Inheritance and Labor Supply ⋆

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Abstract

Most inheritances arrive late in people's working life, when labor supply is especially responsive to wealth. We document this interaction using administrative earnings histories around 135,150 inheritances in Switzerland. We find that inheritors' average earnings fall at all ages, but the responses peak between ages 55 and 64, largely driven by early retirement. Our data allow us to show that those impact responses are significantly smaller than responses to lottery winnings of comparable size—consistent with the partially anticipated nature of inheritance. A calibrated life-cycle model with endogenous labor supply and early retirement reproduces these patterns and maps the estimated individual responses into lifetime and aggregate effects. Depending on assumptions about bequest motives, we estimate inheritance to reduce aggregate labor supply by between 0.5% and 1.9%. We also quantify how using revenue from an inheritance tax to subsidize labor could increase labor supply.

Keywords: inheritance, labor supply, lottery wins, life-cycle effects, taxation

JEL Classification: J22, D31, D64, G51, H31

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1 Introduction

Inheritance represents one of the largest and fastest-growing flows in modern economies. It amounts to 10–15% 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). 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 economy-wide labor supply. Are bequests substitutes for or complements to labor income? How do earnings responses to inheritance vary over the life cycle, and how do they aggregate up when weighted by the age distribution of inheritance receipt? How do heirs' anticipation of inheritance and testators' bequest motives affect labor supply? How can inheritance taxation and the associated spending affect aggregate labor supply?

We answer these questions by combining new 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 non-trivial inheritances and 5,340 comparable 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. This finding validates the concern raised by Kopczuk (2013b) that treating inheritances as equivalent to other exogenous wealth shocks for the purpose of estimating labor supply responses constitutes a "strong assumption" (p. 370).

The largest 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 inheritors. For female inheritors, 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 inheritors' labor supply responses are around twice as large as those of male inheritors.

We then calibrate a life-cycle model on our Swiss data and use its ability to reproduce the broad age profile and magnitude of the estimated earnings elasticities as an external validation. The model allows us to bound the *lifetime* marginal propensity to earn (MPE) out of inherited—and thus at least partly anticipated—wealth at -31.2%. To compare, our estimated average lifetime MPE for lottery wins is -14.8%.

Populated by individuals featuring heterogeneous productivity and preferences, and carefully calibrated, the model is then used to simulate counterfactual scenarios. We also consider a range of plausible bequest motives.

[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).

In a first exercise, we explore the quantitative implications of reducing or removing inheritances for aggregate labor supply. We consider a linear tax and initially abstract from indirect effects through the government budget. In this setting, a hypothetical 100% tax on inheritance would increase aggregate labor supply by between 0.5% and 1.9%, depending on bequest motives; our baseline estimate—assuming no testator-side response to inheritance taxation—being 0.8%. This is our central estimate of the reduction in aggregate labor supply that is due to heirs' responses, both in anticipation and upon receipt of their inheritance.

In a second step, we let the government use the revenue from taxing inheritance. In our central experiment, revenue is allocated to a labor subsidy—which can be thought of as a cut to payroll taxation. Such a policy boosts labor supply through two distinct channels: (i) the income effect already described, as lower post-tax inheritances reduce recipients' wealth and induce them to work more, (ii) and a new substitution effect, as the labor subsidy raises the return to working relative to leisure. Even assuming bequest motives to be such as to reduce the labor supply of testators when facing higher inheritance tax rates, we find that overall labor supply increases when those tax rates are raised. According to our main simulations, a 30% inheritance tax thus employed would boost labor supply by roughly 0.5%, reduce the rate of early retirement by 2.1 percentage points, and raise welfare by 0.7%. We find the welfare gains to be decreasing in age, but positive for all age groups.

If, instead, tax revenue is redistributed lump-sum, our estimated welfare gains are even larger—but the aggregate effects on earnings are negative, as the policy redistributes wealth toward younger workers. Accumumulated over an entire working life, even small reductions in labor supply lead to a noticeable reduction in aggregate earnings. However, we only consider individuals aged 30 and over, and hence this counterfactual experiment abstracts from potential labor supply effects of redistributing tax revenue to individuals before they make their main educational and occupational choices.

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 responses to inheritance. 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 sample—whether from inheritance or from a lottery win—corresponds to about three times annual earnings. 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. With this design, we can assess our identifying assumption transparently while absorbing confounding responses to inheritance receipt—such as grieving—that are unlikely to vary systematically with the size of the shock.

Our paper also breaks new ground by using those data to calibrate a model that allows us to perform counterfactual analyses. We develop a life-cycle model with endogenous labor supply, early retirement, and heterogeneous productivity and preferences.[2] The model shows how 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, we allow wealth shocks to trigger early retirement among those aged 60–65. Inheritance after retirement no longer affects earnings at all, at least to the extent that it is unexpected. Carefully calibrated using orthogonal targets, the model reproduces the broad age profile of the earnings elasticities found in our empirical analysis. As lottery wins are unexpected and inheritances are partly expected, the model implies larger impact earnings elasticities for lotteries, but larger lifetime earnings elasticities for inheritances. Guided by the benchmark signal quality of 0.75 used by Kindermann et al. (2020) to model inheritance expectations, we assign a 75% weight to expected shocks and a 25% weight to unexpected shocks. Under this benchmark mixture, the model reproduces the main life-cycle pattern of the estimated inheritance elasticities.

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. Using survey data, 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.[3] The findings of Imbens et al. (2001) have since been confirmed and extended in large administrative datasets by Cesarini et al. (2017), Picchio et al. (2018), Bulman et al. (2021), and Golosov et al. (2024): on average, positive wealth shocks are 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 inheritance. 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).

We thus 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

[2] We extend De Nardi (2004) by introducing endogenous labor supply along both intensive and extensive margins on top of heterogeneity regarding productivity and preferences.

[3] More recent survey-based evidence on heterogeneous short-run labor supply responses to hypothetical wealth shocks is reported by Georgarakos et al. (2025). 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), to changes in survivor insurance generosity (Giupponi, 2019), and to exogenous changes in retirement pension income (Artmann et al., 2026; French et al., 2026; Kindermann et al., 2026).

to lottery wins estimated elsewhere.[4] We expand on this work by directly comparing responses 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. In the seminal model of optimal inheritance taxation by Piketty and Saez (2013), labor supply is affected 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, a channel that we quantify empirically over the life cycle and incorporate into our counterfactual analysis of inheritance taxation.

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 observe 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 representative-agent life-cycle model to show in closed form how individual labor supply responses to a positive wealth shock can depend

[4] 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 groups, and none of them considers lottery wins and inheritance simultaneously. For a graphical summary of these elasticity estimates, see Appendix Figure A3, based on Nekoei and Seim (2023). Two recent papers, Fjællegaard Jensen and Zhang (2026) and Taşar and Voorheis (2026), document earnings histories following parental death, based on administrative data respectively for Denmark and the United States. Those papers document consistently negative earnings responses to parental death. They cannot directly observe inheritances per se, and they do not focus on life-cycle or anticipation effects.

on recipient age, anticipation effects, and early retirement. In Section 5, we extend the model to heterogeneous agents and simulate counterfactual policy scenarios to quantify the aggregate implications of taxing inheritances. Section 6 concludes.

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.[5] 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 $\approx$ USD 10,000), with the aim of retaining only shocks that are large enough to plausibly affect earnings behavior.[6] We define labor earnings as income from employment plus two-thirds of the amount reported as self-employment income.[7] 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.

[5] 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).

[6] 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.

[7] 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.

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%, the empirically consistent real interest rate.[8] We consider 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 inheritors 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.[9] 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 inheritors 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

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

[9]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.

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 amount received.[10] 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."[11] 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 $g(i)$, at age $a(g(i))$. We index observations by calendar year t and estimate static DiD specifications of the following form:

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

where $\ln(y_{i,t}^w + 1)$ denotes transformed 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).[12] δ_i is an individual fixed effect, while $\gamma_{t,g(i),a(g(i))}$ denotes a fixed effect for the interaction of calendar year t, receipt year $g(i)$, and age at receipt $a(g(i))$. These fixed effects tightly define the comparison groups used for identification. Within any calendar year, individuals are compared only with other recipients who had received (or will receive) their wealth shock in the same calendar year and at the same age. Since calendar year t and receipt year $g(i)$ jointly determine distance from event time, $t - g(i)$, observations within each fixed effect cell are also at the same time distance from the wealth shock. Identification thus comes from comparing the evolution of earnings among individuals who receive wealth shocks in the same year and at the same age, but receive shocks of different sizes.[13] 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

[10]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.

[11]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.

[12]We measure the outcome as $\ln(y_{i,t}^w + 1)$, which allows us to retain observations with zero labor earnings. This is important in our setting because wealth shocks may induce transitions into and out of employment. As emphasized e.g. by Chen and Roth (2024), estimates based on transformations such as $\ln(y + 1)$ need not be scale invariant: the estimated effect can depend on the units in which the outcome is measured, and can combine intensive- and extensive-margin responses in a unit-dependent way. In Section 3.2, we show that our findings are robust to using the inverse hyperbolic sine of earnings and to estimating the relationship between earnings and wealth shocks directly in levels.

[13]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 who will be treated later. $\gamma_{t,g(i),a(g(i))}$ "turns of" the staggered implementation of the treatment by only comparing individuals who experience heterogeneous wealth shocks at the same time and age.

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 transformations 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).[14]

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 inheritor/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.[15]

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:

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

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.

[14] 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 B2), but the implied magnitudes are attenuated.

[15] Our strategy of comparing responses only among same-age and same-year heirs might be more demanding than strictly necessary, because even when heirs can to some extent anticipate parental death, that anticipation appears to trigger no statistically discernible economic responses in the years prior to the event. Research by Vihriälä and Virkola (2025) finds no evidence of consumption or earnings responses by heirs even in the year immediately preceding the death of their second parent.

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. These robustness checks provide reassuring evidence that our findings are not driven by correlations between wealth shock size and pre-existing socioeconomic characteristics.

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.

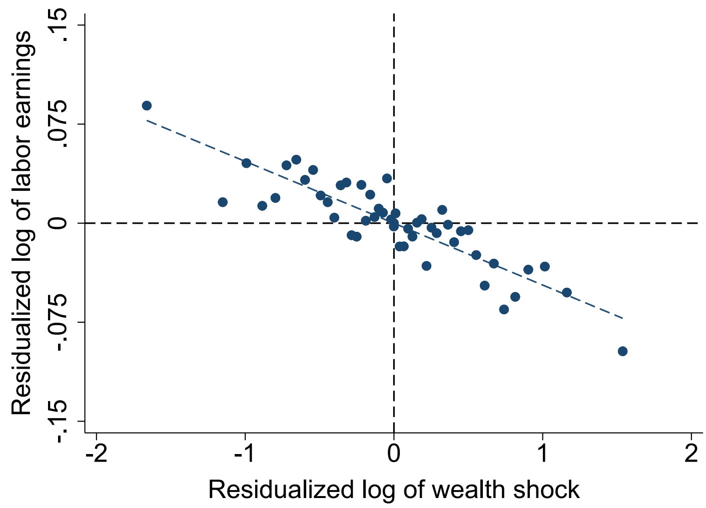
Average earnings responses to wealth shocks. As a preliminary and transparent visualization, Figure 1 shows how labor earnings respond to positive wealth shocks, based on our 1.27 million person-year observations. Each dot represents average residual earnings for individuals binned by the size of their (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.

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]

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

[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.

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 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 inheritors 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 inheritors whom we also know to be lottery players. We find that their responses do not differ significantly from those of non-lottery-playing inheritors. 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 midway 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.

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.

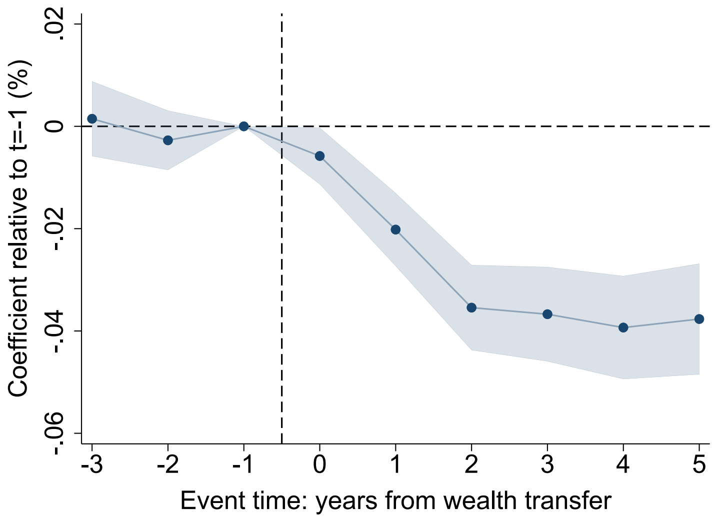
Figure 2 reports event-study estimates obtained from running equation (2), pooled across all ages and wealth shocks. Our estimates suggest that the average earnings response takes two years to materialize and remains permanent thereafter. In Appendix Figure A4, we estimate the same model but for a post-shock 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 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.

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% 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.

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.

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),

Table 2: Age-specific earnings responses to wealth shocks

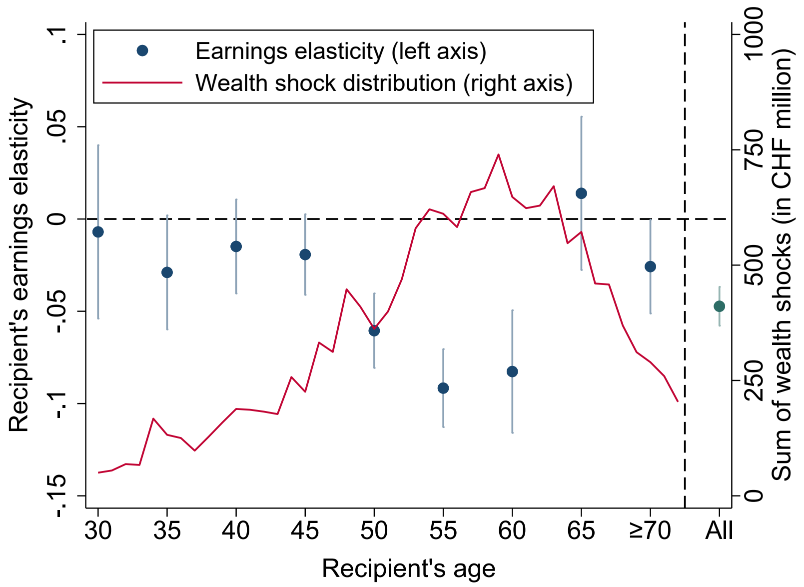
	Recipient's age: 30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	⩾70
	(a) *Sample*: Inheritances								
Earnings elasticity	-0.009	-0.026	-0.015	-0.020*	-0.063***	-0.089***	-0.077***	0.016	-0.026**
	(0.024)	(0.016)	(0.013)	(0.011)	(0.010)	(0.011)	(0.017)	(0.021)	(0.013)
Obs.	35,765	52,901	77,955	119,721	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.

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.

Figure 3: Age profile of earnings responses to wealth shocks



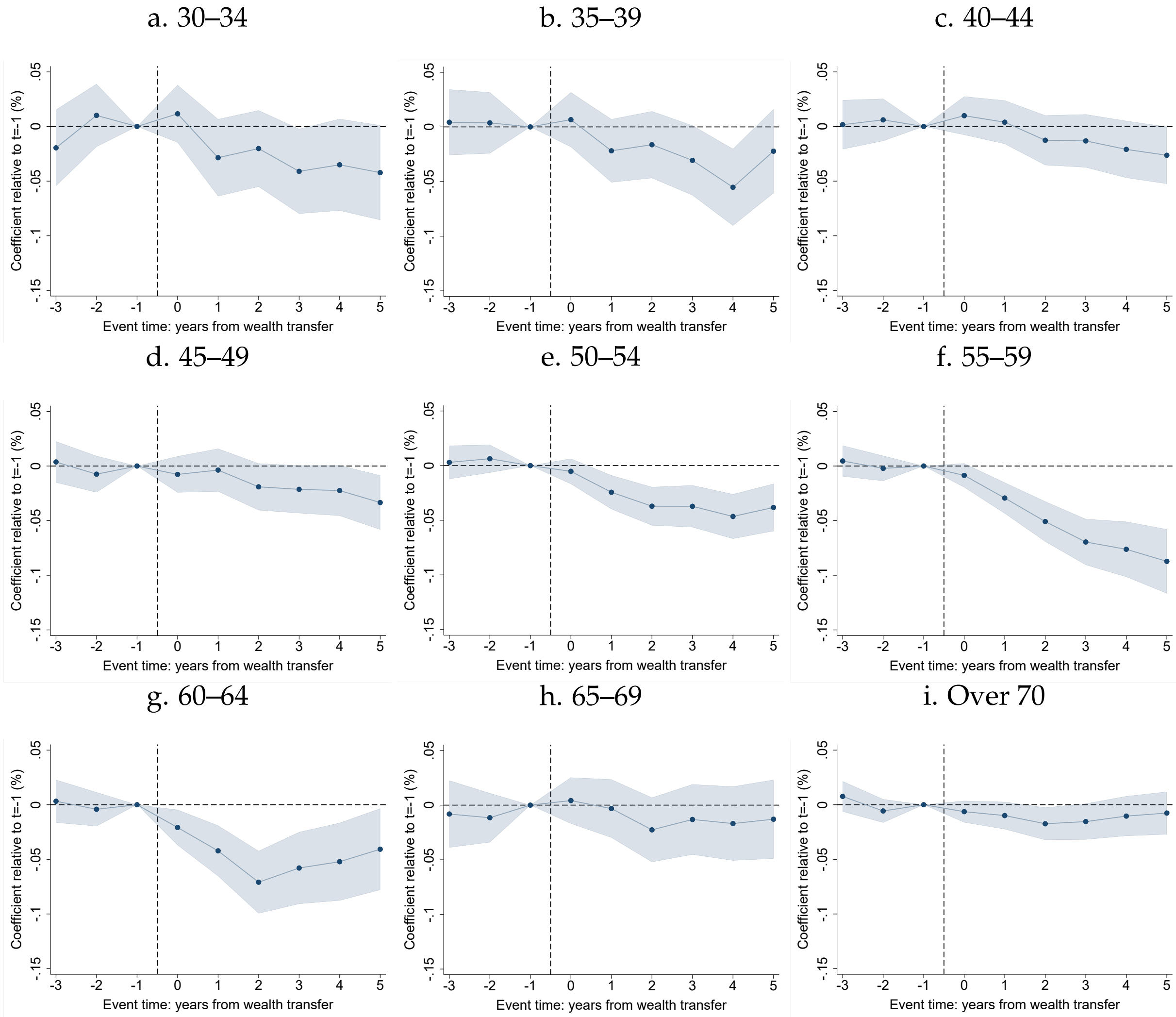
Notes: This figure shows age-specific earnings elasticities to wealth shocks, obtained by estimating the DiD equation (1). Each point reflects the estimated elasticity of log labor earnings with respect to log present-value-adjusted wealth shocks, computed separately by age group at the time of receipt (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.

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 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 individuals 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

Figure 4: Event-study estimates by age group



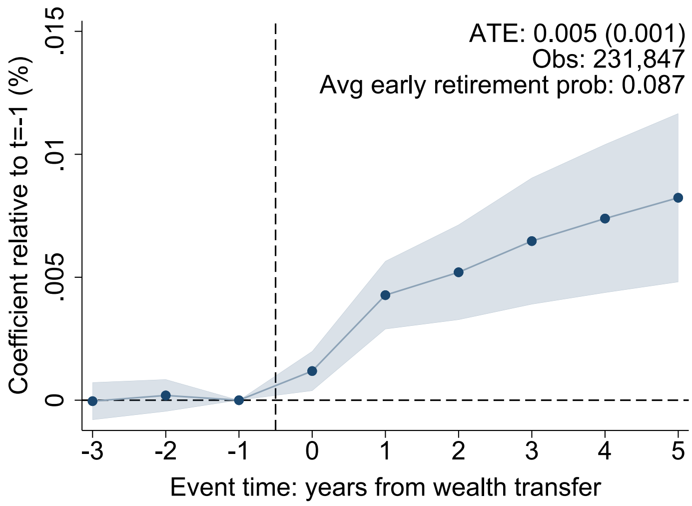
Notes: This figure shows event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings by age group (based on the year when the wealth shock is received). It plots coefficient estimates and the 95% confidence intervals obtained from equation (2): each point 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.

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.

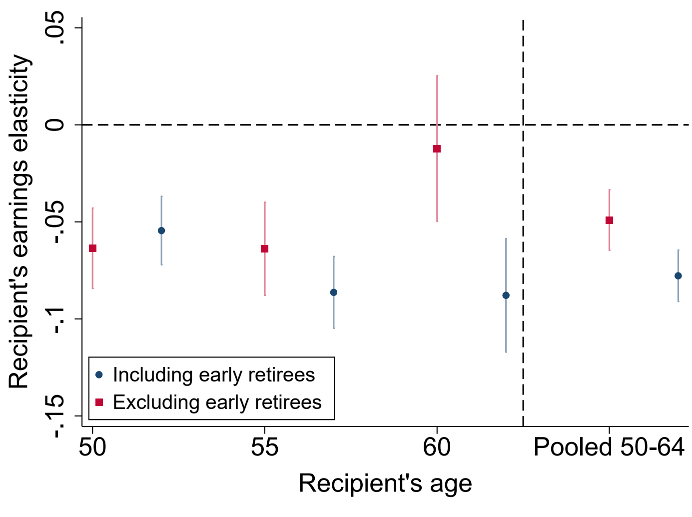
This is what we show in Figure 6, where we plot a replication of the age-specific earnings elasticities of Figure 3 without considering individuals who retire early within our observation

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% 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).

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 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 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 inheritors 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 inheritors 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 inheritors 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 inheritors' 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 inheritors 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.

Alternative functional forms. In our baseline specifications, we transform labor earnings as $\ln(y+1)$, allowing us to retain observations with zero earnings while preserving an elasticity interpretation for positive earnings. We assess the sensitivity of our findings to this particular treatment of zero earnings in two ways.

First, we replace $\ln(y+1)$ with the inverse hyperbolic sine transformation, $\text{asinh}(y)$. Like $\ln(y+1)$, this transformation is defined at zero. For sufficiently large positive values, $\text{asinh}(y) \simeq \ln(2y)$ and thus yields essentially the same elasticity interpretation as a logarithmic specification. Appendix Table B1 shows that the estimated age profile is very similar to our baseline results, as none of the estimated coefficients differs statistically significantly between the two specifications. The largest negative earnings responses are again found for ages 55–64.

Second, we estimate a level–level specification, expressing both earnings and wealth shocks in CHF. The resulting estimates, reported in Appendix Table B2, are again negative and statistically significant across shock types, and stronger for lottery wins than for inheritances. The implied on-impact MPEs are smaller than those obtained from our baseline specification. This is consistent with diminishing marginal wealth effects: a level–level model imposes a constant CHF-for-CHF response and gives relatively greater influence to the largest wealth shocks.

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.

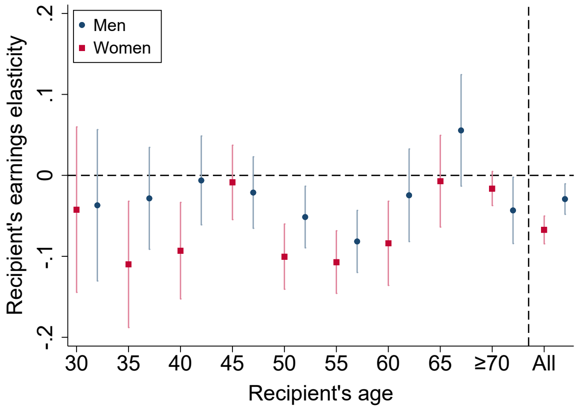
The gender difference is reversed, however, when we consider level effects: a CHF 10,000 wealth shock reduces annual earnings by about CHF 52 for men and CHF 44 for women. Those changes in earnings represent a larger percentage change for women, which is why when expressed as elasticities, women's reactions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

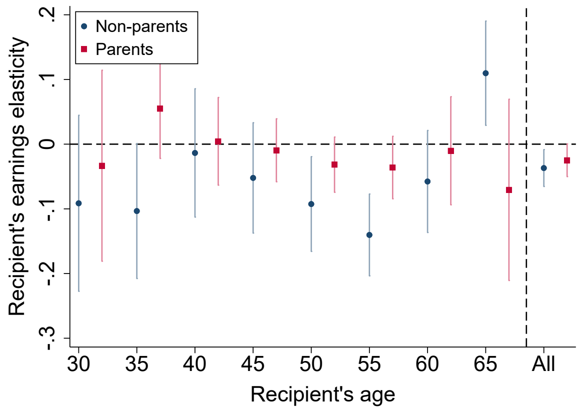
(Cesarini et al., 2017; Golosov et al., 2024; Imbens et al., 2001). Those results stand in contrast to much of the empirical literature in labor economics (Keane, 2011). In our case, female labor supply turns out to be more elastic than male labor supply, consistent with the wider literature.

