, we sequentially add marital-status-by-year fixed effects (to capture life-cycle events that may jointly influence earnings and inheritance timing), municipality-by-year fixed effects (to absorb local labor-market shocks or regional heterogeneity), pre-shock income-quartile-by-year fixed effects, and pre-shock wealth-quartile-by-year fixed effects (to flexibly account for heterogeneous earnings trajectories across the income and wealth distribution). We also estimate a model including all these fixed effects simultaneously. Appendix Figures B1 and B2 show that the estimated dynamic responses remain remarkably similar to our baseline across all specifications. This, in particular, suggests that inter-vivos gifts predating inheritance receipt do not noticeably affect our estimates.

Sensitivity to varying the CHF 10,000 threshold. To ensure that our results are not driven by the specific threshold used to define economically meaningful wealth shocks, we test the sensitivity of our estimates to alternative cutoffs. In the baseline analysis, we exclude inheritances and lottery wins below CHF 10,000, as such small amounts are unlikely to affect labor supply. To assess robustness, we re-estimate equation (1) using thresholds ranging from CHF 5,000 to CHF 15,000, in increments of CHF 100. As shown in Appendix Figure B3, the resulting elasticity estimates remain remarkably stable and closely aligned with the baseline estimate, indicating that our findings are not sensitive to the choice of the threshold.

Discretizing the treatment. To assess the robustness of our main results, we re-estimate our event-study specification using a discrete treatment definition. Specifically, we classify individuals who receive a wealth shock below the average as the control group, and those who receive a shock larger than five times the average as the treated group. This discrete split allows us to recast the DiD model as a standard binary treatment effect estimation, while preserving the essential logic of comparing recipients of varying treatment intensities. Appendix Figure B4 presents the event-study results using this discrete specification. The dynamic pattern of earnings responses remains virtually unchanged relative to our baseline continuous-treatment model: we find no evidence of differential pre-trends, and a clear and persistent decline in earnings after the wealth shocks. Moreover, Appendix Figure B5 shows that the consistency of these results holds across all age groups, and separately for different doses (see Appendix Figures B6 and B7). Results are also robust to alternative discrete thresholds.

Rescaling treatment by pre-shock income. A potential concern in our baseline specification is that the labor supply response to wealth shocks might depend not only on the absolute (present-value-adjusted) size of the shock, but also on its size relative to the recipient's prior income. If higher-income individuals react less to a given wealth shock because it represents a smaller share of their lifetime resources, failing to account for this heterogeneity could bias our estimated elasticities. To address this concern, we perform a robustness test in which we rescale the treatment variable by pre-shock labor earnings, measured as average earnings over the three years preceding the shock. This approach accounts for relative wealth effects and tests whether our findings are driven primarily by variation in shock size relative to prior income. Appendix Figure B8 shows our estimates based on this alternative specification: the pattern of earnings responses remains very similar to that in our main analysis, except for the 60–64 age group. That difference suggests that wealth shocks trigger early retirement, especially for high earners (for whom the wealth shocks appear comparatively small when expressed relative to pre-shock income, and the resulting coefficient is thus closer to zero).

Keeping a balanced sample. Another potential concern is that our baseline estimates may be affected by unbalanced panel composition over event time. In particular, if individuals with shorter observed earnings histories (e.g., due to death or migration) differ systematically in their labor supply responses, this could bias our dynamic estimates. For instance, if those most strongly affected by the wealth shock are also more likely to leave the panel early, our estimates of post-shock effects may understate the true earnings response. To address this issue, we re-estimate our event-study model on a balanced sample of individuals whom we observe for at least three years prior to and five years subsequent to the wealth shock. The dynamic patterns remain consistent with our baseline findings, as shown in Appendix Figure B9. Appendix Figure B10 shows the corresponding event-study estimates by age group. The results again remain remarkably similar to those based on the full sample, confirming that sample imbalance does not drive our findings.

Comparing heirs with lottery players. An important identification concern in our comparison between inheritances and lottery wins is that lottery players may systematically differ from heirs, both in observable and unobservable ways. For example, lottery players might be more risk-seeking, financially constrained, or socioeconomically disadvantaged, which could lead to different labor supply elasticities (see Appendix Table A1 for summary statistics on the subsamples of heirs and lottery winners, and Appendix Section C2 for background on what is known about lottery players more generally). If so, our comparison between responses to inheritance and lottery wins might be confounded by differences in recipient characteristics rather than in shock type. To address this concern, we exploit a unique feature of our data: we observe even trivial lottery winnings, which implies that we can identify individuals who play the lottery even if they never win large amounts. We thus restrict our sample to individuals who receive an inheritance and also play the lottery. Appendix Figure B11 presents the age-specific elasticity estimates for this subset. The pattern of earnings responses closely resembles that of our baseline inheritance results. Again, the age group 60–64 turns out to be an exception: at these ages, lottery players do not seem to react significantly to wealth shocks, in contrast to the population as a whole. Overall, our differential findings for (partly anticipated) inheritance shocks and (unanticipated) lottery shocks do not seem to be driven by endogenous selection into playing the lottery, although we cannot comprehensively reject the presence of a selection effect.

Do liquidity and attachment effects attenuate responses? A potential concern is that inheritance and lottery wealth differ not only in the degree to which they are anticipated, but also in their composition. Whereas lottery prizes are typically received as cash, inheritances often include illiquid assets such as housing or, less frequently, family businesses. This difference could attenuate heirs' earnings responses relative to lottery winners, even conditional on age and shock size, because illiquid wealth is harder to monetize and may also carry sentimental value (e.g., a childhood home). To assess whether liquidity differences drive our findings, we classify inheritances into those consisting predominantly of real estate (at least 50% housing wealth) and those consisting predominantly of liquid assets (at least 50% non-housing wealth). We then estimate separate event studies for both groups. Appendix Figure B12 shows that the labor supply responses of heirs to housing versus cash-dominated inheritances are remarkably similar in both timing and magnitude. This evidence suggests that the smaller responses to inheritance compared to lottery wins are not primarily explained by differences in the nature of the assets received, but rather by the anticipation component inherent in bequests.

Household-level estimates. Our baseline analysis is conducted at the individual level, even though both inheritances and lottery wins are declared at the household level. To assign these shocks to individuals, we split them equally between spouses, which implicitly assumes a 50–50 division of resources within married couples. This choice is necessarily arbitrary, as the true intra-household allocation may reflect bargaining power, consumption preferences, or household-specific sharing rules. To assess whether this assumption drives our findings, we re-estimate our baseline specifications at the household level, treating the wealth shock as a joint event. The resulting estimates, shown in Appendix B13, are virtually unchanged, which reassures us that our conclusions are not sensitive to the unit of observation.

Level-level estimates. Our baseline regression specifications use a log-log functional form, as Figure 1 shows the relationship of income and wealth shocks to be linear in logs, and as this makes the empirical model consistent with concave wealth effects—see our discussion in Section 2.2. We can nonetheless check our log-log estimates against those resulting from a level–level specification. Appendix Table B1 presents such estimates. Like in our log-log models, estimated effects are negative and statistically significant across shock types, and somewhat stronger for lottery wins than for inheritances. Benchmarking the magnitudes of the estimates in Appendix Table B1 against those implied by the log-log estimates of Table 1, we find the on-impact MPEs resulting from level-level regressions to be around half the size of their log-log equivalents. This is as expected, as the level–level model averages a constant dollar-for-dollar effect over a distribution that likely features diminishing marginal wealth effects, so that giving more weight to larger shocks—especially lotteries—will attenuate estimated responses toward zero.

3.3 Heterogeneous effects

Here, we briefly document differential responses by gender and by family status. This serves as a plausibility check on our main estimates, as well as being of interest in its own right.

Women and men. A natural dimension of heterogeneity is gender. Labor supply responses to wealth shocks may differ between men and women because household decision-making and time allocation are shaped by gender roles and bargaining power (Chiappori, 1992; Chiappori, 1988). In particular, women—especially during childbearing years—often have a more elastic labor supply. This may have a number of causes, including traditional gender norms and limited childcare options, often leading women to work less than full-time. Women may therefore adjust more readily when financial constraints are relaxed.

Panel (a) of Figure 7 confirms that women's earnings respond more strongly to wealth shocks than men's in most age groups: the pooled earnings elasticity is roughly twice as large in absolute value for women as for men. In particular, for women, the peak response is observed in the 35–39 age group, and strong responses are also found for the 40–44 age group. This is consistent with evidence that the presence of young children increases in particular women's utility of time outside of paid work and thus leads them to have more elastic labor supply with respect to positive wealth shocks.

The gender difference is reversed, however, when we consider level effects: a CHF 10,000 wealth shock reduces annual earnings by about CHF 52 for men and CHF 44 for women. Those changes in earnings represent a larger percentage change for women, which is why when expressed as elasticities, women's reactions are stronger than men's.

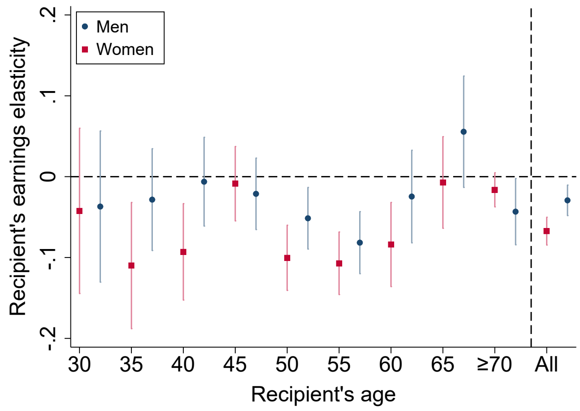
Prior research based on lottery winnings has found men's labor supply if anything to react more strongly than women's labor supply, both when expressed as elasticities and in levels (Cesarini et al., 2017; Golosov et al., 2024; Imbens et al., 2001). Those results stand in contrast to much of the empirical literature in labor economics (Keane, 2011). In our case, female labor supply turns out to be more elastic than male labor supply, consistent with the wider literature.

Presence/absence of children. Parental status can shape labor supply responses through two main channels. First, the opportunity cost of working can differ between parents and non-parents. Parents typically face higher non-market demands on their time due to childcare responsibilities, which make market work relatively less attractive once financial constraints are relaxed. This mechanism is likely stronger for women, who continue to bear a disproportionate share of household and caregiving duties (Kleven et al., 2019). Second, bequest motives can act in the opposite direction, increasing parents' attachment to the labor force, as parents may wish to preserve or augment their wealth to leave an inheritance.

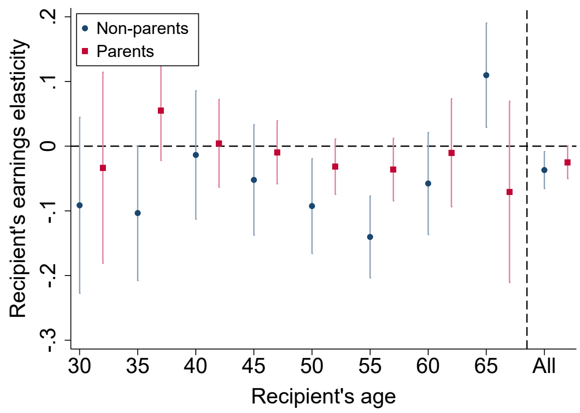
Panels (b) and (c) of Figure 7 show that childless men and women respond slightly more strongly to wealth shocks than parents, consistent with the bequest motives and family-related financial obligations keeping parents more tied to work. Among men, differences between parents and non-parents mostly widen around 55–64, when the option of early retirement becomes salient. Among women, we find a stronger labor supply response from mothers at age 35, when care duties are likely to be important. Taken together, these patterns indicate that childcare constraints drive women's responses at younger ages, while at later ages, the persis-

Figure 7: Earnings responses by gender and presence of children

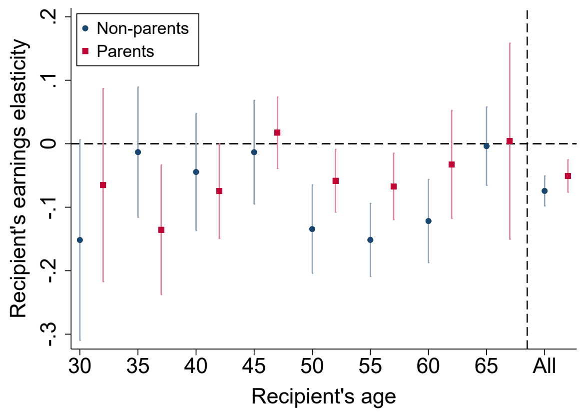
(a) Women vs. men



(b) Men with/without children



(c) Women with/without children



Notes: This figure compares earnings elasticities to wealth shocks by age, estimated separately for women and men (Panel a) and for men and women with dependent children and without dependent children (Panel b and c, respectively). Each point reflects the estimated elasticity of log labor earnings with respect to log present-value-adjusted wealth shocks, computed separately by age group at the time of receipt. The elasticity for "All" corresponds to the pooled estimate across all ages for the respective group. Each elasticity is estimated over a time interval spanning -3 to 5 years around the year of the wealth shock. In the bottom graphs, we remove the age group $\geqslant 70$ because there are just a few observations for individuals with dependent children.

tence of labor market attachment among parents is consistent with bequest motives offsetting pure income effects.

Pre-shock income and wealth. We also test whether heirs with different pre-shock income or wealth levels react differently to inheritance receipt. As shown in Appendix Figure B14, earnings elasticities are remarkably similar across groups: heirs above and below the median of pre-shock income or wealth display nearly identical life-cycle patterns. In both cases, the estimated responses are negative but statistically indistinguishable from each other at all ages. These results suggest that wealth shocks induce similar behavioral adjustments among richer and poorer heirs, implying that liquidity constraints or baseline wealth differences play a limited role in shaping post-inheritance labor supply responses. This finding is also consistent with our robustness checks showing that including pre-shock income- or wealth-quartile-by-year fixed effects leaves our baseline estimates essentially unchanged (see Appendix Figure B8), suggesting that differential earnings trends across the income and wealth distribution do not drive the results.

4 Wealth shocks and labor supply in a life-cycle model

In this Section, we build a life-cycle model with endogenous labor supply in partial equilibrium for a theory-based prediction of how positive wealth shocks affect labor supply at different times in life, whether expected or unexpected. In the model, individuals face age-specific incomes and survival probabilities. Those individuals choose at every age how much to consume and to save, and how many labor hours to supply. We start with a simple version of the model and later present extensions allowing for early retirement and bequest motives. We keep the model tractable enough to allow for closed-form solutions regarding labor supply and consumption.

The aim of this exercise is to produce a framework that can be cross-validated with the empirical findings of Section 3 and serve as a basis for counterfactual simulations. The model is calibrated to match observed life-cycle income and wealth profiles and the *average* labor supply elasticity but *not* age-specific elasticities, which will turn out to match our estimated elasticities after unexpected (lottery) and expected (inheritance) shocks closely. Readers more interested in those applications than in the model itself might choose to jump straight to Section 5.

4.1 A simple life-cycle model with labor supply

We follow the literature by considering age brackets a of 5 years (De Nardi, 2004). In the baseline version of the model, we impose mandatory retirement at age $a = T = 65$, and certain death at $a = D = 90$. Retired individuals receive replacement income from age $a = T + 1$ to age $a = D$.

Baseline model. Individuals i of age $a \geqslant 30$ face a common probability ς_a of being alive next period, with $\varsigma_{D+1} = 0$. For the time being we allow same-age individuals to differ in terms of their wage income $w_{i,a}$. Later on, we will drop the i subscript considering it absorbed by the individual fixed-effect in the empirical section. Individual i of age a with accumulated wealth of $b_{a,t-1}$ has the following lifetime welfare:

$$V\left(b_{i,a-1}\right) = u\left(c_{i,a}, 1 - h_{i,a}\right) + (1+\rho)^{-1}\,\mathbb{E}_a\left\{\varsigma_a V\left(b_{i,a}\right)\right\}, \tag{3}$$

where $c_{i,a}$ is consumption, $h_{i,a}$ denotes hours worked, and $(1+\rho)^{-1}$ is the subjective discount factor. Individuals derive utility from direct consumption $c_{i,a}$, disutility from working a fraction $h_{i,a}$ of their time, and freely carry wealth $b_{i,a}$ from one period to the next. This also applies to negative wealth, meaning that saving and borrowing are unconstrained, within the bounds implied by the transversality condition. Given our assumptions, lifetime welfare can also be expressed as:

$$V\left(b_{i,0}\right) = \mathbb{E}_0\left\{\sum_{a=0}^{D} \frac{\Lambda_a}{(1+\rho)^a} u\left(c_{i,a}, 1 - h_{i,a}\right)\right\}, \tag{4}$$

where $\Lambda_a = \varsigma_0 \varsigma_1 ... \varsigma_a$ is the survival probability between age 0 and age a. The per-period budget constraint of individual i is then:

$$b_{i,a} + c_{i,a} = (1+r)\, b_{i,a-1} + y_{i,a} + \mathcal{W}_{i,a}, \tag{5}$$

where $b_{i,a}$ is current wealth, r is the exogenous rate of return to wealth, $y_{i,a}$ is *income*, which can derive from work or retirement, and $\mathcal{W}_{i,a}$ an exogenous wealth shock. If $a < T+1$ (individual's age is below 66, omitting early retirement for the time being), then individual i works. Her income is $y_{i,a} = y^w_{i,a} = w_{i,a} h_{i,a}$ which is endogenous since individuals choose $h_{i,a}$. If $a \geqslant T+1$, individual i receives an exogenous pension income $y^p_{i,a}$, implying $y_{i,a} = y^p_{i,a}$.

We consider a log-log utility function, which implies separability between consumption and leisure:

$$u\left(c_{i,a}, 1 - h_{i,a}\right) = \ln\left(c_{i,a}\right) + \kappa \ln\left(1 - h_{i,a}\right). \tag{6}$$

In this particular case, Appendix D shows that we can derive closed-form expressions for consumption $c_{i,a}$ and earnings $y^w_{i,a} = w_{i,a} h_{i,a}$:

$$c_{i,a} = \frac{\lambda_i}{\mathbb{E}_a\left\{\Gamma_a\right\}} \Upsilon_{i,a}, \tag{7}$$

$$y^w_{i,a} = w_{i,a} - \frac{\kappa \lambda_i}{\mathbb{E}_a\left\{\Gamma_a\right\}} \Upsilon_{i,a}, \tag{8}$$

where $\Upsilon_{i,a}$ denotes permanent income and λ_i the marginal utility of wealth.[17] Assuming that $\Lambda_a = 1 \; \forall a \leqslant T$, i.e., allowing for death risk only after retirement, and using the definition of Λ_a, the lifetime discount factor Γ_a is given by:

$$\Gamma_a = \frac{(1+\kappa)}{\rho} \left(\frac{(1+\rho)^{T-a} - 1}{(1+\rho)^{T-a}} \right) + \sum_{s=T-a}^{D} \frac{\mathbb{E}_a\left\{\varsigma_{a+1} ... \varsigma_{a+s}\right\}}{(1+\rho)^s}. \tag{9}$$

Equation (9) shows that Γ_a consists of two summands. The first term relates to future working-age periods and captures the labor supply-adjusted lifetime discount factor. The second term relates to future retirement periods and depends on the expected probability of survival. Both terms decline with age—because a increases and because survival probabilities ς_a fall—which implies that the sensitivity of current consumption and current earnings to permanent income $\Upsilon_{i,a}$ increase with age as individuals become more impatient. Further, permanent income is defined as:

$$\Upsilon_{i,a} = \mathbb{E}_a \left[b_{i,a-1} + \sum_{s=0}^{T-a} \frac{w_{i,a+s}}{(1+r)^s} + \sum_{s=T-a}^{D} \frac{y^p_{i,a+s}}{(1+r)^s} + \sum_{s=0}^{D-a} \frac{\mathcal{W}_{i,a+s}}{(1+r)^s} \right], \tag{10}$$

where $b_{i,a-1}$ denotes past-period wealth, the second and third terms respectively capture working-life and retirement permanent income components, both evaluated at age a, and the fourth term is the discounted sum of future expected wealth shocks.

Returning to equation (7), we find that the fraction of permanent income consumed every period is not constant, because Γ_a declines with age. Older individuals consume more, as they

[17] More specifically, λ_i is the Lagrange multiplier associated with the lifetime/intertemporal budget constraint, and as such captures the additional utility gained from an increase in wealth, reflecting the shadow price of wealth in the individual's optimization problem.

become more impatient. By implication, any factor that contributes to increasing individuals' permanent income, such as a higher past wealth $b_{i,a-1}$, higher lifetime income profiles ($y^p_{i,a}$ or $w_{i,a}$) or unexpected wealth shocks $\mathcal{W}_{i,a}$, will raise current consumption.

Equation (8) also shows that the size of the wealth effect on labor supply depends on permanent income $Y_{i,a}$, on the relative weight of leisure in the utility function κ, on the individual-specific marginal valuation of wealth λ_i, and on the age-specific lifetime discount factor Γ_a. In particular the model predicts that the wealth effect on labor supply should be stronger with age because the lifetime discount factor falls, implying larger distortions on labor supply because current earnings become more sensitive to permanent income with age.

Responses to a wealth shock. The above expressions imply the following earnings response to an expected wealth shock at age $a+s$, compared to a situation where no shock is received (ns):

$$\frac{y^w_{i,a} - y^{w,ns}_{i,a}}{y^{w,ns}_{i,a}} = -\mathbb{E}_a \left\{ \frac{\kappa \lambda_i}{\Gamma_a (1+r)^s} \frac{\mathcal{W}_{i,a+s}}{y^{w,ns}_{i,a}} \right\} \leqslant 0. \tag{11}$$

The percentage response of current earnings depends on the size of the initial shock as a percentage of permanent income, and on the elasticity $\frac{\kappa\lambda_i}{\Gamma_a(1+r)^s}$, which itself depends on the individual marginal utility of wealth λ_i, on the age-specific lifetime discount factor Γ_a and on the age distance to the expected shock s interacted with the interest rate r. In any case, the intertemporal wealth effect implies a negative response of earnings, the magnitude of which increases with age—as Γ_a falls when individuals get older. The response of earnings in later periods $\Delta y^w_{i,a+s}$, $s > 0$, to a shock hitting at age a not only depends on the size of the initial shock but also on how much of this wealth shock is consumed on impact, by how much earnings drop on impact and therefore how wealth $b_{i,t}$ is affected. We need to run simulations to determine how these objects evolve.

Before we turn to the simulations, let us define two important elasticities. The first one, which we label "structural", is the log difference of earnings upon receiving a wealth shock at age a with respect to earnings at age a in a counterfactual situation with no shock at any age:

$$\xi^{struct}_a = \frac{\ln y^w_{i,a} - \ln y^{w,ns}_{i,a}}{\ln \mathcal{W}_{i,a}}. \tag{12}$$

The determinants of this elasticity are analogous to those of equation (11).

