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Wealth Inequality, and the Estate Tax

by

Kunze Li
Beijing Normal University

Kanda Naknoi
University of Connecticut

Kai Zhao
University of Connecticut

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365 Fairfield Way, Unit 1063
Storrs, CT 06269-1063
Phone: (860) 486-3022
Fax: (860) 486-4463
http://www.econ.uconn.edu/

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Kunze Li†
Beijing Normal University

Kanda Naknoi‡
University of Connecticut

Kai Zhao§
University of Connecticut

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Abstract

We provide empirical evidence that asset returns are correlated across generations and that this correlation has significant consequences for the distribution of wealth. Using the Panel Study of Income Dynamics and asset price databases, we find that a 10-percentile increase in a father's wealth return rank is associated with an approximately 3-percentile increase in his child's corresponding rank. Next, we construct an overlapping-generations model in which dynasties are linked through returns, earnings, and bequests. Our counterfactual experiments show that the intergenerational correlation in returns (ICR) accounts for a significant fraction of top wealth shares and the ICR is an important driver of persistence at the top of the wealth distribution. Thus, incorporating the ICR alters predictions about the aggregate and distributional effects of estate taxation, with important policy implications.

Keywords: wealth inequality, returns, intergenerational persistence, estate tax

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†Email: li_kunze1995@163.com.

‡Email: kanda.naknoi@uconn.edu.

§Email: kai.zhao@uconn.edu.

1 Introduction

A growing literature has highlighted the role of heterogeneous returns to wealth in shaping the distribution of wealth.[1] For instance, using data from the Panel Study of Income Dynamics (PSID), Cao and Luo (2017) show that heterogeneous returns on wealth contribute to the increase in wealth inequality in the U.S. Xavier (2021) offers similar insights, drawing on data from the Survey of Consumer Finance (SCF). In particular, an important study by Benhabib et al. (2019) shows that heterogeneous returns on wealth are important for shaping the skewed cross-sectional distribution of wealth and social mobility. While many of these studies acknowledge the presence of the intergenerational correlation in returns (ICR) in their models, they do not directly measure its degree in the data; instead, they calibrate it indirectly by matching related moments.

This study aims to fill this gap by directly measuring the degree of the ICR in U.S. households in the PSID, arguably the most suitable longitudinal dataset for this purpose. We then show the quantitative implications of the measured ICR for wealth inequality and the estate tax in a quantitative dynamic macroeconomic model. Specifically, using household-level U.S. data from 1984 to 2019, we find that heterogeneity in returns is significantly driven by individual fixed effects, which are intergenerationally correlated. We estimate the rank-rank correlation between fathers' return fixed effects and those of their children to be 0.28, implying that a 10-percentile increase in the father's rank is associated with an average 2.8-percentile increase in the child's rank. Moreover, returns are significantly more persistent across generations in the bottom and top return quintiles than in the middle return quintiles, suggesting a polarization of the ICR.

Next, we develop a quantitative overlapping-generations model featuring the ICR and intergenerational linkages via earnings and bequests. Guided by our empirical analysis, we model the fixed effect as a key determinant of heterogeneous returns and discipline the degree of the ICR in the model using our empirical estimates. Intuitively, the fixed effect encompasses a broad set of skills that influence returns, including financial sophistication (Lusardi et al., 2017; Kacperczyk et al., 2019), entrepreneurial productivity (Quadrini, 2000; Cagetti and De Nardi, 2006), and social networks. Our baseline calibrated model can closely replicate the distributions of wealth, earnings, and returns on wealth in the PSID.

Intuitively, the ICR amplifies wealth inequality primarily because children with high fixed effects are more likely to receive larger bequests from parents with high fixed effects, which in turn allows them to generate more substantial capital income. To illustrate this mechanism, we show in our counterfactual experiment that shutting down the ICR leads to a significant decrease in wealth inequality, with the coefficient of variation of the wealth distribution declining by 21.5%, the wealth Gini decreasing by 3.3%, and the wealth share of the top 1% falling by 5 percentage points.