Figure 7: Earnings responses by gender and presence of children

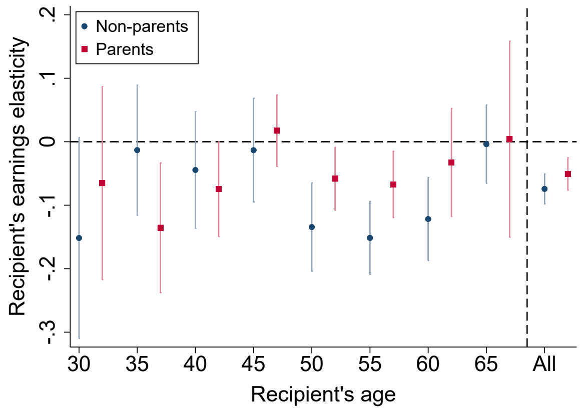
(a) Women vs. men



(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.

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 persistence 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: inheritors 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 partial-equilibrium life-cycle model with endogenous labor supply to derive theory-based predictions for how positive wealth shocks affect labor supply at different stages of life, depending on whether those shocks are expected or unexpected. Individuals face age-specific income profiles and survival probabilities, and choose consumption, savings, and labor supply over the life cycle. We begin with a simple version of the model that remains tractable enough to deliver closed-form expressions for consumption and labor supply, and later extend it to allow for early retirement and bequest motives.

The goal is to provide a framework that can be confronted with the empirical findings of Section 3 and then used as a basis for counterfactual policy experiments, focusing on the implications of inheritance taxation. The calibration uses observed life-cycle income and wealth profiles and an average labor supply elasticity. We then compare the model-implied age profiles with the elasticities estimated after unexpected shocks (lottery wins) and expected shocks (inheritance), using this correspondence as an external validation. Readers primarily interested in the policy applications may therefore wish to jump directly to Section 5.

4.1 A simple life-cycle model with labor supply

Following De Nardi (2004), we index five-year age brackets by $a = 0, \ldots, D$, from ages 30–34 up to ages 85–89. In the baseline version of the model, T denotes the last working-age bracket (ages 60–64), retirement begins in bracket $T + 1$ (ages 65–69), and death is certain after the final bracket D.

Baseline model. Individuals in age bracket a face a common probability ς_a of being alive in the next period, with $\varsigma_D = 0$. 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 $\Lambda_0 = 1$ and $\Lambda_a = \prod_{j=0}^{a-1}\varsigma_j$ for $a \geqslant 1$ 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 $a \leqslant T$ (i.e. the individual is younger than 65, and not considering early retirement for the time being), then individual i works. Her income is $y_{i,a} = y_{i,a}^{w} = w_{i,a}h_{i,a}$ which is endogenous since individuals choose $h_{i,a}$. If $a \geqslant T+1$, individual i receives an exogenous pension income $y_{i,a}^{p}$.

We consider a log-log utility function, which implies separability between consumption and leisure:[17]

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

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

$$c_{i,a} = \frac{1}{\Gamma_a}\Upsilon_{i,a}, \tag{7}$$

$$y_{i,a}^{w} = w_{i,a} - \frac{\kappa}{\Gamma_a}\Upsilon_{i,a}, \tag{8}$$

where $\Upsilon_{i,a}$ denotes permanent income. Allowing for death risk only after retirement, i.e. assuming that $\Lambda_a = 1\ \forall a \leqslant T$, and using the definition of Λ_a, the lifetime discount factor Γ_a is given by:

$$\Gamma_a = (1+\kappa)\sum_{s=0}^{T-a}\frac{1}{(1+\rho)^s} + \sum_{s=T-a+1}^{D-a}\frac{\mathbb{E}_a\left\{\prod_{j=0}^{s-1}\varsigma_{a+j}\right\}}{(1+\rho)^s}. \tag{9}$$

[17]We will introduce heterogeneity in the preference for leisure, κ, in Section 5.

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:

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

where $b_{i,a-1}$ denotes previous-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 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) shows that the size of the wealth effect on labor supply depends on permanent income $\Upsilon_{i,a}$, on the relative weight of leisure in the utility function κ, 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 (noshock):

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

The percentage response of current earnings depends on the size of the initial shock as a percentage of permanent income, and on the elasticity $\frac{\kappa}{\Gamma_a(1+r)^s}$, which itself depends 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, on the drop in earnings on impact and therefore on how wealth $b_{i,t}$ is affected. We will 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:

$$\zeta_a^{struct} = \frac{\ln y_{i,a}^{w} - \ln y_{i,a}^{w,\text{noshock}}}{\ln \mathcal{W}_{i,a}}. \tag{12}$$

The determinants of this elasticity are analogous to those of equation (11).[18]

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:

$$\zeta_a^{impact} = \frac{(\ln y_{i,a}^{w} - \ln y_{i,a-1}^{w}) - (\ln y_{i,a}^{w,\text{noshock}} - \ln y_{i,a-1}^{w,\text{noshock}})}{\ln \mathcal{W}_{i,a}}.^{19} \tag{13}$$

For wealth shocks that are *unexpected*, these two elasticities are identical, because the shocks do not affect earnings prior to their realization, i.e., $y_{i,a-1}^{w} = y_{i,a-1}^{w,\text{noshock}}$. However, the two elasticities will differ when shocks are *expected*. We shall therefore keep track of the two elasticities in the model simulations.[20]

In Appendix D, we show that the two elasticities are approximately related by:

$$\zeta_a^{struct} \approx \zeta_a^{impact} - \frac{\kappa \mathcal{W}_{i,a}}{\Gamma_{a-1}(1+r) y_{i,a-1}^{w,\text{noshock}} \ln \mathcal{W}_{i,a}}, \tag{14}$$

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 the size of the wealth shock relative to prior earnings ($\mathcal{W}_{i,a}/y_{i,a-1}^{w,\text{noshock}}$), on the preference for leisure (κ), on the age-specific discount factor (Γ_{a-1}), and on the interest rate (r).

4.2 Calibration and simulation

We now use the above expressions to derive our objects of interest. For the time being, we abstract from the heterogeneity of agents within age cohorts, which allows us to drop the subscript i. We shall consider individual-level heterogeneity in Section 5.[21] 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), consumption c_a (using equation 7) and

[18] $\mathcal{W}_{i,a}$ is the amount of the positive wealth shock: the difference between wealth with and without the shock. Consistent with our empirical measure, $\ln \mathcal{W}_{i,a}$ thus takes the log of this wealth difference and not the change in log wealth.

[19] In the model, we compare earnings with and without the shock; in the data, we use variation in shock size across recipients. The two objects therefore have closely related economic interpretations and measure how earnings respond to the size of a wealth shock. Their magnitude naturally depends on the shock relative to income. Our reduced-form estimates account for income heterogeneity within age brackets through individual and age-calendar-year fixed effects. Alternative specifications directly scale the wealth shock by pre-shock income and wealth (see Appendix Figure B8).

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

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

wealth 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 observed life-cycle profile of labor income. 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. Our calibrated life-cycle profiles are shown in Table 3. We infer age-specific wages such that, in equilibrium, the model matches the profile of incomes observed in the data.[22]

Table 3: Calibration

Age	Surv. prob., ς_a (data)	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.

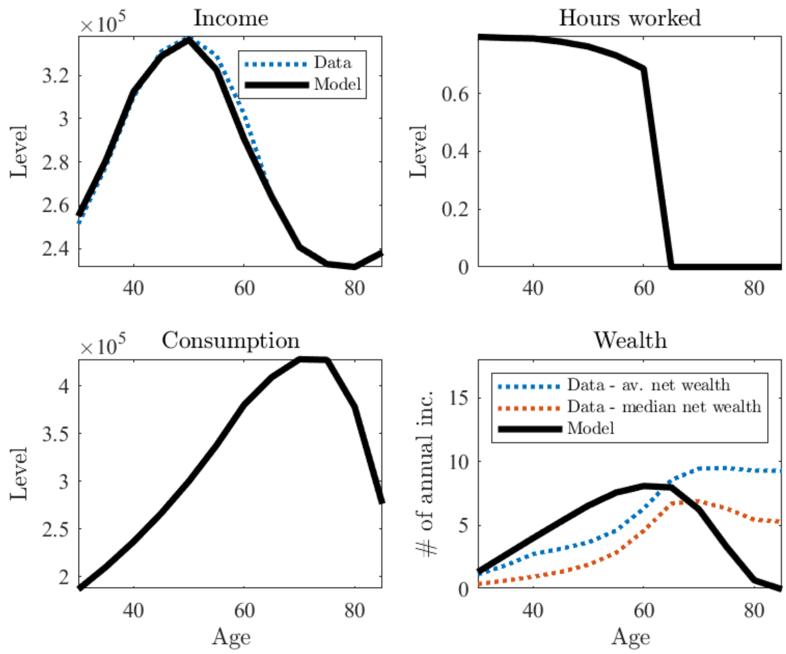
For people over 65, retirement income is calibrated with average incomes observed in our tax micro data. In the model, the intra-temporal labor supply elasticity is governed by κ, which we set to $\kappa = 0.35$ to yield an average labor supply elasticity of 0.3, in line with available evidence (see Chetty et al., 2011). Furthermore, we impose a 3% annual interest rate such that $r = (1 + 0.03)^5 - 1 = 0.1593$. Finally, we adjust the subjective discount factor $\rho = 0.03$ for the model to fit the observed life-cycle net wealth profile, again taken from our 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 data for income and wealth.

We observe the usual hump-shaped life-cycle profiles for income and consumption. Consumption rises over the working life and peaks around retirement. At older ages, declining survival probabilities eventually dominate the return/discount-rate wedge in the Euler equation, causing consumption to fall. Wealth follows a similar non-monotonic pattern: it accumulates until retirement and is then decumulated rapidly, reaching zero at the terminal age. Observed wealth depletion after retirement, however, turns out to be less pronounced. We revisit this issue below by considering a bequest motive. Hours worked are stable before 50 and

[22] For this, we consider household incomes in 2010, which marks the midpoint of our 2002–2019 observation period; see Section 2.1.

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.

then decline somewhat in the run-up to retirement. This is in line with empirical evidence (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. In the left panel of Figure 9, we show short-run structural earnings elasticities implied by unexpected wealth shocks received at different ages. 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 at older ages.[23] As already shown in closed form (Section 4.1), we find impact responses to be negative at all ages above 30, rising monotonically up until retirement.

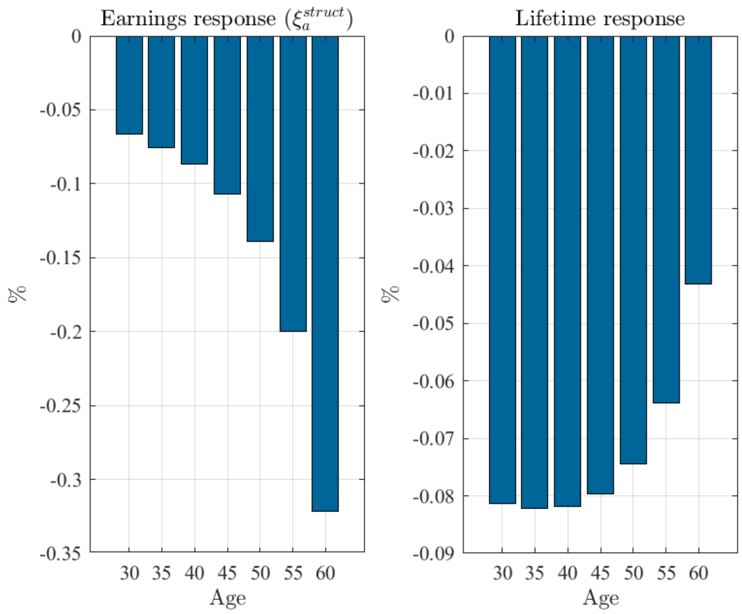
The right panel of Figure 9 illustrates the corresponding lifetime cumulative responses, i.e., how a wealth shock at age a affects the sequence of earnings at age a, $a+1$ until retirement at $a = T$. In contrast to the effects on impact, the cumulative effects turn out to be decreasing with age. This is because even though the impact elasticity is larger for older workers, the earnings drop lasts over a shorter remaining work life: the duration effect dominates the elasticity effect.[24]

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

[23] 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.

[24] For the elasticity effect to dominate, we would need to assume a number of hours worked that would be too low to be consistent with the life-cycle patterns targeted by our calibration.

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 logarithm of the shock amount, measured in CHF. Recall that in the case of unexpected shocks considered here, $\xi_a^{struct} = \xi_a^{impact}$. Lifetime elasticities are computed by taking the log-difference in lifetime sums of earnings divided by the logarithm of the shock amount received at 30.

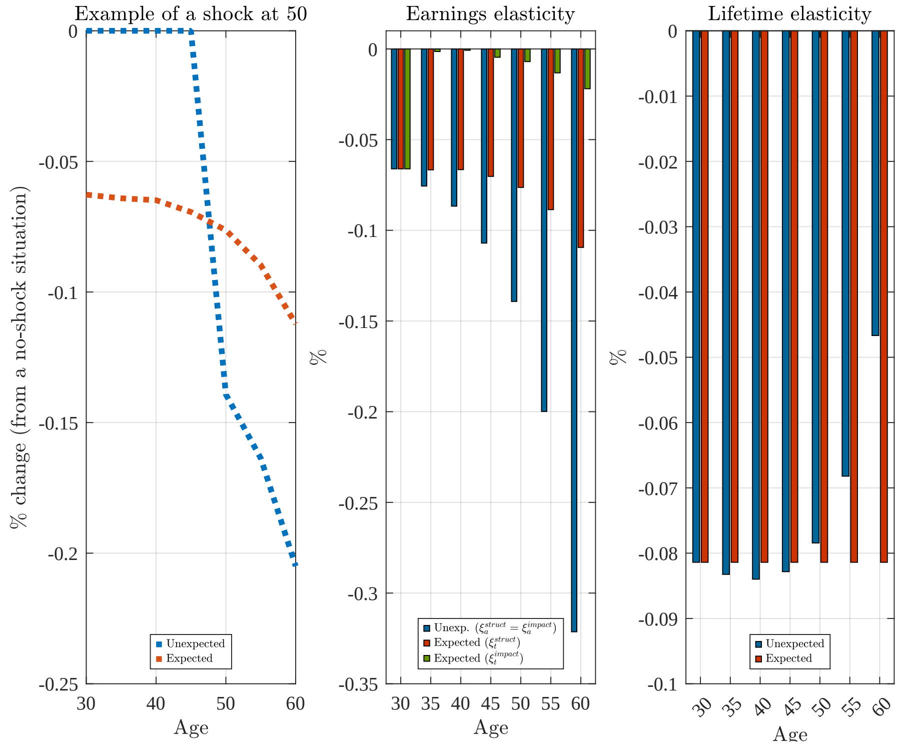
means that individuals know they will receive at some point in time, but the exact timing is irrelevant to the adjustment of their lifetime response.[25] Equations (7)-(8) imply that consumption and earnings will react upon receiving the information, and not upon the realization of the shock. Figure 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 illustrates life-cycle labor supply in the case of a wealth shock hitting at 50. If that 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, however, the shock is expected, workers reduce earnings over their entire life cycle, also below the age of 50. Yet, even with expected shocks, labor supply differences with respect to the no-shock counterfactual are not constant across ages, since individuals do not value leisure vs. consumption equally over the life cycle.

In the middle panel of Figure 10, we show earnings elasticities. Those elasticities are always larger when shocks are unexpected than when they are expected. For expected shocks, the graph shows the impact and structural elasticities of equation (14). It appears clearly that the impact elasticities, which we can estimate in the data, are considerably smaller in absolute value than the structural elasticities, which are relevant for policy evaluation.

[25]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 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 logarithm of the shock amount, measured in CHF. 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 logarithm of the shock amount received at 30.

Since expected shocks affect earnings over the entire life cycle, the cumulative changes in earnings again turn out to be larger when shocks are expected than when they are not, as we show in the right panel of Figure 10. Our model thus predicts larger impact effects but smaller cumulative effects from unexpected shocks, such as lottery wins, than from (partly) expected shocks, such as inheritance.

Early retirement. Our model so far does not account for the retirement margin and therefore misses one of the key mechanisms suggested by the data. Therefore, we extend the model by allowing individuals to retire one five-year period ahead of the statutory retirement age. We assume that, from age 50 onward, households may opt for an early-retirement regime under which they stop working at age 60 rather than 65 and receive permanently lower pension income thereafter. The early-retirement decision is modeled as an absorbing discrete choice: once selected, the household remains on that path for the rest of the life cycle. Because the decision is forward-looking, the option affects behavior already before retirement actually occurs. In particular, households compare the continuation values associated with statutory retirement and early retirement, taking into account the additional leisure gained at age 60, the associated pension penalty, and the implied adjustment of savings and labor supply between ages 50 and 60. As shown in Appendix D2, this extension introduces a potentially important extensive margin at older ages, on top of the intensive-margin labor supply response already present in the baseline model.

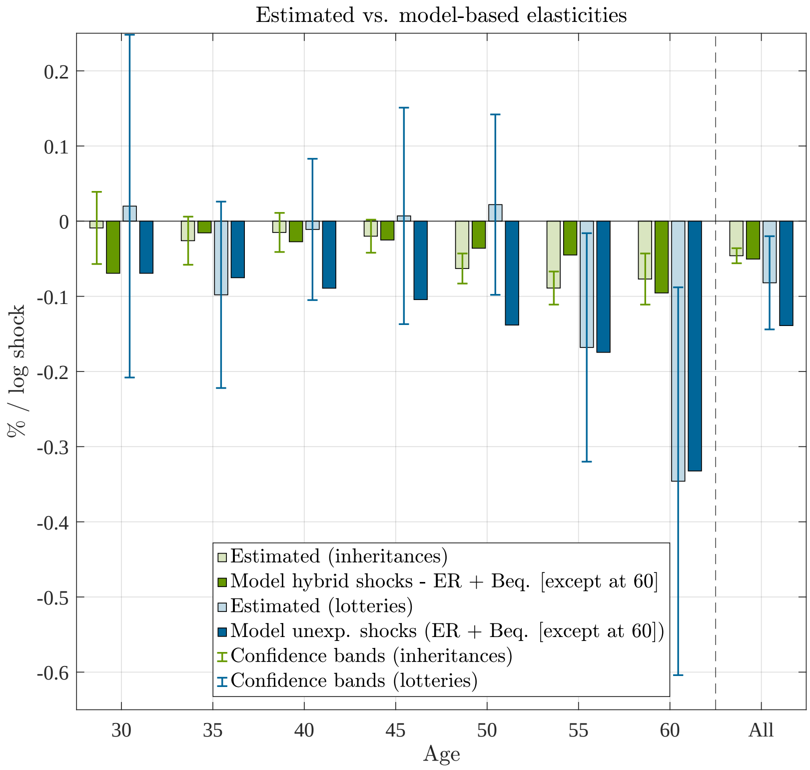
Early retirement with a terminal bequest motive. A second limitation of the baseline model is that it cannot generate the persistence of end-of-life wealth observed in the data (Figure 8), nor can it capture how inheritance taxation could affect donors through wealth accumulation in old age. We therefore further enrich the model by introducing a "warm-glow" bequest motive following De Nardi (2004). Households are now assumed to derive utility from end-of-life wealth, which raises the continuation value of saving and therefore makes decumulation in retirement less attractive. This extension changes the intertemporal savings problem and, through it, the value of early retirement relative to continued work. Quantitatively, adding a bequest motive increases labor supply and wealth accumulation along the life cycle, slows wealth decumulation after retirement, and potentially makes the early-retirement decision more contingent on the realization of a wealth shock (see Appendix D2).

4.3 Taking stock

Based on closed-form expressions for changes in earnings after unexpected wealth shocks, our 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 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 can affect labor supply at the extensive margin.

In Figure 11, we compare the quantitative predictions of the model with the estimated impact elasticities. The figure presents the age profiles of labor supply responses generated by the

Figure 11: A comparison of estimated and model-based elasticities



Notes: Estimated elasticities and confidence intervals are taken from Table 2. Model-based elasticities are taken from the case with an early retirement option and a bequest motive, 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. For inheritances, the reported elasticity assigns a 75% weight to the response to expected shocks and a 25% weight to the response to unexpected shocks (see Kindermann et al., 2020). '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).

model with early retirement and a terminal bequest motive, as described above and detailed in Appendix D2, alongside the baseline estimates of Section 3 (Table 1, and Panels b and c of Table 2).[26] For inheritances, we construct a hybrid model-based elasticity that assigns a 75% weight to the response to expected shocks and a 25% weight to the response to unexpected shocks. This choice is motivated by the benchmark signal quality of 0.75 used by Kindermann et al. (2020) to model inheritance expectations and captures substantial but incomplete anticipation.

Figure 11 provides an external validation of our calibrated model. The model broadly reproduces the negative earnings responses and their variation over the life cycle. The remaining gap is most visible at ages for which the hybrid specification predicts smaller inheritance responses in absolute value. The predictions for unexpected shocks also reproduce the broad age profile of the lottery estimates remarkably well.

When we pool all age groups, as shown by the four right-most bars of Figure 11, the hybrid model-based inheritance elasticity is -0.040, compared with an empirical estimate of -0.046. This close correspondence is obtained using the externally motivated 75% anticipation weight. For lottery wins, the model predicts an elasticity of -0.128, compared with an empirical esti-

[26] For the 60–64 age category, we report the intensive-margin response from the model without early retirement and a bequest motive. In the representative-agent model, the early-retirement decision is a corner: the household either continues working or retires completely. It therefore cannot generate a finite, smooth extensive-margin elasticity at that age.

mate of -0.082. The model response is larger in absolute value, but remains within the empirical 95% confidence interval of $[-0.144, -0.020]$.

The values shown in Figure 11 are earnings elasticities measured over the five-year window following the wealth shock. For a more intuitive quantification, we compute marginal propensities to earn (MPEs), which capture the share of an inheritance or lottery win that translates into lower earnings rather than higher consumption or savings over the recipient's remaining working life. For lottery wins, the estimated remaining-worklife MPE is -14.8%, as shown in the bottom row of Table 1. The corresponding inheritance estimate is -4.3%. This estimate excludes labor supply adjustments made in anticipation of the inheritance and therefore provides an upper bound, in the sense of being the least negative and smallest-magnitude estimate of the lifetime MPE. At the opposite extreme, the model with perfectly anticipated inheritances and frictionless borrowing implies a lifetime MPE of -31.2%.[27] The comparison in Figure 11 is consistent with substantial anticipation, but it does not identify the precise degree of anticipation. We therefore interpret -4.3% and -31.2% as indicative bounds: the structural lifetime response to inheritance should be more negative than the response measured only upon receipt and may plausibly exceed the estimated lifetime response of -14.8% to unanticipated lottery wins.

5 Counterfactual policy experiments

The aggregate effect of inheritance on labor supply depends not only on individual earnings elasticities but also on how inheritances are distributed across recipients, who differ by amount received, age and other household characteristics. We therefore now extend the representative-household framework of Section 4 to a heterogeneous-agent version of the model and use it to conduct counterfactual policy experiments involving inheritance taxation.

Heterogeneity—not only in amounts received, timing or age but also in productivity and preferences—matters for two reasons. First, it allows the model to reproduce the empirically observed distributions of earnings and inheritances. Second, it prevents the early-retirement margin from being driven by a corner solution in which either all households retire early or none do.

5.1 Framework, heterogeneity, and calibration

Relative to the model of Section 4, our key extension is that we allow households to differ along three dimensions in addition to age: permanent productivity, the disutility of labor, and the size of inheritance received conditional on receipt.

Heterogeneity dimensions and distributions. Formally, household i is characterized by a triplet $(z_i, \kappa_i, \varphi_i)$, where productivity z_i shifts the deterministic age profile of wages, κ_i governs the willingness to supply labor, and φ_i scales the age-specific average inheritance amounts observed in the data. We assume that z_i and φ_i are jointly log-normally distributed and positively correlated, so that households with stronger earnings capacity also tend to come from richer

[27] This mirrors our distinction between impact and structural elasticities in equations 12 to 14, except that MPEs are expressed in levels and cumulated over the remaining working life.

families and receive larger transfers.[28] The labor-disutility parameter κ_i is also log-normal, but independent of inheritance size in the benchmark specification. Conditional on $(z_i, \kappa_i, \varphi_i)$ and on the timing of inheritance receipt, households solve a dynamic problem that we spell out in Appendix Section D3: consumption and savings are chosen numerically, labor supply is pinned down by the intratemporal first-order condition, and early retirement is chosen if the value of retiring at 60 exceeds the value of continuing until age 65. Aggregate objects are then obtained by integrating individual outcomes over the joint distribution of household types and over the age distribution inferred from the data reported in Table 2.