A second elasticity concept, which we label "impact", corresponds to what we have estimated in Section 3, looking at the difference between the log change in earnings upon receiving a wealth shock and the counterfactual log change in earnings absent the shock:[18]

$$\xi^{impact}_a = \frac{(\ln y^w_{i,a} - \ln y^w_{i,a-1}) - (\ln y^{w,ns}_{i,a} - \ln y^{w,ns}_{i,a-1})}{\ln \mathcal{W}_{i,a}}. \tag{13}$$

For wealth shocks that are *unexpected*, these two elasticities are identical, because the shocks

[18]Our baseline empirical specification features a continuous treatment variable, but the interpretation of the resulting elasticity estimate is equivalent, *mutatis mutandis*. The elasticity also depends on the relative size of the wealth shock. Larger shocks relative to income naturally imply larger proportional responses. Our reduced-form estimates account for this by allowing for individual heterogeneity in income within each age bracket (through the inclusion of individual and age-calendar-year fixed effects). In alternative specifications, we also directly rescale the wealth shock by pre-shock income and wealth (see Appendix Figure B8).

do not affect earnings prior to their realization, i.e., $y^{w}_{i,a-1} = y^{w,ns}_{i,a-1}$. However, the two elasticities will differ when shocks are *expected*. We shall therefore keep track of the two elasticities in the model simulations.[19] Further, Appendix D shows that the two elasticities are approximately related by:

$$\xi_a^{struct} \approx \xi_a^{impact} - \frac{\kappa \lambda_i \mathcal{W}_{i,a}}{\Gamma_{a-1}(1+r) y^{w,ns}_{i,a-1} \ln \mathcal{W}_{i,a}}, \tag{14}$$

which quantifies the difference between the impact and structural elasticities due to anticipation. Knowing in advance that one will receive a wealth shock at age a triggers a response at the time the information is known, which is then incorporated in the dynamics of earnings ahead of the shock. That response is negative and needs to be added to the negative impact response, so that the structural elasticity to expected shocks is larger than the impact elasticity. The size of the anticipated response depends on a number of factors, among which the size of the wealth shock relative to prior earnings ($\mathcal{W}_{i,a}/y^{w,ns}_{i,a-1}$), and on the factors including the preference for leisure (κ), the marginal utility of wealth (λ_i), the age-specific discount factor (Γ_{a-1}), and the interest rate (r).

4.2 Calibration and simulation

We now use the above expressions to derive our objects of interest. For this application, we abstract from the heterogeneity of agents within age cohorts, which allows us to drop the subscript i.[20] We use our dataset (Bern Tax Administration, 2025; see Section 2.1) to match the average life-cycle income profile y_a, and WHO (2023) for the age-contingent probability of dying ς_a. These data allow us to infer life-cycle profiles of wages w_a (using equation 8), and to compute consumption profiles c_a (using equation 7) and wealth profiles b_a (using equation 5). Our first step consists of computing the life-cycle wage profile w_a that, combined with the endogenous equilibrium life-cycle profile of hours worked h_a, matches the life-cycle profile of labor income observed in the data. In a second step, we make use of the same set of equations and calibrations to investigate the contemporaneous and lifetime effects on earnings of a wealth shock received at a given age.

Calibration. We continue to consider 5-year age cohorts, to abstract from individuals aged below 30, and to assume people who reach their 90th year to die with certainty. The model is thus populated by individuals in age cohorts $a = \{30-34, ..., 85-89\}$. As explained above, we calibrate the life-cycle wage profile such that, in equilibrium, the model matches the life-cycle profile of income taken from the Bern tax data for 2010, which marks the midpoint of our 2002–2019 observation period (see Section 2.1). The two sets of inputs are shown in the first two columns of Table 3.

Furthermore, we impose a 3% annual interest rate such that $r = (1+0.03)^5 - 1 = 0.1593$, and we normalize $\lambda_i = 1$. The model is solved and the wage process adjusted (see the last column of Table 3) such that the life-cycle profile of earnings (wages × hours worked) fits the life-cycle pattern of income. For people over 65, retirement income is calibrated with average

[19] The two elasticities also coincide when expected shocks hit in the first period of individuals' life, which, as in Section 3, we assume to be at age 30.

[20] Our empirical models feature individual and calendar year-by-age fixed effects to neutralize this potential source of heterogeneity (see Section 2.2).

Table 3: Calibration

Age	Surv. prob., ς_a	Income (data)	Hourly wage (inferred)
30 – 34	1	2.51	28.65
35 – 39	1	2.78	31.69
40 – 44	1	3.10	35.35
45 – 49	1	3.31	37.75
50 – 54	1	3.38	39.47
55 – 59	1	3.29	39.41
60 – 64	0.97	3.02	37.88
65 – 69	0.96	2.64	-
70 – 74	0.93	2.41	-
75 – 79	0.89	2.33	-
80 – 84	0.79	2.31	-
85 – 89	0.65	2.38	-

Notes: Incomes are reported for 5-year periods and expressed in CHF 100,000. Following De Nardi (2004), individuals are assumed not to die before age 60, so that $\varsigma_{a<60} = 1$. For age cohorts with $0 \leqslant \varsigma_a \leqslant 1$, probabilities of dying are taken from actuarial tables (WHO, 2023). Hourly wages are calculated as total labor earnings divided by total hours (using the average of 1,711 hours per worker-year), and expressed in CHF.

incomes observed in our administrative tax data. In the model, the intra-temporal labor supply elasticity is governed by κ, which we set to $\kappa = 0.35$ to yield an average labor supply elasticity of 0.3, in line with available evidence (see, e.g., Chetty et al., 2011). Finally, we adjust the subjective discount factor $\rho = 0.0725$ for the model to fit the observed life-cycle net wealth profile, again taken from our administrative tax data.

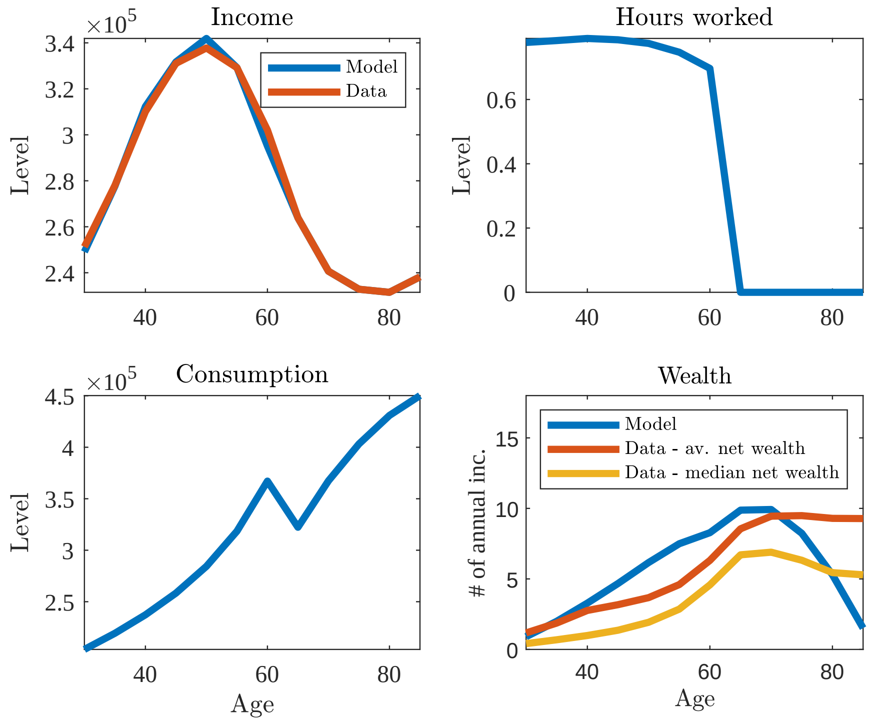
Life-cycle profiles. Figure 8 shows life-cycle profiles of earnings, hours worked, consumption and net wealth implied by our calibrated model, and corresponding age-group specific averages observed in our tax micro data for income and wealth.

We observe the usual hump-shaped life-cycle profile for income, an increasing life-cycle profile for consumption and a non-monotonic pattern for wealth. Note that consumption increases over time because (i) income is increasing until age 50 and (ii) individuals become more 'impatient' after 60 due to probabilities of dying gaining importance with age, which in turn increases the implicit subjective discount rate through a lower Γ_a. Wealth, on the other hand, decreases after 70. Given the life-cycle pattern of consumption, this implies that people consume part of their wealth towards the end of their active life, and wealth decreases markedly. Observed wealth depletion after retirement, however, is much less pronounced.[21] Hours worked are stable before 50 and then decline somewhat in the run-up to retirement. This is in line with empirical observation (e.g., Alesina et al., 2005). Hours worked matter insofar as the age-specific elasticity of labor supply directly depends on them: with the utility function (6), working more hours is associated with less elastic labor supply, and vice-versa.

Unexpected wealth shocks. Figure 9 reports earnings elasticities implied by unexpected wealth shocks received at different ages (left panel). We normalize the size of these shocks to one year of earnings when hitting at age 30, and adjust them to be present-value equivalent when hitting

[21] Introducing a non-separable bequest motive could largely reconcile the model with the data. Below, we introduce a separable bequest motive to model endogenous early retirement decisions.

Figure 8: Life-cycle profiles: model and data



Notes: Based on our calibration, earnings are computed using equation (8), consumption using equation (7), and wealth b_a recursively using equation (5). People who reach their 90th year die with certainty with zero wealth.

at older ages.[22] The right panel reports the corresponding lifetime cumulative effects.

The left panel of Figure 9 shows earnings elasticities with respect to unexpected wealth shocks. The impact response is negative irrespective of the age at which the wealth shock hits, as already shown in closed form, and it increases monotonically with age up until retirement.

In the right panel, we report cumulative responses, i.e., how a wealth shock at age a affects the sequence of earnings at age a, $a+1$ until retirement at $a = T$. In contrast to the effects on impact, which increase with age, the cumulative effects turn out to be decreasing with age. This is because even though the earnings elasticity is larger for older individuals, that effect lasts over a shorter remaining work life. The profile of lifetime earnings responses is therefore shaped more strongly by the duration effect than by the elasticity on impact.[23]

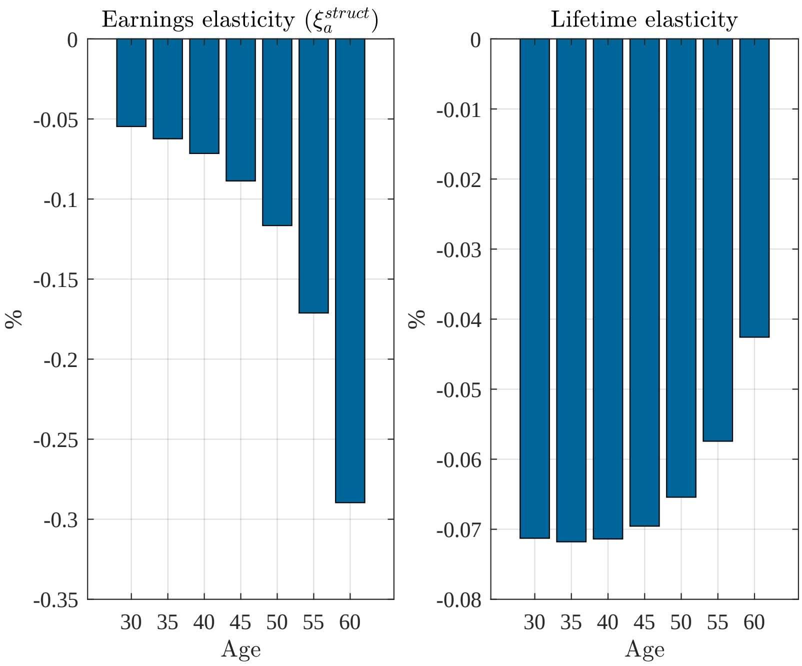
Expected wealth shocks. Given that inheritance is rarely completely unexpected, we now consider the opposite scenario, whereby the sequence of shocks featured in equation (10) is known at age 30. Because we assume present-value equivalence and costless borrowing, this means that individuals know they will receive at some point in time, but the exact timing is irrelevant to the adjustment of their lifetime response.[24] Equations (7)-(8) imply that consump-

[22]Imagine receiving a certain amount at a young age and investing it to earn the market return r. This amount grows over time so that receiving at a later age needs to be adjusted to be neutral from an intertemporal perspective.

[23]For the elasticity to dominate the duration effect, a considerably larger labor supply elasticity would be needed. In our framework and with our utility function, this would require a much lower level of hours worked and would not be consistent with the life-cycle patterns targeted by our calibration.

[24]We assume frictionless borrowing and lending. Hence, knowing in advance that they will inherit leads agents to borrow and to adjust hours and consumption immediately, as they can repay at no further cost once the shock is realized.

Figure 9: Earnings responses to unexpected wealth shocks



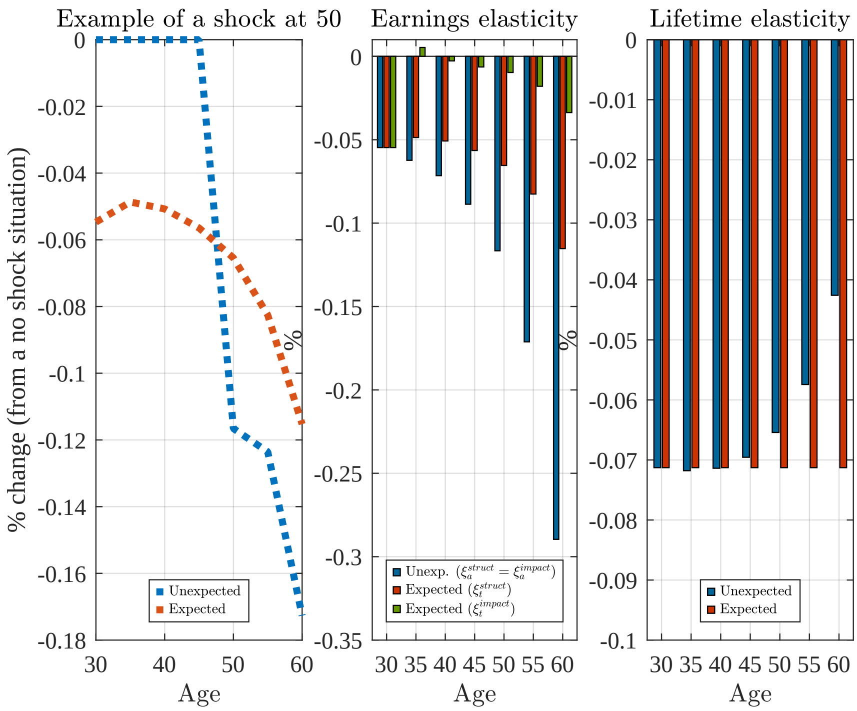
Notes: Based on our calibration. The size of the shock is normalized to represent one year (1/5 period) of the earnings at age 30, and to remain present-value equivalent when hitting at later ages. Impact elasticities are computed as log-deviations of earnings from the steady state divided by the log of the shock. Recall that in the case of unexpected shocks, $\xi_a^{struct} = \xi_a^{impact}$. Lifetime elasticities are computed by taking the log-difference in lifetime sums of earnings divided by the log-size of the shock received at 30.

tion and earnings will react upon receiving the information, and not upon the realization of the shock. Figure 10 shows the impact and cumulative responses of earnings to unexpected and expected shocks. In the case of expected shocks, we need to distinguish between the two elasticity concepts, ξ_a^{struct} and ξ_a^{impact}, to quantify the impact response.

The left panel of Figure 10 shows the example of a wealth shock hitting at 50 and compares the life-cycle responses when the shock is expected or unexpected. If the shock is unexpected, there can be no response before 50, but the impact response of earnings at 50 is strongly negative. In the subsequent periods, earnings decline further because of (a) the cumulative interest income from the additional wealth received at 50, and (b) the rising subjective discount factor when individuals get older. If the shock hitting at 50 is expected, however, individuals reduce earnings over their entire life cycle, including at ages below 50. Two things are worth noting. First, even when shocks are expected, changes in labor supply are not identical across ages since individuals do not value leisure vs. consumption equally over the life cycle. Second, the difference between the impact elasticity and the structural elasticity shown in equation (14) is captured here by the distance between the blue line and the red line at age 50 in the left panel of Figure 10, and by the difference between the red and green bars in the middle panel of Figure 10.

The impact earnings response ξ_a^{impact} (when the shock actually hits) is always smaller if the shock is expected. However, since expected shocks affect earnings over the entire life cycle, the cumulative changes in earnings turn out to be larger than with unexpected shocks. This difference increases in age, as shown in the right panel of Figure 10. The model therefore predicts

Figure 10: Expected vs. unexpected shocks.



Notes: Based on our calibration. The size of the shock is normalized to represent one year (1/5 period) of earnings at age 30, and to remain present-value equivalent when hitting at later ages. Impact elasticities are computed as log-deviations of earnings divided by the log of the wealth shock. Recall that in the case of unexpected shocks, $\xi_a^{struct} = \xi_a^{impact}$. Lifetime elasticities are computed by taking the log-difference in lifetime sums of earnings divided by the log-size of the shock received at 30.

larger impact effects but smaller cumulative effects from unexpected shocks, such as lottery wins, than from (partly) expected shocks, such as inheritance. Note also the stark difference between ξ_a^{impact} and ξ_a^{struct} in the case of expected shocks. The observed change in earnings after the realization of the wealth shock, ξ_a^{impact}, is much smaller than the economically relevant elasticity ξ_a^{struct}, since, as the shock was anticipated and could be borrowed against, the entire lifetime path of earnings had already been adjusted prior to the shock.

Early retirement. So far, we have assumed pension income to be available only from age T onward. We now consider a more flexible setting, where individuals are given the option of retiring one 5-year period ahead of the statutory retirement age. By exercising this option, they can enjoy more leisure, at the cost of a permanent penalty to annual retirement income. When making this choice, individuals compare the value functions implied by the two options. In Appendix D, we show that when individuals choose to retire early ("ER" hereafter), they consume more and supply less labor—and thus accumulate less wealth—already *before* they actually retire. Upon early retirement, they also cut consumption by more than when waiting for the statutory age, which results in larger wealth from 60 to 70, but faster wealth depletion after 70. While facing a permanent income penalty, early retirees enjoy more leisure at age $a = 60$, which then implies that the value of the ER decision is above the value of working until the statutory retirement age whether individuals receive a wealth shock or not. In that case, all individuals choose to retire early. We present an extension featuring a bequest motive in which shocks may trigger decisions to retire early.

Appendix D also shows that the negative response of earnings to wealth shocks hitting at or after 50 is magnified by ER, because individuals supply less labor already in the periods preceding retirement, which makes their labor supply more elastic between ages 50 and 60. The model with ER thus also predicts a larger negative earnings response *at the intensive margin*.

Early retirement with a bequest motive. A striking feature of early retirement as shown in Appendix D is that individuals exercising this option end up giving up a lot of their wealth at the end of their lives to smooth lifetime consumption, compared to the case without early retirement. This implication seems unrealistic for at least two reasons. First, wealth can be illiquid—e.g., in the form of housing—and therefore unsuitable for consumption smoothing. Second, our baseline calibration implies that early retirees end up with zero or even slightly negative wealth, which is inconsistent with the data (see Figure 8) and indeed with the very existence of wealth shocks from bequests.

In Appendix D2, we thus further extend the model by introducing a 'warm-glow' bequest motive into utility function, again following De Nardi (2004).[25]

The left panel of Figure 11 traces the difference in value functions $V_t - V_t^*$, with (V_t^*) or without (V_t) the option of retiring early. Earnings responses to unexpected wealth shocks are shown in the right panel. The left panel shows that unexpected wealth shocks shift the decision of individuals towards retiring early *for a given bequest motive*, determined by two utility parameters governing the strength of the bequest motive (ω) and its non-homotheticity (μ), calibrated for illustrative purposes (see Appendix D). As a result, unexpected wealth shocks now affect earnings not only at the intensive margin—individuals adjusting the number of hours worked before 60—but also at the extensive margin choosing to retire at 60 (right panel, green bar) *because of* the shock. The right panel of Figure 11 also shows that earnings decrease much more when unexpected wealth shocks trigger early retirement, due to the combined intensive-margin effect (before 60), and extensive-margin effects (at 60).

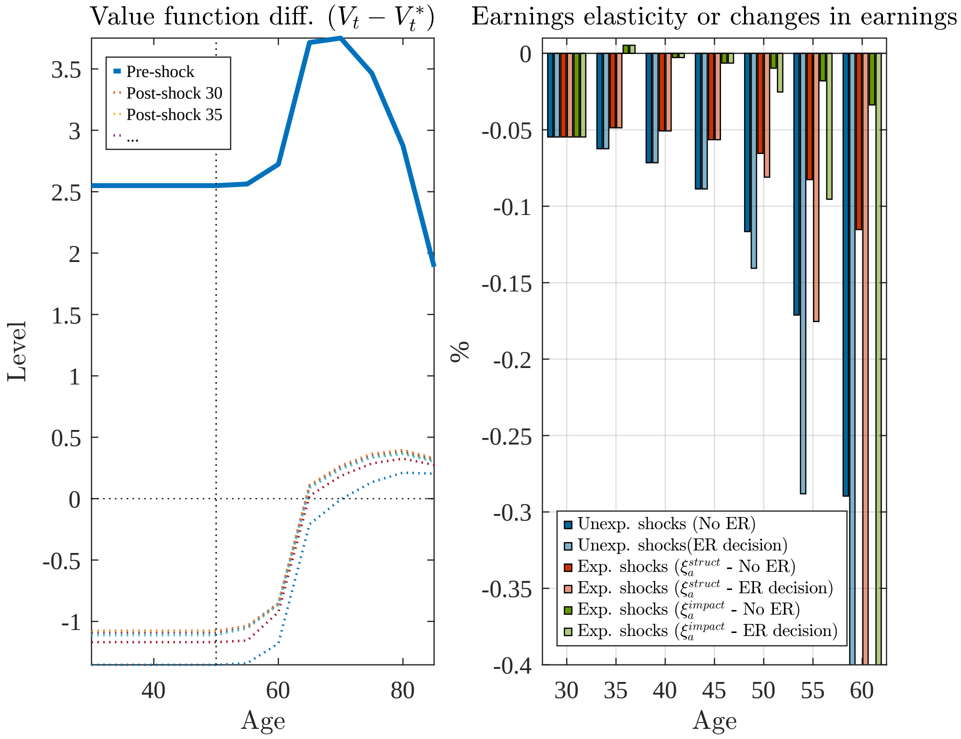
4.3 Taking stock

Our model provides predictions that can be validated by the empirical estimates. Based on closed-form expressions for changes in earnings after unexpected wealth shocks, the model shows that earnings will decrease both on impact and in subsequent periods up until retirement. In simulations of the baseline variant and extensions with early retirement, we find that the size of impact responses depends (i) on the age of the recipient (older individuals should respond more), (ii) on whether shocks are expected (thus resembling inheritance) or unexpected (thus resembling lottery wins), with expected shocks triggering smaller impact responses, and (iii) on the possibility of early retirement, which increases the labor supply elasticity of older workers.

We compare the quantitative predictions of the model to our data-derived elasticities in Figure 12. The graph presents the age profiles of labor supply responses implied by the model with early retirement and a bequest motive, shown in Figure 11, side-by-side with the baseline

[25]Given the log-log specification of the utility function, wealth will not affect the marginal utility of consumption of individuals and thus will not directly interact with consumption and savings decisions. Yet, the bequest motive will contribute to shaping the ER decision by altering value functions of the two options—early or statutory-age retirement.