Moreover, shutting down the ICR reduces the wealth-to-earnings ratios of the top 10%, 5%, and 1% wealthiest agents by 18%, 24% and 38%, respectively. These scales indicate that, absent the ICR, capital income inequality and heterogeneous returns become less important drivers of wealth inequality, and the share of high-return agents at the top of the distribution declines. Furthermore, intergenerational wealth persistence declines by 16% in the absence of our ICR channel, with persistence among wealthy families

[1] See Cao and Luo (2017), Benhabib et al. (2019), Fagereng et al. (2020), Hubmer et al. (2021), İmrohoroğlu and Zhao (2022), and Smith et al. (2023), among many others.

decreasing significantly while persistence among poor families changes only minimally.

Finally, we examine the quantitative impact of estate tax policy. Specifically, we consider reforms that vary the marginal estate tax rate. We do so across several scenarios to balance the government budget, including adjustments to the labor and capital income taxes, as well as lump-sum transfers. We find that reducing the marginal estate tax rate increases aggregate wealth and inequality, whereas raising the tax rate decreases them, consistent with the existing literature (De Nardi and Yang, 2016). Quantitatively, changes in inequality, aggregate wealth, and welfare are amplified by the ICR; thus, the quantitative impact of changes in the marginal estate tax is larger than in the model without the ICR. Intuitively, agents with high-return fixed effects are more responsive to changes in inherited wealth, so a larger share of their bequests is forgone under estate taxation when the ICR is present than when it is absent. Hence, abstracting from the ICR leads to an underestimation of the effectiveness of estate taxation in reducing wealth inequality.

Our study belongs to the growing literature emphasizing the role of intergenerational linkages in explaining the wealth distribution.[2] This literature has long examined the implications of bequests and intergenerational labor productivity transmission for wealth inequality. An important finding is from De Nardi (2004), who shows that bequests often behave like luxury goods, leading to heterogeneous saving rates across households, the formation of large estates and a highly skewed wealth distribution. We contribute to this literature by documenting a new intergenerational linkage through wealth returns and showing how this channel interacts with well-known linkages through bequests and earnings.

Our modeling strategy is closely related to Benhabib et al. (2019), whose model also features heterogeneity in bequests, earnings and returns on wealth. Nevertheless, the magnitude of the ICR in their quantitative model is not estimated directly from U.S. data; rather, it is calibrated to match the wealth distribution and intergenerational wealth mobility in U.S. data. Instead, we measure the magnitude of the ICR directly using the PSID and estimate it at 0.28, substantially larger than the calibrated value reported in Benhabib et al. (2019). Our study is also related to the literature documenting that entrepreneurial productivity is partially transmitted from parents to children, leading to returns that correlate across generations.[3] Our concept of the ICR is more comprehensive, including not only entrepreneurial productivity but also returns on a diversified portfolio of business, stocks, real estate, and other assets.

This study also contributes to the literature that quantitatively examines estate tax reform. Most related studies model only intergenerational earnings correlations and thus may underestimate the effects of reform.[4] We show that estate tax reforms mainly affect agents with high fixed effects rather than those with only high labor productivity; thus, incorporating the ICR is important.

Our empirical exercise complements the literature on rates of return by estimating the intergenerational correlation of return rates for U.S. households. Cao and Luo (2017), Xavier (2021), and Smith et al. (2023) estimate returns on wealth in the United States,

[2]See De Nardi (2004), De Nardi and Yang (2014), De Nardi and Fella (2017), and Cooke et al. (2025), among others.

[3]See Cagetti and De Nardi (2006), Cagetti and De Nardi (2009), and İmrohoroğlu and Zhao (2022), among others.