Preferences. Our calibration combines externally disciplined parameters with internally targeted moments. All calibrated values and their associated sources or target values are shown in Panel A of Table 4, including those that are inherited from the model of Section 4. Mean labor disutility is set to $\kappa = 0.33$, which implies an average Frisch-like labor supply elasticity close to 0.3 and in line with Chetty et al. (2011). As in Section 4, we assume an annual real return of 3% and adjust the discount rate to $\rho = 0.065$ to match average wealth at age 65, and we model inheritance shocks as 75% expected, following Kindermann et al. (2020).

Finally, the bequest parameter cannot simply be imported from the representative-agent calibration. In the representative-agent case, we calibrate this parameter to match average terminal wealth. In the model with heterogeneous agents, average terminal wealth results from the aggregation of very different wealth trajectories that include potential inheritances received and heterogeneous earnings and savings paths aggregated with population weights. Hence, our target in the model of this section will differ, and so will the calibrated value of ω. Because our inheritance-tax experiments will operate both through recipients' labor supply responses as well as through donors' bequest behavior, the aggregate donor-side flow of bequests must furthermore be quantitatively consistent with the aggregate receipt-side flow of inheritances. When we recalibrate the warm-glow parameter to $\omega = 1.65$ here, the implied aggregate bequest flow—defined as the population-level probability weighted sum of terminal wealth and accidental bequests in case of early death—matches the aggregate inheritance flow of some 12% of GDP observed in the data (Brülhart et al., 2026).

Life-cycle patterns. Survival probabilities are taken from actuarial tables (see Table 3). The deterministic age profile of labor income is taken from our data (see Table 2) and used to infer the age profile of average wages (see Table 3). The distribution of inheritance receipt and the associated average amounts by age group are also taken directly from the data, using Table 2. Population weights across age groups are reconstructed from the observed number of recipients and age-specific receipt probabilities.

Heterogeneity. The heterogeneous dimensions are disciplined by a set of distributional moments. First, we set the life-time probability of receiving a nonzero inheritance to $\pi_a = 0.95$, so that the aggregate inheritance flow in the model matches the targeted inheritance-to-GDP ratio of 12%. Second, the dispersion of the inheritance multiplier, $\sigma_\xi = 1.95$, is chosen to reproduce the dispersion of nominal inheritance flows, conditional on a correlation between inheritance

[28] Strong correlations between the wealth and income of parents and that of their children are empirically well documented (see, e.g., Adermon et al., 2018; Fagereng et al., 2021).

size and productivity that we set to $\text{Corr}(\log z, \log \xi) = 0.85$.[29] Third, the early-retirement penalty parameter—defined in the detail exposition of the model in Appendix D— is set to $\theta = 0.918$. This implies an early-retirement penalty $1 - \theta$ that allows us to match the unconditional early-retirement rate of 22.4% observed in the data.[30] Fourth, the dispersion of productivity, $\sigma_z = 0.50$, is chosen to reproduce the dispersion of annual earnings among inheritors. Finally, the dispersion of labor disutility, $\sigma_\kappa = 0.80$, is disciplined by the distribution of male employment rates in the Swiss Labor Force Survey (SAKE/ESPA).[31]

Simulation, fit and quantitative implications. Using our benchmark calibration, we simulate 500 household types and use a 100-point asset grid to solve the value function of each type before aggregation. The resulting model fits the key targets well for our purposes. Appendix D4 provides a detailed discussion of how the model performs.

The quantitative implications can be read from Panel B of Table 4. It shows that the model generates economically meaningful heterogeneity. Low-productivity households earn and receive earnings corresponding to 61% of the aggregate mean, while high-productivity incomes correspond to 139% of the mean. By contrast, heterogeneity in labor disutility primarily affects hours and retirement choices. Households with low κ work substantially more, with average hours of 0.89, and almost never retire early at age 60. Households with high κ work much less, with average hours of 0.67, and they display an early-retirement rate of 47.9%. The contrast is sharp and useful: productivity heterogeneity mainly governs the distribution of earnings and income, while heterogeneity in labor disutility is what generates an empirically plausible retirement margin. Both sources of heterogeneity are therefore needed in the benchmark calibration.

Further, Figure D2 in the Appendix provides a visual summary of the distributions implied by the benchmark calibration. Productivity, labor disutility, and the individual inheritance scaling parameter are right-skewed, with the inheritance parameter displaying the strongest concentration at low values and a long right tail. Consumption is less dispersed than earnings or income, consistent with life-cycle smoothing.

5.2 Inheritance taxation

We now consider the introduction of a proportional tax on inheritances. In all experiments, statutory incidence remains on recipients: if a testator leaves behind a gross inheritance x, the heir's budget constraint includes only the net transfer $(1 - \tau)x$, and government revenue is τx. Economic incidence, however, can also fall on testators, for two reasons: because they too can be recipients during their lifetime, and because they may account for τ when deciding how large a gross inheritance they desire to leave behind.

[29] In Appendix Figure D3, we report the baseline inheritance-tax experiment with this correlation set to 0.4, all else equal. All predicted responses are qualitatively unchanged, and the earnings and early-retirement responses are also quantitatively very similar.

[30] Based on observed early-retirement rates at age 60 and the official annual pension penalty of 6.8%, the penalty parameter would be somewhat lower (i.e., the penalty would be larger), around $\theta = 0.825$. A higher effective penalty parameter (a lower penalty) in the model can be interpreted as capturing institutional and financial arrangements that soften the private cost of early retirement, such as employer-specific packages or non-pecuniary benefits.

[31] Data available at https://www.bfs.admin.ch/bfs/fr/home/statistiques/travail-remuneration/enquetes/espa.html. We use the male distribution because the aggregate distribution of hours is strongly shaped by gender-specific labor-market behavior, whereas the model does not include a separate gender margin. The non-targeted part-time bins are reported below as a diagnostic check rather than imposed as calibration targets.

Table 4: Benchmark calibration and simulated moments

Panel A. Calibration and aggregate moments

Parameter	Value	Source/Target
Survival probabilities	-	Taken from Table 3
Weight of cohorts	-	Inferred from Table 2
Age-specific wage profile	-	Taken from Table 3
Penalty parameter	0.918	Unconditional ER rate
Common bequest motive	1.650	Targets the bequest/GDP ratio
Discount parameter ρ	0.065	Taken from rep-agent model
Std. log z	0.500	Mean and std. earnings of recipients
Std. log φ	1.950	Mean and std. inheritance flows
Std. log κ	0.800	Male full-time employment share
Corr$(\log z, \log \varphi)$	0.850	Intergenerational persistence
Inheritance incidence π_a	0.950	Agg. inheritance to annual GDP
Weight on expected inheritances	0.750	Kindermann et al. (2020)
Mean productivity draw	1.000	Assumption
Mean inheritance multiplier	1.000	Assumption
Mean κ draw	0.330	Taken from rep-agent model
Moment	**Model**	**Data**
Inheritance / GDP ratio	0.1215	Explicit target: 0.12
Bequest flow / GDP ratio	0.1219	Explicit target: 0.12
ER rate at 60, mixed unconditional	0.2231	Explicit target: 0.2238
ER rate at 60, mixed conditional	0.2574	-
Mean annual earnings (recipients)	46,060	43,500
Std. annual earnings (recipients)	45,618	Explicit target: 43,121
Mean net wealth (recipients)	250,666	303,852
Std. net wealth (recipients)	213,131	2,662,145
Mean nominal inheritance	133,606	129,038
Std. nominal inheritance	700,832	Explicit target: 699,576
Mean recipient age	55.62	57.62
Std. recipient age	11.59	11.48
Mean hours worked	0.779	Explicit target: 0.77
Hours share $< 20\%$	0.028	0.019
Hours share 20–49%	0.004	0.036
Hours share 50–69%	0.023	0.044
Hours share 70–89%	0.112	0.061
Hours share 90–100%	0.833	Explicit target: 0.840

Panel B. Simulated moments by subgroup

	All	Low z	High z	Low κ	High κ
Hours worked	0.779	0.782	0.776	0.890	0.667
Earnings / mean earnings	1.000	0.611	1.389	1.144	0.856
Income / mean income	1.000	0.612	1.388	1.144	0.856
Wealth / annual income	4.056	3.726	4.386	2.807	5.304
ER rate at 60	0.240	0.227	0.253	0.000	0.479

Notes: Panel A reports the benchmark parameterization of the heterogeneous-agent model together with the main sources and targets, along with some non-targeted moments. Moments for earnings, wealth, inheritance, and recipient age are computed in the model conditional on receiving an inheritance and aggregated using the relevant weights, in line with the empirical summary statistics for inheritors. The bequest flow is computed using age-specific probabilities of death as well as relevant asset levels and weights. Hours shares are computed among employed men in the SAKE/ESPA occupation-rate tables over 2010–2025; only the full-time share is targeted. Panel B reports simulated moments by subgroup. "Low" and "High" refer to draws below and above the median of the relevant dimension. Earnings and income are normalized by their aggregate means.

Bequest motives and simulations. In our baseline specification, we assume the bequest motive to be such that the desired gross bequest is unaffected by τ. In this "inelastic gross bequest" case, donors are therefore assumed to care about their gross bequest only, and the statutory and economic incidence of inheritance taxes both fall on the recipient.

Other representations of testator preferences, however, might be no less realistic. In two alternative specifications, we therefore assume that testators care about the net-of-tax bequest. With those specifications, the economic incidence of inheritance taxes is shared between donors and recipients. We only state the qualitative implications of these preference specifications here and leave the details to Appendices D2 (expression 30) and D4.

In the first case, an inheritance tax will *reduce* the gross bequest desired by testators. In such a "negatively elastic gross bequest" specification, the tax will also reduce testators' labor supply. In the contrasting "positively elastic gross bequest" specification, an inheritance tax will *increase* desired gross bequests and thus induce testators to supply more labor.

Since the two cases imply opposite-signed labor supply responses on the part of donors, they serve to bound a realistic range of aggregate responses in the face of uncertainty about the exact nature of bequest motives. The limited empirical evidence that exists on this relationship suggests gross bequests to be weakly negatively elastic with respect to inheritance tax rates.[32]

Despite the invariance of desired bequests with respect to the tax rate assumed in the inelastic case, realized gross inheritances are endogenous through an intergenerational feedback: inheritance taxation affects recipients' labor supply, saving, retirement, and terminal assets, which in turn determine the bequests received by the next generation. For each tax rate considered, we therefore rescale the pre-tax inheritance amounts in such a way that aggregate inheritances received by heirs equal the model-implied flow of bequests left by donors. This flow is computed from life-cycle asset profiles that mix over inheritance histories.

In all experiments, we use 500 household types and a 100-points grid, and we report earnings, early-retirement responses, tax revenue, and welfare in consumption-equivalent variation (CEV) units. Aggregate welfare is computed as the population-weighted average of lifetime utility across types and ages, and then converted into the uniform percentage change in consumption that would make households indifferent between the benchmark and the counterfactual. A negative CEV therefore indicates a welfare loss.

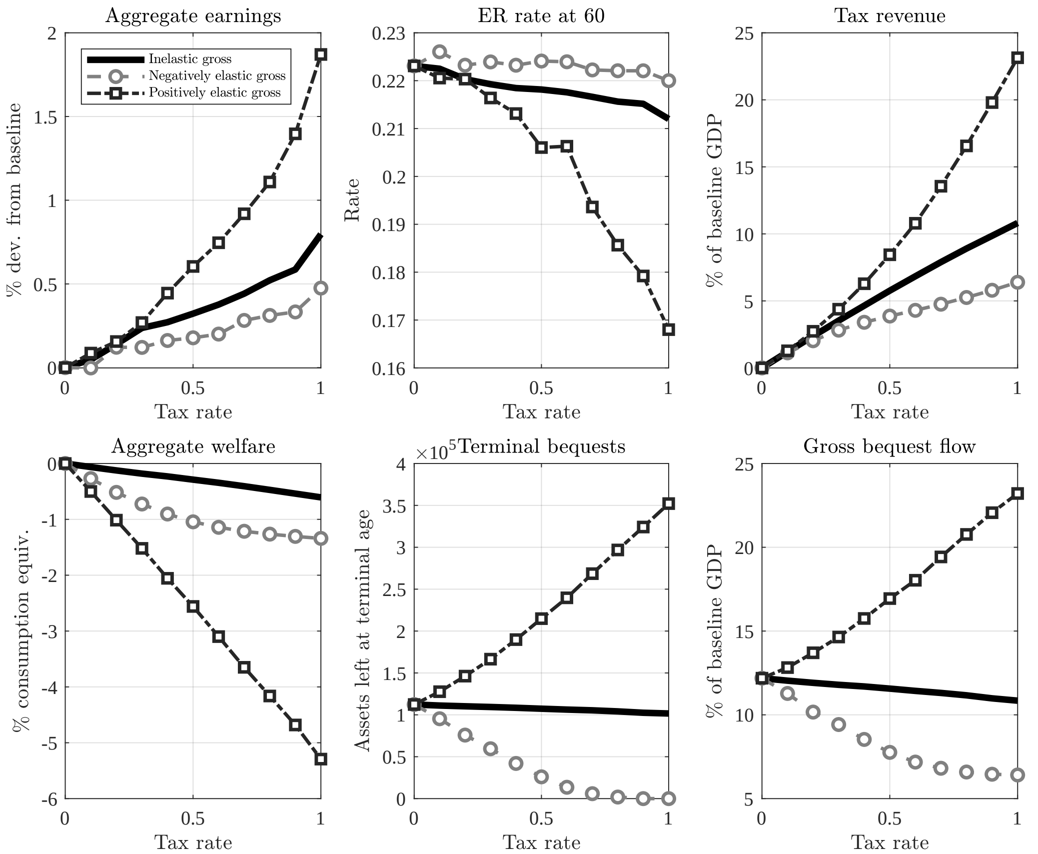
No rebate of tax revenue. For analytical purposes, we begin with a hypothetical (and unrealistic) scenario in which inheritance tax revenues are not returned to households and simply dissipated. This allows us to isolate the behavioral responses to taxation by heirs and testators, without considering the effects of revenue use. Within this scenario, we explore the implications of the three alternative assumptions about bequest motives and thus economic incidence.

Figure 12 shows our simulation results.[33] A non-rebated tax raises aggregate labor supply because it removes some of the bequeathed wealth. In the baseline specification with inelastic gross bequests (solid lines), aggregate earnings increase by 0.24% at $\tau = 0.30$ and by 0.38% at $\tau = 0.60$. The early-retirement rate at age 60 falls by 0.38 percentage points at $\tau = 0.30$ and

[32]In a survey of this evidence, Kopczuk (2013b) reports a plausible range of 0.1 to 0.2 for the elasticity of reported estates with respect to the net-of-tax bequest tax rate. Goupille-Lebret and Infante (2018) confirm this qualitative result but find the effect size for real responses to be very small.

[33]Appendix D4 provides the corresponding equations, numerical details, and subgroup decompositions.

Figure 12: Non-rebated inheritance tax and differing bequest motives: aggregate effects



Notes: The figure reports the effects of a proportional inheritance tax when revenues are not returned to households. Statutory incidence remains on recipients in all three cases. The thick solid line is the baseline, in which economic incidence operates through the negative wealth effect on recipients and the tax does not affect desired gross bequests. When desired gross bequests are assumed to be negatively elastic with respect to the tax rate, the tax lowers the transfer valued by donors, generating a positive wealth effect. In the positively elastic case, donors seek to preserve heirs' net transfer and bear a negative wealth effect from financing a larger desired gross bequest. Effective gross inheritances are endogenous and scale with the model-implied flow of total bequests. In the case of negatively elastic gross bequests, it could seem contradictory that terminal bequest tend to zero as $\tau \to 1$ (bottom middle panel) while tax revenue remains positive throughout (top right panel). The main explanation for the seeming discrepancy is accidental bequests, i.e. not all bequests are terminal bequests.

by 0.55 percentage points at $\tau = 0.60$. Since recipients face negative wealth effects, aggregate welfare falls by 0.18% of consumption equivalent at $\tau = 0.3$ and by 0.35% at $\tau = 0.6$. In addition, the increase in earnings does not compensate the lifetime negative wealth effects, so that both terminal wealth and bequeathed amounts fall with the inheritance tax rate.

Most effects are qualitatively unchanged with alternative specifications of bequest motives. The negatively elastic gross bequest case provides our lower bound for labor supply responses: earnings rise by 0.12% at $\tau = 0.30$ and by 0.20% at $\tau = 0.60$. Donors now reduce desired bequests and work less as the tax rate is increased, which partially offsets the recipient response. The positively elastic gross bequest case provides our upper bound: earnings rise by 0.27% and 0.75%, respectively, as donors work more to finance the larger gross bequest required to mitigate the reduction in the net-of-tax bequest.[34] In terms of welfare, bequest motives focusing on net-of-tax transfers naturally imply larger aggregate losses from inheritance taxation than our baseline model in which we assume inelastic gross bequests.

In Table 5, Panel A, we decompose the aggregate responses for the baseline case with inelastic gross bequests. Corresponding decompositions for the simulations with different bequest motives are shown in Appendix Table D1. We find that high-productivity households account for most of the earnings response: at $\tau = 0.30$, they contribute 0.22 percentage points out of the aggregate 0.24% increase in earnings; at $\tau = 0.60$, they contribute 0.34 percentage points out of 0.38%. This reflects both their larger earnings base and the positive correlation between productivity and inheritance size. The retirement response is instead fully accounted for by high-κ households. Consistent with our reduced-form estimates of Section 3, earnings responses to inheritance taxes are positive at all working ages but concentrated among the older age groups. The age category 60-64 alone accounts for roughly two-thirds of the aggregate tax-induced earnings increase.

Table 5: Effects of inheritance taxation: decompositions

	Panel A. No rebate							**Panel B. Labor subsidy**					
	$\tau = 0.30$			$\tau = 0.60$				$\tau = 0.30$			$\tau = 0.60$		
	$\Delta Y/Y$	ΔER	ΔCEV	$\Delta Y/Y$	ΔER	ΔCEV		$\Delta Y/Y$	ΔER	ΔCEV	$\Delta Y/Y$	ΔER	ΔCEV
All	0.237	-0.382	-0.181	0.377	-0.551	-0.346	All	0.464	-2.059	0.735	0.867	-4.344	1.483
Low z	0.019	-0.049	-0.029	0.037	-0.108	-0.054	Low z	0.112	-1.051	0.407	0.190	-1.915	0.840
High z	0.218	-0.333	-0.153	0.340	-0.443	-0.291	High z	0.351	-1.008	0.328	0.677	-2.429	0.644
Low κ	0.026	0.000	-0.072	0.053	0.000	-0.143	Low κ	0.040	0.000	0.392	0.082	0.000	0.758
High κ	0.210	-0.382	-0.110	0.324	-0.551	-0.203	High κ	0.423	-2.059	0.343	0.785	-4.344	0.725
Age 30	0.002	-0.006	-0.004	0.005	-0.007	-0.008	Age 30	0.006	-0.235	0.148	0.013	-0.519	0.296
Age 35	0.003	-0.015	-0.010	0.006	-0.019	-0.019	Age 35	0.005	-0.262	0.145	0.012	-0.571	0.291
Age 40	0.006	-0.028	-0.017	0.011	-0.036	-0.032	Age 40	0.009	-0.286	0.132	0.021	-0.613	0.268
Age 45	0.012	-0.045	-0.026	0.022	-0.061	-0.049	Age 45	0.020	-0.307	0.114	0.036	-0.648	0.233
Age 50	0.019	-0.070	-0.036	0.034	-0.100	-0.067	Age 50	0.026	-0.324	0.092	0.046	-0.674	0.187
Age 55	0.027	-0.097	-0.043	0.050	-0.144	-0.083	Age 55	0.031	-0.328	0.065	0.058	-0.675	0.131
Age 60	0.169	-0.121	-0.045	0.249	-0.183	-0.087	Age 60	0.366	-0.316	0.039	0.681	-0.643	0.077

Notes: Simulations for baseline assumption on bequest motives (inelastic gross bequests). $\Delta Y/Y$ reports the contribution of each subgroup to the percentage change in aggregate earnings, in percentage points relative to the zero-tax benchmark. ΔER reports the contribution of each subgroup to the change in the unconditional early-retirement rate at age 60, in percentage points. ΔCEV reports the contribution of each subgroup to aggregate welfare, measured in percentage points of consumption-equivalent variation. "Low" and "High" refer to draws below and above the median of the relevant dimension. The age rows report the contribution of each five-year age group to the aggregate response.

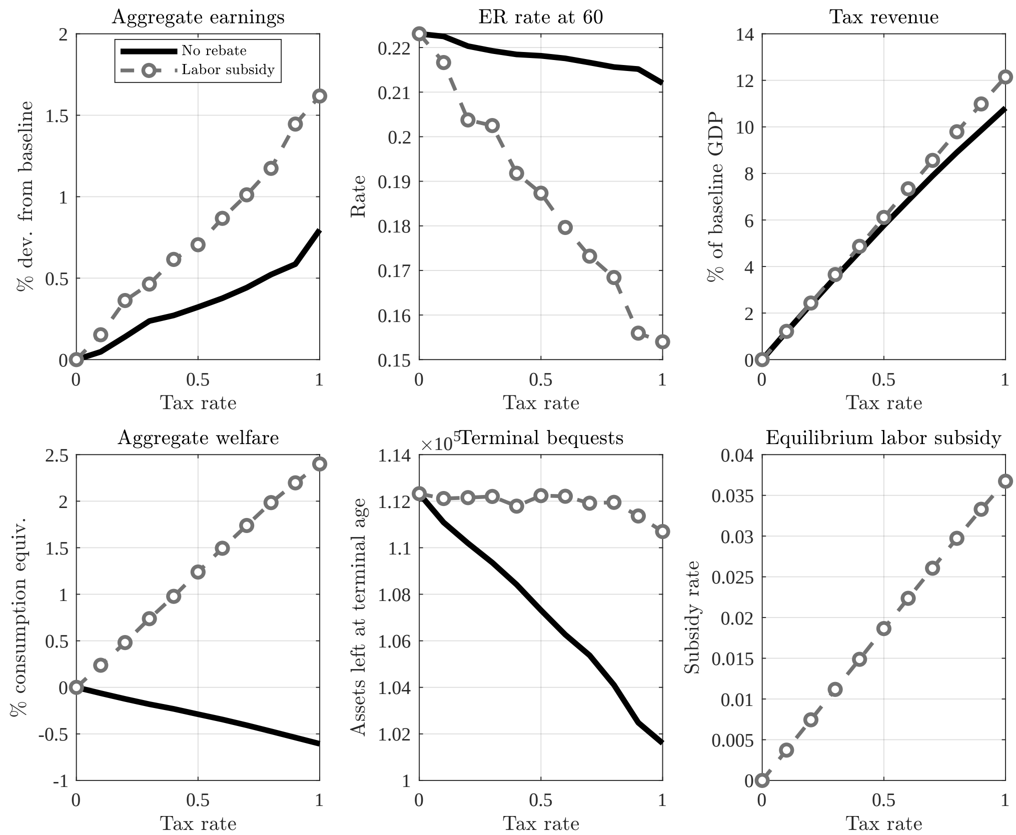
The no-rebate simulations furthermore allow us to quantify the aggregate labor supply effect of inheritance, which we define as the change in aggregate earnings under a hypothetical scenario with $\tau = 1$. As can be seen in the top-left panel of Figure 12, our baseline specification with a bequest motive that is insensitive to inheritance taxation implies earnings that are approximately 0.8% higher if all inheritances are simply removed. This effect drops to 0.5% if we assume testators to reduce their labor supply when bequests are taxed, and it rises to 1.9% if we assume testators to increase their labor supply when bequests are taxed. In sum, our

[34] The assumed bequest function in the positively elastic case is not well defined at $\tau = 1$. As explained in the Appendix, we thus choose to work with a normalized function. Indeed, $\ln(\mu + b_{i,D}/(1-\tau)) = \ln(\mu(1-\tau) + b_{i,D}) - \ln(1-\tau)$ and, since the final term does not affect household choices, we solve the model using the normalized bequest term $\omega \ln(\mu(1-\tau) + b_{i,D})$. This produces the same choices for every $\tau < 1$ and a well-defined limiting allocation as $\tau \to 1$. The results reported at $\tau = 1$ correspond to this limit. CEV results for the positively elastic specification use the same normalized objective and are interpreted conditional on this normalization.

simulations suggest that the incentive effects of inheritance on heirs and bequeathers add up to reducing aggregate labor supply by somewhere between 0.5% and 1.9%, our baseline estimate being 0.8%. In terms of GDP, assuming a 65% labor share, this would imply an output reduction of roughly 0.5%.

Using inheritance tax revenue to subsidize labor. So far, we have ignored the use of revenue raised from the inheritance tax. This has allowed us to isolate the direct incentive effects of taxation, but it unrealistically abstracts from the expenditure side of the government budget. We therefore now consider a reform in which inheritance tax revenue is not dissipated but used to finance a proportional subsidy to labor earnings. We think of this as our model analogue to a policy that uses inheritance taxation to reduce payroll taxation.

Figure 13: Inheritance tax used to subsidize labor: aggregate effects



Notes: The figure compares the effects of an inheritance tax with non-rebated revenues to those of an inheritance tax used to fund a proportional labor subsidy for the baseline assumption on bequest motives (inelastic gross bequests). The bottom-right panel reports the equilibrium labor subsidy rate implied by the government budget constraint.