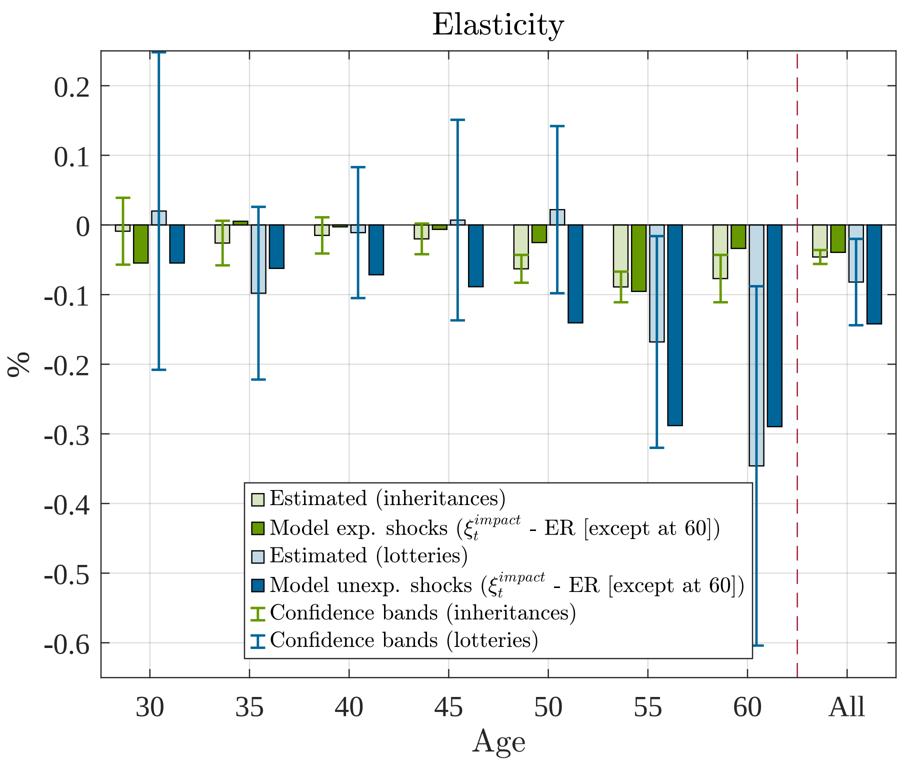
Figure 11: An extension with 'warm-glow' bequest motive



Notes for left panel: Difference in value functions for unexpected shocks between V_t, the lifetime value function *without* the ER option, and V_t^*, the lifetime value function *with* the ER option. Pre-shock, $V_t > V_t^*$, and the representative individual does not retire early. With a shock, $V_t < V_t^*$ and the representative individual retires early (i.e. at 60 instead of 65). More details can be found in Appendix Section D2.
Notes for right panel: The size of the shock is normalized to represent one year (1/5 periods) of earnings at age 30, and present-value equivalent thereafter. Impact elasticities are computed as log-deviations of earnings divided by the log of the shock, with the exception of the elasticity for the age group 60–65 with early retirement. In this case individuals stop working, labor supply falls to zero (100% reduction).

estimates of Section 3 (Table 1, and Panels b and c of Table 2).[26] The correspondence turns out to be strong: our simulation-based predictions are mostly within the 95% confidence bands of the empirical estimates. The one exception is the 50–54 age category, for which the model underpredicts the inheritance response but overpredicts the lottery response.

Figure 12: A comparison of estimated and model-based elasticities



Notes: Estimated elasticities and confidence intervals are taken from Table 2. Model-based elasticities ξ_a^{impact} are taken from the case with an early retirement option and wealth in the utility function, except for age 60. In this case the elasticity with an early retirement option is either zero (without wealth in the utility) or infinite (with wealth in the utility), so we consider the elasticity without an early retirement option. 'All' refers to the elasticities estimated in Table 1 and to the model elasticities weighted by the relative number of individuals (third rows of Panels b [inheritances] and c [lottery wins] in Table 2).

Figure 12 confirms that our estimated responses to lottery wins are close to the model predictions for unexpected shocks, while our estimated responses to inheritance bear greater resemblance to the model predictions for expected shocks.

When we compare the pooled estimates across all age groups, shown in the four rightmost bars of Figure 12, we find that our estimates lie between the two bounds predicted by the model. Our observed pooled earnings elasticity with respect to inheritances (-0.046) is somewhat larger in absolute value than that implied by the model for perfectly expected shocks (-0.039). This is consistent with real-world inheritances being expected but not perfectly so. The observed point estimate for the pooled elasticity with respect to lottery wins (-0.082), in contrast, is lower in absolute value than that implied by the model for unexpected shocks (-0.142). However, the model prediction is still within the 95% confidence interval $[-0.144, -0.02]$ of the empirical estimate.

The estimates shown in Figure 12 are earnings elasticities, estimated over a five-year time window after the wealth shock. For a more intuitive way of quantifying those responses, we

[26]For the 60–64 age category, we replace the simulation prediction from the model with early retirement, which is either zero or infinity, with the corresponding value from the model without early retirement and bequest motives (Figure 10).

can compute marginal propensities to earn (MPEs), which capture the share of any inheritance or lottery win that translates into lower earnings (as opposed to higher consumption or savings) over the recipient's lifetime. For lotteries, this amounts to the estimated "remaining lifetime MPE" of −14.8%, shown in the bottom row of Table 1. The corresponding estimate for inheritance in Table 1 is −4.3%. That estimate, however, does not include the labor-supply effect due to anticipation. It therefore represents an upper-bound (i.e., least negative and thus smallest-magnitude) estimate of the lifetime MPE, for an unrealistic scenario in which inheritances come as a complete surprise. We can turn to the model to add some realism by considering anticipatory responses.[27] The lifetime elasticities for expected shocks, shown in the right panel of Figure 10, imply a lifetime MPE of −27.4%. This is our lower-bound (i.e., largest-magnitude) estimate, based on a scenario with perfectly anticipated inheritance and no borrowing frictions. Our estimated impact elasticities are markedly closer to the theoretical benchmark with perfect anticipation than to that without anticipation (see Figure 12). This suggests that the true (i.e. structural) lifetime MPE of inheritance is closer to the lower bound of −27.4% than to the upper bound of −4.3%, and thus larger in magnitude than the estimated lifetime MPE of −14.8% for lottery wins.

5 Counterfactual experiments

Based on our estimated age-specific elasticities and on the model, we now seek to quantify aggregate earnings responses and to conduct counterfactual experiments.

For that purpose, we need to account for the observed heterogeneity in early retirement decisions. In practice, those decisions will be driven by factors such as marital status, family composition or occupation. We capture such idiosyncrasies through a log-normally distributed parameter governing the bequest motive (see Appendix Section D3). We populate the model with individuals with heterogeneous bequest motives, feed some of them with inheritance flows —using observed probabilities of receiving and observed average amounts received by age group—, compute the individual policy functions (consumption, hours worked, and wealth with or without inheritance, for every strength of the bequest motive), and then aggregate up the different outcomes within and across age groups. The total effects will then result from the interaction between behavioral responses to shocks, the age-specific size of wealth shocks, the age-specific probabilities of receiving and the relative weight of each cohort—the age structure of population.

As suggested by Figure B1, income heterogeneity does not seem to play an important role and is therefore not considered in the "aggregate" model.[28] Further, the assumption of an exogenous real interest rate and wage level should not be overly constraining in our setting, given that Switzerland is a small open economy with high cross-border mobility of capital and labor.

[27] This mirrors our distinction between impact and structural elasticities in equations 12 to 14, the difference being that for MPEs we need to consider level effects and cumulate them over the full working life.

[28] Introducing heterogeneity in income could be done by introducing heterogeneous productivity as in Auray et al. (2025) on top of bequest and age heterogeneity. We prefer leaving this for future research.

5.1 Introducing an inheritance tax

Our first counterfactual experiment is the introduction of a linear tax (τ) on inheritances. Keeping our focus on the labor supply channel, we consider that the government does not redistribute the money. We also abstract from behavioral responses other than heirs' labor supply. The sole implication of the tax in our thought experiment will thus be to reduce the size of amounts received by heirs. What we call taxation is therefore isomorphic to "dissipation shocks" such as those considered by Moll et al. (2022), affecting wealth at death.

When we consider expected shocks, we model the expected amount as being net of tax, meaning that individuals are assumed to know the tax rate that will apply ahead of the shock. This will raise earnings by pushing recipients to supply more labor, both at the age at which they receive lower amounts and throughout their lifetime.

In the model, we allow for changes both at the intensive margin and, via early retirement, at the extensive margin. Starting from a zero-tax benchmark, Figure 13 reports the percentage change in aggregate earnings implied by different tax rates in scenarios with inherited wealth shocks based on average amounts received at different ages taken from the data. Wealth shocks can be treated as expected (solid lines) or as unexpected (dotted lines), and we allow for an endogenous early retirement decision (black lines) or not (gray lines). Our baseline is the case where inheritance shocks are expected and where we allow for an early retirement decision (solid black line), a case that delivers impact elasticities ξ^{impact} that align well with our estimated elasticities (see Figure 12).

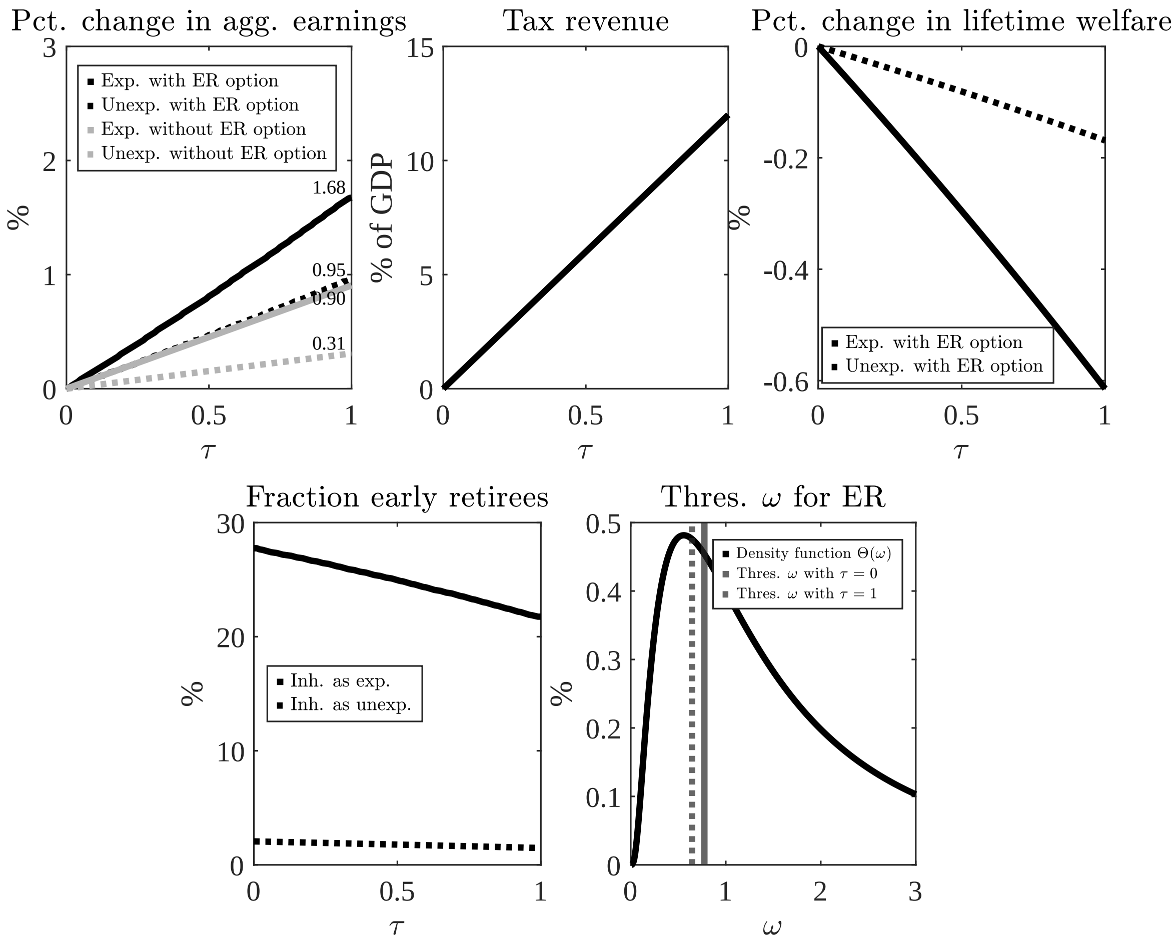
We track how changes in inheritance tax rates affect stationary distributions and disregard short-run dynamics. The top left panel reports percentage changes in aggregate earnings from their steady-state values. The top middle panel shows the associated tax revenue, the top-right panel shows changes in lifetime welfare, the bottom left panel shows the share of early retirees in the working-age population, and the bottom right panel shows the displacement of the threshold value for early retirement decisions.

Figure 13 shows how increasing the inheritance tax pushes individuals to work more. In Section 4 we showed that expected wealth shocks have stronger lifetime effects than unexpected shocks, while unexpected shocks deliver stronger labor supply responses on impact. In aggregate terms, the lifetime responses dominate the impact responses, and so reducing the size of wealth shocks leads to a larger increase in labor supply when shocks are expected. In either case, since individuals work more and consume less as the tax is raised, and since we abstract from the use of the tax, the welfare effects of the tax are negative. In the baseline case with perfectly expected shocks and an early retirement option, we find that a 50% inheritance tax would increase earnings by 0.81% and decrease welfare by 0.3%.[29] A 100% tax (i.e., complete confiscation of estates) would lead to a 1.68% increase in earnings and a 0.6% decline in lifetime welfare.

If we consider only the model that features an early-retirement option, then confiscation of inheritance through a 100% estate tax increases labor supply by something between 0.95% (if inheritance is completely unexpected) and 1.68% (if inheritance is perfectly anticipated). Assuming a labor share of 0.68, these numbers would in turn translate into a steady-state increase

[29] Here aggregate welfare is computed on a utilitarian basis, given equal weights to all individuals.

Figure 13: Effects of an inheritance tax



Notes: Amounts received (nominal), population weights and probabilities of receiving at different ages are taken from Table 2. Baseline model simulations use the model of Section 4 with early retirement and a bequest motive governed by parameters ω and μ. Across all cohorts, ω is distributed as in Figure D2. Expected shocks affect earnings over the entire life-cycle. Unexpected shocks trigger earnings responses on impact and thereafter. "No ER" is the model in which the early-retirement option is switched off.

in GDP of between 0.65% and 1.14%.[30] Given that our estimated inheritance response is closer to the case of expected shocks, i.e., to the upper bound of this range (see Section 4.3), our implied point estimate of the effect on GDP is 1.1%. Within the stylized setting of the model and the structure of our data, this is our estimate of the "output cost of inheritance".

This estimated output cost can be compared to the fiscal externality of inheritance taxation computed by Kindermann et al. (2020). According to their baseline estimate, labor supply responses imply that every dollar of inheritance tax revenue generates an additional 0.09 dollars of labor income tax revenue. Taking a representative income tax rate of 35% and an inheritance-to-GDP ratio of 0.12 (Brülhart et al., 2018), our simulated upper-bound labor supply effect of 1.68% implies that a dollar of inheritance tax revenue generates 0.05 dollars in additional labor income tax revenue (where $0.05 = 0.35 \times 0.0168 \div 0.12$). Our estimate is thus somewhat more conservative than that of Kindermann et al. (2020).

[30] A standard Cobb-Douglas production function, $\frac{\Delta Y_t}{Y_t} = \alpha \underbrace{\frac{\Delta K_t}{K_t}}_{=0} + (1-\alpha)\frac{\Delta L_t}{L_t}$, where L_t is total labor and wages are assumed to remain constant, implies that $\frac{\Delta Y_t}{Y_t} = (1-\alpha)\frac{\Delta L_t}{L_t}$.

To what extent are these effects driven by early retirement? First, note that the early retirement rate declines from 27.7% without a tax to 25% with a 50% tax and 21.7% with a 100% tax. This is further illustrated by the leftward shift of the early-retirement threshold in the distribution of ω (bottom right panel of Figure 13). So, a maximum of 8% of the age group 60–64 that retire without the tax could reverse their decision and work full time instead. Second, the gray lines in the top-left panel of Figure 13 allow us to quantify the contribution of this mechanism by shutting down extensive-margin responses, so that the difference between the black and gray lines can be interpreted as the contribution of the early-retirement margin. Without the early-retirement option, aggregate earnings would increase by 0.45% with a 50% tax and by 0.9% with a 100% tax. This means that, in the baseline model, early retirement decisions account for slightly less than half of the total effect, while the other half is attributable to intensive-margin labor supply decisions.

5.2 Shifting the age distribution of inheritance

In a second exercise, we examine how aggregate labor supply responds to changes in the age profile of inheritance receipt. Moving bequests towards younger cohorts provides a simple way of emulating policies that encourage inter-vivos giving. Operationally, we shift the age distribution of inheritance receipt to the left (towards younger individuals) in five-year increments. Conversely, demographic aging can be interpreted as shifting the age profile towards older recipients, a plausible future scenario given rising life expectancy and absent changes in bequest behavior.

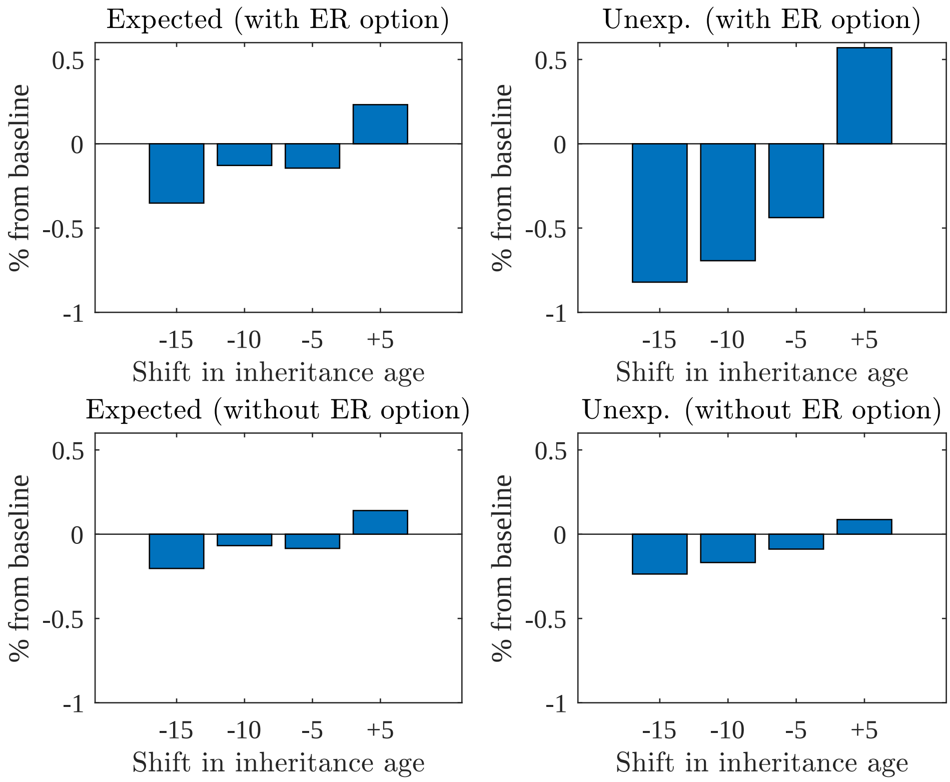
In each scenario, we shift both the probability of receiving and the associated amounts, compute the age-specific labor supply responses implied by the model, and aggregate them up to obtain percentage changes in total earnings. Figure 14 reports the results.

Two patterns emerge clearly. First, transferring inheritances earlier in life reduces aggregate earnings, while delaying them increases earnings. This is consistent with the model's prediction that the wealth effect on lifetime labor supply is stronger when shocks arrive earlier, because individuals have more periods over which to spread additional resources.

Second, the dominant mechanism depends on expectations. When shocks are *expected* (left panels), the effect of shifting probabilities is null—consistent with the timing of wealth shocks being neutral when they are expected—, and the labor supply effect is entirely driven by shifts in amounts—receiving more or less than before the age-shift during work life. Allowing for an early retirement option (top left) roughly doubles the total impact relative to the no-early-retirement case (bottom left), reflecting the model's mechanism working through the extensive margin of early retirement.

When shocks are *unexpected* (right panels), the effects are mostly driven by shifts in probabilities of receiving. Without anticipation, the timing of the shocks directly alters current labor supply through an unmitigated wealth effect. In this case, cumulative responses are larger overall when allowing for an early retirement option: receiving more and earlier generates large shifts in early retirement, producing larger changes in aggregate earnings. When shutting down the early retirement option (bottom right panel), shifting the amounts and probabilities of receiving generates overall much smaller—though qualitatively similar—changes in aggregate earnings.

Figure 14: Changes in aggregate earnings after shifting the age structure of inheritance



Notes: Amounts received (nominal) and probabilities of receiving at different ages are taken from Table 2 but shifted forward or backward. Population weights remain unchanged. The effect of amounts received shifts amounts but not the probabilities of receiving. The effect of inheritance probabilities shifts probabilities but not amounts. The interaction term is obtained by taking the difference between the total effect (combining both sources of changes) and the sum of the two marginal effects (amounts and probabilities).

In sum, shifting the age profile towards younger recipients lowers equilibrium aggregate earnings, while shifting it towards older recipients raises them, *ceteris paribus*.

To get a sense of the magnitude of such effects, consider a rightward shift of the age distribution of inheritance by five years, all else equal. This for example corresponds to the increase in global life expectancy predicted by Vollset et al. (2024) for the period 2022-2050. According to our simulations shown in the top-left panel of Figure 14—considering inheritances as expected and allowing for an ER option—this would increase aggregate earnings by 0.23%. When translated into GDP assuming an unchanged labor share, that simulated labor supply effect in turn implies that the output cost of inheritance would fall by around one-fifth, from 1.14% to 0.91%.

Taken together, our results highlight how the interaction of timing, expectations, and early retirement decisions shapes the aggregate labor supply response.

6 Conclusion

We investigate empirically and theoretically how inheritance affects labor supply, both in the aggregate and by subgroups. Our analysis confirms the dominance of income effects: on the whole, inheritance—like other unearned wealth shocks—reduces labor supply. On impact, this effect is particularly pronounced for older workers, who often respond to inheritance receipt by choosing to retire early. As those "sensitive ages" coincide with the arrival of the bulk of inheritance, responses triggered by inheritance are quantitatively non-negligible also at the macro level. Within the framework of our model and data, inheritance reduces aggregate labor supply between 0.95% (when shocks are treated as unexpected) and 1.68% (when shocks are treated as expected). This translates into a GDP loss between 0.65% and 1.14%, with our measured elasticities implying a point estimate of 1.1%—what one might refer to as the output cost of inheritance.

While we believe that our analysis charts important new ground, much progress is still possible.

From a theory standpoint, our life-cycle model is highly stylized and partial-equilibrium. While it offers the benefit of closed-form expressions in the baseline case and a theoretical representation of individual decisions, a richer general equilibrium model with productive capital where an inheritance tax could affect the interest rate and GDP through capital accumulation could help gain further insights. Similarly, allowing for heterogeneity in productivity levels across individuals would shed light on the distribution of output costs of inheritance, and on the incidence and redistributive effects of inheritance taxation.