[4]See Nishiyama (2002), Castaneda et al. (2003), De Nardi and Yang (2016), and Guo (2023).

but omit the correlation in returns across generations. By exploiting administrative data from Nordic countries, Bach et al. (2020) (Swedish data) and Fagereng et al. (2020) (Norwegian data) find that returns on wealth are heterogeneous and positively correlated with wealth, which is consistent with our findings. In particular, Fagereng et al. (2020) report an intergenerational correlation in wealth returns of 0.22, which is close to our estimate of 0.28.

The remainder of our study is organized as follows. The next section presents the empirical evidence of the intergenerational correlation in returns. Section 3 describes the quantitative dynamic model, and Section 4 provides the calibration. The main quantitative results are reported in Sections 5 and 6. We conclude in Section 7.

2 Measuring Intergenerational Correlation in Returns

We first describe the data and methodology used to construct wealth-return rates for U.S. households. We then discuss the empirical regularities that emerge from our return measures and our empirical estimates of the ICR.

2.1 Measuring the household-level rates of return

We define the rates of return (r_t) on household wealth as the sum of the yield income component (r^i_t) and the capital gain component (r^g_t) as:

$$r_t = r^i_t + r^g_t, \tag{1}$$

such that

$$\begin{aligned} r^i_t &= \frac{I_{t+1}}{W_t}, \\ r^g_t &= \sum_c \omega_{c,t} R_{c,t}, \end{aligned}$$

where I_{t+1} denotes the total asset income paid in year $t+1$, W_t denotes the total net wealth in year t, $\omega_{c,t}$ denotes the share of asset class c in total wealth in year t, and $R_{c,t}$ denotes capital gains for asset class c from years t to $t+1$.

Empirically, we construct a panel of rates of return for U.S. households for 1984, 1989, 1994, and 1999–2019, using information from three databases: the PSID, the Financial Accounts of the U.S., and Shiller (2015). Our sample years are constrained by the PSID, which collects data on household-level wealth, asset compositions, and debt compositions in 1984, 1989, 1994, and biennially starting from 1999.[5]

[5] The PSID sample includes the Survey Research Center (SRC), Survey of Economic Opportunity (SEO), and Latino family sub-samples. The SRC is representative of the U.S. population at the time and is itself a random sample. The SEO oversamples the poor, and the Latino family sub-sample collects information on Latino groups. To make results more representative and free of weighting problems, we follow Haider (2001) and use only the SRC sub-sample.

Additionally, the PSID provides an identification variable that links the parents' household to their child's. Consequently, this database contains sufficient information to calculate the values of I_{t+1}, W_t and $\omega_{c,t}$ for both parents and their children. We proceed as follows. First, we calculate I_{t+1} as the sum of income paid in year $t+1$ from businesses, dividends, interest, rent, royalties, and trust funds.

Next, we obtain the net wealth W_t as the sum of net values of all assets, namely (1) real estate; (2) business; (3) stocks; (4) checking or savings accounts, money market funds, certificates of deposit, government savings bonds, or treasury bills; (5) vehicles; (6) private annuities or individual retirement accounts (IRAs); and (7) other assets; (8) minus other debts. Thus, our measure of wealth is the net value, similar to that in Cao and Luo (2017). We exclude all households in which at least one member is a farmer or rancher because the PSID does not count capital income from farms after the 1993 wave.

Third, to calculate the asset share $\omega_{c,t}$, we assume that capital gains or losses result from the valuation of only businesses, real estate, and stocks. To this end, we exclude households with negative net worth in these three types of assets. We also account for stock holdings in private annuities and IRAs by assigning 90%, 10%, and 50% shares to private annuities and IRA portfolios classified as "Mostly stocks," "Mostly interest earning," and "Split," respectively.[6]

Fourth, to calculate capital gains $R_{c,t}$, we rely on the Financial Accounts of the U.S. and the price indexes reported in Shiller (2015) because capital gains data are unavailable in the PSID.[7] Similar to Xavier (2021), we construct capital gain measures as follows. We use "Nonfinancial Noncorporate Business; Proprietors' Equity in Noncorporate Business, Level (NNBPEBA027N)" series in the Financial Accounts of the U.S. to calculate noncorporate business capital gains. For corporate business capital gains, we use "Households and Nonprofit Organizations; Corporate Equities; Asset, Level (HNOCEAA027N) series". Price indexes for real estate and stocks are from Shiller (2015).[8]