With a labor subsidy, a second force appears: the after-tax return to work rises, generating a substitution effect through the intratemporal labor supply condition. The inheritance tax now both reduces inherited wealth and raises the return to labor. As a consequence, the labor-subsidy case produces significantly larger labor supply effects than the no-rebate case. We show simulations for the baseline case with tax-inelastic gross bequests in Figure 13. Aggregate earnings are found to rise by 0.46% at $\tau = 0.30$ and by 0.87% at $\tau = 0.60$, more than twice as strongly as in the no-rebate case. Taxing inheritance now has a positive effect on aggregate welfare, with CEV gains of 0.74% at $\tau = 0.30$ and 1.48% at $\tau = 0.60$ in our simulations.

In Table 5, Panel B, we decompose the aggregate effects shown in Figure 13. As in the no-rebate case, high-productivity households account for most of the earnings response, contributing 0.35 percentage points out of the aggregate 0.46% increase at $\tau = 0.30$, and 0.68 percentage points out of the 0.87% increase at $\tau = 0.60$. This again reflects their higher earnings base. Low-productivity households, however, receive a larger share of the welfare gains than they do in the no-rebate case: their CEV contribution is 0.41 percentage points at $\tau = 0.30$ and 0.84 at $\tau = 0.60$. The labor subsidy thus spreads welfare gains more broadly than the earnings decomposition alone would suggest. The age decomposition confirms that all working age groups are affected but, again, the strongest labor supply responses are found near retirement. The 60-64 age group alone accounts for more than four fifths of the aggregate earnings response, confirming the weight of the retirement margin.

Lump-sum redistribution. In Appendix D4, we describe an alternative experiment in which inheritance tax revenues are rebated lump-sum rather than being used to fund a labor subsidy. The lump-sum redistribution case differs starkly from the no-rebate and labor-subsidy cases, as it implies a negative aggregate labor supply response to inheritance taxation. This is due to lump-sum redistribution acting as positive wealth shocks to younger workers, inducing them to consume more leisure. In welfare terms, however, inheritance taxation with lump-sum redistribution performs even better than inheritance taxation used for subsidizing labor.[35] Note that we only take account of households aged 30 and above, thus largely abstracting from effects on educational and occupational choices. This modeling exercise is therefore not informative about policy schemes that would rebate tax revenues to younger individuals (e.g., in the form of a "universal basic inheritance").

Taking stock. Our counterfactual policy simulations contain four main results. First, taxing inheritances raises aggregate labor supply by weakening the wealth effect associated with inheritance receipt. This net effect holds for all functional forms of bequest motives considered. Second, the aggregate labor supply response is concentrated among workers close to the early-retirement margin—who receive a disproportionate share of inheritance among workers—and among households with high labor disutility. High-productivity workers also matter quantitatively, both because their labor supply responses carry more weight in aggregate earnings and because they tend to receive larger inheritances in the calibrated economy. Third, donor-side bequest motives matter quantitatively. With negatively elastic gross bequests, donors experience a positive wealth effect from inheritance taxation and reduce their labor supply. However, this effect is never sufficient to offset the labor supply response of inheritors in our experiments. If, however, bequest motives were so strong as to imply positively elastic gross bequests, then inheritance taxes would generate a negative wealth effect on testators as well and thus *raise* their labor supply. We see these two cases as providing lower and upper bounds for the aggregate labor supply response if inheritance taxes were to affect the strength of bequest motives. Fourth, the use of tax revenue matters. When it is earmarked to fund a labor subsidy (our representation of a drop in payroll taxation), inheritance taxation combines the negative wealth effect on heirs with a substitution effect on all workers, further boosting employment

[35] This can be seen by comparing the bottom-left panel of Figure 13 to that of Appendix Figure D4.

responses and yielding positive aggregate welfare effects.

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 by between 0.5% and 1.9%, depending on bequest motives, our baseline estimate being 0.8%. This implies that aggregate labor supply increases in the level of bequest taxation, an effect we show to be further magnified if the resulting revenue is used to subsidize labor (i.e. as a substitute for lower payroll taxes).

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

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). Moreover, due to the challenges of empirically identifying labor supply responses of young adults, we limit our analysis to individuals aged 30 and over. The effects of inheritance (or other positive wealth shocks) on educational and occupational choices of the young remain relatively understudied.[36] Further, our data allow us to identify entrepreneurial investments only partially, by tracking transitions into self employment. Entrepreneurial responses to inheritance, however, can also take other forms and may well matter for overall output and productivity, but their aggregate-level weight remains to be rigorously quantified.

Another deliberate 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 more challenging than in the case of transfers at death, as the timing, the amount and even the nature of gifts are endogenous.[37] The labor supply implications of inter-vivos gifts therefore present another promising object for further research.

[36] Boar and Lashkari (2025) find that, conditional on on exogenous observables, children of higher-income parents choose occupations with lower earnings but greater non-monetary advantages. This suggests that the labor supply effects identified in our analysis may not differ qualitatively from those that arise from wealth-contingent occupational choices.

[37] For recent evidence on the endogeneity of inter-vivos transfers, see Fagereng et al. (2025) and Barczyk et al. (2025). Note that in our empirical analyses we take account of gifts as potentially confounding wealth shocks.

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A Additional tables and figures

A1 Summary statistics

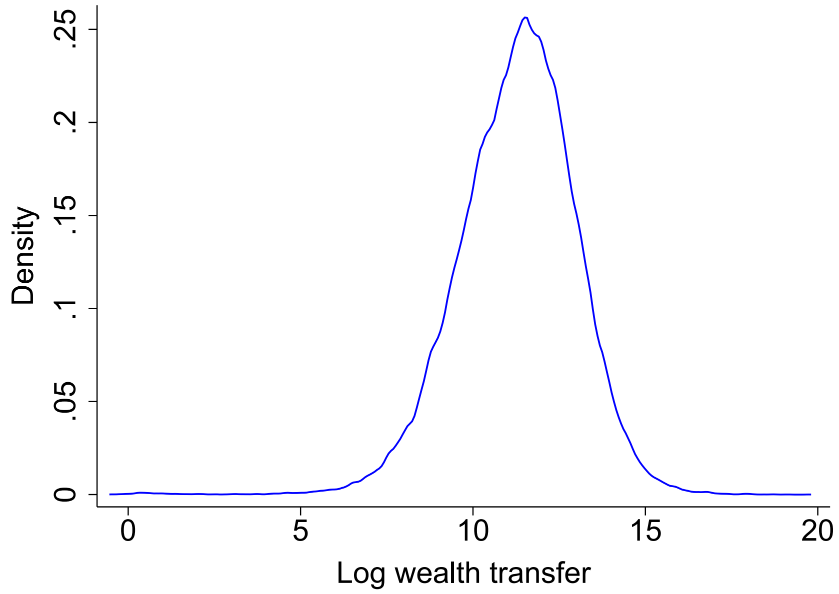
Table A1: Summary statistics

	Mean	Standard deviation
	(1)	(2)
	Sample of inheritors	
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

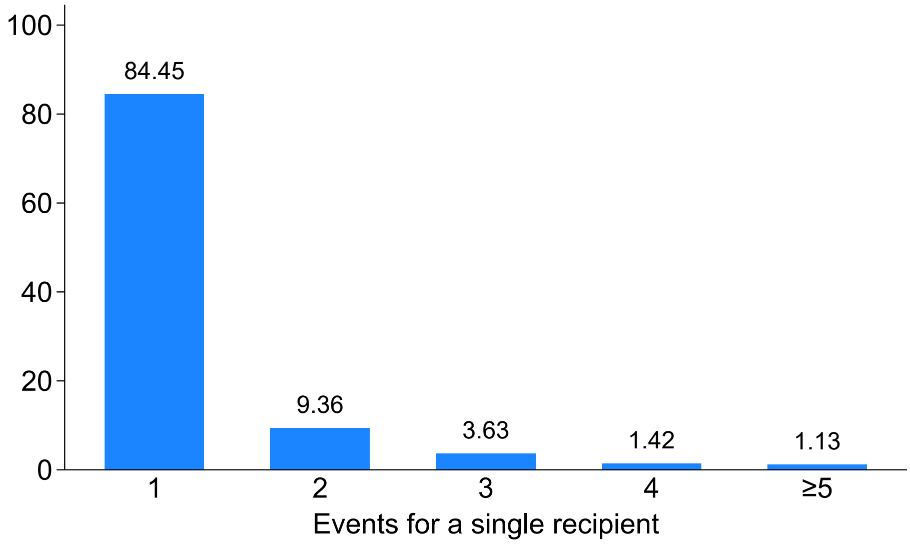
Figure A1: Wealth shock distribution



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

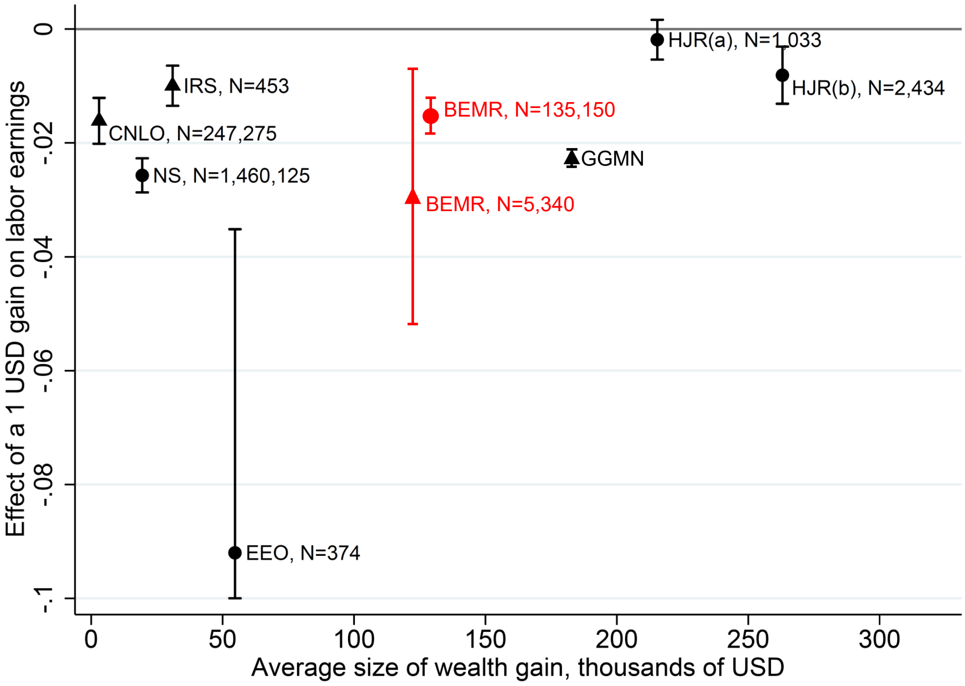
Figure A2: Frequency of wealth transfers



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

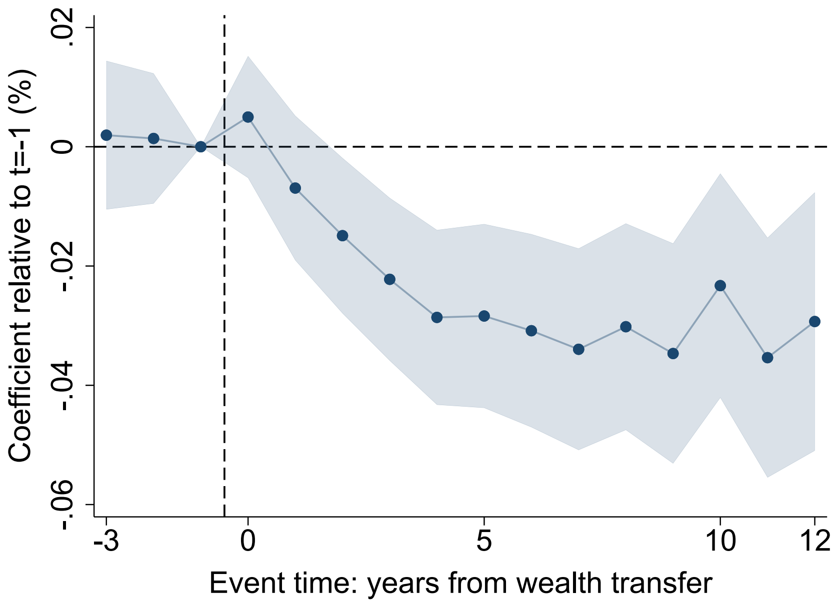
Figure A3: Meta analysis following Nekoei and Seim (2023)



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

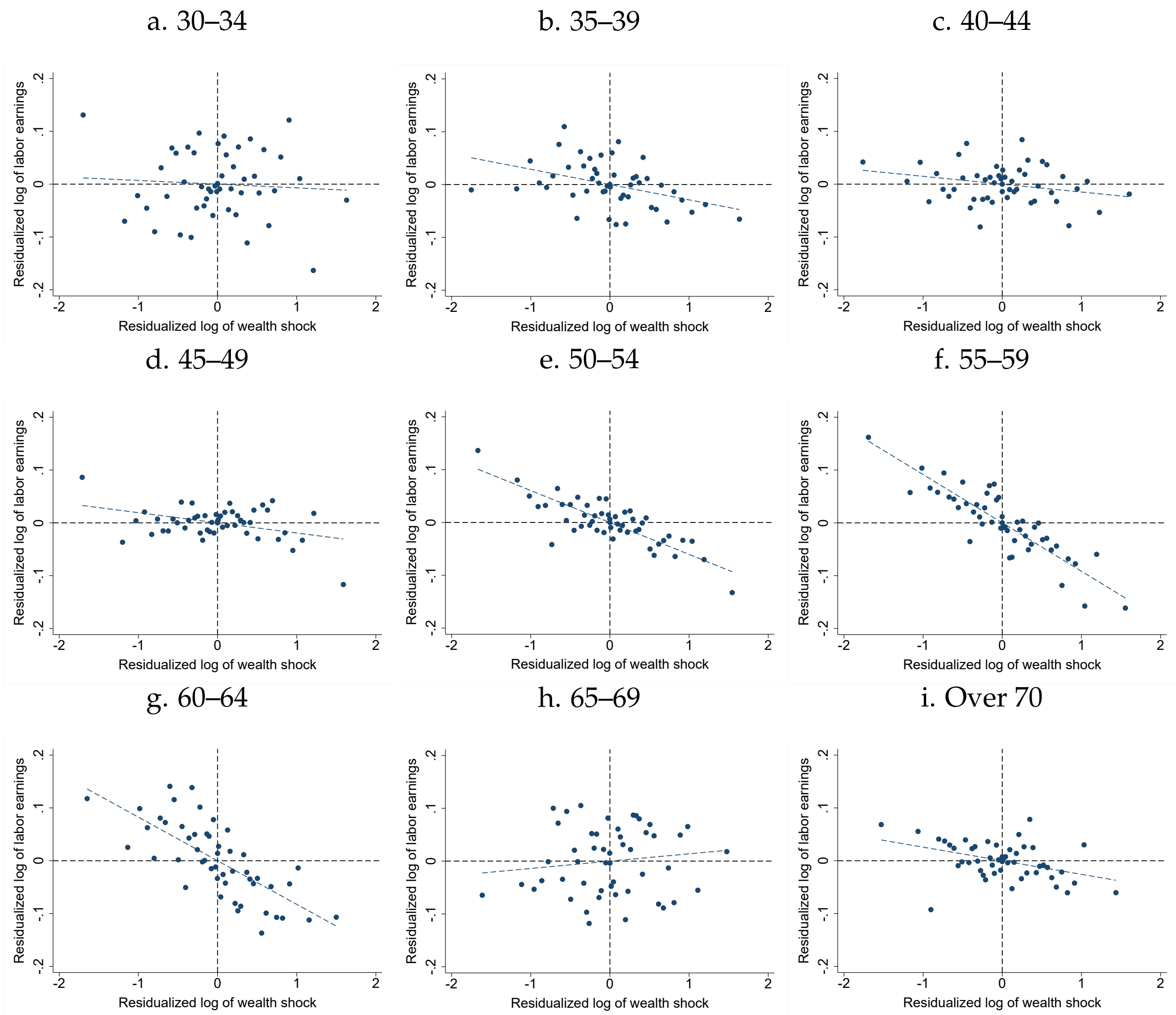
Figure A4: Event-study estimate of the long-run earnings response



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% 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

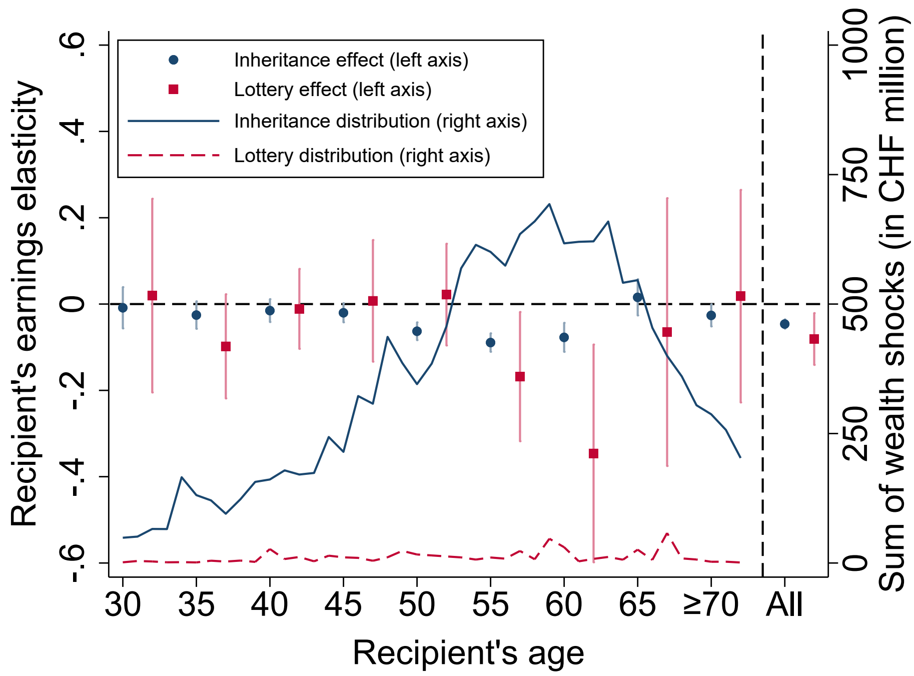
Figure A5: Binscatter by age group



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

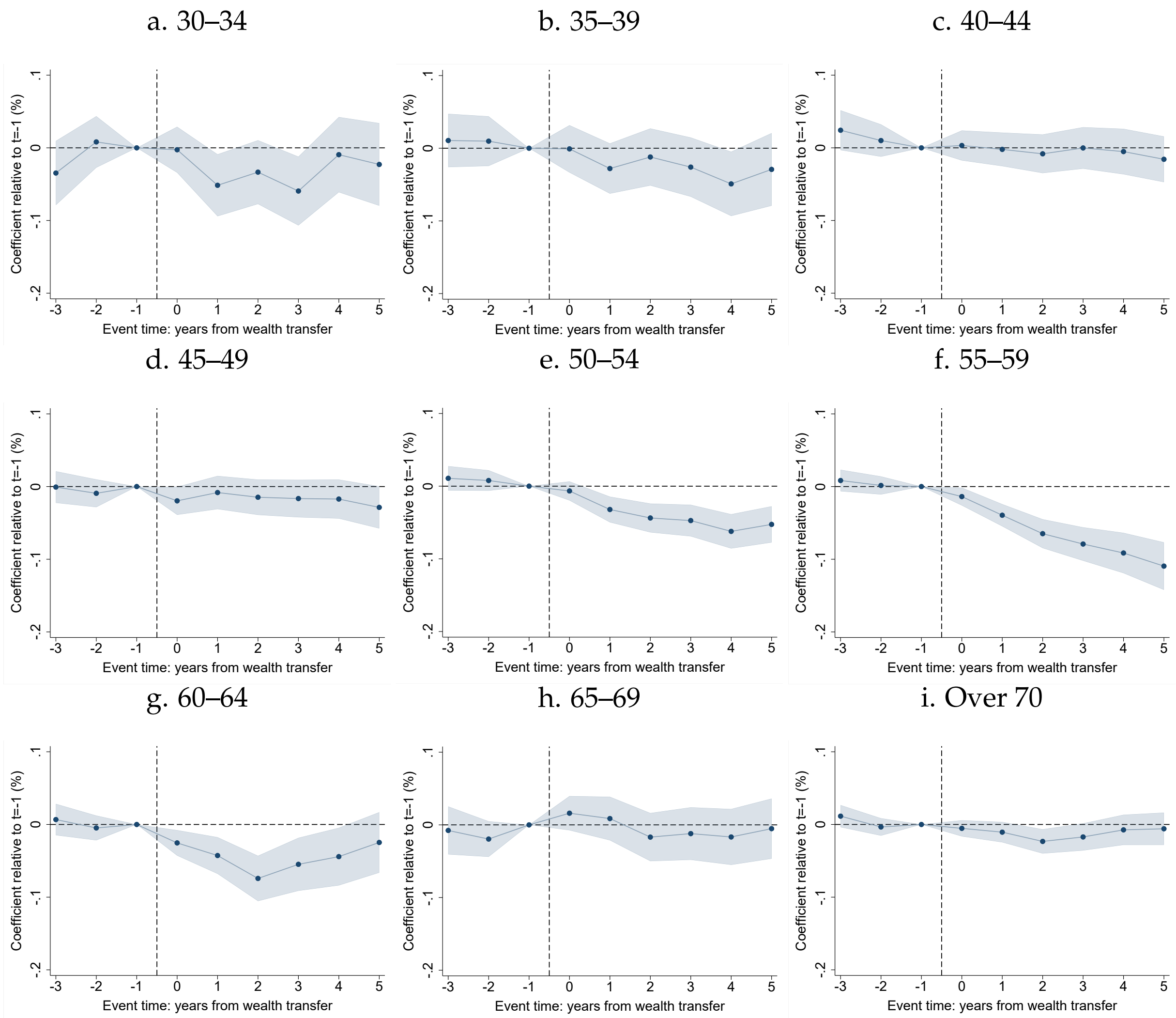
Figure A6: Age profile responses by wealth



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

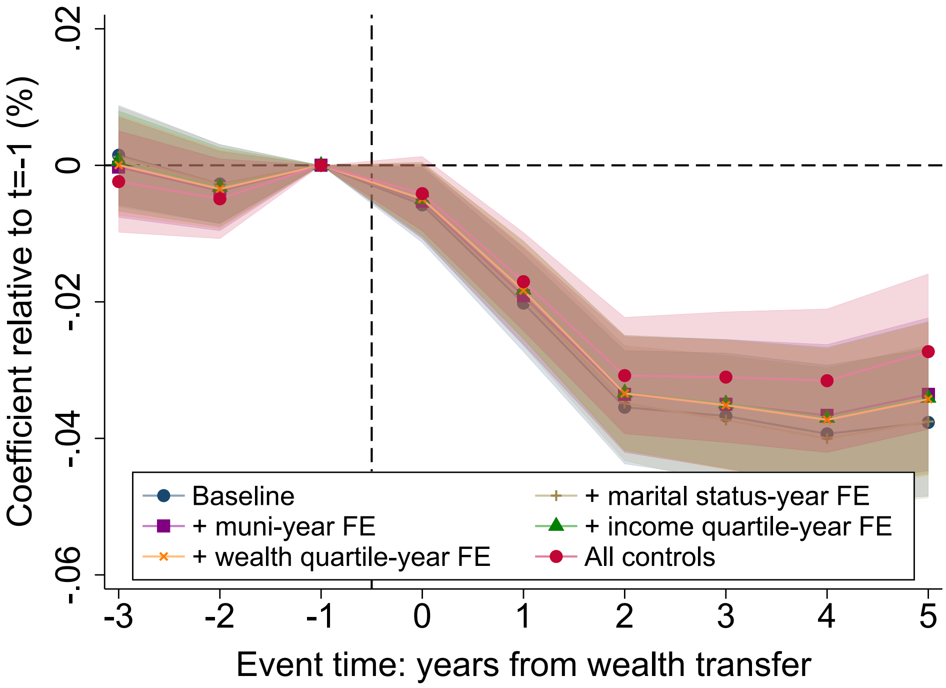


Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings by age group. It plots coefficient estimates and the 95% confidence intervals obtained from equation (2): each point shows the effect $k \in [-3, 5]$ years from the realization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