Regarding the estimation of labor supply responses, it would be particularly interesting to draw on data that allow researchers to decompose the earnings response into its different components (hours, wage rate, choice of occupation). Further, our data do not allow us to identify entrepreneurial investments in terms of time and wealth. Such responses to inheritance surely exist and could matter for overall output and productivity, but their aggregate-level weight remains to be rigorously quantified.

Perhaps the most evident omission from our quantitative analysis is inter-vivos gifts. Gifts represent a large and possibly growing share of intergenerational wealth transfers. However, the analysis of their effects on the behavior of recipients is considerably more challenging than in the case of transfers at death. The timing, the amount and even the nature of gifts are entirely endogenous. When we simulate changes in the age distribution of inheritance in this paper, we implicitly treat inter-vivos gifts as differing from inheritance only by arriving earlier, for reasons that are exogenous to the recipient. Reality is more complicated. This offers a particularly promising avenue for further research.

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Online Appendix

A Additional tables and figures

A1 Summary statistics

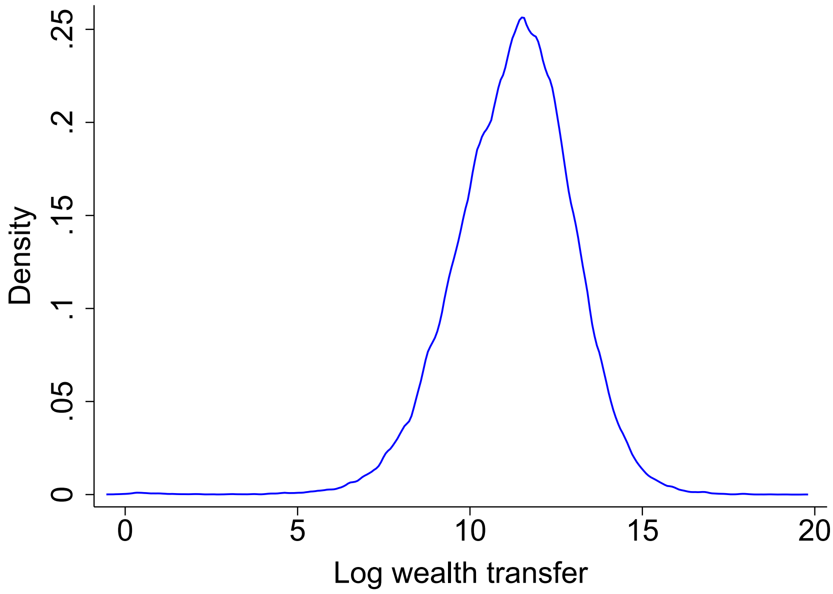
Table A1: Summary statistics

	Mean (1)	Standard deviation (2)
	Sample of heirs	
Wealth shock (CHF, p.v. adjusted)	349,703	2,335,501
Wealth shock (CHF, nominal)	129,038	699,576
Age	57.615	11.481
Female	0.532	0.499
Married	0.696	0.449
Single	0.304	0.449
Has kids $<$ 18	0.272	0.419
Average earnings (CHF)	43,500	43,121
Taxable income (CHF)	38,596	70,201
Net wealth (CHF)	303,852	2,662,145
N of recipients	135,150	
	Sample of lottery winners	
Wealth shock (CHF, p.v. adjusted)	352,662	3,256,443
Wealth shock (CHF, nominal)	123,261	1,128,965
Age	50.846	12.139
Female	0.459	0.498
Married	0.570	0.483
Single	0.430	0.483
Has kids $<$ 18	0.303	0.436
Average earnings (CHF)	44,029	35,959
Taxable income (CHF)	33,556	42,179
Net wealth (CHF)	93,886	297,036
N of recipients	5,340	

Notes: This table reports summary statistics for the main variables used in the analysis, separately for individuals who receive a positive wealth shock (inheritance or lottery win). The unit of observation is an individual. The table shows the number of observations, means, and standard deviations. Earnings and wealth variables are expressed in Swiss francs. The sample is restricted to individuals with a recorded wealth shock of at least CHF 10,000. See Section 2.1 for sample construction and variable definitions.

A2 Wealth shock distribution

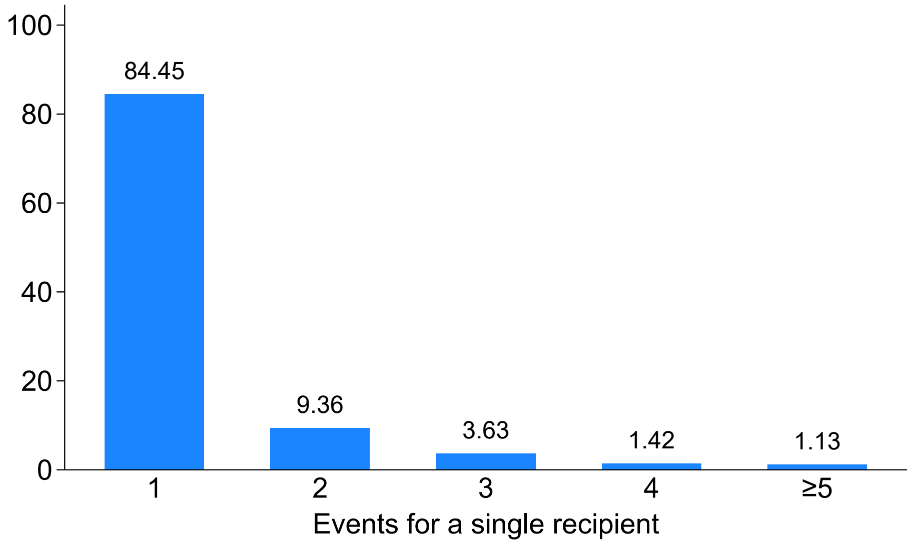
Figure A1: Wealth shock distribution



Notes: This figure shows the distribution of the size of wealth shocks in log CHF. The y-axis represents the estimated probability density function obtained via kernel smoothing.

A3 Frequency of wealth transfers

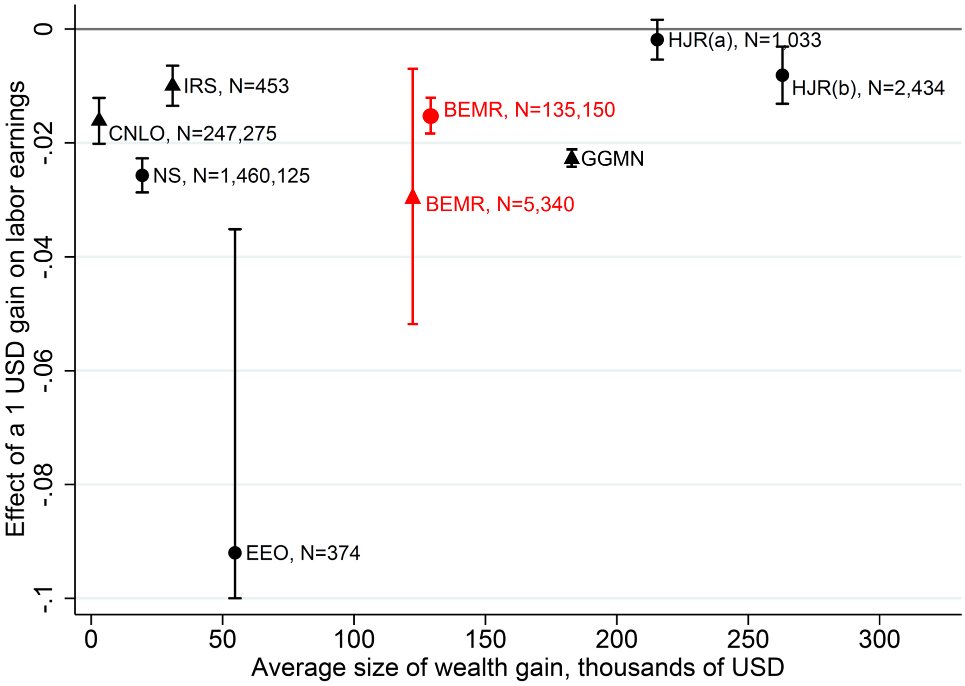
Figure A2: Frequency of wealth transfers



Notes: This figure shows the distribution of the number of wealth transfers per individual across the full sample. It includes all types of observed wealth shocks (as declared on tax returns): inheritances, lottery wins, and inter-vivos gifts. The figure highlights that the vast majority of individuals experience only a single wealth shock over the observation period, underscoring the infrequency and lumpy nature of such events. This supports our empirical strategy focusing on discrete treatment events and helps interpret extensive-margin responses as capturing behavior following largely isolated transfers.

A4 Comparison with estimates from other countries

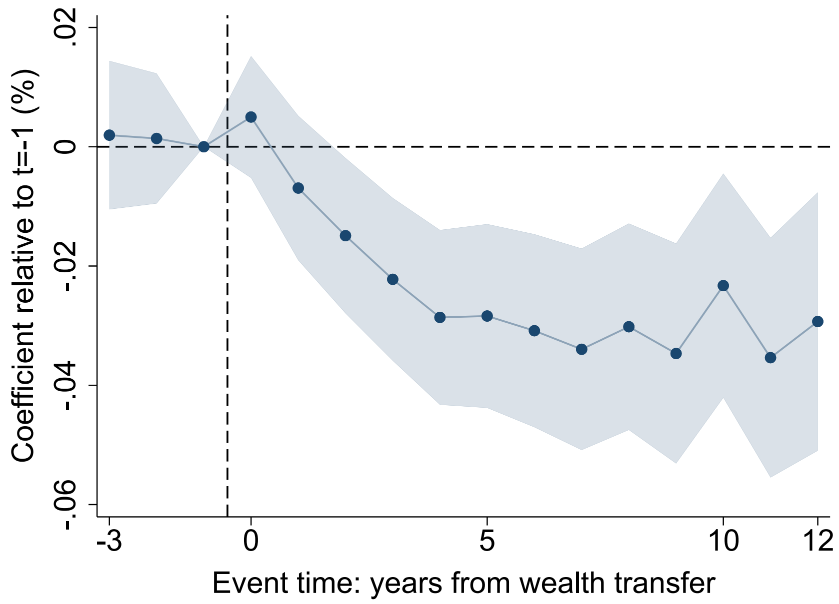
Figure A3: Meta analysis following Nekoei and Seim (2023)



Notes: This figure replicates Figure C.13 of the Online Appendix to Nekoei and Seim (2023). The y-axis quantifies the effect in USD of one additional USD in sudden wealth on labor earnings shortly after wealth receipt. This is what we refer to as "on-impact marginal propensities to earn (MPE)" in Section 3, but computed relative to nominal, not present-value adjusted, wealth shocks. The x-axis captures the sample average wealth shock sizes in 2018 USD. Circles represent responses to inheritance shocks, and triangles represent responses to lottery wins. Vertical bars represent 95% confidence intervals. IRS refers to Imbens et al. (2001) (U.S. data), CNLO refers to Cesarini et al. (2017) (Swedish data), NS refers to Nekoei and Seim (2023) (Swedish data), EEO refers to Elinder et al. (2012) (Swedish data), and HJR refers to Holtz-Eakin et al. (1993) (U.S. data). Details can be found in the Online Appendix to Nekoei and Seim (2023). We add the baseline estimate of Golosov et al. (2024) (GGMN; U.S. data; estimate shown in column 1 of their Table II) as well as our own estimates for inheritance and lottery shocks (BEMR). For our own estimates, we take the effects shown in the bottom row of Table 1, and we scale them relative to wealth shocks in nominal terms so as to make them comparable to the effects reported in the other studies.

A5 Long-run impact

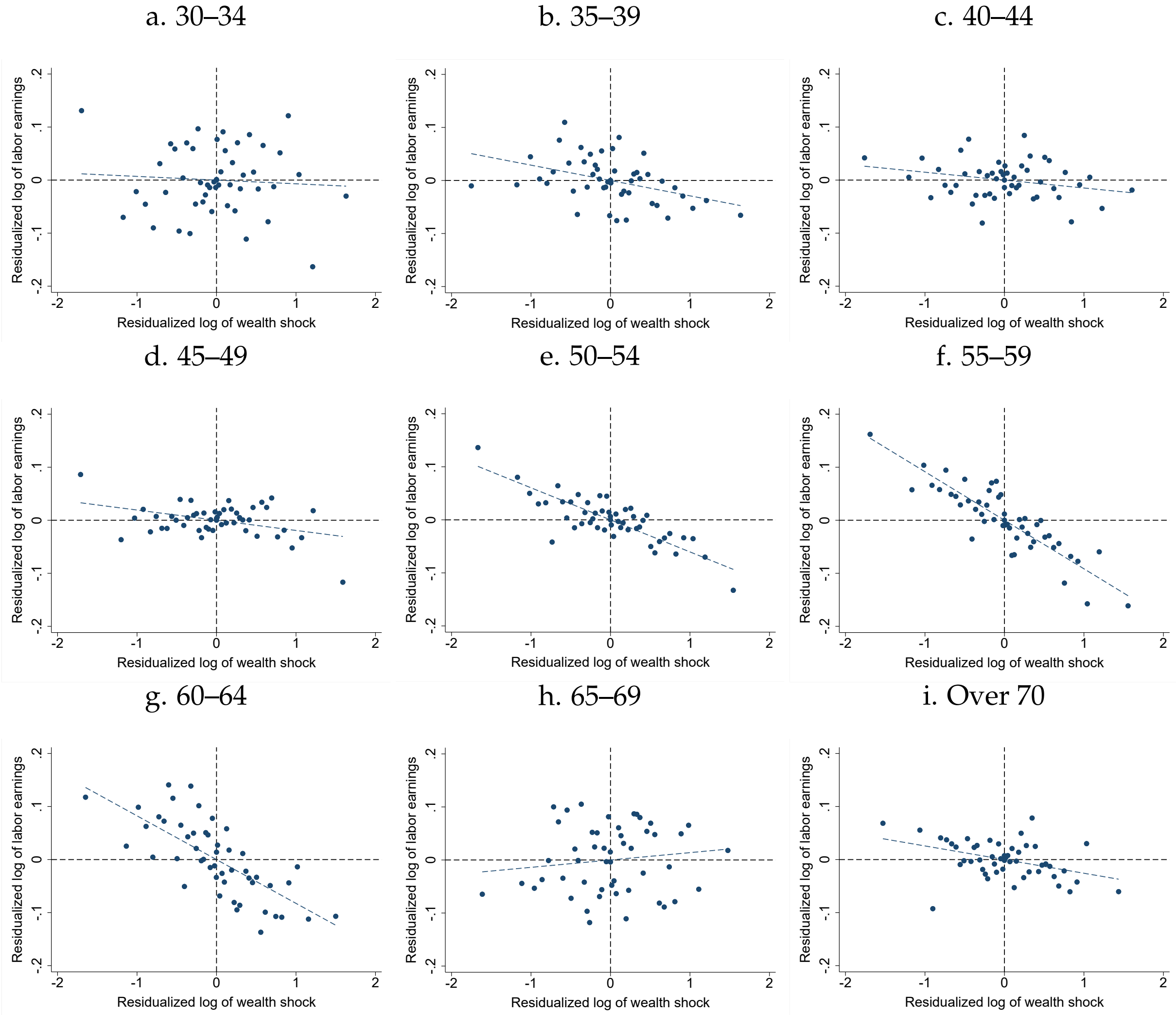
Figure A4: Event-study estimate of the long-run earnings response



Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2): each point shows the effect $k \in [-3, 12]$ years from the realization of the shock. Standard errors are clustered by individuals. The wealth shock includes both inheritances and lottery wins.

A6 Binscatter by age group

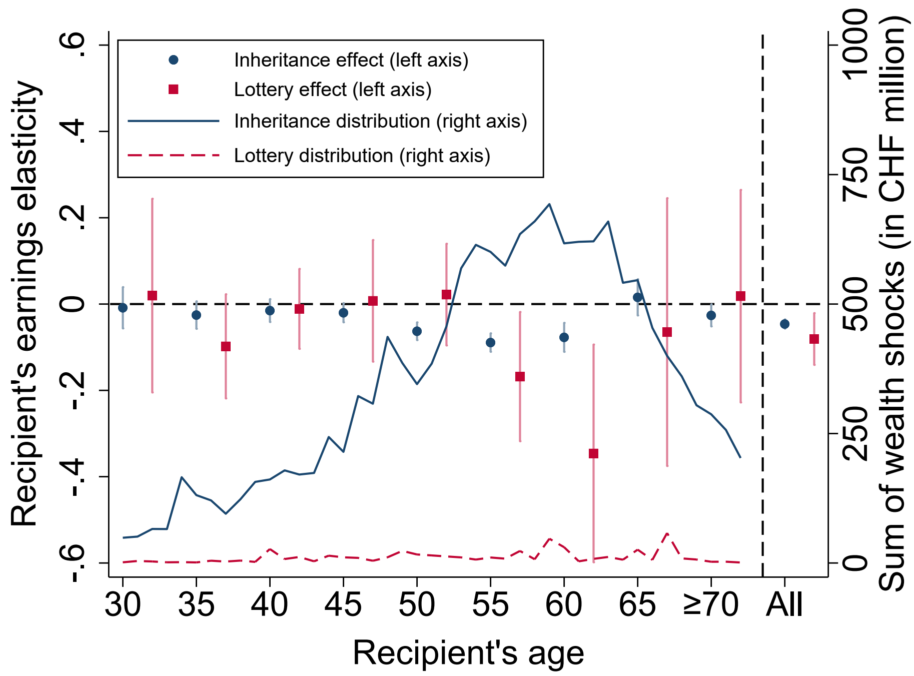
Figure A5: Binscatter by age group



Notes: For each recipient's age group, the corresponding figure provides a graphical representation of the labor earnings elasticity with respect to wealth shocks, including both inheritances and lottery wins. It compares the log of labor earnings (vertical axis) with the interaction of the log of the present-value-adjusted wealth shock and the post-treatment dummy (horizontal axis). We depict the residuals obtained by regressing each variable on individual fixed effects and age-at-the-time-of-the-shock-calendar-year fixed effects. Each figure plots the residuals in 50 equal-sized bins and shows the line of best fit, which corresponds to the β estimate obtained from regressing equation (1), estimated over a time interval spanning -3 to 5 years from the wealth shock. For sample sizes, see Table 2.

A7 Life-cycle responses to inheritance and lottery wins

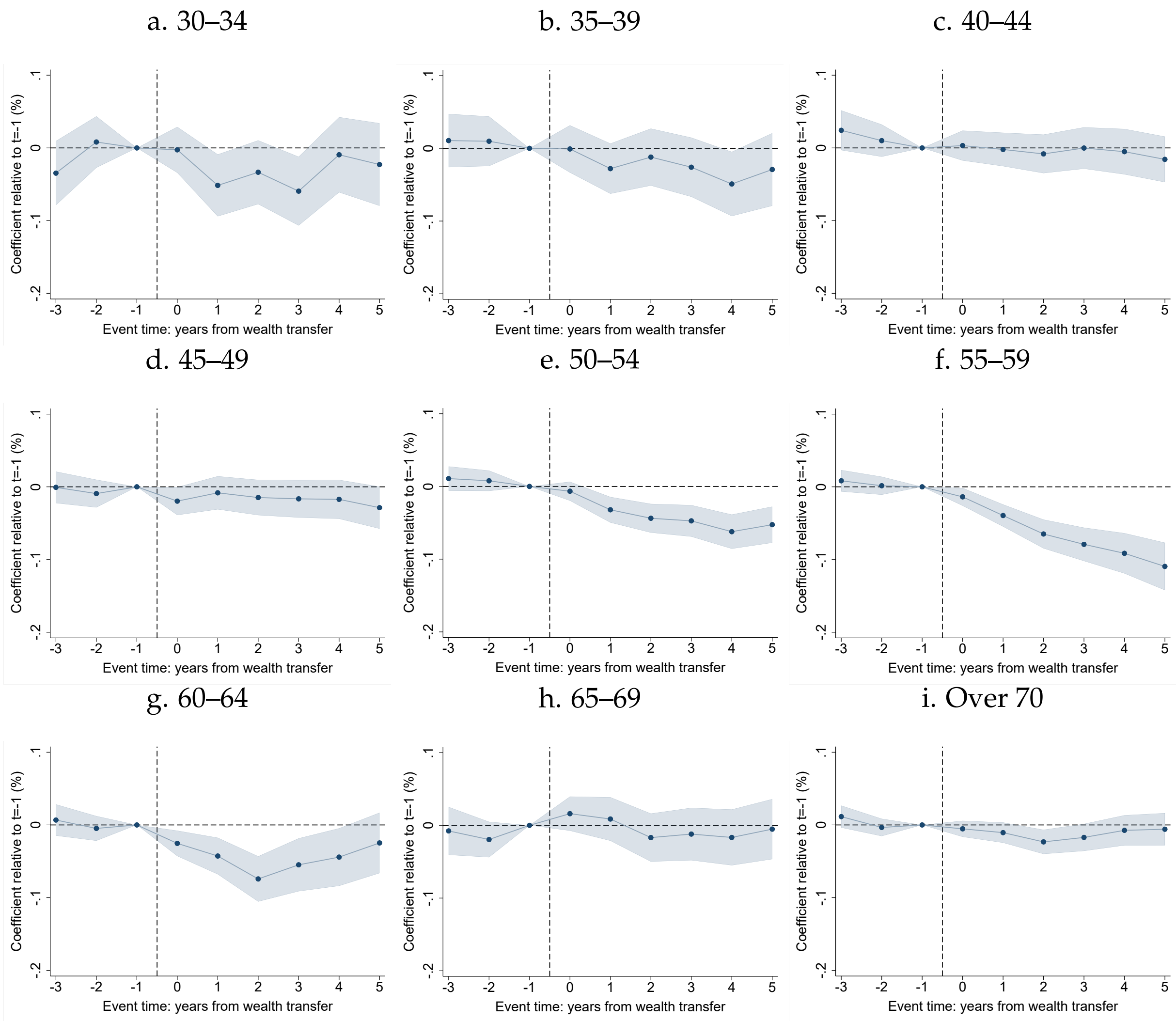
Figure A6: Age profile responses by wealth



Notes: This figure shows age-specific earnings elasticities to inheritances (blue circles) and lottery wins (red squares), obtained by estimating the DiD equation (1). Each point reflects the estimated elasticity of log labor earnings with respect to log present-value-adjusted wealth shocks, computed separately by age group at the time of receipt (left axis). The elasticity for "All" corresponds to the pooled estimate across all ages. Each elasticity is estimated over a time interval spanning -3 to 5 years around the realization of the wealth shock. The figure also shows the empirical distribution of each type of wealth transfer (blue line for inheritance and red line for lottery wins; right axis), measured as the sum of wealth shocks received by each age group (in CHF million, pooled over 2002–2019). The sample contains 1,266,430 person-year observations.

A8 Event-study results for inheritances by age group

Figure A7: Event-study results for inheritances by age group

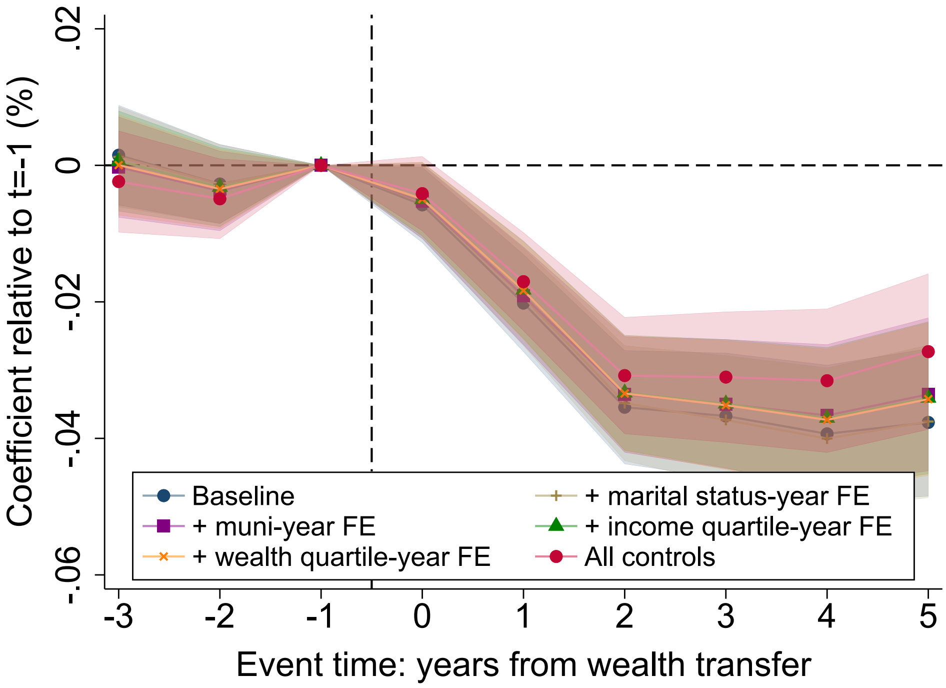


Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings by age group. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2): each point shows the effect $k \in [-3, 5]$ years from the realization of the shock. Standard errors are clustered by individuals. For sample sizes, see Table 2.

B Robustness

B1 Event-study results with additional controls

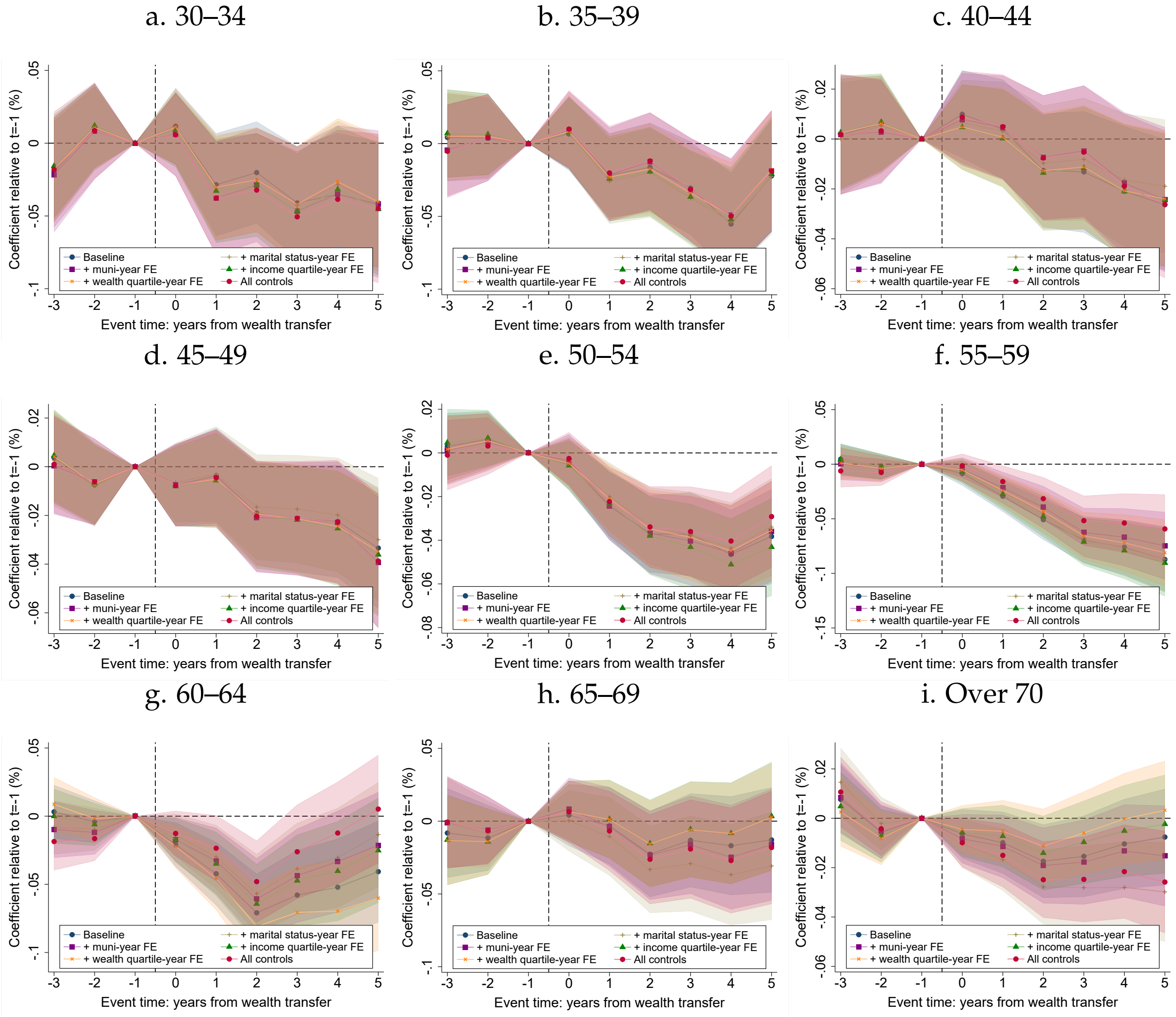
Figure B1: Event-study results with additional controls



Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2): each point shows the effect $k \in [-3, 5]$ years from the realization of the shock. Standard errors are clustered by individuals. Wealth shocks include both inheritances and lottery wins. The figure shows estimates of six specifications: (i) baseline controls (individual fixed effects and age-by-year fixed effects); (ii) baseline plus marital status-by-year fixed effects; (iii) plus municipality-by-year fixed effects; (iv) plus pre-shock income quartile-by-year fixed effects; (v) plus pre-shock wealth quartile-by-year fixed effects; and (vi) a fully saturated model including all additional controls. These additional fixed effects are intended to account for potentially confounding shocks and to refine the comparison groups by conditioning on more granular characteristics.

B2 Event-study results by age with additional controls

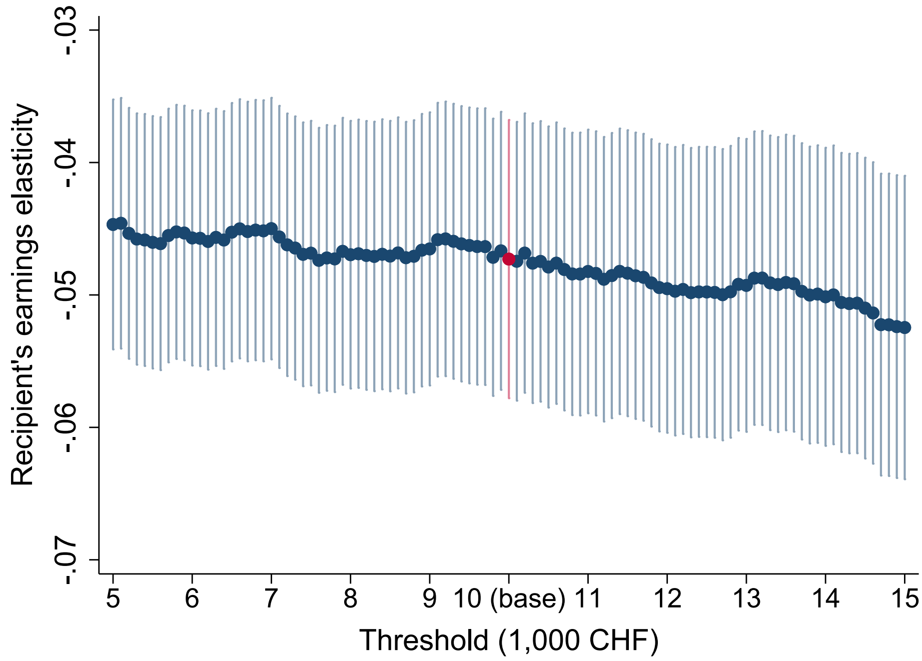
Figure B2: Event-study results by age with additional controls



Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings by age group. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2): each point shows the effect $k \in [-3, 5]$ years from the realization of the shock. Standard errors are clustered by individuals. Wealth shocks include both inheritances and lottery wins. The figure shows estimates of six specifications: (i) baseline controls (individual fixed effects and age-by-year fixed effects); (ii) baseline plus marital status-by-year fixed effects; (iii) plus municipality-by-year fixed effects; (iv) plus pre-shock income quartile-by-year fixed effects; (v) plus pre-shock wealth quartile-by-year fixed effects; and (vi) a fully saturated model including all additional controls. These additional fixed effects are intended to account for potentially confounding shocks and to refine the comparison groups by conditioning on more granular characteristics.

B3 Sensitivity to varying the CHF 10,000 threshold

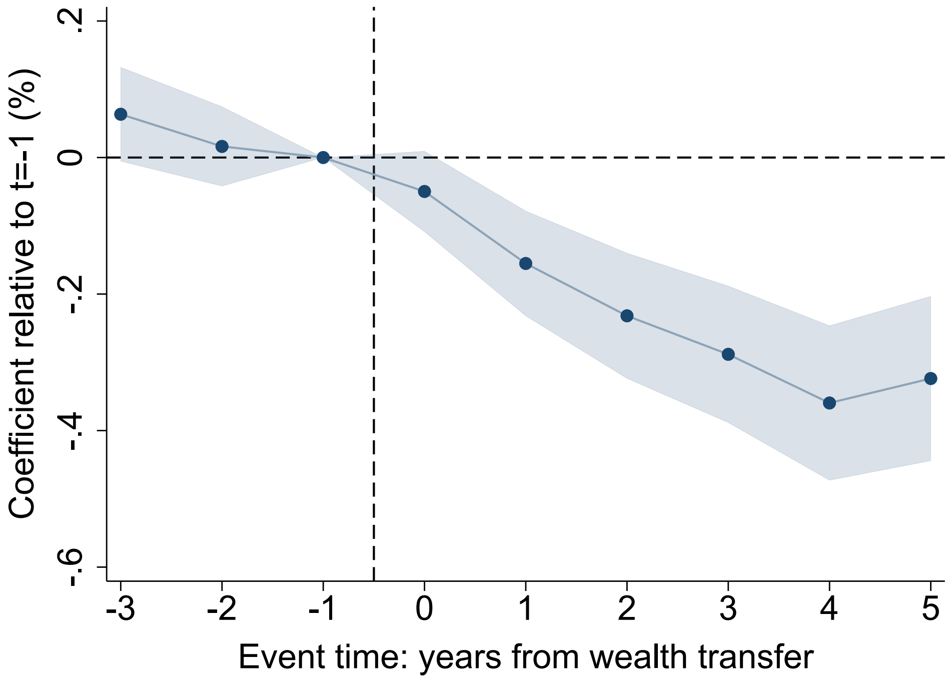
Figure B3: Sensitivity to varying the CHF 10,000 threshold



Notes: This figure tests the sensitivity of our main estimates to perturbations of the CHF 10,000 threshold used in the baseline analysis (we exclude all inheritances and lottery wins below CHF 10,000, considering them unlikely to affect earnings behavior). We re-run equation (1) by choosing thresholds from CHF 5,000 to CHF 15,000 and using increments of CHF 100. The figure shows that alternative threshold choices (in blue) yield estimates that remain remarkably similar to the baseline (in red).

B4 Event-study results with a discrete treatment

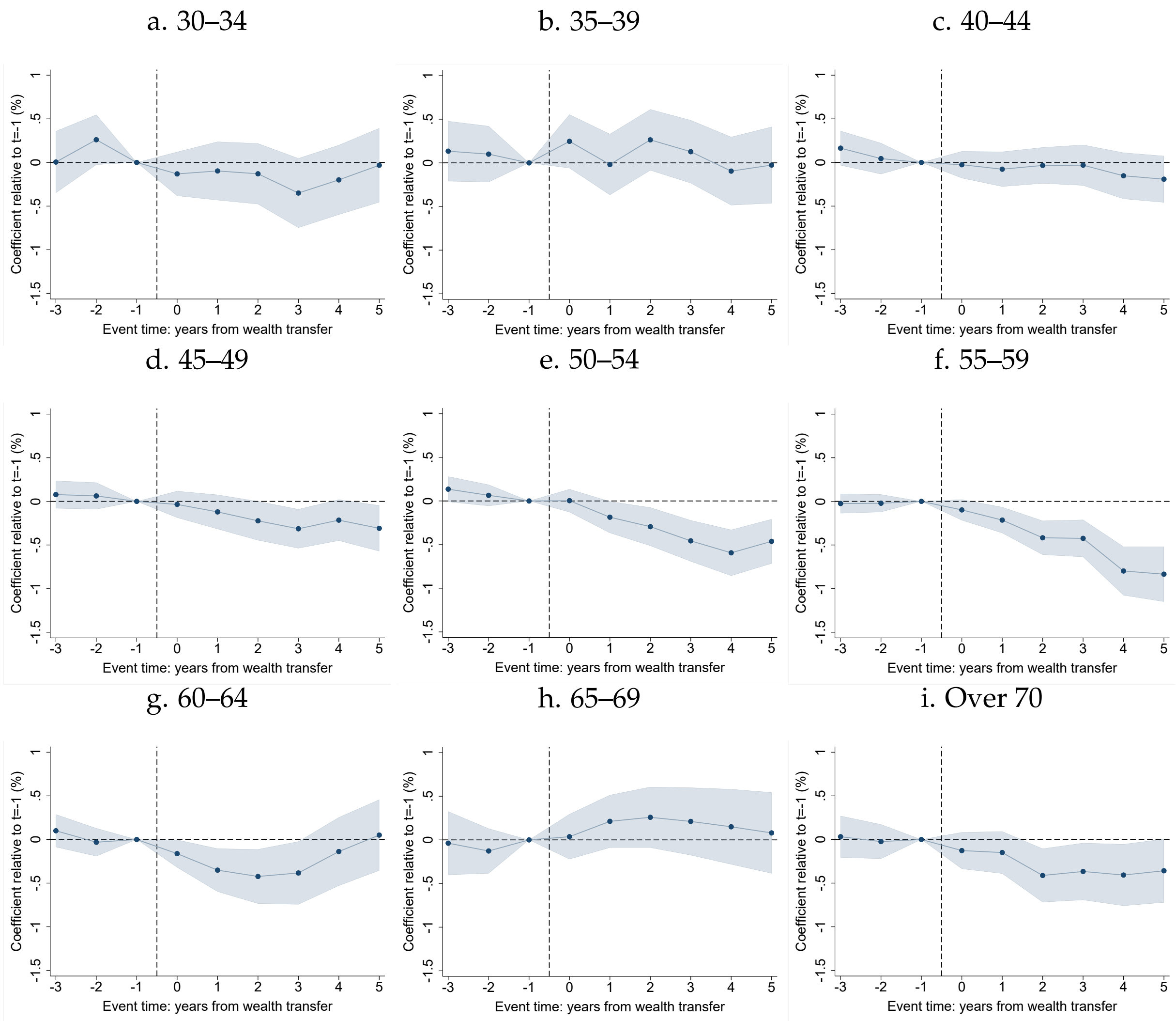
Figure B4: Event-study results with a discrete treatment



Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2), but using a discrete treatment rather than a continuous one: each point shows the effect $k \in [-3, 5]$ years from the realization of the shock. Standard errors are clustered by individuals. Wealth shocks include both inheritances and lottery wins. We classify individuals who receive a wealth shock below the average as the control group, and those who receive a shock larger than five times the average as the treated group.

B5 Event-study results by age with a discrete treatment

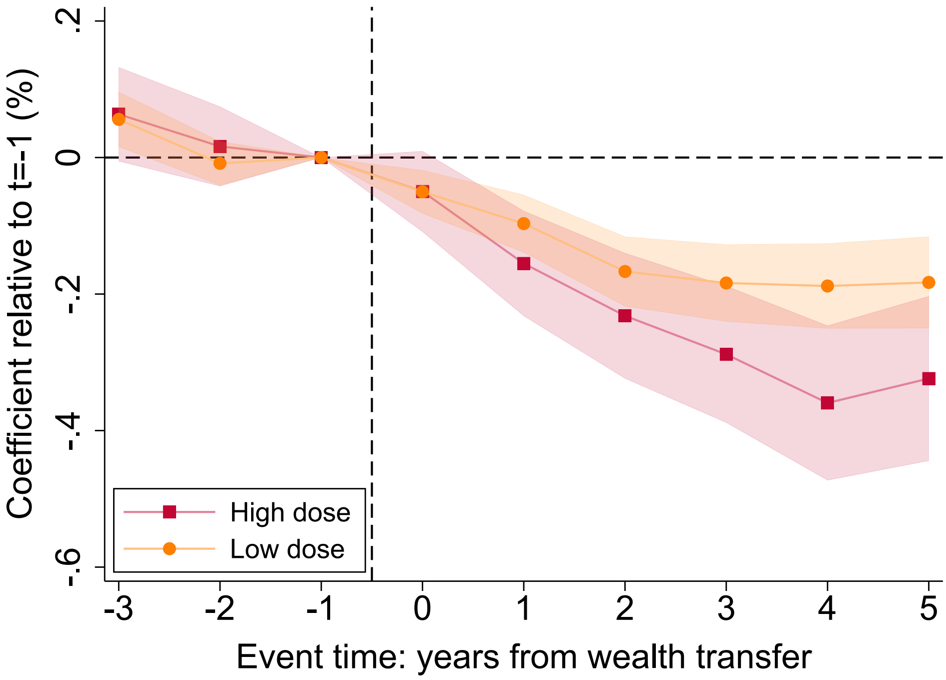
Figure B5: Event-study results with a discrete treatment by age group



Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings by age group. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2), but using a discrete treatment rather than a continuous one: each point shows the effect $k \in [-3, 5]$ years from the realization of the shock. Standard errors are clustered by individuals. Wealth shocks include both inheritances and lottery wins. We classify individuals who receive a wealth shock below the average as the control group, and those who receive a shock larger than five times the average as the treated group.

B6 Event-study results with discrete treatment and different doses

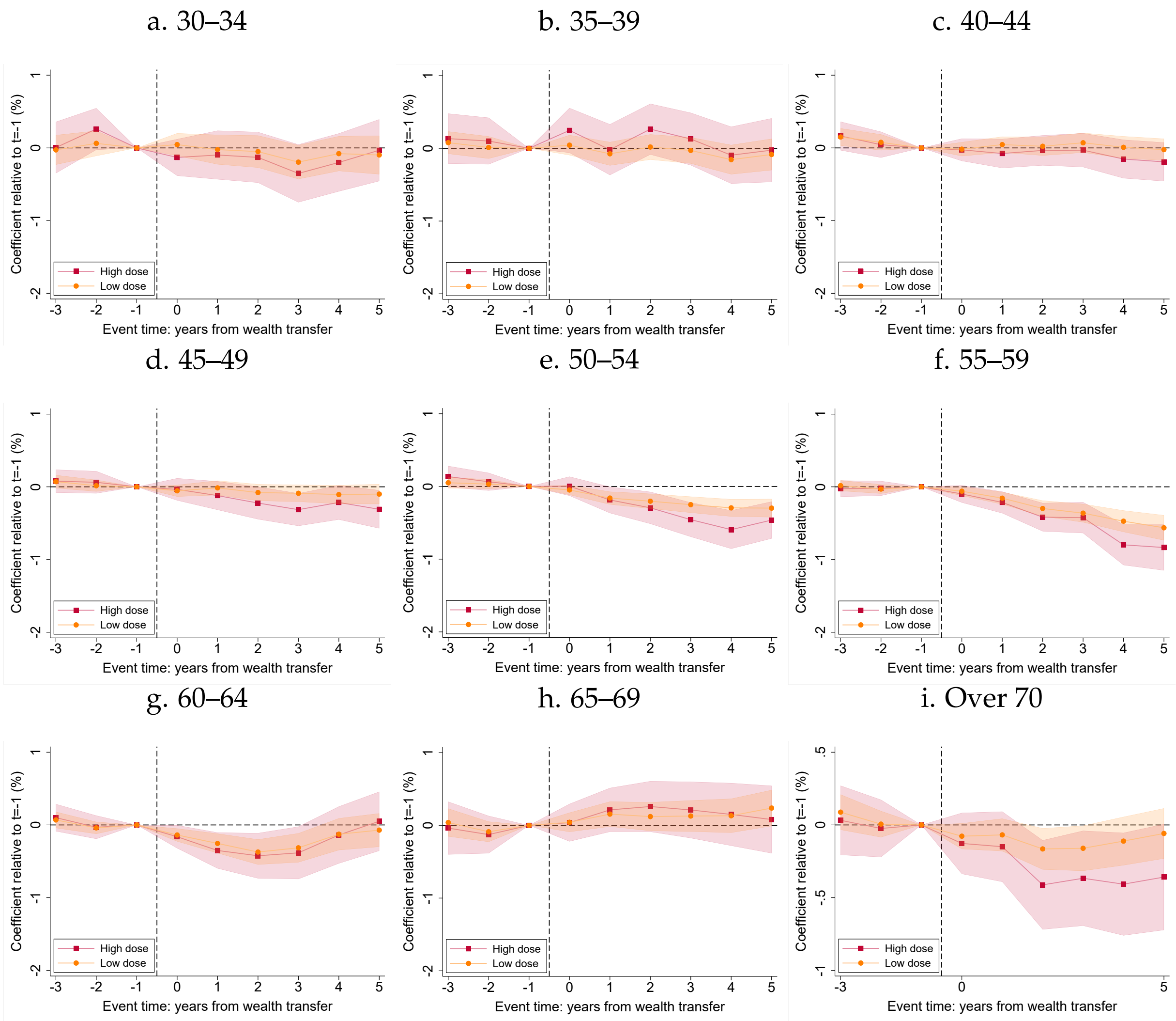
Figure B6: Event-study results with discrete treatment and different doses



Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2), but using a discrete treatment rather than a continuous one: each point shows the effect $k \in [-3, 5]$ years from the realization of the shock. Standard errors are clustered by individuals. Wealth shocks include both inheritances and lottery wins. We define "low-dose" treatment as wealth shocks below the average (orange circles), and "high dose" as wealth shocks larger than five times the average (red squares).