B Robustness

B1 Event-study results with additional controls

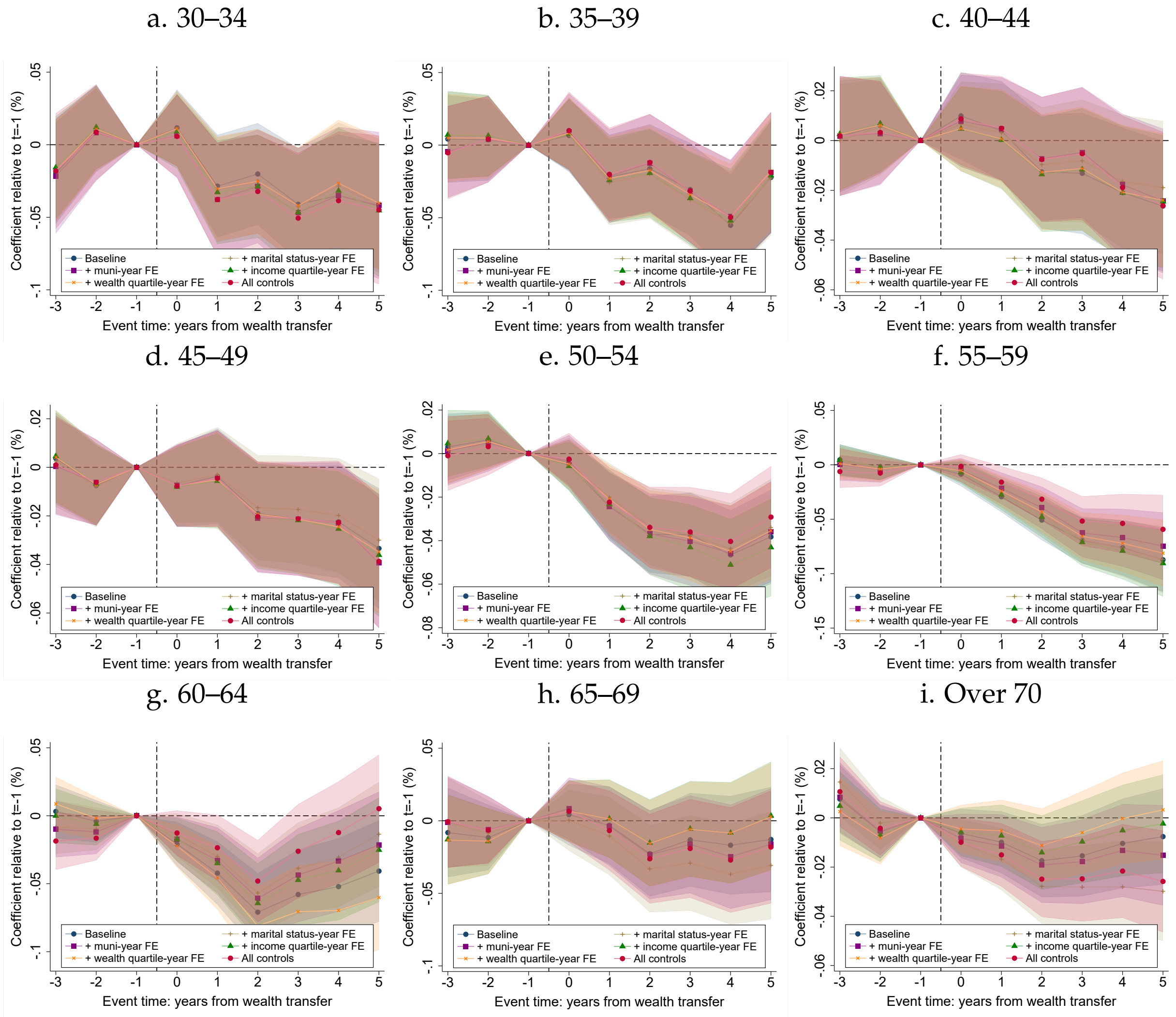
Figure B1: Event-study results with additional controls



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% 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

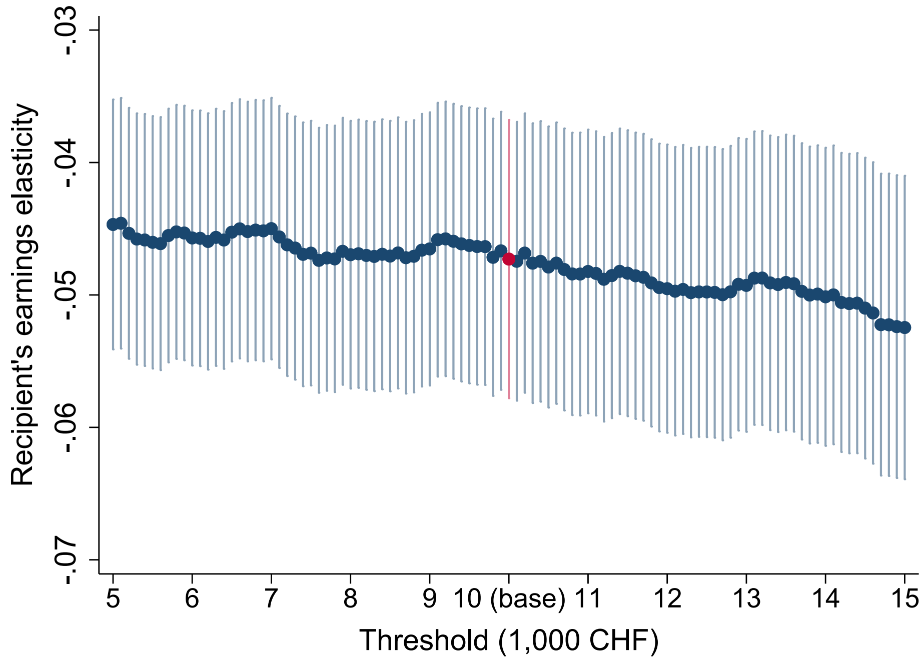
Figure B2: Event-study results by age with additional controls



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% 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

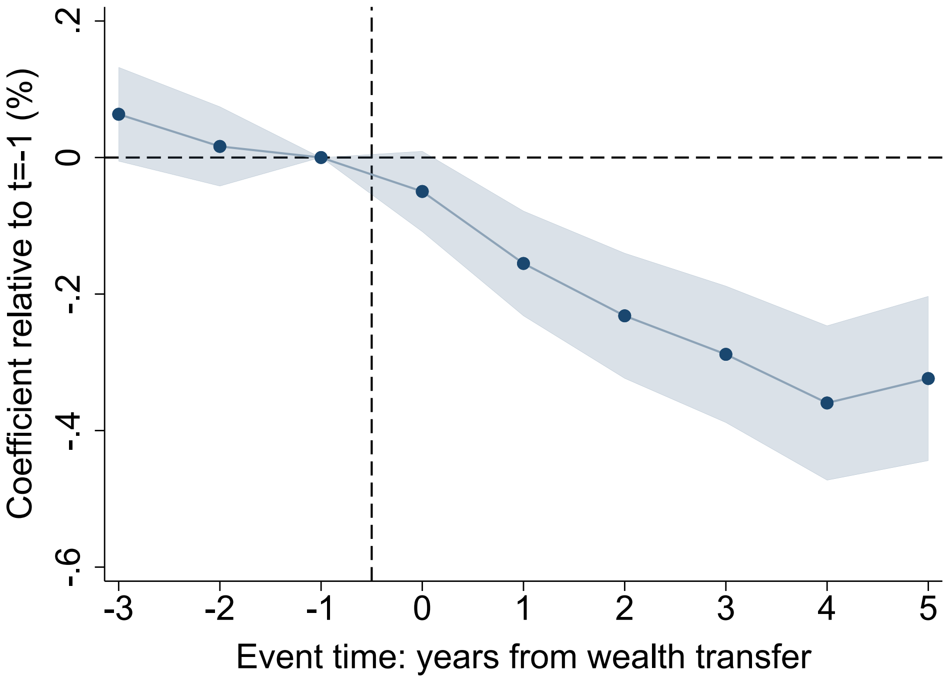
Figure B3: Sensitivity to varying the CHF 10,000 threshold



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

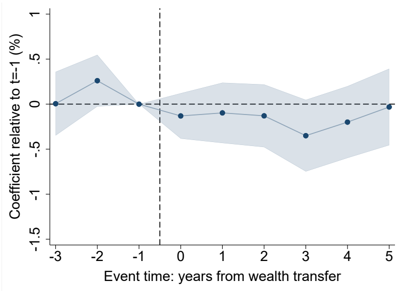


Notes: This figure shows the event-study coefficient estimates of the impact of receiving a wealth shock on the log of labor earnings. It plots coefficient estimates and the 95% confidence intervals obtained from equation (2), but using a discrete treatment rather than a continuous one: each point shows 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

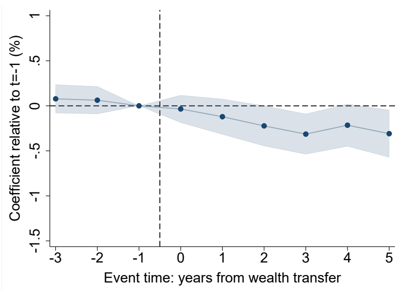
a. 30–34



b. 35–39

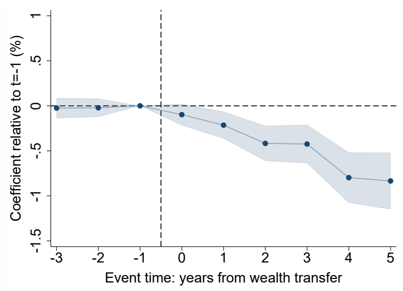
c. 40–44

d. 45–49

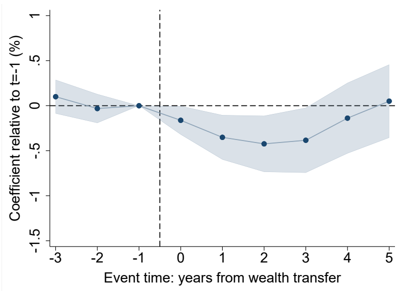


e. 50–54

f. 55–59



g. 60–64



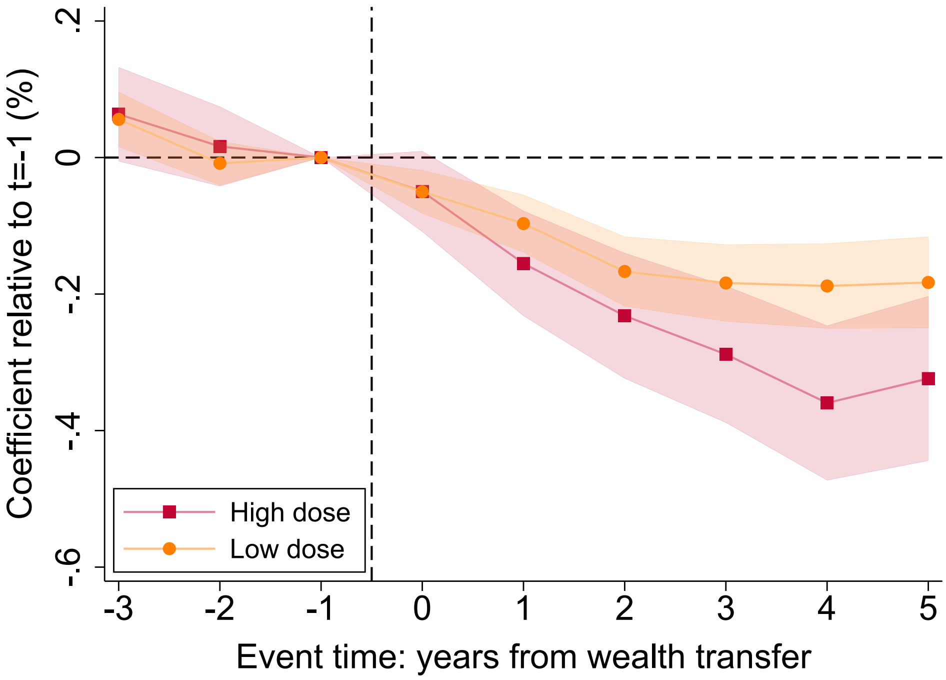
h. 65–69

i. Over 70

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% 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

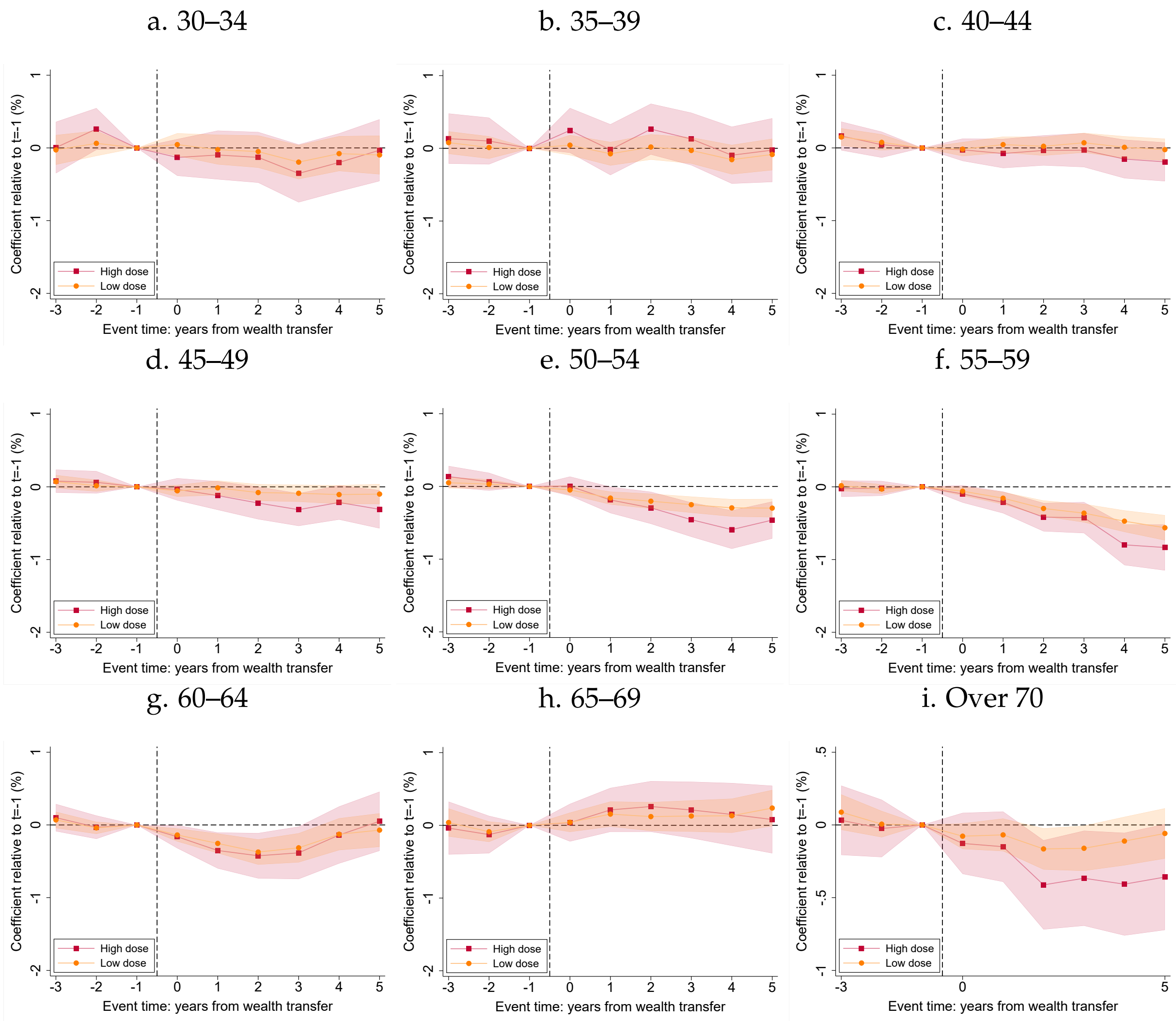
Figure B6: Event-study results with discrete treatment and different doses



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% 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

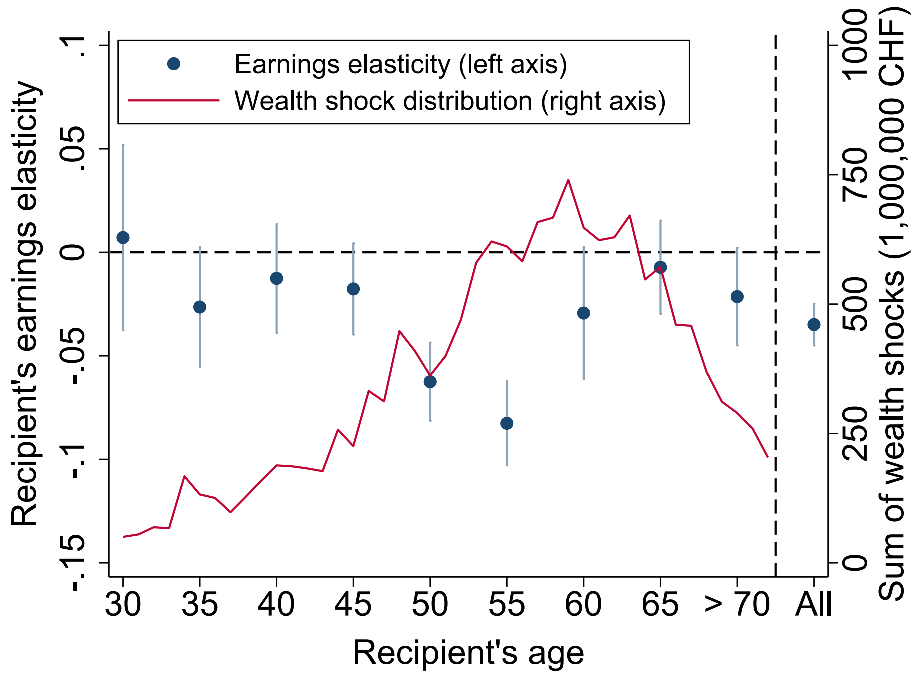
Figure B7: Event-study results with a discrete treatment and different doses by age group



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% 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

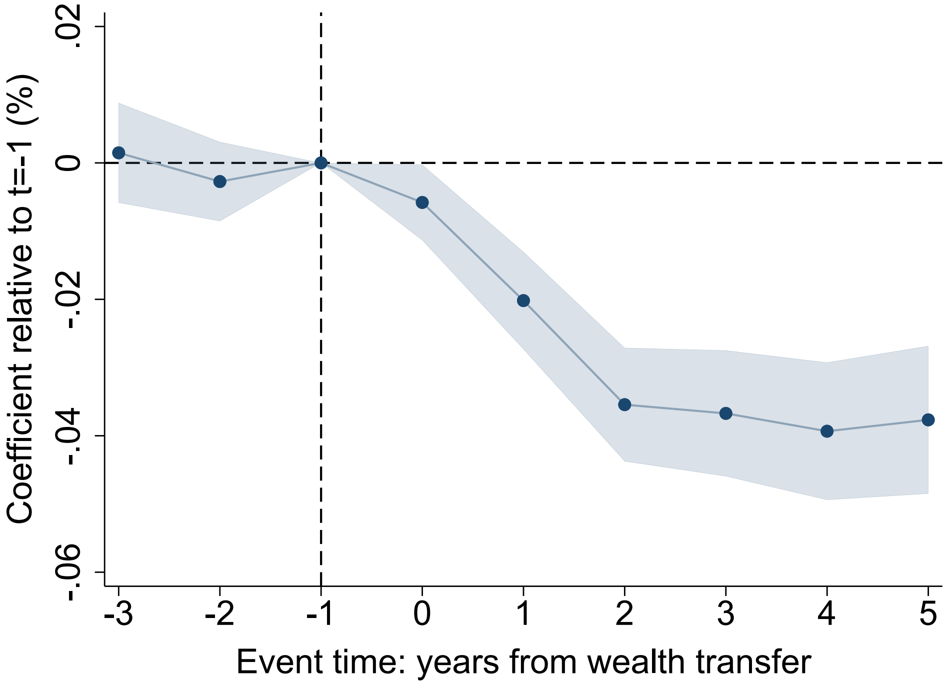
Figure B8: Treatment scaled by pre-shock income



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

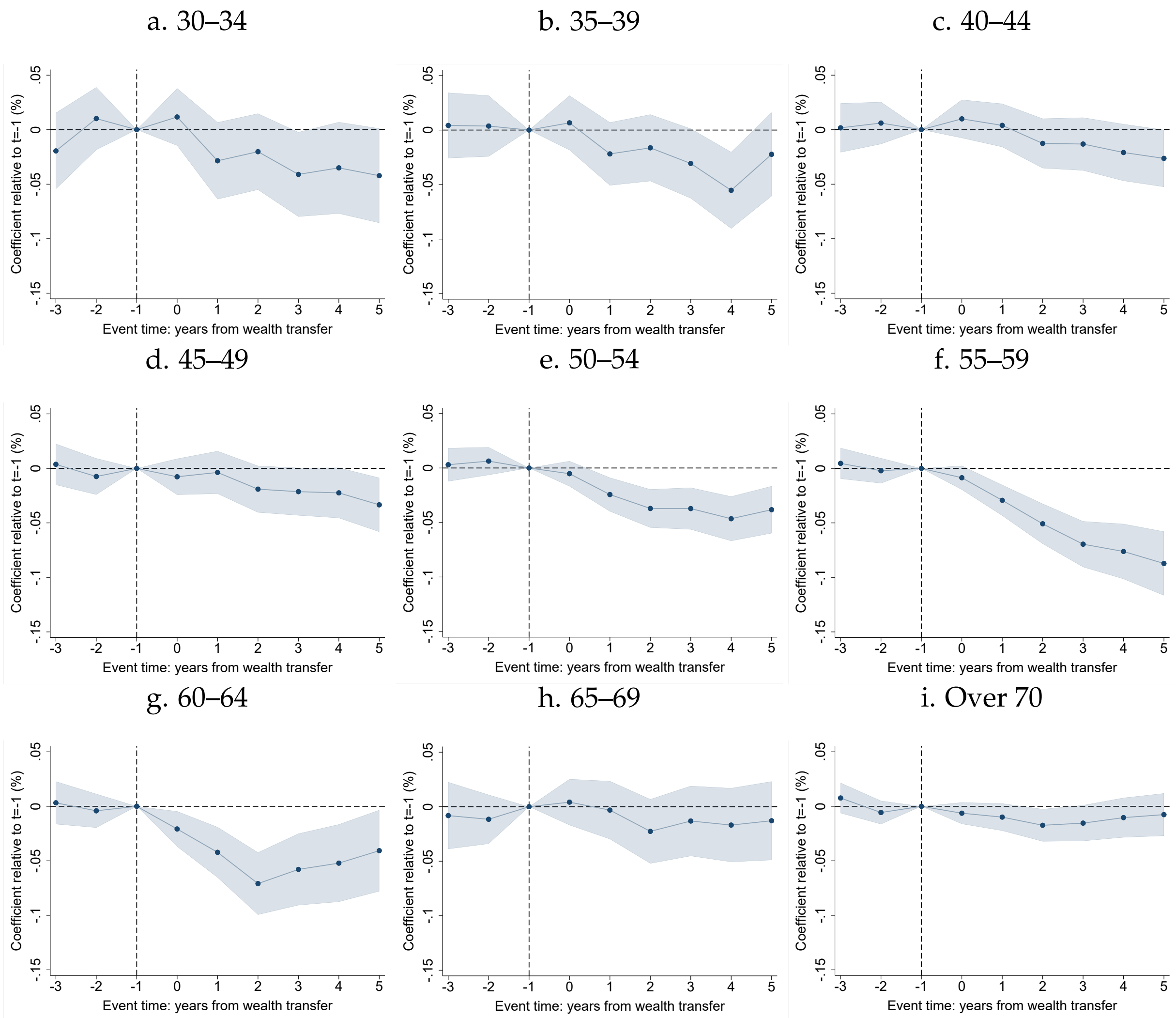
Figure B9: Event-Study Result Using a Balanced Sample



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% 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

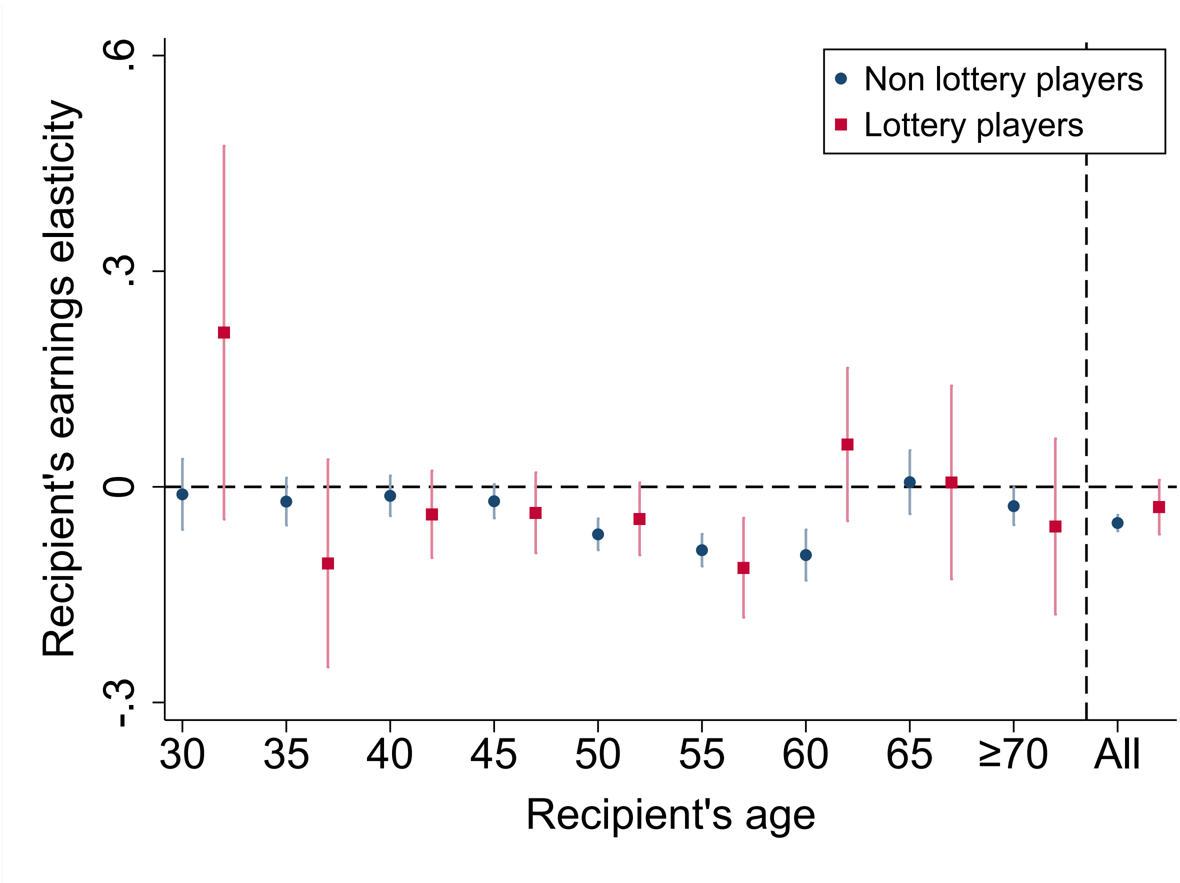
Figure B10: Event-study results by age using a balanced sample



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% 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?