B7 Event-study results with a discrete treatment and different doses by age group

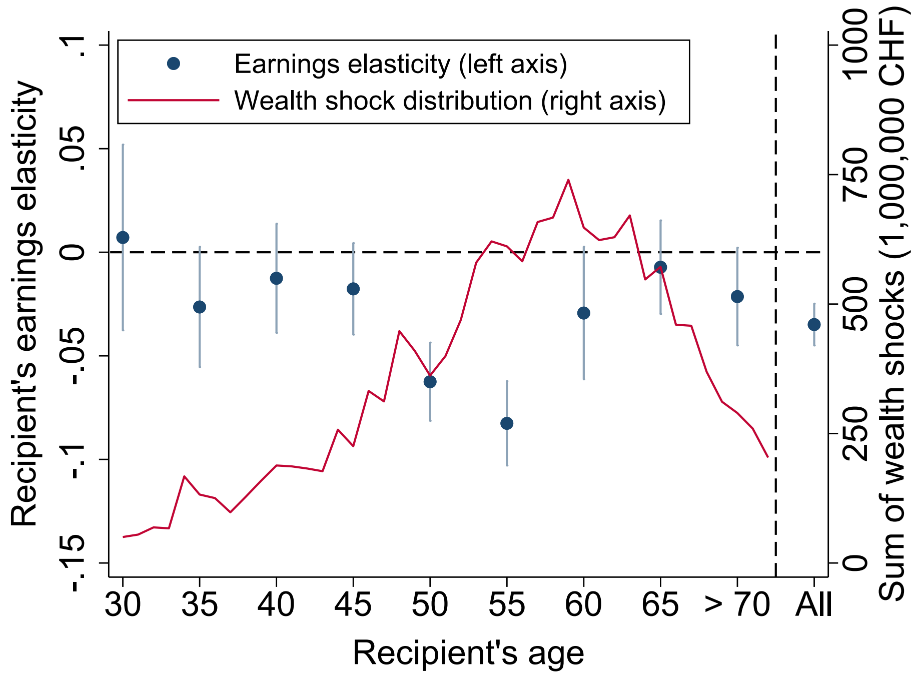
Figure B7: Event-study results with a discrete treatment and different doses by age group



Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings by age group. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2), but using a discrete treatment rather than a continuous one: each point shows the effect $k \in [-3, 5]$ years from the realization of the shock. Standard errors are clustered by individuals. Wealth shocks include both inheritances and lottery wins. We define "low-dose" treatment as wealth shocks below the average (orange circles), and "high dose" as wealth shocks larger than five times the average (red squares).

B8 Treatment scaled by pre-shock income

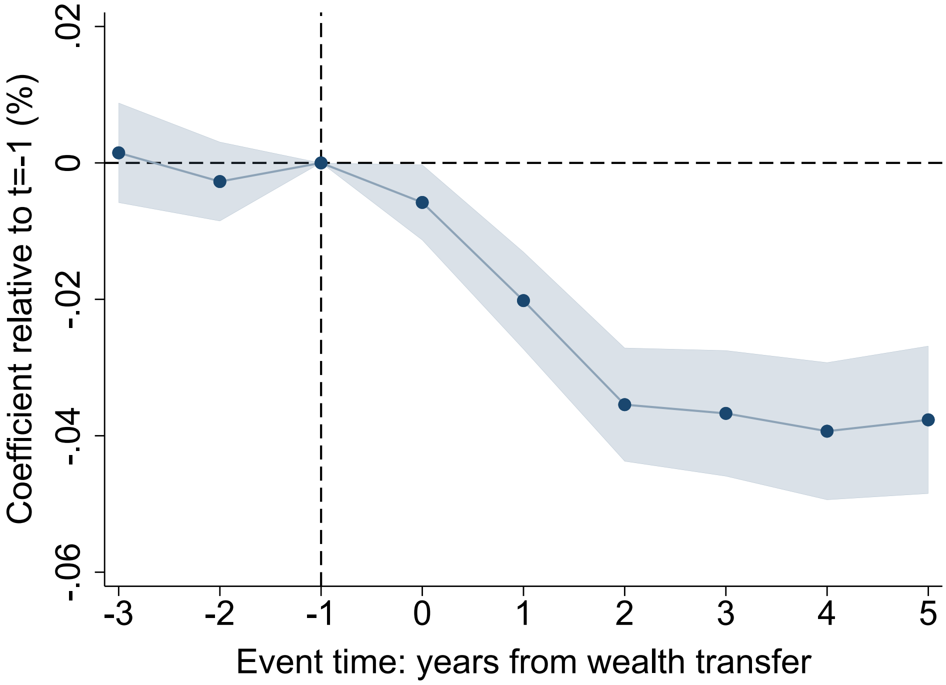
Figure B8: Treatment scaled by pre-shock income



Notes: This figure shows age-specific earnings elasticities to wealth shocks, obtained by estimating the DiD equation (1). Each point reflects the estimated elasticity of log labor earnings with respect to log present-value-adjusted wealth shocks, computed separately by age group at the time of receipt (left axis). Wealth shocks are scaled by individual-level pre-shock labor earnings, measured as average earnings over the three years preceding the shock. The elasticity for "All" corresponds to the pooled estimate across all ages. Each elasticity is estimated over a time interval spanning -3 to 5 years around the realization of the wealth shock. The figure also shows the empirical distribution of wealth transfers (red line; right axis), measured as the sum of wealth shocks received by each age group (in CHF million, pooled over 2002–2019). The sample contains 1,266,430 person-year observations.

B9 Event-study results using a balanced sample

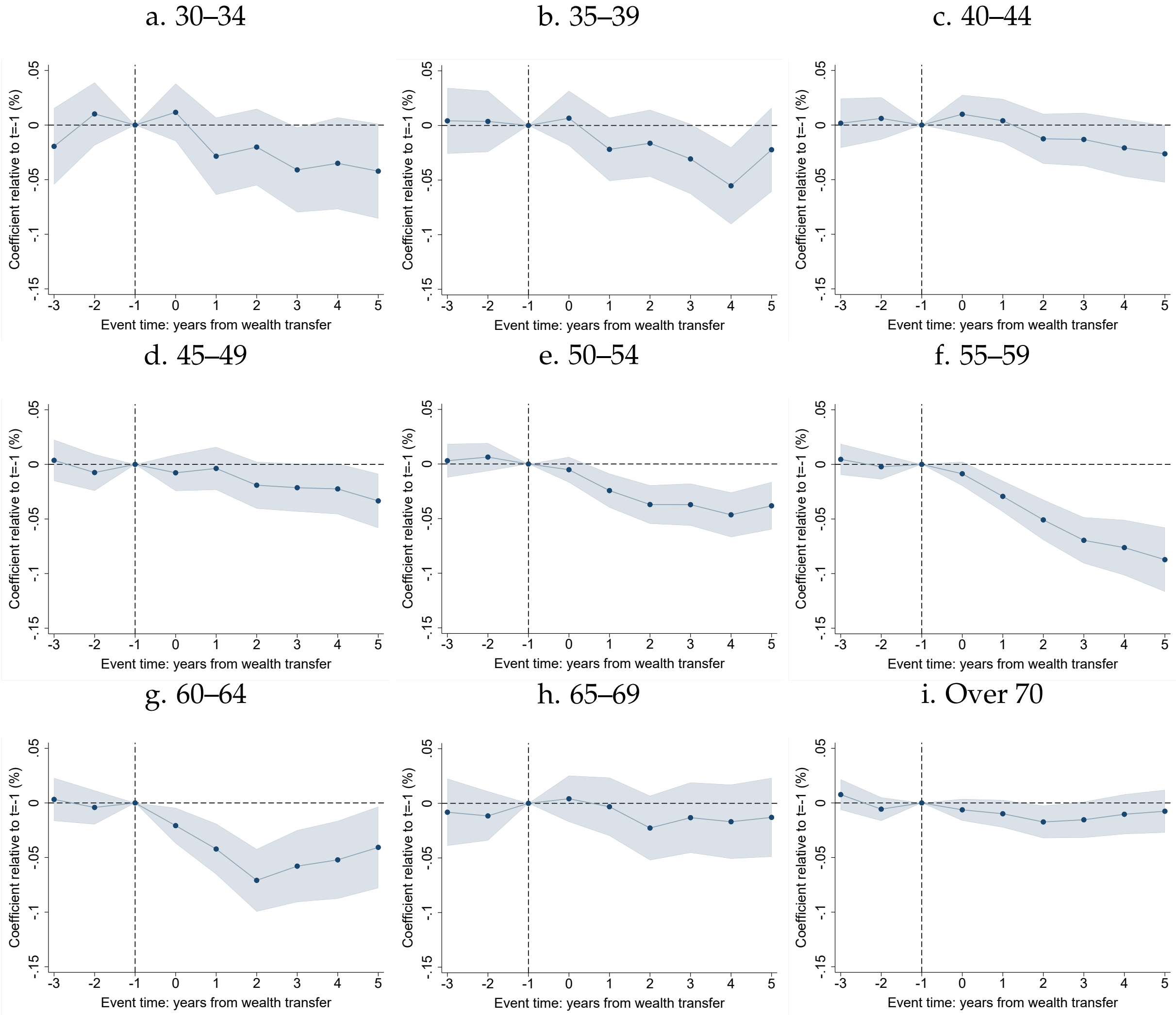
Figure B9: Event-Study Result Using a Balanced Sample



Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2): each point shows the effect $k \in [-3, 5]$ years from the realization of the shock. Standard errors are clustered by individuals. Wealth shocks include both inheritances and lottery wins. These estimates are based on a balanced sample of individuals whom we observe for at least three years before and five years after the wealth shock.

B10 Event-study results by age using a balanced sample

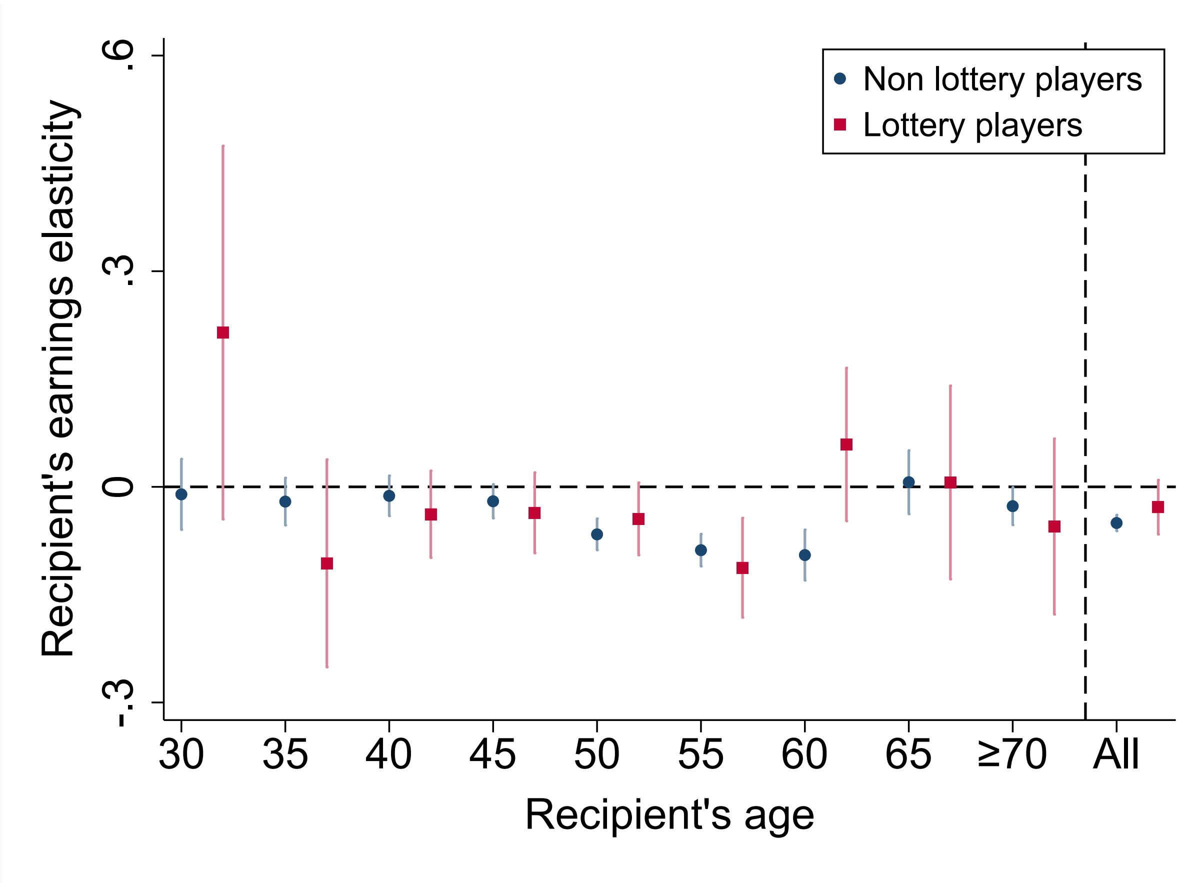
Figure B10: Event-study results by age using a balanced sample



Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings by age group. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2): each point shows the effect $k \in [-3, 5]$ years from the realization of the shock. Standard errors are clustered by individuals. Wealth shocks include both inheritances and lottery wins. These estimates are based on balanced samples of individuals whom we observe for at least three years before and five years after the wealth shock.

B11 Are lottery players different?

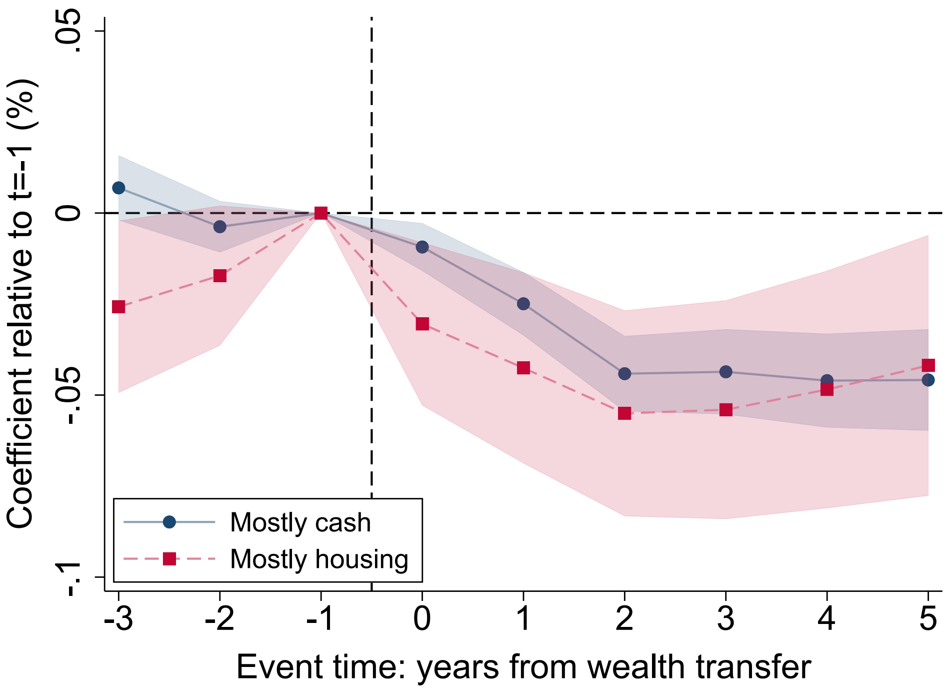
Figure B11: Are lottery players different?



Notes: This figure examines whether heirs who play the lottery exhibit different earnings responses to inheritance compared to the general population of heirs. The figure plots age-specific earnings elasticities to inheritance, as estimated from equation (1), separately for the sample of heirs who do not play the lottery (blue circles; 1,194,500 observations overall) and those who play the lottery (red squares; 135,701 observations overall). Each point represents the estimated elasticity of log labor earnings with respect to log present-value-adjusted wealth shocks from inheritance, calculated separately for each age group at the time of receipt. An additional estimate labeled "All" corresponds to the pooled elasticity across all ages. The estimation window spans from three years before to five years after receiving an inheritance. Lottery players are defined as individuals who have declared a lottery win (usually of trivial size) over the period 2002–2019.

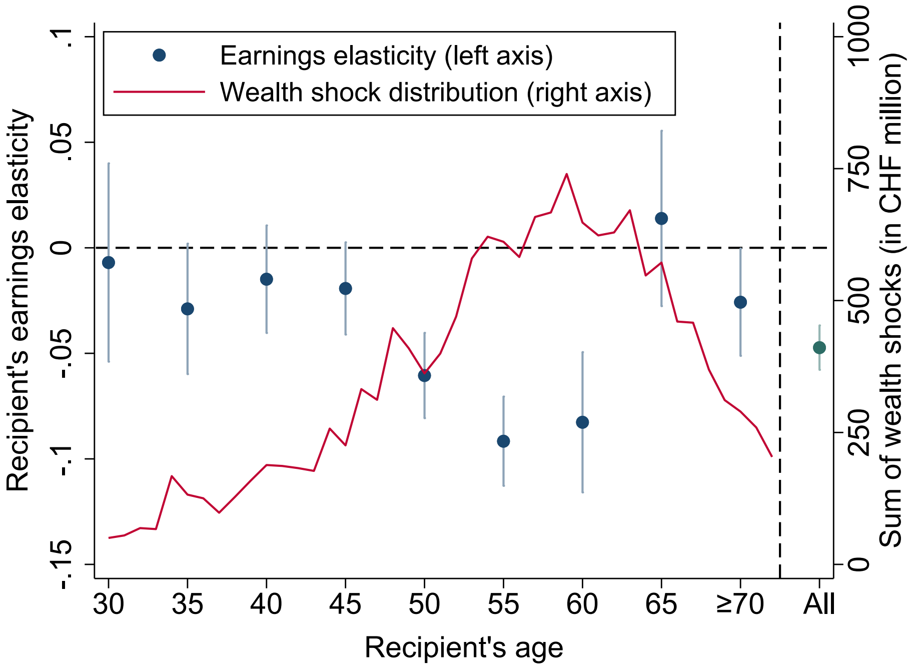
B12 Do liquidity and attachment effects attenuate responses?

Figure B12: Do liquidity and attachment effects attenuate responses?



Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2): each point shows the effect $k \in [-3, 5]$ years from the realization of the shock. Standard errors are clustered by individuals. Wealth shocks include both inheritances and lottery wins. The sample is split into (i) heirs for whom at least 50% of the inheritance value consists of housing wealth ("mostly housing"), and (ii) heirs for whom at least 50% of the inheritance value consists of non-housing wealth ("mostly cash").

Figure B13: Age profile of earnings responses to wealth shocks - household level



Notes: This figure shows age-specific earnings elasticities to wealth shocks, obtained by estimating the DiD equation (1). Different from the baseline estimate, here the unit of observation is the household. Each point reflects the estimated elasticity of log labor earnings with respect to log present-value-adjusted wealth shocks, computed separately by age group at the time of receipt (left axis). The estimated values are given in Table 2. The elasticity for "All" corresponds to the pooled estimate across all ages. Each elasticity is estimated over a time interval spanning -3 to 5 years around the realization of the wealth shock. The figure also shows the empirical distribution of wealth transfers (red line; right axis), measured as the sum of wealth shocks received by each age group (in CHF million, pooled over 2002–2019).

Table B1: Level-level estimates

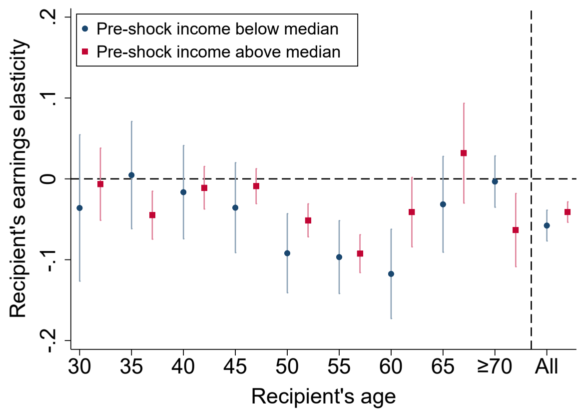
	Sample:		
	All wealth shocks	Inheritances	Lottery wins
	(1)	(2)	(3)
Level-level estimate	-0.00259***	-0.00256***	-0.00363***
	(0.00032)	(0.00033)	(0.00126)
Obs.	1,266,430	1,219,122	47,308
On-impact MPE to CHF 1k p.v. adj. (CHF)	-3	-3	-4

Notes: This table reports estimates from a level-level specification, using the same fixed effects as in equation (1). Column (1) considers wealth shocks from inheritance and lottery wins; column (2) focuses only on inheritances; column (3) only on lottery wins. On-impact *MPE* (marginal propensity to earn out of unearned income) refers to the average annual earnings loss associated with receiving a present-value adjusted wealth shock of CHF 1,000, over the first five years after treatment. Sample definition and summary statistics are the same as in Table 1.

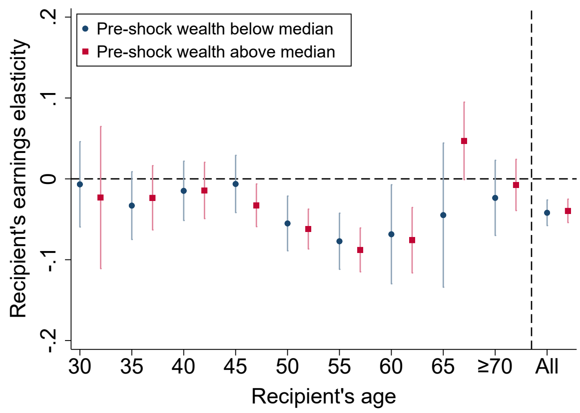
B13 Heterogeneity by pre-shock income and wealth

Figure B14: Earnings responses by pre-shock income and wealth

(a) By pre-shock income



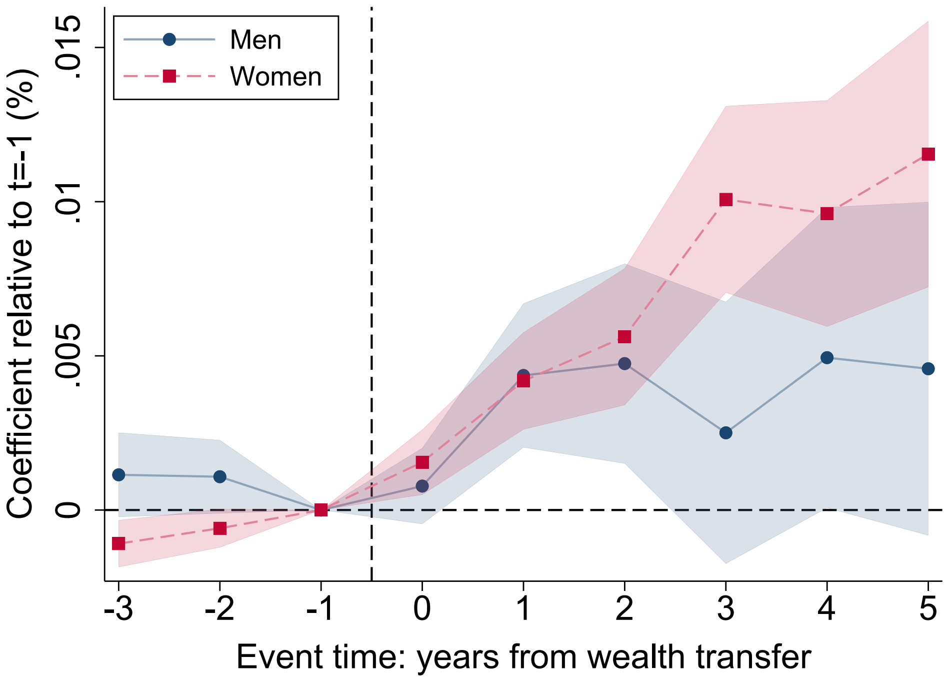
(b) By pre-shock wealth



Notes: This figure compares earnings elasticities to wealth shocks by age, estimated separately for heirs with pre-shock income below vs above the median (Panel a) and pre-shock wealth below vs above the median (Panel b). Each point reflects the estimated elasticity of log labor earnings with respect to log present-value-adjusted wealth shocks, computed separately by age group at the time of receipt. The elasticity for "All" corresponds to the pooled estimate across all ages for the respective group. Each elasticity is estimated over a time interval spanning -3 to 5 years around the year of the wealth shock.

B14 Early retirement responses by gender

Figure B15: Early retirement responses by gender



Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings. It plots coefficient estimates and the 95 percent confidence intervals obtained from equation (2): each point shows the effect $k \in [-3, 5]$ years from the realization of the shock. Standard errors are clustered by individuals. Wealth shocks include both inheritances and lottery wins. The outcome variable is a binary indicator equal to one in each year before the statutory retirement age (65 for men, 64 for women) during which the individual begins receiving an occupational or public pension, or cashes out pension savings for retirement, conditional on having been labor-market active in the previous year. The earliest possible age to formally retire early is 58, hence, we consider individuals who receive a wealth shock at ages 55–59.

C Institutional background

C1 Taxation of income, wealth and wealth transfers in Switzerland

C1.1 Taxable income and wealth

Our data come from annual filings for income and wealth taxes. Those declarations have to be submitted by all households, with married couples filing jointly.

Wealth and income are self-reported. To encourage taxpayers to report capital incomes and corresponding wealth, a withholding tax of 35% is levied on dividends and interest, including interest income from Swiss bank accounts (above an exemption of CHF 200). Since the withholding tax rate typically exceeds the marginal consolidated income tax rate, taxpayers have an incentive to report the corresponding assets, in which case the withholding tax is refunded. With the introduction of the automatic exchange of information in 2017, foreign bank accounts of Swiss taxpayers in over 100 countries are automatically reported to the Swiss tax authorities, providing an incentive for taxpayers to declare those accounts as well (Baselgia, 2023).

The canton of Bern further mandates that employers send the salary information of their employers directly to the cantonal tax authorities, such that wage income is third-party reported (at least for those taxpayers whose employer is located in the canton, as employers in other cantons may not always be aware of this cantonal rule).

The cantonal tax administration implements automated checks on how income and wealth evolve over time. Changes in reported wealth that are not consistent with the evolution of income are inspected further by the authorities and require an explanation. For this reason, it is common for taxpayers to also report gifts, inheritances and lottery winnings—even in cases where they are not subject to taxation. The standard tax return also asks about lottery winnings, inheritances, and gifts received or made, which further increases the coverage of these variables.

C1.2 Lottery taxes

Subject to the lottery tax are winnings in cash and in kind from traditional lotteries (Lotto), raffle tickets, sweepstakes, sport gambles, or race betting. Winnings from casino games and poker tournaments are subject to lottery taxes since 2019 in some cases. At the same time, the tax exemption level for most lotteries was increased to CHF 1m. We therefore limit our analysis to lottery winnings prior to 2019.

At the federal level, lottery gains are taxed as income, pooled together with all other income sources. The progressive federal income tax defaults to a flat maximum average tax rate of 11.5% for taxable incomes above a specified threshold.[1] For the canton and municipal tax, respectively, the canton of Bern applies a flat rate tax of 10%, after a deduction of 5% of the amount won.Figure C1 shows the marginal and average tax rates on lotteries in the canton of Bern over the period 2002–2018. Individuals subject to the church tax face an additional 8% tax on their winnings.[2] The canton of Bern, however, caps the total tax burden on lottery winnings at 35%, to maintain the reporting incentives in light of the 35% withholding tax (in practice,

[1] In 2002, the threshold was CHF 664,400 for singles and CHF 788,500 for married taxpayers, respectively. Tax brackets are adjusted regularly for inflation.

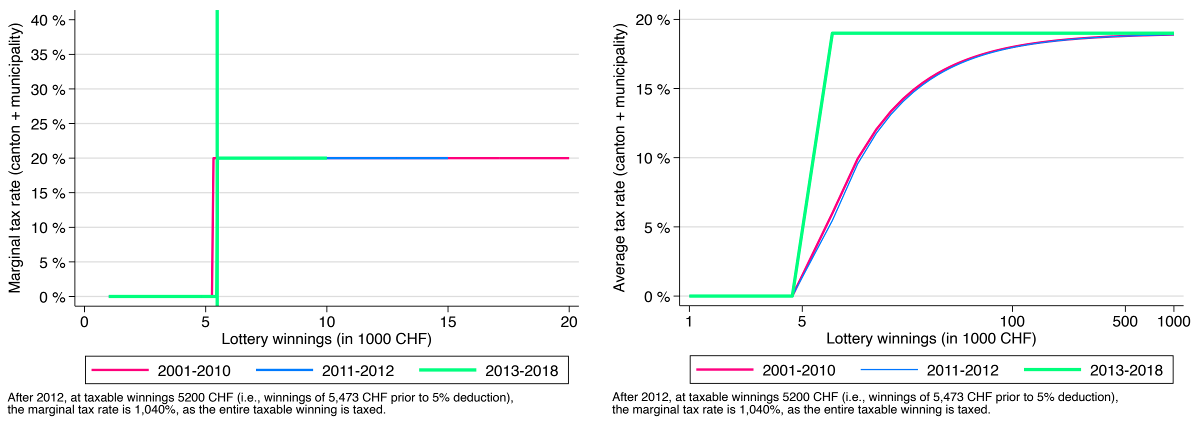
[2] In Switzerland, cantonal church taxes are levied by officially recognized churches. Individuals who declare to be members of such a church are liable for church tax on their income and wealth.

this provision is only relevant for individuals subject to church tax).

Taking into account taxpayers' actual federal income tax rate and specific deductions applicable to lottery wins as well as the local flat rate taxes allows us to compute the lottery gains net of taxes.

Figure C1: Lottery tax rates, canton of Bern

A. Marginal tax rates B. Average tax rates



Notes: The figures plot statutory lottery tax rates in the canton of Bern. Note that since 2013, winnings exceeding the exemption amount are fully taxed. For the federal tax, lotteries are treated as income and hence added to the income tax base, which is why the federal tax on lotteries is not included in the graph. At the top, the federal income tax defaults to a flat rate average tax of 11.5%.

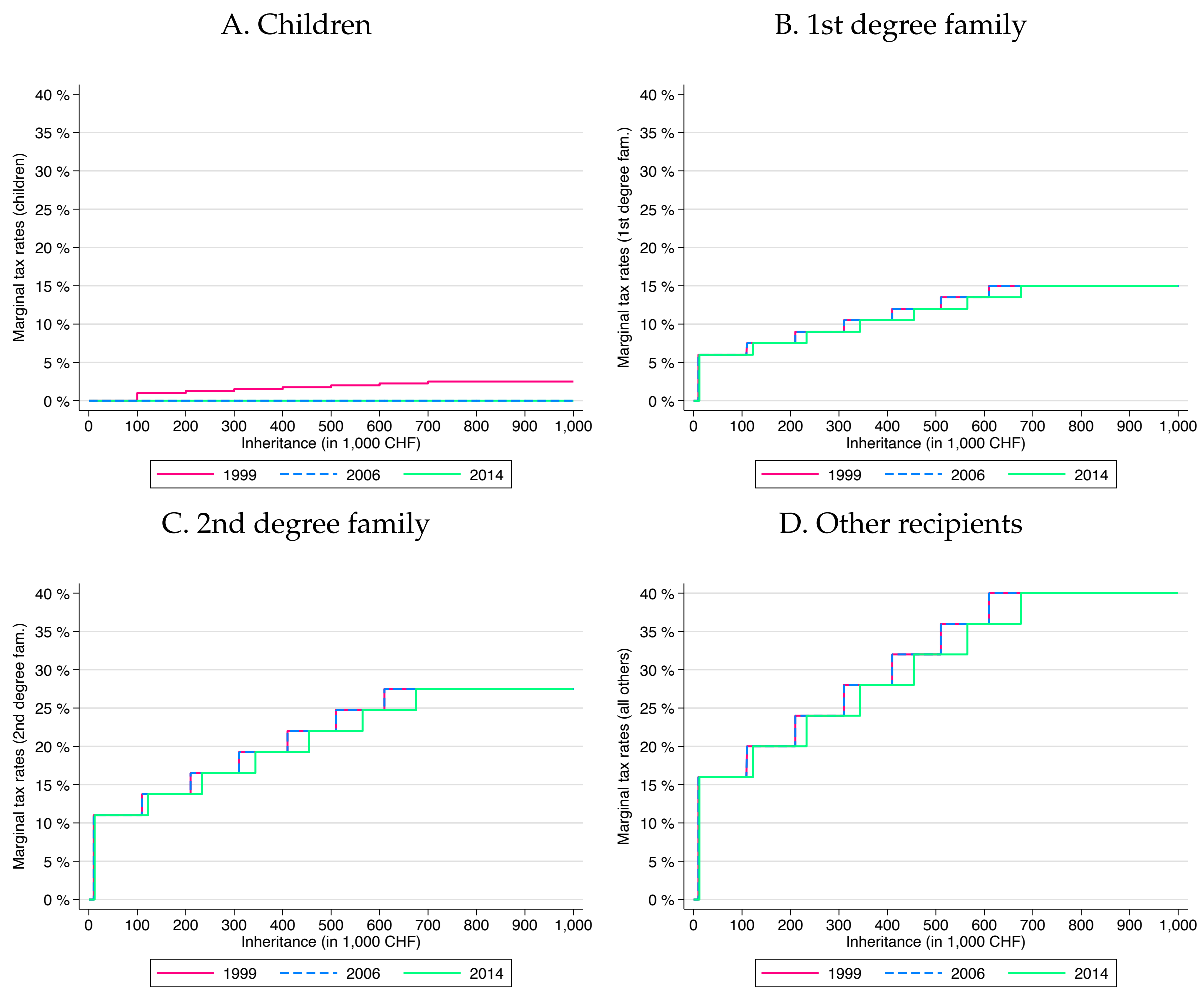
C1.3 Inheritance and gift taxes

Bequests are only taxed by cantons and municipalities, not at the federal level. To avoid tax evasion through deathbed gifting, inter-vivos gifts are taxed like inheritances, typically cumulating gifts and inheritances from the same donor over five years. In the canton of Bern, inheritance taxes on spouses were abolished in 1989, and since 2006, no inheritance and inter-vivos gift tax is levied on direct descendants. The latter reform was adopted by the cantonal parliament in November 2004, making room for tax planning through delaying gifts until January 2006. For non-relatives, however, the top marginal tax rate has remained unchanged at 40%. Figure C2 illustrates the evolution of statutory tax schedules for different classes of heirs.

All transferred assets are subject to the inheritance and gift tax, including forgiven debt. In case of so-called mixed gifts, where there is an obvious mismatch between the price paid for an asset and its market value, the gift tax is levied only on the gifted portion of the asset.

Transferred businesses (corporations, cooperatives, and holding companies) received a 50% tax reduction until 2013, and are completely exempt from the inheritance tax since 2014, as long as the heir is: (a) employed in the business in a managerial function, and (b) a tax resident in the canton of Bern. In the case of holding companies, a majority participation in operating businesses of at least 40% (of the capital or the voting rights) is also required. All of the above requirements must be met for at least ten years after the transmission of the business, otherwise the tax reduction is forfeited and back-taxes are due.

Figure C2: Inheritance and gift tax rates, canton of Bern



Notes: The figures plot inheritance and gift tax rates on different classes of recipients for heirs/donees in the canton of Bern. 1st degree family includes siblings, parents, grandparents and common-law partners. 2nd degree family includes nieces/nephews, aunts/uncles and parents-in-law.

C2 Lottery players

A representative survey conducted in 2021 (Moneyland, 2021) revealed that 34% of the Swiss population play the traditional lottery (Lotto) at least several times a year, and 27% buy raffle tickets. Other forms of gambling such as sports gambling, casino games, card games etc. are practised only by small fractions of the population. While cohorts aged 18–25 engage in a larger variety of types of gambling, older cohorts are more prone to playing the traditional lottery: 46% of those aged 50–74 play regularly. Men play more often than women, which is in line with the higher risk aversion typically found in women. Interestingly, and maybe in contrast to conventional views, wealthy individuals play more often, too. Of those with wealth between 0.5–1m, 44% play regularly.

These observations for Switzerland are broadly in line with findings on lottery players in Germany, where Lutter et al. (2018) find that 24.8% of respondents play the lottery at least a few times a year (15.9% [11.7%] play at least once a month [weekly]). Men are also found to play more often and to spend more than women. Higher-income survey respondents are more likely to play (but spend proportionally less of their income on lottery tickets). Respondents above the age of 59 play more regularly and spend more, both in absolute terms and relative to their income, than younger respondents.

Investigating the reasons to play the lottery, Lutter et al. (2018) find that the more one expresses a belief in good luck and daydreams about a positive future, the higher the odds of playing the lottery. This is in line with Kocher et al. (2014), who show that part of the value of playing the lottery are positive anticipatory emotions. In the same vein, Burger et al. (2020) find in a large field experiment in the Netherlands that lottery participation has a utility value in itself. In Lutter et al. (2018), work dissatisfaction is also significantly positively associated with the probability of playing the lottery at least a few times a year. Furthermore, a decline in income might be associated with a higher probability of playing the lottery. This could explain why we see more lottery wins as individuals approach retirement, a period when incomes typically start falling. We conclude from the literature on motivations to play the lottery that even though lottery players are self-selected, it is not necessarily selection of individuals with low-socioeconomic status: the psychological factors that determine whether someone plays the lottery apply to a wide range of the population.

C3 Pension system and retirement decisions

C3.1 The Swiss three-pillar pension system

The Swiss pension system is based on three pillars: pay-as-you-go social security pensions (first pillar), contribution-based occupational pensions (second pillar), and voluntary private pension savings plans (third pillar).

All labor incomes from employment and self-employment are fully subject to social security contributions. Occupational pension plans are mandatory above a legally defined minimal gross income (ranging between CHF 19,350 and CHF 24,750, or about 1/3 of the full-time median salary, in our sample period) for all employees. Firms must provide a pension plan to their workforce. Workers cannot choose their pension plan. Age-specific monthly minimum contribution rates are set by law, but firms have some freedom to increase the rates and/or to contribute more than the employee. Unfortunately, tax data or any other administrative data lacks information on the specifics of an individual's occupational pension plan or the individual's amount of wealth saved in such a plan. In addition to their contributions, individuals have the option for voluntary buy-ins to improve their future pensions. Because these buy-ins are tax-deductible, we observe them in our data. Self-employed can choose to join an occupational pension plan. The third pillar, finally, consists of private retirement savings accounts and life-insurance policies. Savings accounts are the predominant form, accounting for 64% of all capital in the third pillar in 2018 (Schüpbach & Müller, 2019).

Pension wealth in the second and third pillar is tax-exempt (and hence not part of our or any other individual-level register data), and annual contributions are deductible from taxable income. Tax deduction of voluntary contributions is capped at legally defined maximum amounts, both, in the second and third pillar.[3] Contributions to the third pillar are only tax-deductible for individuals who are employed or self-employed in a given year.

[3]The maximum buy-in amounts in the second pillar depend on the gap between an individual's projected pension and their current salary.

C3.2 Regular retirement

Across all three pillars, the statutory retirement age is 64 for women (63 before 2005) and 65 for men. Social security pensions are calculated based on average earnings and number of contribution years. Retirement savings from the second pillar can be drawn as annuitized pensions, or they can be cashed out. Most pension plans also allow for a mix between capital withdrawals and a pension. Annuitization, however, is only possible if the individual is still employed at the time of (early or regular) retirement, i.e., those who become unemployed shortly before entering retirement only have access to their capital. Savings from the third pillar can typically only be withdrawn as lump-sum.

C3.3 Early and late retirement

Rules for early retirement differ by pillar, but are the same in all cantons and across all industries. Retirement can be also be deferred until age 70 in all three pillars.

In the first pillar, early retirement is possible up to 48 months prior to reaching the statutory retirement age. The pension is reduced accordingly, and early retirees still need to make social security contributions until they reach the statutory age. For early retirees and all non-working individuals, contributions are based on personal income and wealth. They can be hefty, as individuals also have to cover the part that is otherwise covered by the employer. Partial retirement is not possible in the first pillar. However, it is possible to retire early and start drawing a social security pension, and at the same time continue working part-time. In this case, social security contributions are covered through the employment contributions. Deferring retirement in the first pillar leads to an increase in later pensions. However, if individuals return to work once they have started drawing a pension, their pension is unaffected.

Occupational pensions can be drawn no earlier than at age 58 (and some pension plans only allow drawing the pensions starting at age 60).[4] In contrast to the first pillar, the second pillar allows for partial retirement. If labor supply is reduced by at least 20 or 30% (depending on the pension plan), the corresponding fraction can be drawn as a pension or cashed out. Partial retirement can be progressive: it is possible, for example, to go from full-time employment to 70% at age 62, reduce to 50% at age 63, and stop working at age 64. This strategy further allows to cash out the pension capital in several installments, which reduces the tax progression on these capital payments. Deferring retirement will increase the later pension, but rules vary by pension plan. Going back into work after having cashed out or annuitized the second pillar pension capital does not affect the occupational pension.

The pension capital from third pillar accounts can be withdrawn up to five years prior to reaching the statutory retirement age, i.e., at age 59 for women (age 58 up until 2004) and at age 60 for men. Typically, the capital is withdrawn, annuitization is extremely rare (and only available if a life insurance was bought). Individuals can return to work, in which case they become again eligible to make voluntary, tax-deductible contributions to the third pillar scheme. This is possible until age 70.

[4]Provisions around early retirement differ by firm and pension plan. Employees at larger firms and top executives may benefit from more favorable conditions (Dorn & Sousa-Poza, 2005). In the construction sector, early retirement is possible at age 60 under a collective bargaining agreement (FAR). The bridging pension is financed by contributions from both employers and employees. Unfortunately, in the tax data, we lack information on the profession or firm. Our definition of early retirement therefore be too strict for some workers.

D Model derivations

D1 Baseline model

The lifetime budget constraint evaluated at time 0 writes:

$$b_{i,-1} + a_{i,0} + r_{i,0} + \sum_{a=0}^{D} \frac{\mathcal{W}_{i,a}}{(1+r)^a} = \sum_{a=0}^{D} \frac{c_{i,a}}{(1+r)^a} \tag{1}$$

where:

$$a_{i,0} = \sum_{a=0}^{T} \frac{w_{i,a} h_{i,a}}{(1+r)^a} \tag{2}$$

denotes active-life income evaluated at time 0, and:

$$r_{i,0} = \sum_{a=T+1}^{D} \frac{y_{i,a}^{p}}{(1+r)^a} \tag{3}$$

stands for retirement income evaluated at time 0. Let us define λ_i as the marginal utility of wealth at time 0, then first-order conditions for consumption and labor supply imply:

$$u_{c,i,a} = \frac{\lambda_i}{\Lambda_a} \left[\frac{1+\rho}{1+r}\right]^a \tag{4}$$

$$-u_{h,i,a} = \frac{\lambda_i w_{i,a}}{\Lambda_a} \left[\frac{1+\rho}{1+r}\right]^a, \text{ if } a < T+1 \tag{5}$$

Let us now define the utility function as:

$$u\left(c_{i,a}, 1-h_{i,a}\right) = \ln\left(c_{i,a}\right) + \kappa \ln\left(1-h_{i,a}\right) \tag{6}$$

and replace to get:

$$c_{i,a} = \frac{\Lambda_a}{\lambda_i} \left[\frac{1+r}{1+\rho}\right]^a \tag{7}$$

$$\kappa\left(1-h_{i,a}\right)^{-1} = \frac{\lambda_i w_{i,a}}{\Lambda_a} \left[\frac{1+\rho}{1+r}\right]^a \tag{8}$$

Then, substitute the first one in the second to get:

$$\kappa \frac{c_{i,a}}{\left(1-h_{i,a}\right)} = w_{i,a} \tag{9}$$

which is the usual labor supply equation and shows that labor supply depends negatively on consumption, and thus on age if consumption increases along the life cycle. Rearranging yields:

$$h_{i,a} = 1 - \kappa \frac{c_{i,a}}{w_{i,a}} \tag{10}$$

which, plugged in the expression of net earnings in the budget constraint gives:

$$b_{i,-1} + a'_{i,0} + r_{i,0} + \sum_{a=0}^{D} \frac{\mathcal{W}_{i,a}}{(1+r)^a} = \sum_{a=0}^{T} \frac{(1+\kappa)\, c_{i,a}}{(1+r)^a} + \sum_{a=T+1}^{D} \frac{c_{i,a}}{(1+r)^a} \tag{11}$$

where

$$a'_{i,0} = \sum_{a=0}^{T} \frac{w_{i,a}}{(1+r)^a} \tag{12}$$

Then, note that the FOC on consumption implies:

$$c_{i,a} = \mathbb{E}_0 \left\{ \frac{\Lambda_a}{\Lambda_0} \right\} \left[\frac{1+r}{1+\rho} \right]^a \frac{c_{i,0}}{\lambda_i}, \forall s \tag{13}$$

so that the RHS of the intertemporal budget constraint (11) writes:

$$\sum_{a=0}^{T} \frac{(1+\kappa)\, c_{i,a}}{(1+r)^a} + \sum_{a=T+1}^{D} \frac{c_{i,a}}{(1+r)^a} = c_{i,0} \frac{\mathbb{E}_0 \{\Gamma_0\}}{\lambda_i} \tag{14}$$

where:

$$\Gamma_0 = \sum_{a=0}^{T} \frac{(1+\kappa)}{(1+\rho)^a} \mathbb{E}_0 \left\{ \frac{\Lambda_a}{\Lambda_0} \right\} + \sum_{a=T+1}^{D} \frac{1}{(1+\rho)^a} \mathbb{E}_0 \left\{ \frac{\Lambda_a}{\Lambda_0} \right\} \tag{15}$$

Let us now wrap up and derive the expression for consumption using the intertemporal budget constraint:

$$c_{i,0} = \frac{\lambda_i}{\mathbb{E}_0 \{\Gamma_0\}} \mathbb{E}_0 \left[b_{i,0} + \sum_{a=0}^{T} \frac{w_{i,a}}{(1+r)^a} + r_{i,a} + \sum_{a=0}^{D} \frac{\mathcal{W}_{i,a}}{(1+r)^a} \right] \tag{16}$$

We can rewrite this expression for any a:

$$c_{i,a} = \frac{\lambda_i}{\mathbb{E}_a \{\Gamma_a\}} \mathbb{E}_a \left[b_{i,a-1} + a'_{i,a} + r_{i,a} + \sum_{s=0}^{D-a} \frac{\mathcal{W}_{i,a+s}}{(1+r)^s} \right] \tag{17}$$

where λ^i now denotes the marginal utility of wealth at time a, and where:

$$r_{i,a} = \sum_{s=T-a}^{D} \frac{y^p_{i,a+s}}{(1+r)^s},\; a'_{i,a} = \sum_{s=0}^{T-a} \frac{w_{i,a+s}}{(1+r)^s}, \tag{18}$$

After assuming that $\Lambda_a = 1, \forall a \leqslant T$, and using the definition of Λ_a:

$$\Gamma_a = \frac{(1+\kappa)}{\rho} \left(\frac{(1+\rho)^{T-a} - 1}{(1+\rho)^{T-a}} \right) + \sum_{s=T-a}^{D} \frac{\mathbb{E}_a \{\varsigma_{a+1} \ldots \varsigma_{a+s}\}}{(1+\rho)^s} \tag{19}$$