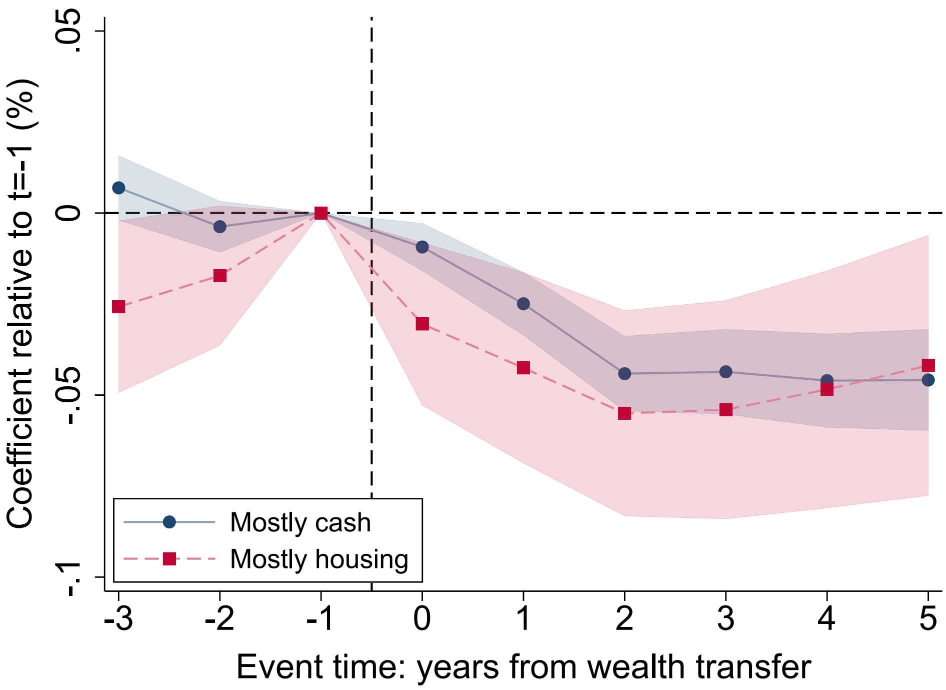
Figure B11: Are lottery players different?



Notes: This figure examines whether inheritors who play the lottery exhibit different earnings responses to inheritance compared to the general population of inheritors. The figure plots age-specific earnings elasticities to inheritance, as estimated from equation (1), separately for the sample of inheritors 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?

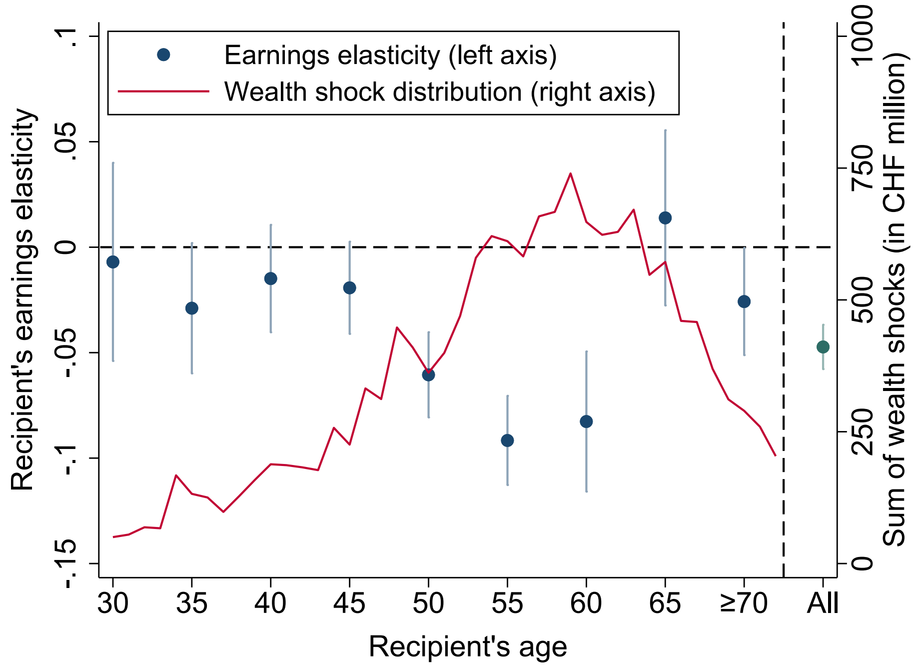
Figure B12: Do liquidity and attachment effects attenuate responses?



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% 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) inheritors for whom at least 50% of the inheritance value consists of housing wealth ("mostly housing"), and (ii) inheritors for whom at least 50% of the inheritance value consists of non-housing wealth ("mostly cash").

B13 Household-level estimates

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).

B14 Inverse hyperbolic sine specification

Table B1: Age-specific earnings responses to wealth shocks: inverse hyperbolic sine specification

	Recipient's age:								
	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	⩾70
	(a) *Sample*: Inheritances								
Earnings response	-0.012	-0.034*	-0.024	-0.031**	-0.082***	-0.113***	-0.094***	0.018	-0.039***
	(0.027)	(0.018)	(0.015)	(0.013)	(0.012)	(0.013)	(0.019)	(0.024)	(0.015)
Obs.	35,809	52,964	78,094	119,997	171,386	218,327	215,515	157,360	206,861
Individuals	4,198	6,089	8,599	13,086	18,778	24,139	23,593	17,101	23,461
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	-3	-3	-4	-12	-18	-15	2	-1
R.-worklife MPE (CHF)	-32	-89	-65	-68	-155	-142	-46	-	-
	(b) *Sample*: Lottery wins								
Earnings response	0.021	-0.073	-0.026	-0.022	-0.113	-0.117	-0.421***	-0.185	0.060
	(0.122)	(0.080)	(0.051)	(0.079)	(0.087)	(0.095)	(0.145)	(0.169)	(0.166)
Obs.	4,542	5,371	6,605	6,579	6,662	6,242	5,305	3,385	2,913
Individuals	528	618	749	737	734	694	593	366	331
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	-27	-3	-3	-20	-13	-61	-6	1
R.-worklife MPE (CHF)	237	-764	-57	-51	-257	-102	-190	-	-

Notes: This table reports earnings responses to wealth shocks by five-year age group, estimated using the inverse hyperbolic sine of labor earnings, asinh(y), as the outcome variable. Panel (a) focuses on inheritances, and Panel (b) on lottery wins. Since asinh(y) $\approx$ log($2y$) for sufficiently large positive values of y, the estimated coefficients have approximately the same elasticity interpretation as the baseline log specification for individuals with positive earnings, while remaining well defined when earnings are zero. 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. Given the close approximation between the inverse hyperbolic sine and the logarithm at the earnings levels observed in the data, we compute the MPE by scaling the estimated coefficient by the ratio of average earnings to the average wealth shock for the relevant age group. *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.

B15 Level-level specification

Table B2: Age-specific earnings responses to wealth shocks: level–level specification

	Recipient's age:								
	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	⩾70
	(a) *Sample*: Inheritances								
Earnings response	0.0011	-0.0001	-0.0006	-0.0006	-0.0022*	-0.0038***	-0.0049***	-0.0036***	-0.0036**
	(0.0007)	(0.0006)	(0.0005)	(0.0006)	(0.0012)	(0.0009)	(0.0006)	(0.0008)	(0.0015)
Obs.	35,809	52,964	78,094	119,997	171,386	218,327	215,515	157,360	206,861
Individuals	4,198	6,089	8,599	13,086	18,778	24,139	23,593	17,101	23,461
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)	1.1	-0.1	-0.6	-0.6	-2.2	-3.8	-4.9	-3.6	-3.6
R.-worklife MPE (CHF)	36	-3	-13	-10	-28	-30	-15	-	-
	(b) *Sample*: Lottery wins								
Earnings response	-0.0004	-0.0044***	-0.0018**	-0.0030	-0.0077***	-0.0009	-0.0112***	-0.0033	0.0024
	(0.0021)	(0.0013)	(0.0009)	(0.0022)	(0.0020)	(0.0040)	(0.0040)	(0.0028)	(0.0017)
Obs.	4,542	5,371	6,605	6,579	6,662	6,242	5,305	3,385	2,913
Individuals	528	618	749	737	734	694	593	366	331
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)	-0.4	-4.4	-1.8	-3.0	-7.7	-0.8	-11.2	-3.2	2.4
R.-worklife MPE (CHF)	-12	-123	-42	-57	-101	-7	-35	-	-

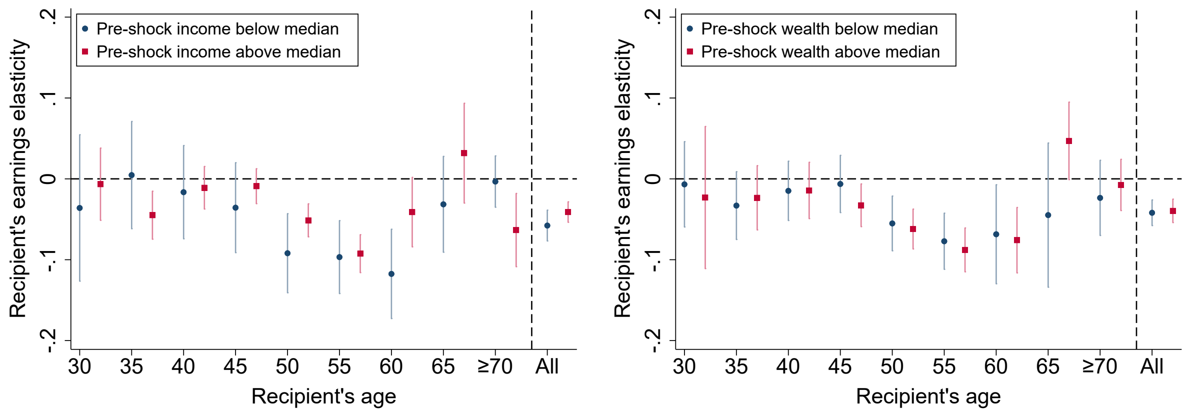
Notes: This table reports earnings responses to wealth shocks by five-year age group from a level–level specification in which both labor earnings and the present-value-adjusted wealth shock are measured in CHF. Panel (a) focuses on inheritances, and Panel (b) on lottery wins. The estimated coefficient measures the CHF change in annual labor earnings associated with an additional CHF 1 of present-value-adjusted wealth. 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) reports the average annual earnings change in CHF associated with receiving an additional CHF 1,000 of present-value-adjusted wealth over the first five years after treatment, and is therefore obtained by multiplying the estimated coefficient by 1,000. *Remaining-worklife MPE* corresponds to the associated cumulative subsequent earnings change, computed by multiplying the on-impact MPE by the average number of years remaining until statutory retirement. This calculation provides an estimate of the total change in earnings over the remaining 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. Standard errors are reported in parentheses.

B16 Heterogeneity by pre-shock income and wealth

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

(a) By pre-shock income

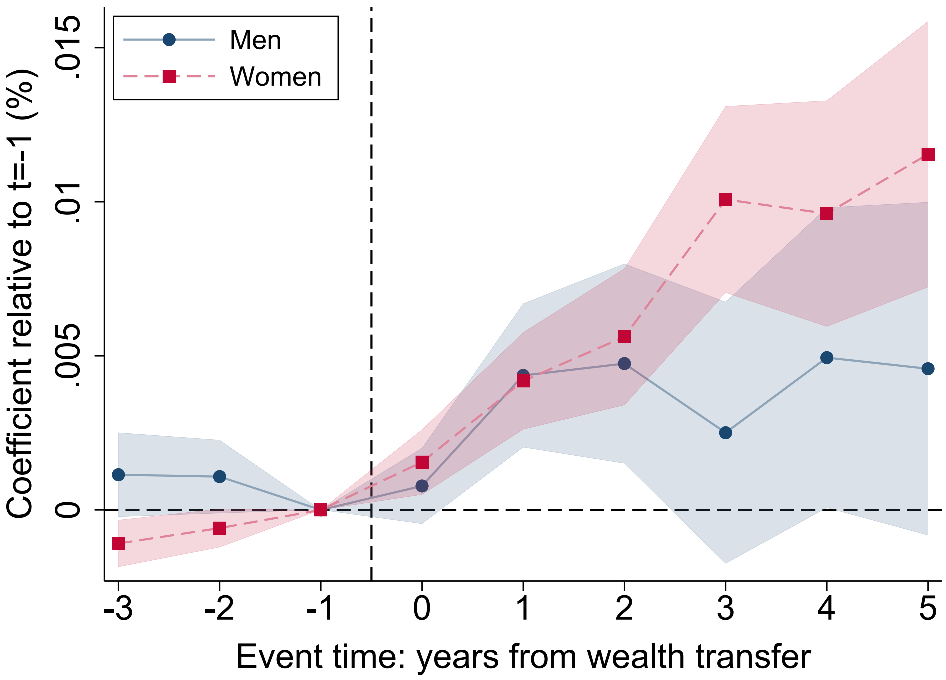
(b) By pre-shock wealth



Notes: This figure compares earnings elasticities to wealth shocks by age, estimated separately for inheritors 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.

B17 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% 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.

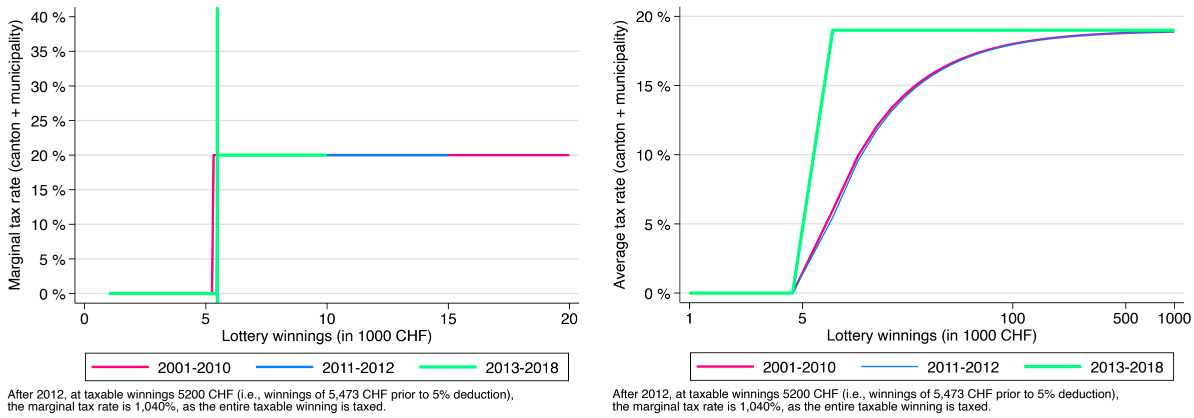
this provision is only relevant for individuals subject to church tax).

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%.

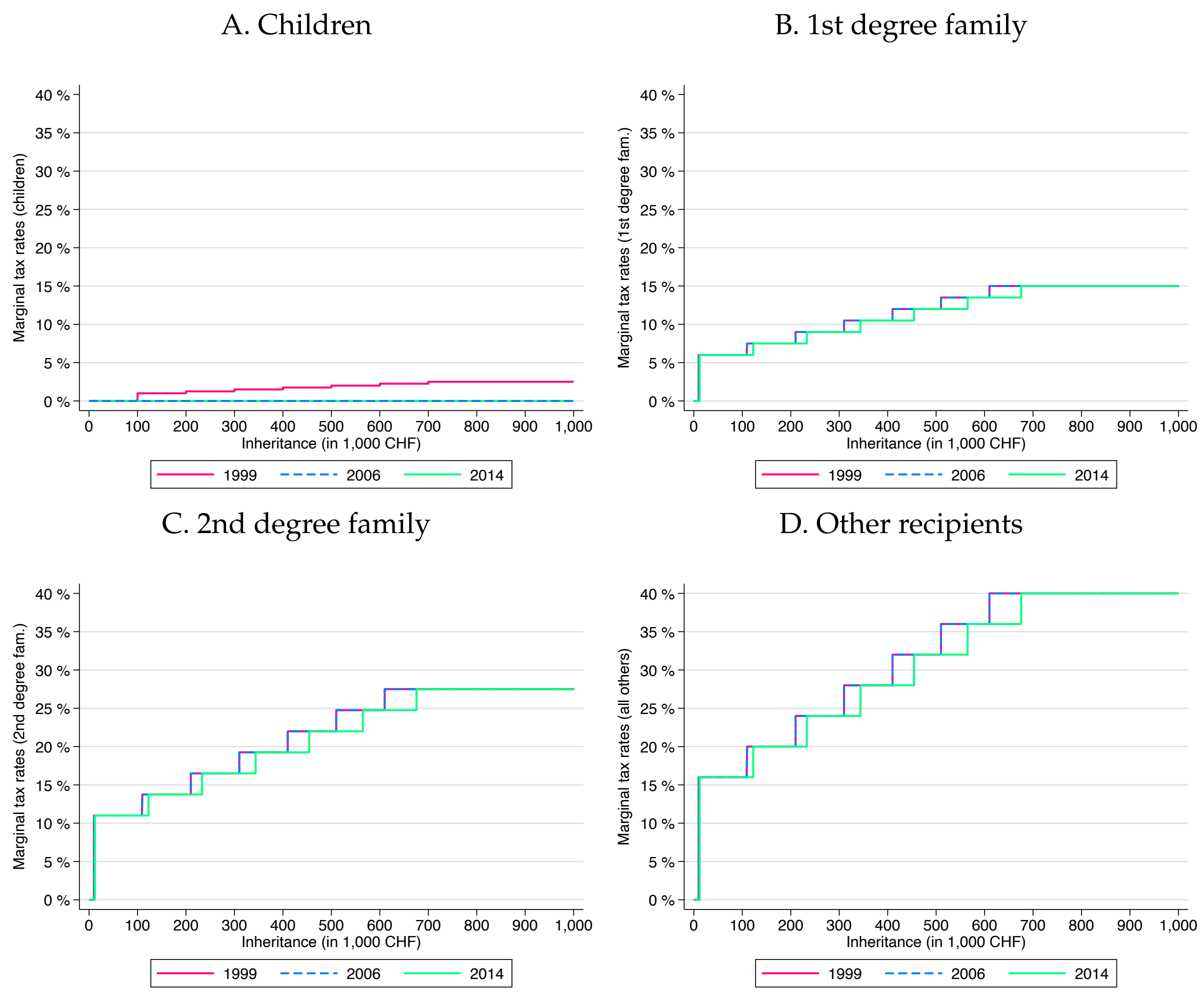
C1.3 Inheritance and gift taxes

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

D1 Simple model

The lifetime budget constraint evaluated at time 0 writes:

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

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. The first-order conditions for consumption and labor supply then imply:

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

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

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. Since consumption rises over the working life in our calibration, this channel lowers hours with age up to retirement. 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:

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

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

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

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:

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

We can rewrite this expression for any a:

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

where:

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

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

$$\Gamma_a = (1+\kappa) \sum_{s=0}^{T-a} \frac{1}{(1+\rho)^s} + \sum_{s=T-a+1}^{D-a} \frac{\mathbb{E}_a \left\{ \prod_{j=0}^{s-1} \varsigma_{a+j} \right\}}{(1+\rho)^s} \tag{19}$$

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:

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

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:

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

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

$$\zeta_a^{struct} = \frac{\ln y^w_{i,a} - \ln y^{w,\text{noshock}}_{i,a}}{\ln \mathcal{W}_{i,a}}. \tag{22}$$

Consistent with our empirical approach, we also define the impact elasticity ζ_a^{impact} 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:

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

These two elasticities are related by:

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

The second term on the RHS captures the anticipatory earnings response occurring before the shock. If the shock is unexpected, then $y^w_{i,a-1} = y^{w,\text{noshock}}_{i,a-1}$ and $\zeta_a^{struct} = \zeta_a^{impact}$. 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:

$$y^w_{i,a} = w_{i,a} - \frac{\kappa}{\Gamma_a} \mathrm{Y}_{i,a}. \tag{25}$$

If $\mathcal{W}_{i,a}$ was anticipated at time $a-1$, then $\mathrm{Y}_{i,a-1}$ 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:

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

Substituting this into the relation between the elasticities yields:

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

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

D2 Extended model with early retirement, terminal bequests, and heterogeneous productivity

We now consider an extended version of the model aimed at capturing three additional margins that are central in the quantitative analysis: (i) the possibility of early retirement, (ii) a motive to leave wealth at the end of life, and (iii) heterogeneity in earnings capacity and in the disutility of work. Relative to the baseline model of Subsection D1, the main methodological change is that the life-cycle problem is no longer solved fully in closed form. Instead, we preserve the analytical intratemporal solution for labor supply, while solving the intertemporal savings problem numerically on an asset grid.

Preferences, productivity, and labor disutility. We assume that individual i has permanent productivity $z_i > 0$, which scales the deterministic age-profile of wages. Labor income at age $a \leqslant T$ is therefore:

$$y^w_{i,a} = z_i w_a h_{i,a}, \tag{28}$$

where w_a is the common age-specific wage profile and $h_{i,a} \in [0,1]$ denotes labor supply. Instantaneous utility during life is given by:

$$u(c_{i,a}, 1-h_{i,a}) = \ln(c_{i,a}) + \kappa_i \ln(1-h_{i,a}), \qquad a \leqslant D, \tag{29}$$

with the convention that $h_{i,a} = 0$ in retirement. The parameter $\kappa_i > 0$ governs the disutility of labor and is allowed to differ across individuals. This provides a simple reduced-form way of capturing persistent heterogeneity in tastes for leisure, job amenity, health, or work capacity.

To capture a motive to leave positive wealth at death, we augment the terminal value of the problem with a warm-glow bequest term. Specifically, in the last period of life, utility is increased by:

$$\omega \ln(\mu + b_{i,D}), \quad \text{or} \quad \omega \ln(\mu + (1-\tau^b) b_{i,D}), \quad \text{or} \quad \omega \ln\left(\mu + \frac{b_{i,D}}{1-\tau^b}\right), \tag{30}$$

where $\omega \geqslant 0$ measures the common strength of the bequest motive, $\mu > 0$ introduces non-homotheticity in the bequest motive, and τ^b is a proportional estate tax. The first specification—"inelastic gross bequest"—assumes that households value terminal wealth in a way that is independent of inheritance taxation. The second specification—"negatively elastic gross bequest"—suggests that testators value the net transfer actually received by heirs, so that a higher inheritance tax directly weakens the desire to accumulate end-of-life wealth. The third specification—"positively elastic gross bequest"—implies instead that households care strongly about delivering a given after-tax amount to heirs, so that a higher inheritance tax raises the desired amount of end-of-life wealth.