Finally, we can write earnings as $y^w_{i,a} = w_{i,a} h_{i,a}$ and plug the expression for $c_{i,a}$ to get:

$$y^w_{i,a} = \underbrace{w_{i,a}}_{i+a \text{ FE}} - \frac{\kappa \lambda_i}{\mathbb{E}_a \{\Gamma_a\}} \mathbb{E}_a \left[\underbrace{b_{i,a-1} + a'_{i,a} + r_{i,a}}_{\text{Init. wealth + wage + ret. income}} + \underbrace{\sum_{s=0}^{D-a} \frac{\mathcal{W}_{i,a+s}}{(1+r)^s}}_{\text{Exogenous wealth shocks}} \right] \tag{20}$$

Focusing on percentage changes in $y^w_{i,a}$ as a function of potential changes in $\mathcal{W}_{i,a+s}$, the above expression implies:

$$\frac{\Delta y^w_{i,a}}{y^w_{i,a}} = -\mathbb{E}_a \left\{ \frac{\kappa \lambda_i}{\Gamma_a (1+r)^s} \frac{\Delta \mathcal{W}_{i,a+s}}{y^w_{i,a}} \right\}. \tag{21}$$

In the main text, we define the structural elasticity ζ^{struct}_a as the log earnings gap at time a between the observed and no-shock paths:

$$\zeta^{struct}_a = \frac{\ln y^w_{i,a} - \ln y^{w,ns}_{i,a}}{\ln \mathcal{W}_{i,a}}. \tag{22}$$

Consistent with our empirical approach, we also define the impact elasticity ζ^{impact}_a as the *observed* impact of a wealth shock $\mathcal{W}_{i,a}$ on the five-year log change in earnings, relative to the no-shock counterfactual:

$$\zeta^{impact}_a = \frac{(\ln y^w_{i,a} - \ln y^w_{i,a-1}) - (\ln y^{w,ns}_{i,a} - \ln y^{w,ns}_{i,a-1})}{\ln \mathcal{W}_{i,a}}. \tag{23}$$

These two elasticities are related by:

$$\zeta^{struct}_a = \zeta^{impact}_a + \frac{\ln y^w_{i,a-1} - \ln y^{w,ns}_{i,a-1}}{\ln \mathcal{W}_{i,a}}. \tag{24}$$

The second term on the RHS captures the anticipatory earnings response occurring before the shock. If the shock is unexpected, then $y^w_{i,a-1} = y^{w,ns}_{i,a-1}$ and $\zeta^{struct}_a = \zeta^{impact}_a$. However, when the shock is anticipated from time $a = 0$, it enters the definition of permanent income from the start. In that case, we can express the anticipatory correction term using the model structure. From Equation (8), we have:

$$y^w_{i,a} = w_{i,a} - \frac{\kappa \lambda_i}{\Gamma_a} \Upsilon_{i,a}. \tag{25}$$

If $\mathcal{W}_{i,a}$ was anticipated at time $a-1$, then $\Upsilon_{i,a-1}$ includes the term $\mathcal{W}_{i,a}/(1+r)$ which implies a change in earnings at time $a-1$—compared to a no-shock situation—of:

$$\ln y^w_{i,a-1} - \ln y^{w,ns}_{i,a-1} \approx -\frac{\kappa \lambda_i \mathcal{W}_{i,a}}{\Gamma_{a-1}(1+r) y^{w,ns}_{i,a-1}}. \tag{26}$$

Substituting this into the relation between the elasticities yields:

$$\zeta^{struct}_a \approx \zeta^{impact}_a - \frac{\kappa \lambda_i \mathcal{W}_{i,a}}{\Gamma_{a-1}(1+r) y^{w,ns}_{i,a-1} \ln \mathcal{W}_{i,a}} \tag{27}$$

This expression quantifies the difference between the empirical and structural elasticities due to anticipation. It depends on the relative preference for leisure (κ), the marginal utility of wealth (λ_i), the age-specific discount factor (Γ_{a-1}), the interest rate (r), and the size of the wealth shock relative to prior earnings.

D2 An extension with early retirement

Baseline case. We now extend the model by allowing individuals to opt for early retirement (ER). Specifically, we solve the life-cycle model in two alternative cases: (a) one where individual i retires at $T+1 = 65$ as in the simple model above, and (b) one where individual i retires one period earlier, at $T = 60$, which implies a different future path of income. We then compute the forward-looking value functions associated with each option, and we let individual i choose the value-maximizing path. Because the model is forward-looking, we consider that the choice of retiring early is irreversible: once individual i has chosen to retire early, she remains on that path for subsequent periods.

We denote variables pertaining to the ER decision case with an asterisk. When individual i decides to retire early (at age $a = T$), we endow her with a fraction $\theta < 1$ of the retirement income she would have got had she delayed retirement until age $a = T+1$, i.e., $\overline{y}^*_{i,T} = \theta \overline{y}_{i,T+1}$; and we then apply the same penalty θ to later retirement income, $\overline{y}^*_{i,T+a} = \theta \overline{y}_{i,T+a}$ for $a = 1, ..., D-T$. In other words, retiring early involves a permanent financial penalty. The associated drop in income can be smoothed using wealth but still implies adjusting consumption over time. In exchange of these costs, early retirees derive utility from additional leisure. Finally, we assume that individuals become aware of the option to retire early only from age 50 onwards.

Formally, let $\left\{y^p_{i,a}, y^{*,p}_{i,a}\right\}$ denote the exogenous income paths respectively associated with retiring at the statutory age and with the ER decision. We solve both models $\mathcal{M} = \{c_{i,a}, h_{i,a}, b_{i,a}\}$ and $\mathcal{M}^* = \left\{c^*_{i,a}, h^*_{i,a}, b^*_{i,a}\right\}$ conditional on income paths, compute value functions $\left\{V_{i,a}, V^*_{i,a}\right\}$, and define an indicator function $\mathbb{1}^r_{i,a} = (V^*_{i,a} > V_{i,a})$ if $a \geqslant 50$ and $\mathbb{1}^r_{i,a} = 0$ otherwise.[5] The resulting solution path is then given by:

$$\tilde{c}_{i,a} = \mathbb{1}^r_{i,a} c^*_{i,a} + (1 - \mathbb{1}^r_{i,a}) c_{i,a} \tag{28}$$
$$\tilde{h}_{i,a} = \mathbb{1}^r_{i,a} h^*_{i,a} + (1 - \mathbb{1}^r_{i,a}) h_{i,a} \tag{29}$$
$$\tilde{b}_{i,a} = \mathbb{1}^r_{i,a} b^*_{i,a} + (1 - \mathbb{1}^r_{i,a}) b_{i,a} \tag{30}$$
$$\mathbb{1}^r_{i,a} = (V^*_{i,a} > V_{i,a}) \text{ if } a \geqslant 50 \text{ and } 0 \text{ otherwise} \tag{31}$$

To run simulations, we need to assign a value to the new parameter θ. In Switzerland, the penalty for early retirement is 6.8% per year.[6] Based on early retirement rates over the last 20 years, we compute the average penalty faced by early retired individuals—computing the average retirement age for people between 60 and 64—and obtain 20%, which implies $\theta = 0.8$.[7]

Panel (a) of Figure D1 shows that the ER decision implies a drop in income due to the early retirement penalty, which then lasts for the whole retirement period.

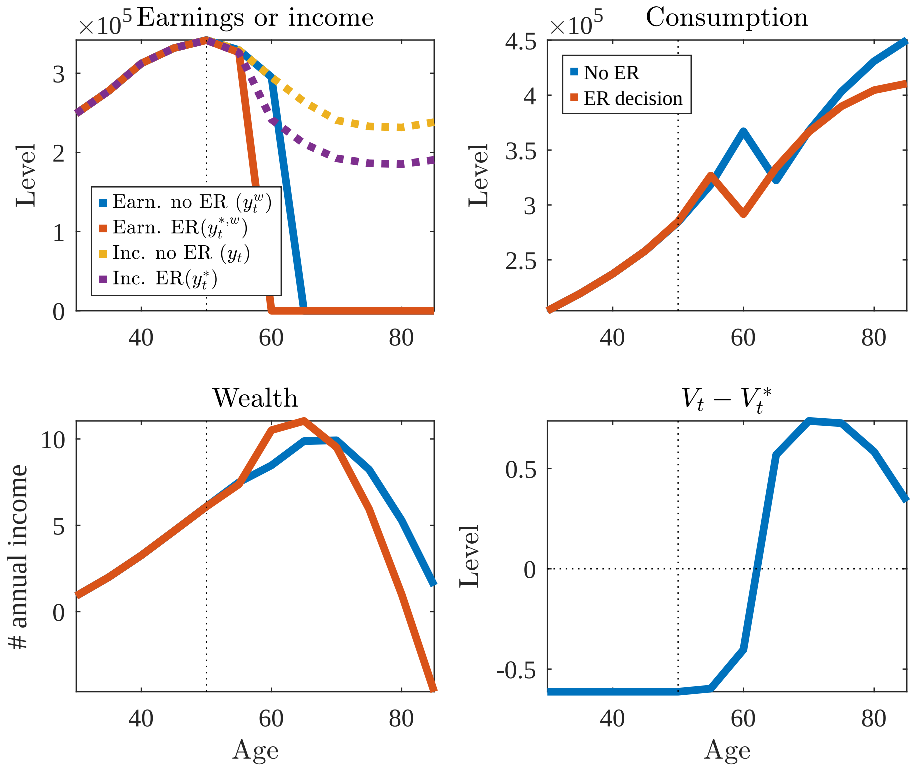
[5] Solving for $h_{i,a}$ and $h^*_{i,a}$ is the same as solving for $y^w_{i,a}$ and $y^{*,w}_{i,a}$.

[6] Source: https://www.ahv-iv.ch/p/3.04.e.

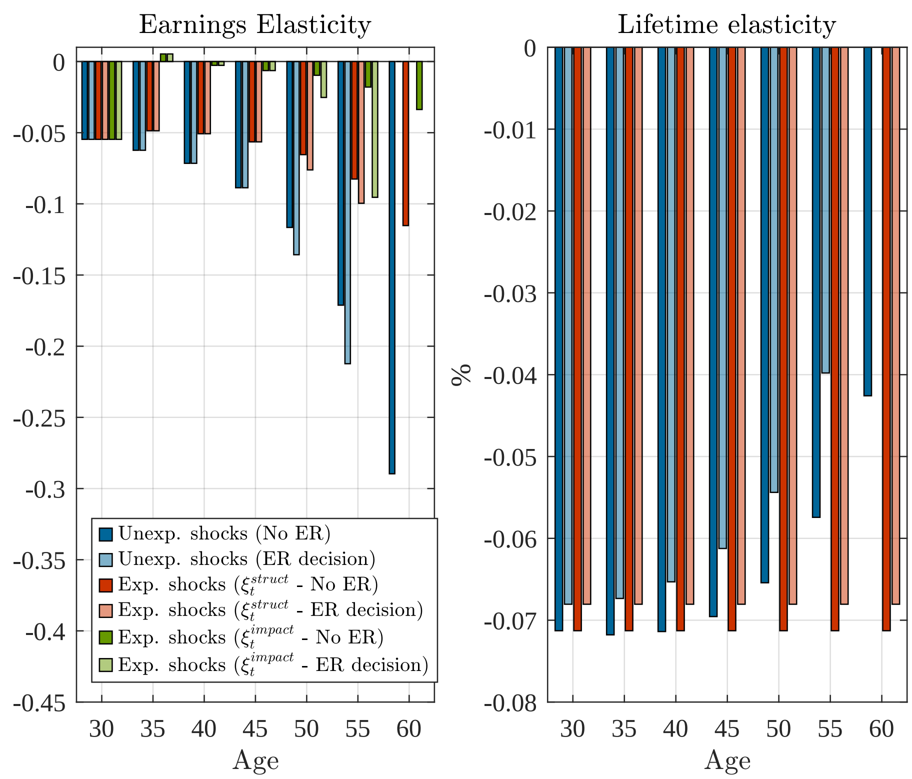
[7] Average early retirement rates for people between 60 and 64 are computed using 2010–11, 2012–2014, 2015–2017 and 2018–2020 survey data ("Enquête suisse sur la population active"). We obtain an average rate of 20%.

Figure D1: An extension with early retirement

(a) Life-cycle profiles



(b) Changes in earnings



Notes for Panel (a): Based on our calibration, earnings/hours are computed using Equation (8), consumption using equation (7), wealth b_t using equation (5) and value function V_t using equation (3). People who reach their 90th year die with certainty with zero wealth.
Notes for Panel (b): The size of the shock is normalized to represent one year (1/5 periods) of the earnings at age 30, and present-value equivalent. Impact elasticities are computed as log-deviations of earnings divided by the log of the wealth shock. Recall that in the case of unexpected shocks, $\xi_a^{ns} = \xi_a$. Lifetime elasticities are computed by taking the log-difference in lifetime sums of earnings divided by the log-size of the shock received at 30.

Early retirement also leads individuals to consume more and to supply less labor—and thus to accumulate less wealth—in the periods *before* they actually retire. Upon early retirement, they cut consumption by more than when waiting for the statutory retirement age, which results in larger wealth from 60 to 70, but faster wealth depletion upon deciding to retire early. While facing a permanent income penalty, early retirees enjoy more leisure in period $T = 60$, which implies that the value of the ER decision is always above the value of working until the statutory retirement age. Hence, in this baseline model, individuals choose to retire early.

Panel (b) of Figure D1 reports the impact and cumulative response of earnings upon receiving a wealth shock in the ER case and compares it with the case of retirement at the statutory age.

By assumption, the *impact* response of earnings is not affected by ER when wealth shocks hit before 50. Furthermore, the response to shocks hitting at or after 50 is magnified. The main reason is that, in the calibration illustrated in Figure D1, individuals always choose to retire early when given the option. Compared to the baseline model without ER, they supply less labor ahead of their effective retirement decision, which makes their labor supply more elastic between 50 and 60 compared to the case of retirement at the statutory age. The model thus predicts a *larger* negative response of earnings after 50 to unexpected wealth shocks when individuals retire early than under statutory-age retirement. Last, since individuals always choose to retire early, earnings are unaffected at age 60 since they do not work anymore. The cumulative effects are potentially mixed. With ER decision, labor supply becomes more elastic between 50 and 60 so that wealth shocks affect earnings more then under statutory-age retirement, which implies a stronger elasticity effect. However, labor supply is affected for one period less, which reduces the duration effect. The second effect turns out to dominate quantitatively, so that the cumulative earnings response is always lower with ER than without.

Introducing a bequest motive. A striking feature of early retirement as shown in Figure D1 is that individuals choosing this option end up giving up a lot of their wealth at the end of their lives to smooth lifetime consumption, in comparison to the case of retirement at statutory age. This implication of the baseline model with early retirement may be considered unrealistic for at least two reasons. First, wealth may be illiquid—e.g., in the form of housing—and therefore unsuitable for consumption smoothing.[8] Second, our baseline calibration implies that early retired individuals end up with zero or even slightly negative wealth, which is inconsistent with the data shown in Figure 8, and indeed with the very existence of wealth shocks from bequests.

Introducing a (separable) bequest motive into the log-log utility function of our model would not directly interact with consumption and savings decisions, because wealth would not affect the marginal utility of consumption. Yet, a bequest motive can contribute to shaping the ER decision by altering value functions of the two options—early or statutory-age retirement. Following De Nardi (2004), we therefore consider a "warm glow" variant of the model modifying the utility function to:

$$u\left(c_{i,a}, 1-h_{i,a}, b_{i,a}\right) = \ln\left(c_{i,a}\right) + \kappa \ln\left(1-h_{i,a}\right) + \omega \ln\left(\mu + b_{i,a}\right). \tag{32}$$

[8]We abstract here from practical possibilities to make housing wealth liquid, such as life annuities or reverse mortgages.

With this specification, individuals derive utility from wealth/bequests above a certain level μ, which governs the extent to which bequests are luxury goods.[9] For illustrative purposes, we calibrate μ to average net wealth, and $\omega = 0.4$, implying that individuals retire at the statutory age in steady state but choose ER upon receiving the wealth shocks we already considered. Other parameters remain unchanged.

D3 Allowing for heterogeneous agents

Heterogeneous bequest motives. Given the potential importance of early retirement in shaping the overall earnings response, we need to take a stand on how to treat extensive-margin responses. In our extended model with early retirement, all individuals choose to retire early when given the opportunity to do so. With a bequest motive and an arbitrary value of utility parameters (ω and μ), only individuals receiving wealth shocks retire early. In reality, not all individuals will retire early, even after receiving a wealth shock close to the statutory retirement age. We therefore now consider a heterogeneous-agent version of the model in which ω, the parameter that governs bequest motives, is distributed log-normally, i.e., $\exp(\omega) \sim \mathcal{N}(\overline{\omega}, \sigma_\omega^2)$. We define $\Theta(\omega)$ as the resulting distribution of ω.

Let $y_a^w(\omega)$ denote earnings at age a of an agent ω resulting from the optimal choice given by the model of Section 4. At age a, every agent faces an age-specific probability p_a of inheriting, and the unconditional probability of inheriting over the course of one's working-age life is $\pi = \sum_{a=0}^{t=T} p_a$, where $a = 0$ again corresponds to age 30 and $a = T$ to age 65. If individual ω does not receive an inheritance, her earnings are simply $y_a^w(\omega)$.

If individual ω receives an expected wealth shock, under rational expectations, her lifetime response is $y_a^{w,exp}(\omega)$ and is independent of the age at which the shock is effectively received. In this case, aggregate earnings can be written as:

$$y^{w,exp} = \sum_{t=0}^{a=T} n_a \int \left[\pi y_a^{w,exp}(\omega) + (1-\pi) y_a^w(\omega)\right] \Theta(\omega) d\omega, \tag{33}$$

where n_a is the weight of individuals aged a in total population. For a given ω, earnings at age a are a weighted average of the response at age a knowing a shock will occur at some point in time—which depends on age a but not on the age at which the shock hits—and the change in earnings at age a knowing there will be no shocks. For each age group the responses are integrated over the distribution of ω, and the aggregate response is the weighted average of total responses by age groups.

If instead shocks are unexpected, average earnings at age a for agent ω are:

$$y_a^{w,uxp}(\omega) = p_a y_{a,a}^{w,uxp}(\omega) + (1-p_a)\left[\sum_{s=0}^{s=T-1} p_s y_{a,s}^{w,uxp}(\omega) + (1 - \sum_{s=0}^{s=T-1} p_s) y_a^w(\omega)\right], \tag{34}$$

where $y_{a,s}^{w,uxp}$ denotes earnings at age a for wealth shocks received at age s. This expression is a composite of (a) the current response to wealth shocks hitting at age a weighted by the probability of receiving at that age, (b) the *current* response to *past* shocks weighted by their probabilities of occurrence and (c) the *current* response in absence of past shocks weighted by

[9] For evidence on bequests as a luxury good, see De Nardi et al. (2025).

the probability of not receiving until age a. Aggregate earnings can then be written as:

$$y^{w,uxp} = \sum_{a=0}^{t=T} n_a \int y_a^{w,uxp}(\omega)\Theta(\omega)d\omega. \tag{35}$$

Both measures of aggregate earnings can also be computed without allowing for the option of retiring early, which provides an interesting alternative case.

Calibration. Before running counterfactual experiments, parameters of the model need to be calibrated. Unless stated otherwise, we use the same parameter values as in Section 4.

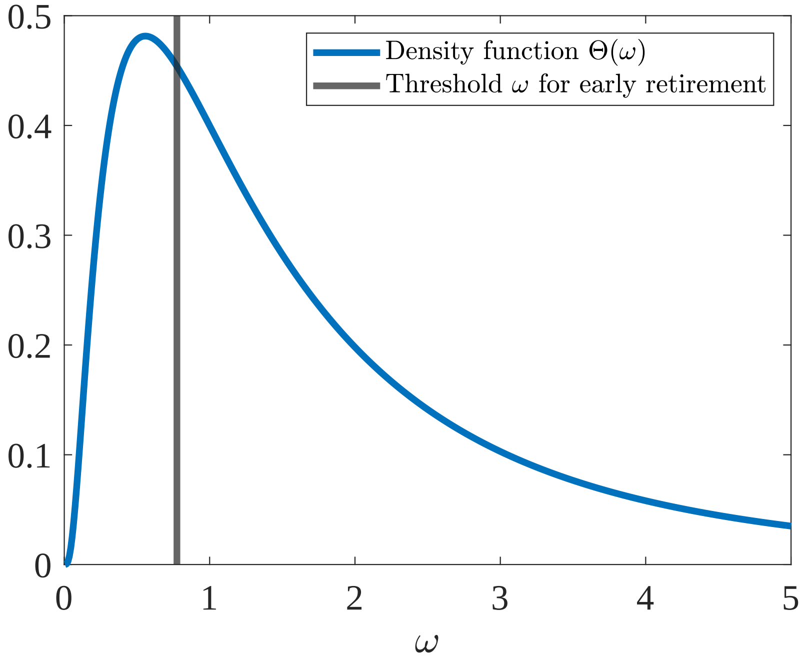
First, age-group weights n_a and amounts inherited can be taken directly from the data (see Table 2). Second, age-specific probabilities of receiving an inheritance shock p_a are computed based on the probabilities of inheriting in Table 2 and normalized so that the unconditional probability of receiving over the life cycle is equal to π. We further normalize π so that the proportion of total inheritance flows represents 12% of aggregate GDP—which is total earnings divided by the labor share (0.68) in our model, as estimated on Swiss data by Brülhart et al. (2018), which implies $\pi = 0.658$.[10]

Last, three parameters remain to be set: the extent to which bequests are luxury goods μ, and the mean and standard deviation of the log-normal distribution of ω. Regarding μ we keep our assumption that it equated the average net wealth. Regarding ω, recall that it governs early retirement decisions by affecting the weight of net wealth in the utility function. We set the mean $\overline{\omega}$ and standard deviation σ_ω of the log-normal distribution so as to match two moments of the data: (i) the average early retirement rate, which is 27.7% and (ii) the average wealth-income ratio at age 60, which is 6.3 in our data.[11] We obtain $\overline{\omega} = 1.3965$ and $\sigma_\omega = 0.9581$, which produces the distribution reported in Figure D2. Compared to the illustrative value of $\omega = 0.4$ used in Section 4, this means that the *average* agent has a much stronger bequest motive and needs to receive a much larger wealth shock than one year of labor income to retire early. The variance σ_ω is relatively large however, signaling that the sensitivity of early retirement decisions is quite heterogeneous.

[10] In Switzerland, the average labor share was 0.68 over the period 2002–2019. Source: University of Groningen and University of California, Davis, Share of Labour Compensation in GDP at Current National Prices for Switzerland [LABSHPCHA156NRUG], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/LABSHPCHA156NRUG, September 18, 2025.

[11] In the model we consider the early retirement rate when wealth shocks are treated as expected. We compute the average early retirement rate between 60 and statutory retirement age (which differs for men and women) based on OFS data.

Figure D2: Calibrated log-normal distribution of the wealth-in-utility parameter ω



Notes: The vertical line indicates the threshold value above which individuals choose *not* to retire early.

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