Dynamic problem. Let $b_{i,a-1}$ denote beginning-of-period wealth at age a. Conditional on a retirement regime $R \in \{N, ER\}$, the household solves:

$$V^R_{i,a}(b_{i,a-1}) = \max_{c_{i,a}, h_{i,a}, b_{i,a}} \left\{ u(c_{i,a}, 1-h_{i,a}) + \beta s_{a+1} V^R_{i,a+1}(b_{i,a}) \right\}, \tag{31}$$

subject to:

$$c_{i,a} + b_{i,a} = (1+r)b_{i,a-1} + y^R_{i,a} + x_{i,a}, \tag{32}$$

where s_{a+1} is the conditional survival probability from age a to age $a+1$, $x_{i,a}$ denotes any inheritance transfer received at age a, and labor income is given by:

$$y^N_{i,a} = z_i w_a h_{i,a} \quad \text{for } a \leqslant 65,$$

under statutory retirement, while under early retirement:

$$y^{ER}_{i,a} = \begin{cases} z_i w_a h_{i,a}, & a < 60, \\ \theta \bar{y}^p_a, & a \geqslant 60. \end{cases}$$

For retirees, we impose $h_{i,a} = 0$. At the terminal date, the continuation value is replaced by the warm-glow bequest payoff:

$$V^R_{i,D}(b_{i,D-1}) = \max_{c_{i,D},\, b_{i,D}} \Big\{ \ln(c_{i,D}) + \omega \ln\big(\mu + \mathcal{B}(b_{i,D}, \tau^b)\big) \Big\}, \tag{33}$$

subject to the corresponding terminal budget constraint, where $\mathcal{B}(b_{i,D}, \tau^b)$ is the bequest term.

Analytical labor supply and numerical savings choice. Conditional on the continuation value associated with the savings decision, labor supply can still be solved analytically. For working-age individuals, the intratemporal first-order condition implies:

$$\frac{\kappa_i}{1 - h_{i,a}} = \lambda_{i,a}(1+\tau^h) z_i w_a, \tag{34}$$

where $\lambda_{i,a} = 1/c_{i,a}$ under log utility and τ^h denotes a possible proportional labor subsidy. Rearranging yields:

$$\kappa_i \frac{c_{i,a}}{1 - h_{i,a}} = (1+\tau^h) z_i w_a, \qquad a \leqslant T, \tag{35}$$

so that optimal hours satisfy:

$$h_{i,a} = 1 - \kappa_i \frac{c_{i,a}}{(1+\tau^h_a) z_i w_a}. \tag{36}$$

Hence, conditional on next-period assets, labor supply is pinned down exactly. In the numerical implementation, we therefore solve only for savings using value-function iteration on an asset grid with 100 points, while labor supply is recovered analytically using Equation (36). This preserves the intuition of the baseline model while allowing for richer state dependence and for discrete retirement choices.

Early retirement. The second extension is to allow for early retirement. Statutory retirement occurs at age 65, but households are given the option to retire at age 60, with the decision taken at that age. Prior to age 60, all households behave as if they were on the statutory-retirement path. As a result, the early-retirement margin operates only through a discrete extensive-margin decision at age 60.

To keep the problem transparent, we solve two lifetime plans separately. Under the first plan, denoted by $\mathcal{P}^N$, the household retires at the statutory age. Under the second plan, denoted by $\mathcal{P}^{ER}$, the household retires at age 60. Let $V_{i,a}^{N}(b)$ and $V_{i,a}^{ER}(b)$ denote the associated value functions at age a as functions of beginning-of-period wealth b. The early-retirement regime is absorbing: once the household chooses early retirement at age 60, it remains on that path for the rest of the life cycle.

Formally, for all ages $a < 60$, households remain on the statutory-retirement path:

$$\mathbb{1}_{i,a}^{ER} = 0, \qquad a < 60. \tag{37}$$

At age 60, a household compares the continuation values associated with the two regimes and chooses early retirement if it yields a higher value:

$$\mathbb{1}_{i,60}^{ER} = \mathbb{1}\left[V_{i,60}^{ER}(b_{i,59}) > V_{i,60}^{N}(b_{i,59})\right]. \tag{38}$$

If $\mathbb{1}_{i,60}^{ER} = 1$, subsequent consumption, labor supply, and savings are governed by the early-retirement plan; otherwise they continue to follow the statutory-retirement plan.

Retirement income and penalty. Let $\bar{y}_a^p$ denote pension income under statutory retirement. Under early retirement, pension income becomes effective at age 60 and is scaled by a penalty factor $\theta \in (0, 1]$:

$$\bar{y}_a^{p,ER} = \theta \bar{y}_a^p, \qquad a \geqslant 60. \tag{39}$$

Thus, retiring early involves a permanent reduction in pension income. In the calibration used for the heterogeneous-agent exercises, the value of θ is chosen so that the model reproduces the observed prevalence of early retirement at age 60.

Role of the terminal bequest motive and of heterogeneous labor disutility. The bequest motive affects the retirement decision through the terminal value of wealth. In the absence of a bequest motive, early retirement is attractive because it allows households to substitute leisure for labor earlier in life, at the cost of lower lifetime resources. By contrast, when terminal wealth is valued directly through equation (30), the household faces a stronger incentive to preserve assets until the end of life. This raises the continuation value of work and saving and therefore makes early retirement less attractive, other things equal. Importantly, because the bequest term enters only at the terminal date, it does not modify the intratemporal labor supply condition directly. Instead, it operates through the intertemporal savings decision.

Heterogeneity in κ_i plays a different role. Households with a higher κ_i experience a stronger disutility from labor, supply fewer hours during working life, and value the option of stopping work at age 60 more strongly. Introducing dispersion in κ_i therefore generates a smoother and more realistic extensive-margin response of early retirement than a representative-agent specification. In the quantitative analysis below, this heterogeneity is key to reconciling realistic retirement-income penalties with observed early-retirement rates, while avoiding the excessively discontinuous extensive-margin responses generated by a homogeneous specification.

Calibration. The calibration of the extended model remains close to that of the baseline model, but a few parameters are adjusted to match the life-cycle profiles generated by the numerical solution. First, we set $\kappa = 0.33$ (close to the prior $\kappa = 0.35$ value) which implies an average labor supply close to $\bar{h} = 0.75$. Under the log-log specification, this corresponds to a labor supply elasticity around $(1 - \bar{h})/\bar{h} = 0.3$. Second, we set $\rho = 0.065$ so as to match the average wealth-to-income ratio around age 65 without a bequest motive—the same target as the simple model. Third, in the benchmark specification with a bequest motive, we set $\omega = 2.95$, which allows the model to match the wealth-to-income ratio at 85—the simple model implied zero wealth at 85. The parameter μ is set equal to the average level of net wealth in the data. Finally, the savings problem is solved numerically on an asset grid with 100 points. This is fine enough to yield smooth savings policies while keeping computation times modest. Relative to the baseline closed-form model, the numerical solution allows the response to wealth shocks to combine three margins: a direct wealth effect on labor supply, an intertemporal savings response, and, when activated, an extensive-margin response through the early-retirement decision. The terminal bequest motive interacts with these margins by raising the value of end-of-life wealth and thus dampening the propensity to retire early in the absence of shocks. This richer environment is the one used in the numerical exercises reported below.

Illustration of the various margins. The resulting model is used to generate the life-cycle profiles and earnings responses reported in Figure D1. To allow the various margins to be active, we set $\theta = 0.925$, a level such that: (i) households without a bequest motive exercise the early-retirement option at age 60 even in the absence of a wealth shock, while (ii) households with a bequest motive do not retire early along the no-shock path, but may do so upon receiving a sufficiently large wealth shock.

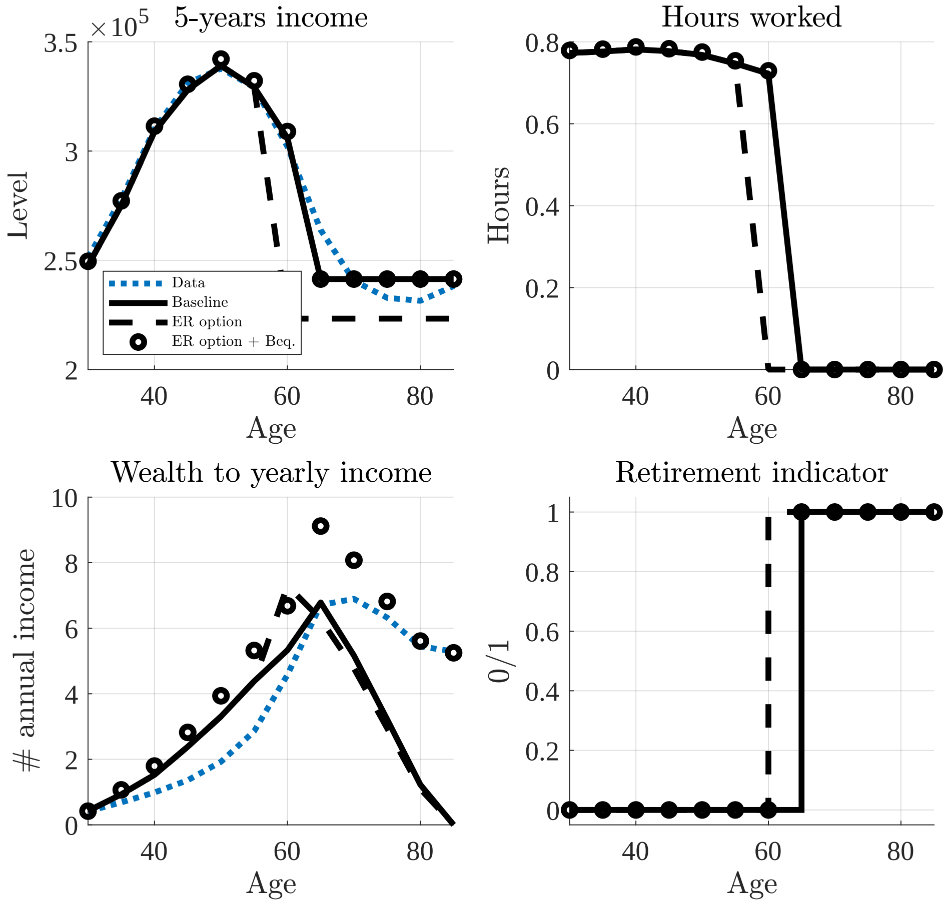
Panel (a) of Figure D1 reports the life-cycle profiles generated by the extended numerical model. The baseline case without early retirement and without a bequest motive (solid black line) remains close to the simple model. Income follows the exogenous hump-shaped profile taken from the data, hours worked decline gradually toward the end of working life, wealth accumulates up to the statutory retirement age, and is then decumulated during retirement. In this benchmark case, retirement occurs at age 65.

Allowing for early retirement, but still abstracting from a bequest motive (dashed black line), changes the profile mainly through the discrete retirement decision at age 60. In the calibration shown here, the early-retirement option is attractive enough that the representative household exercises it even in the absence of a wealth shock. As a result, the retirement indicator jumps to one at age 60 rather than 65, hours drop to zero at that age, and income falls permanently because pension income is scaled down by the early-retirement penalty. Relative to the benchmark without early retirement, wealth is somewhat higher shortly before retirement and then decumulated more rapidly afterward. Importantly, because the early-retirement decision is now taken only at age 60, the ER option does not materially alter labor supply before that age except through standard wealth-accumulation effects.

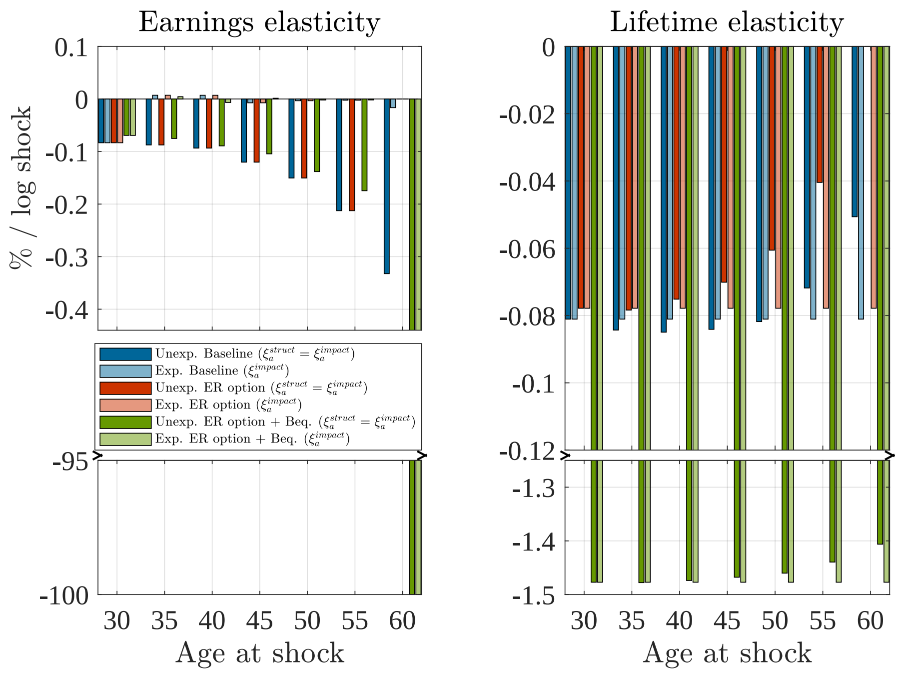
Introducing a bequest motive (circles) overturns that no-shock retirement decision. The bequest motive raises the value of carrying wealth into old age and therefore makes early retirement less attractive in the absence of a shock. Relative to the other two cases, households work slightly more over the life cycle, accumulate substantially more wealth, and decumulate it much more slowly in retirement. In other words, the bequest motive primarily affects the

Figure D1: An extension with early retirement

(a) Life-cycle profiles



(b) Changes in earnings



Notes for Panel (a): Based on our calibration, earnings and hours are computed using Equation (36), while consumption, savings, wealth b_t and the retirement decision are obtained by value-function iteration. Individuals who reach their 90th year (age 85 in the model) die with certainty with zero wealth unless they have a bequest motive.
Notes for Panel (b): The size of the shock is normalized to represent one year (1/5 periods) of earnings at age 30, and to remain present-value equivalent across ages. Impact elasticities are computed as log-deviations of earnings divided by the log of the wealth shock. Lifetime elasticities are computed by taking the log-difference in lifetime sums of earnings divided by the log-size of the shock received at age 30.

level and persistence of wealth holdings, while also restoring statutory retirement along the no-shock path.

Panel (b) turns to the response of earnings to wealth shocks. In the baseline case, the numerical model reproduces the main qualitative message of the simple model. Unexpected shocks reduce earnings on impact, with larger responses at older ages. By contrast, expected shocks now generate almost no measured impact response because their effects are largely absorbed by anticipatory adjustments prior to realization, so that little remains in the earnings path used to construct the measured impact elasticity. The corresponding lifetime effects, built on the structural elasticities, remain negative however, and are slightly larger in absolute value than under unexpected shocks.

Allowing for early retirement alone adds little to the intensive-margin responses, and tts main effect is instead concentrated at age 60 itself: the response to a shock received at age 60 is mechanically zero because households are already retired at that age. In that sense, the early-retirement option mainly matters through the extensive margin at age 60.

The interaction between early retirement and the bequest motive is the most interesting case. Before age 60, impact responses remain negative and broadly similar in shape to the benchmark model, although somewhat attenuated relative to the case without a bequest motive. At age 60, however, a wealth shock triggers retirement and produces a large extensive-margin response, again corresponding to a complete drop in earnings. The same mechanism also dominates the lifetime effects: for the model with both early retirement and bequests, lifetime earnings losses are much larger than in the other cases and lie in the lower segment of the broken right-hand axis for all shock ages. This reflects the fact that wealth shocks can activate retirement at 60 in a model where households otherwise remain attached to the labor force because of the desire to preserve end-of-life wealth.

Overall, the figure points to a sharp distinction between the two extensions. Early retirement by itself mainly adds an extensive-margin response at age 60, with limited consequences for measured impact responses at younger ages. The bequest motive, in turn, keeps households on the statutory-retirement path in the absence of a shock—for this specific calibration at least, but makes the retirement decision at age 60 sensitive to wealth realizations. In that environment, wealth shocks do not merely reduce labor supply through a standard wealth effect; they can also trigger a discrete exit from the labor force, which in this case becomes the dominant source of variation in both impact and lifetime earnings responses.

D3 Introducing heterogeneous agents

We now move from the representative-household version of the model to a heterogeneous-agent extension. This step is important for two reasons. First, the representative-household model tends to generate corner outcomes for early retirement: depending on the calibration, either all households exercise the option at age 60 or none do. Second, the data display substantial dispersion in labor income, in inheritance receipt, and in inheritance amounts. A heterogeneous-agent framework is therefore needed both to match the empirical cross-sectional distribution more closely and to generate realistic aggregate retirement responses.

Sources of heterogeneity. We introduce three sources of heterogeneity at the household level. The first is permanent productivity, denoted z_i, which scales the common age-specific wage profile and generates dispersion in lifetime labor income. The second is the disutility of labor, denoted κ_i, which governs the willingness to supply labor and therefore the attractiveness of early retirement. The third is the size of the inheritance received, conditional on receipt. In contrast with earlier versions of the model, the warm-glow bequest motive is kept common across households; the extensive-margin heterogeneity in retirement decisions is instead generated by variation in labor productivity, labor disutility, and inheritance size.

Formally, we assume:

$$\ln z_i \sim \mathcal{N}(\mu_z, \sigma_z^2), \qquad \ln \kappa_i \sim \mathcal{N}(\mu_\kappa, \sigma_\kappa^2), \tag{40}$$

with $\mu_z = 1$ and μ_κ chosen so that the mean of κ_i generates an average labor supply elasticity around 0.3. Gross inheritance amounts at age a $W_{i,a} = \varphi_i W_a$ are also assumed to be log-normally distributed through an inheritance scaling parameter φ_i:

$$\ln \varphi_i \sim \mathcal{N}(\mu_\varphi, \sigma_\varphi^2). \tag{41}$$

To capture the fact that households with higher lifetime earnings also tend to receive larger inheritances, we allow $(\ln z_i, \ln \varphi_i)$ to be jointly normally distributed with positive correlation coefficient $\varrho_{z,\varphi} > 0$. By contrast, κ_i is drawn independently of inheritance size in the benchmark specification.[5]

Inheritance incidence and timing. Households do not all receive an inheritance. Let π_a denote the probability of receiving a transfer in age group a. The empirical age profile $\{\pi_a\}$ is taken directly from the data and normalized so that the implied aggregate inheritance flow matches the targeted inheritance-to-GDP ratio. Conditional on receiving at age a, household i receives amount $W_{i,a} = \varphi_i W_a$, i.e. the average inheritance observed in age a scaled by the individual shifter φ_i. Hence, heterogeneity in inheritances operates both through the timing of receipt and through the cross-sectional dispersion in amounts implied by φ_i.

Household problem. Conditional on a type $(z_i, \kappa_i, \varphi_i)$ and on the timing of inheritance receipt, the household problem is identical to that described in Subsection D2. Each type solves the same dynamic optimization problem, with common prices, common pension schedules—adjusted by z_i and κ_i of course, and common bequest motive, but type-specific labor income and type-specific willingness to supply labor. In particular, productivity heterogeneity affects the level of earnings and wealth accumulation, while heterogeneity in κ_i affects hours worked, savings, and the value of retiring at age 60.

Aggregation. Let $\Theta(z, \kappa, \varphi)$ denote the joint distribution of household characteristics. For any age a, aggregate earnings, wealth, consumption, and retirement rates are obtained by integrating the corresponding individual outcomes over that distribution, together with the empirical

[5]This assumption is mainly for parsimony. Allowing for correlation between labor disutility and inheritance size or productivity would be possible, but would add an extra layer of identification and calibration that is not central to our counterfactual exercises.

age weights in the population. For example, aggregate earnings at age a are given by:

$$Y_a^w = \iiint y_a^w(z, \kappa, \varphi)\, \Theta(z, \kappa, \varphi)\, dz\, d\kappa\, d\varphi, \tag{42}$$

and similarly for aggregate wealth, consumption, and the early-retirement rate. In the quantitative implementation, these integrals are approximated numerically by simulating a finite number of household types drawn from the joint distribution.

Economic role of heterogeneity. The three sources of heterogeneity affect behavior through distinct channels. Higher productivity raises earnings at all ages, makes wealth accumulation easier, and tends to increase both the ability to smooth shocks and the feasibility of retiring early after receiving an inheritance. Higher labor disutility lowers desired hours worked and raises the attractiveness of exiting the labor force at age 60. Finally, larger inheritance amounts relax the budget constraint directly and may trigger early retirement even for households that would otherwise remain on the statutory-retirement path. The positive correlation between productivity and inheritance size reinforces these mechanisms by concentrating large transfers among households with high earnings capacity. A key implication is that the extensive-margin response is no longer a corner solution. Some households retire early even without an inheritance, some do so only after receiving a transfer, and others never do. This richer heterogeneous-agent environment is therefore better suited to match observed retirement patterns and provides the basis for the policy counterfactuals reported below.

D4 Details the heterogeneous-agent model

Simulations and fit. In our benchmark calibration, we simulate 500 household types and use a 100-point asset grid to solve the value function of each type before aggregation. The resulting model fits the key targets for our purposes. It matches the aggregate inheritance flow closely, with an inheritance-to-GDP ratio of 12.2%. It also matches the donor-side bequest flow, at 12.0% of GDP, and the unconditional early-retirement rate, at 22.5% against a target of 22.4%. The conditional early-retirement rate among inheritor households is higher, at 25.9%, reflecting the fact that the retirement margin is concentrated among households sufficiently close to the early-retirement threshold.

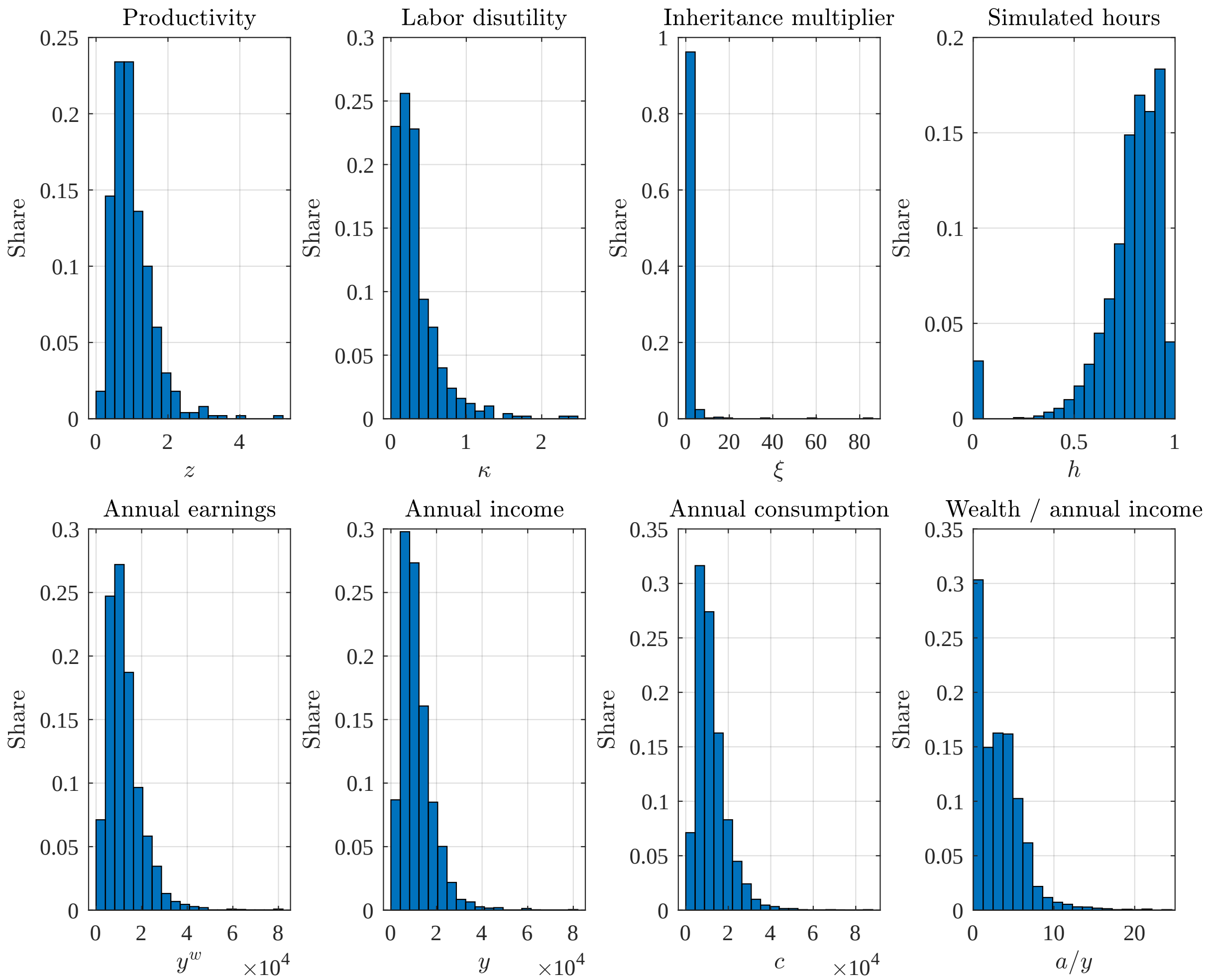
The model also reproduces the main labor-income and inheritance moments reasonably well. Mean annual earnings among recipients are CHF 45,991, compared with CHF 43,500 in the data; and the standard deviation of annual earnings is CHF 45,571, compared with CHF 43,121 in the data. Mean nominal inheritance is CHF 133,610, compared with CHF 129,038 in the data, and the standard deviation of nominal inheritances is CHF 700,830, almost exactly in line with the target of CHF 699,576. The mean recipient age is somewhat too low, at 55.62 years compared with 57.62 in the data, although the dispersion of recipient age is well matched. Average hours worked are 0.78, close to the target of 0.77, and the model matches the full-time employment share almost exactly, at 83.3% against 84.0% in the data.

The main limitation of the fit concerns wealth. Mean net wealth among inheritors is CHF 242,550, somewhat lower than the empirical mean of CHF 303,852. The model strongly understates wealth dispersion: the simulated standard deviation is CHF 202,920, compared with

CHF 2.66 million in the data. This is not surprising given that the model abstracts from several sources of extreme wealth heterogeneity, including entrepreneurial risk, housing capital gains, inter vivos transfers, portfolio heterogeneity, and dynastic accumulation beyond the warm-glow channel. However the model is designed to discipline the labor supply and inheritance channels in the broad population, not to reproduce the upper tail of the wealth distribution.

Simulated distributions. Figure D2 provides a visual summary of the cross section implied by the benchmark calibration.

Figure D2: Simulated cross-sectional distributions



Notes: The figure reports simulated cross-sectional distributions for the main heterogeneous dimensions and endogenous outcomes in the benchmark calibration. Productivity, labor disutility and inheritance multipliers are drawn from the calibrated log-normal distributions. Earnings, income, wealth and consumption are obtained from the simulated household policy functions and aggregated across ages and household types using the model-implied population weights.

The first three histograms show the exogenous sources of heterogeneity. Productivity is right-skewed but remains relatively concentrated around its mean. Labor disutility is also right-skewed, with most households clustered around moderate values and a thinner upper tail. By contrast, the inheritance multiplier is extremely dispersed, with a very long right tail. The reason is that the data display substantially more dispersion in inheritances than in labor earnings, and reproducing that feature requires a much fatter-tailed distribution for ξ_i than for either productivity or labor disutility.

The endogenous distributions line up naturally with that structure. Earnings and income are both strongly right-skewed and broadly inherit the shape of the productivity distribution. Consumption is less dispersed than either earnings or income, reflecting life-cycle smoothing. Wealth is more concentrated than earnings or income and displays a thicker right tail, although the model still falls short of reproducing the empirical dispersion of wealth. This limitation should be kept in mind when interpreting the counterfactuals, but it is less problematic for our purposes than a failure to match the labor-income distribution, the size and timing of inheritance flows, or the prevalence of early retirement.

Correlation robustness. The benchmark calibration sets $\mathrm{Corr}(\log z, \log \xi) = 0.85$. Given the lack of clear empirical evidence regarding this number, we repeat the baseline no-rebate experiment with inelastic gross bequests using a lower correlation of 0.4 while holding all other calibrated parameters and numerical settings fixed. This isolates the role of the correlation; as a consequence, the zero-tax moments are allowed to adjust modestly across the two specifications. Results are shown in Figure D3.

The aggregate earnings effects are only modestly attenuated by the lower correlation. Earnings increase by 0.22% at $\tau = 0.30$ and by 0.34% at $\tau = 0.60$, compared with 0.24% and 0.38% in the benchmark calibration. At $\tau = 1$, the two effects are nearly identical, at 0.80%. The early-retirement response, tax-revenue path, and terminal-bequest path are also close across specifications. The consumption-equivalent losses are larger with the lower correlation. This is consistent with inheritances being less concentrated among high-productivity recipients: taxation then removes more wealth from households with a smaller contribution to aggregate earnings and a higher marginal utility of consumption. Overall, the central labor-supply conclusions do not depend on the correlation assumed in our baseline calibration.

Donor-side incidence of the bequest motive. Figure 12 in the main text compares the baseline inheritance-tax effect with two specifications in which the tax also affects the donor-side desired gross bequest. This appendix provides their formal definitions, quantitative results, and subgroup decompositions.

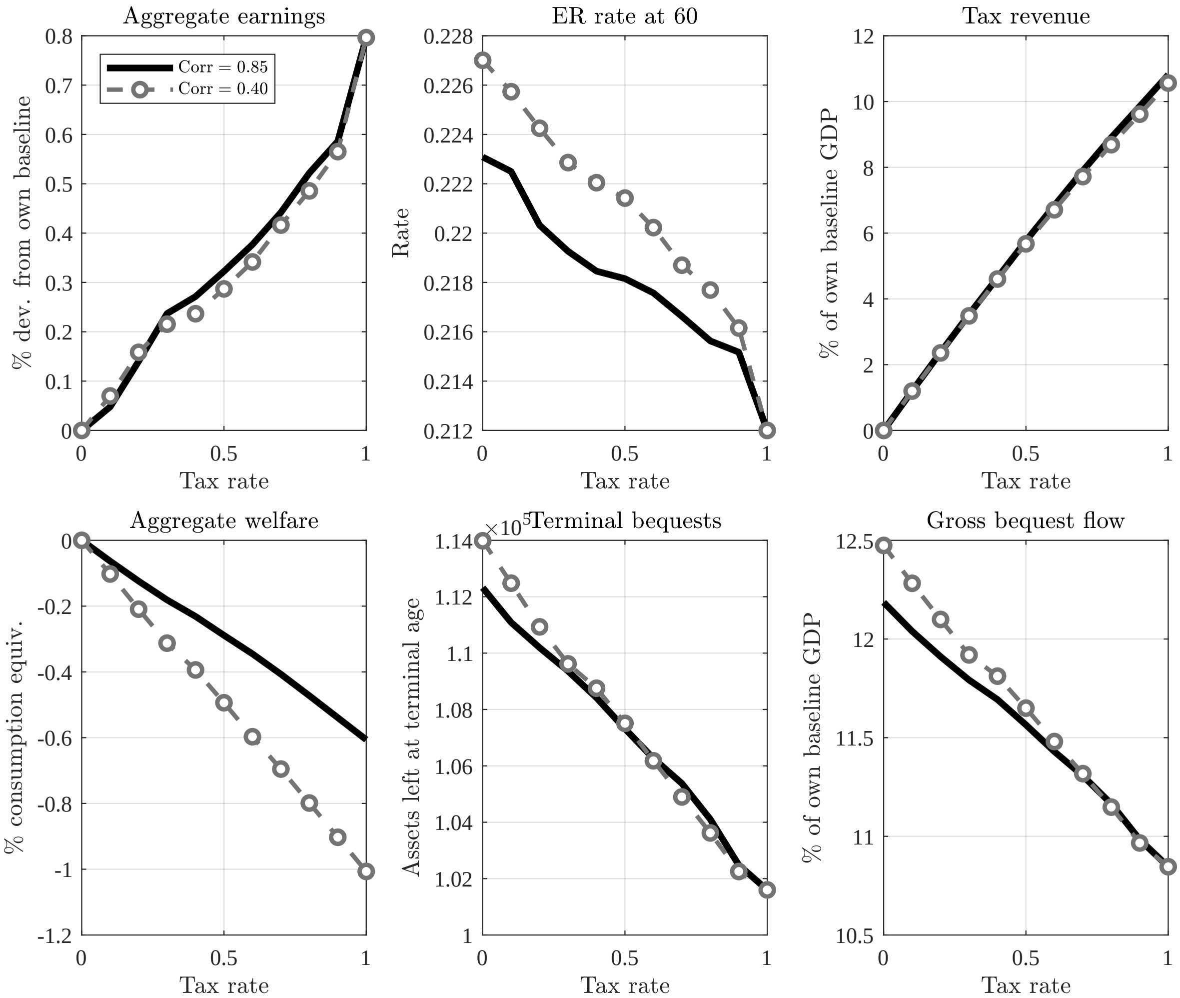
While the statutory incidence of the tax is always on the heirs, the economic incidence depends on bequest motives, through the effect of τ on the donor's valuation of terminal wealth. Depending on the exact nature of the bequest motive, donors shoulder a larger or smaller share of the incidence, and their labor supply responses can be qualitatively different. All specifications considered use endogenous gross inheritances, with pre-tax inheritances received by heirs rescaled under each tax rate to match the aggregate model-implied flow of total bequests.

In our baseline scenario, we assume that desired gross bequests left by donors are unaffected by inheritance taxes. We alternatively also consider two contrasting representations that imply tax-sensitive desired gross bequests.

In the *negatively elastic gross bequest* specification, donors in their terminal utility function value the after-tax transfer left to heirs in the following way:

$$\ln(c_{i,D}) + \omega \ln\big(\mu + (1-\tau)b_{i,D}\big). \tag{43}$$

Figure D3: Inheritance taxation and the productivity–inheritance correlation



Notes: The solid black lines report the benchmark calibration with $\mathrm{Corr}(\log z, \log \xi) = 0.85$ (Figure 12). The dashed gray lines with circles use an assumed correlation of 0.40. Both specifications impose no rebate and inelastic gross bequests. Earnings and consumption-equivalent welfare are expressed as percentage deviations from the specification-specific zero-tax baseline. Tax revenue and gross bequest flows are expressed as percentages of calibration-specific baseline GDP.

Here, a given gross bequest $b_{i,D}$ delivers only $(1-\tau)b_{i,D}$ inside the bequest argument.[6] The marginal value of an additional dollar of terminal wealth is thus:

$$\frac{\omega(1-\tau)}{\mu+(1-\tau)b_{i,D}}, \tag{44}$$

which *falls* as τ rises. The distinctive feature of this specification is that inheritance taxes induce donors reduce their bequest-related saving. This implies a positive wealth effect and thus a reduction of testators' labor supply. In this case, inheritance taxes trigger offsetting labor supply responses by donors and recipients: testators are induced to work less, heirs (according to our empirical estimates) to work more.

Note that this specification does not imply that total bequests mechanically fall to zero as $\tau \to 1$. First, the bequest argument is $\mu + (1-\tau)b_{i,D}$ rather than simply $(1-\tau)b_{i,D}$: the shift term μ remains even as the transfer component affected by the tax becomes small. We think of μ as representing status motives that confer intrinsic value to personal wealth, even late in life. Second, the aggregate bequest flow also includes accidental bequests, not only terminal wealth. Households who die before terminal age leave the assets they hold at death, and these age-specific accidental bequests are included in the model's total bequest flow.

In the *positively elastic gross bequest* specification, donors in their terminal utility function value the after-tax transfer left to heirs in the following way:

$$\ln(c_{i,D}) + \omega \ln\big(\mu + b_{i,D}/(1-\tau)\big). \tag{45}$$

Division by $(1-\tau)$ raises the effective target associated with a given terminal bequest when the tax increases.[7] The marginal value of terminal wealth can then be written as:

$$\frac{\omega}{\mu(1-\tau)+b_{i,D}}, \tag{46}$$

which *rises* in τ. The distinctive feature of this specification is that inheritance taxes induce donors to increase their bequest-related saving, as if to protect the amount ultimately received by heirs. Financing this additional gross bequest implies a negative wealth effect for donors and thus an increase in their labor supply. Unlike in the negatively elastic gross bequest case, the donor's labor supply response to the tax is positive, i.e. it has the same sign as the labor supply response of heirs.

These two variants of modeling bequest motives are useful for assessing sensitivity to donor-side incidence.

In the negatively elastic gross bequest specification, the positive wealth effect of an inheritance tax on donors partly offsets the negative wealth effect on recipients. Aggregate labor supply still rises because the recipient-side response dominates, but less than in the baseline

[6] This specification is equivalent to the non-homothetic "warm-glow" model of bequest motives introduced by De Nardi (2004) and further developed in De Nardi and Fella (2017) and De Nardi et al. (2025), and it is qualitatively consistent with the (limited) empirical evidence on the link between bequest taxes and bequeathable wealth (Kopczuk, 2013; Goupille-Lebret and Infante, 2018).

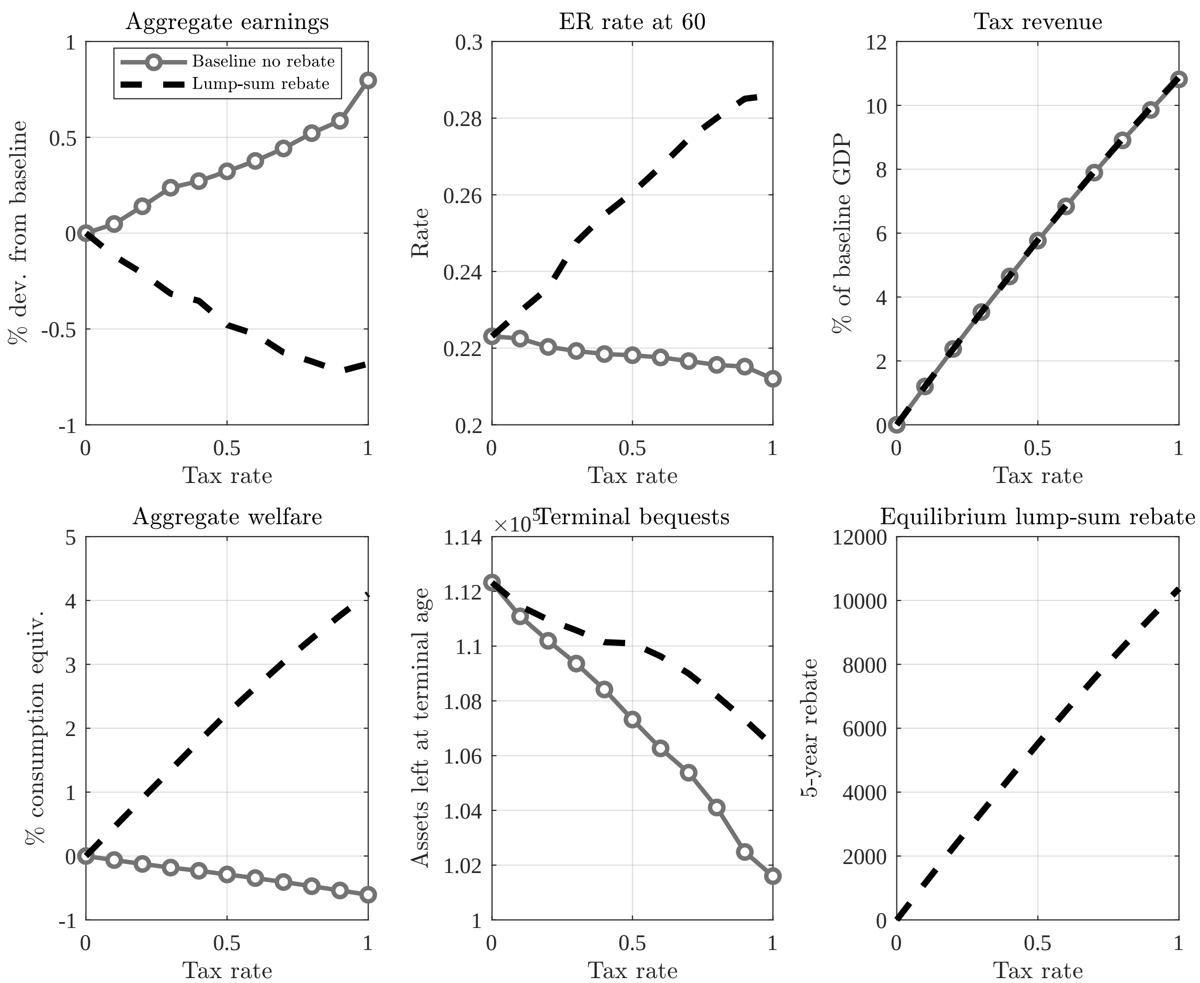
[7] For $\tau < 1$, $\ln(\mu + b_{i,D}/(1-\tau)) = \ln(\mu(1-\tau) + b_{i,D}) - \ln(1-\tau)$. The final term does not affect household choices. We therefore solve the model using the normalized bequest term $\omega \ln(\mu(1-\tau) + b_{i,D})$. This produces the same choices for every $\tau < 1$ and a well-defined limiting allocation as $\tau \to 1$. The results reported at $\tau = 1$ correspond to this limit. CEV results for the positively elastic specification use the same normalized objective and are interpreted conditional on this normalization.

case. According to our no-rebate simulation results shown in Table D1, aggregate earnings increase by 0.12% at $\tau = 0.3$ and by 0.20% at $\tau = 0.6$, while welfare in CEV terms drops, respectively, by 0.73 and 1.15 percentage points.

Conversely, in the positively elastic gross bequest specification, inheritance taxation induces both donors and heirs to supply more labor. According to our simulation results shown in Table D1, aggregate earnings increase by 0.27% at $\tau = 0.3$ and by 0.75% at $\tau = 0.6$, while welfare in CEV terms drops, respectively, by 1.53 and 3.15 percentage points. The decompositions in Table D1 show that the earnings response is concentrated among high-productivity households, while the retirement response is concentrated among high-κ households and among workers close to age 60.

Lump-sum rebate of tax revenues. We also consider a case in which inheritance-tax revenues are rebated lump-sum to all households, as an alternative to the labor-subsidy case that we consider in Section 5. Note that we only take account of households that feature in the model, i.e. those aged 30 and above. This modeling exercise is therefore not informative about policy schemes that would rebate tax revenues to younger households e.g. in the form of a "universal basic inheritance".

Figure D4: Inheritance tax redistributed lump sum: aggregate effects



Notes: The figure compares the baseline no-rebate case from the main text with the same recipient-paid inheritance tax when revenues are rebated lump-sum.

For this simulation, we retain the inelastic gross bequest specification. A scenario with lump-sum redistribution is informative mainly because it separates the resource value of tax revenues from the labor-wedge effects emphasized in the main text. It first and foremost redistributes resources away from heirs, who pay the tax and receive lower net inheritances, toward the whole population, including non-heirs. Because inheritances are concentrated at older ages, the rebate also shifts resources from older recipients toward younger households. Such transfers have two implications for labor supply. First, they broaden the set of households affected by the policy, since non-heirs also receive transfers. Second, they change the timing of wealth effects: younger households receive resources earlier in their life cycle, which lowers labor supply ahead of inheritance receipt and raises the early-retirement rate.

Quantitatively, we find the lump-sum rebate to *lower* aggregate earnings by 0.32% at $\tau = 0.3$ and by 0.53% at $\tau = 0.6$. The early-retirement rate rises by 2.5 and 4.4 percentage points (see Table D2). Aggregate welfare nevertheless rises, with CEV gains of 1.34% and 2.60%, because tax revenues are returned broadly across households rather than being discarded. The distributional decomposition shows that welfare gains are concentrated among low-productivity households, whose CEV contribution equals 1.03 percentage points at $\tau = 0.3$ and 1.99 percentage points at $\tau = 0.6$. High-productivity households account for a smaller welfare gain, and slightly lose at $\tau = 0.3$, reflecting the fact that they bear a larger share of the inheritance-tax burden.

In these simulations, labor supply responses are concentrated among high-κ households and at older ages. High-κ households account for the full increase in early retirement, while low-κ households show no response at the early-retirement margin. The tax-cum-rebate lowers earnings throughout the working life, with the largest impact at age 60. The CEV gains are instead larger for younger households and decline with age, reflecting the fact that a lump-sum transfer received earlier in life has a higher resource value in the life-cycle problem.

We need to emphasize again that these simulations abstract from transfers received before age 30, because the model focuses on labor supply from age 30 onward and because inheritance receipt before that age is rare in the data. Lump-sum transfers received earlier in life might have different—i.e. positive—effects on earnings depending on how they affect life-time productivity through educational and occupational choices. We leave these channels for future research.

Table D1: Effects of no-rebate inheritance tax: decompositions for different bequest motives

Panel A. Negatively elastic gross bequests

	$\tau = 0.30$			$\tau = 0.60$		
	$\Delta Y/Y$	ΔER	ΔCEV	$\Delta Y/Y$	ΔER	ΔCEV
All	0.121	0.084	-0.728	0.200	0.086	-1.149
Low z	0.030	-0.097	-0.057	0.053	-0.166	-0.082
High z	0.091	0.181	-0.671	0.147	0.252	-1.067
Low κ	0.001	0.000	-0.416	0.005	0.000	-0.652
High κ	0.120	0.084	-0.311	0.196	0.086	-0.498
Age 30	-0.005	0.070	-0.035	-0.008	0.093	-0.052
Age 35	-0.006	0.065	-0.055	-0.011	0.087	-0.085
Age 40	-0.002	0.053	-0.078	-0.002	0.071	-0.123
Age 45	0.000	0.032	-0.105	0.007	0.042	-0.166
Age 50	0.010	-0.003	-0.134	0.020	-0.006	-0.211
Age 55	0.019	-0.047	-0.155	0.036	-0.069	-0.247
Age 60	0.106	-0.087	-0.166	0.159	-0.131	-0.265

Panel B. Positively elastic gross bequests

	$\tau = 0.30$			$\tau = 0.60$		
	$\Delta Y/Y$	ΔER	ΔCEV	$\Delta Y/Y$	ΔER	ΔCEV
All	0.269	-0.670	-1.531	0.746	-1.677	-3.148
Low z	0.044	-0.094	-1.021	0.175	-0.701	-2.081
High z	0.225	-0.576	-0.511	0.571	-0.977	-1.068
Low κ	0.055	0.000	-0.690	0.124	0.000	-1.398
High κ	0.214	-0.670	-0.841	0.622	-1.677	-1.750
Age 30	0.013	-0.078	-0.189	0.032	-0.161	-0.409
Age 35	0.013	-0.086	-0.207	0.036	-0.185	-0.443
Age 40	0.018	-0.092	-0.223	0.048	-0.210	-0.465
Age 45	0.028	-0.097	-0.234	0.064	-0.238	-0.479
Age 50	0.028	-0.103	-0.236	0.078	-0.272	-0.480
Age 55	0.029	-0.106	-0.229	0.084	-0.299	-0.454
Age 60	0.139	-0.107	-0.213	0.404	-0.312	-0.418

Notes: $\Delta Y/Y$ reports the contribution of each subgroup to the percentage change in aggregate earnings, in percentage points relative to the zero-tax benchmark. ΔER reports the contribution of each subgroup to the change in the unconditional early-retirement rate at age 60, in percentage points. ΔCEV reports the contribution of each subgroup to aggregate welfare, measured in percentage points of consumption-equivalent variation.

Table D2: Effects of no-rebate and lump-sum-rebate inheritance taxation: decompositions

Panel A. No rebate, inelastic gross bequests

	$\tau = 0.30$			$\tau = 0.60$		
	$\Delta Y/Y$	ΔER	ΔCEV	$\Delta Y/Y$	ΔER	ΔCEV
All	0.237	-0.382	-0.181	0.377	-0.551	-0.346
Low z	0.019	-0.049	-0.029	0.037	-0.108	-0.054
High z	0.218	-0.333	-0.153	0.340	-0.443	-0.291
Low κ	0.026	0.000	-0.072	0.053	0.000	-0.143
High κ	0.210	-0.382	-0.110	0.324	-0.551	-0.203
Age 30	0.002	-0.006	-0.004	0.005	-0.007	-0.008
Age 35	0.003	-0.015	-0.010	0.006	-0.019	-0.019
Age 40	0.006	-0.028	-0.017	0.011	-0.036	-0.032
Age 45	0.012	-0.045	-0.026	0.022	-0.061	-0.049
Age 50	0.019	-0.070	-0.036	0.034	-0.100	-0.067
Age 55	0.027	-0.097	-0.043	0.050	-0.144	-0.083
Age 60	0.169	-0.121	-0.045	0.249	-0.183	-0.087

Panel B. Lump-sum rebate, inelastic gross bequests

	$\tau = 0.30$			$\tau = 0.60$		
	$\Delta Y/Y$	ΔER	ΔCEV	$\Delta Y/Y$	ΔER	ΔCEV
All	-0.316	2.457	1.339	-0.527	4.423	2.604
Low z	-0.209	1.302	1.027	-0.427	3.242	1.986
High z	-0.107	1.156	0.312	-0.100	1.180	0.618
Low κ	-0.038	0.000	0.590	-0.075	0.000	1.137
High κ	-0.277	2.457	0.749	-0.452	4.423	1.467
Age 30	-0.022	0.355	0.259	-0.044	0.658	0.501
Age 35	-0.028	0.379	0.255	-0.051	0.699	0.494
Age 40	-0.030	0.390	0.240	-0.059	0.717	0.468
Age 45	-0.030	0.390	0.211	-0.058	0.707	0.408
Age 50	-0.021	0.367	0.170	-0.042	0.655	0.330
Age 55	-0.016	0.322	0.125	-0.031	0.558	0.244
Age 60	-0.169	0.255	0.081	-0.242	0.429	0.160

Notes: $\Delta Y/Y$ reports the contribution of each subgroup to the percentage change in aggregate earnings, in percentage points relative to the zero-tax benchmark. ΔER reports the contribution of each subgroup to the change in the unconditional early-retirement rate at age 60, in percentage points. ΔCEV reports the contribution of each subgroup to aggregate welfare, measured in percentage points of consumption-equivalent variation. Tax revenue is collected only from recipients in both panels.

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