Fifth, we deflate all series using the 2015 consumer price index to obtain real rates of return. Additionally, we drop households whose net wealth is below $1,000 before summing each component in Eq. (1) into r_t, truncate observations with r_t in the top 1.0% and the bottom 1.0% of the distribution, and keep only households whose representative individuals are aged between 25 and 75 in our data set. In this regard, representative individuals for households are not necessarily household heads. Instead, they are determined first by whether their fathers are identified in the PSID-SRC, which helps expand the sample size for studying the ICR; if not, the household head is selected. As a result, 19.62% of representative individuals are spouses.

Finally, we retain households that have at least three observations for our panel

[6] Changing the share of stock holdings in the first category to 70% or 80% has minimal impact on our main results.

[7] In sample years, the PSID asks how much money households received from selling or investing in real estate, businesses, or stocks since January of the previous survey year, rather than over the previous calendar year. Interview dates in the survey year are not all in January, so this information cannot be used to calculate capital gains from year t to $t+1$. Moreover, these measures do not correspond to capital gains by definition.

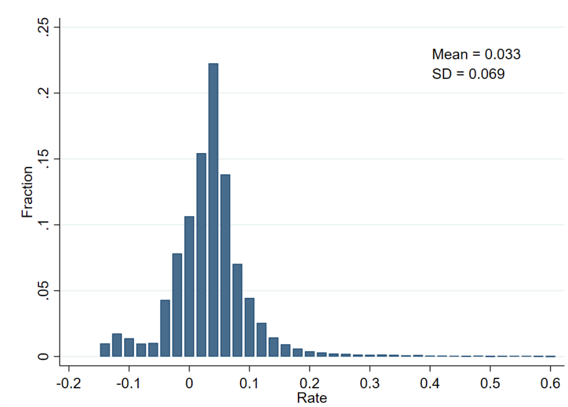
[8] These series are available online at Shiller Data: https://shillerdata.com/. Over the sample period, the average capital gains for noncorporate businesses, corporate equity, real estate, and stocks are 2.90%, 6.76%, 1.57%, and 5.01%, respectively. This methodology implies that households' capital gains differ only by asset class, asset shares, and year, which may underestimate the heterogeneity in capital gains.

empirical analysis. In the end, there are 30,623 observations in the main sample, which forms the basis of the empirical results.

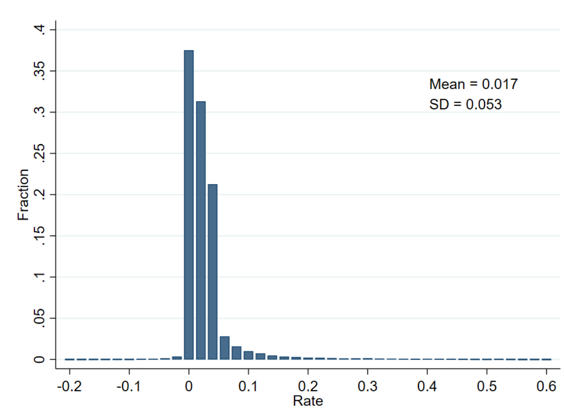
2.2 Descriptive statistics

Figure 1 displays the distribution of returns and its two components. The rate of return is quite heterogeneous, with a mean of 0.033 and a standard deviation of 0.069. Approximately 18% of households experience negative returns, 11% have zero returns, while the 90th percentile household's rate of return is as high as 0.093. There are 38% and 15% of households with zero yield income and zero capital gain, respectively. Most negative returns come from the capital gain (loss) component; 22% of households incur capital losses, and less than 1% have negative yield incomes. The yield income component, however, contributes to extremely high returns; the 99th percentile of the yield income component reaches 0.301, whereas that of the capital gain component is only 0.122.

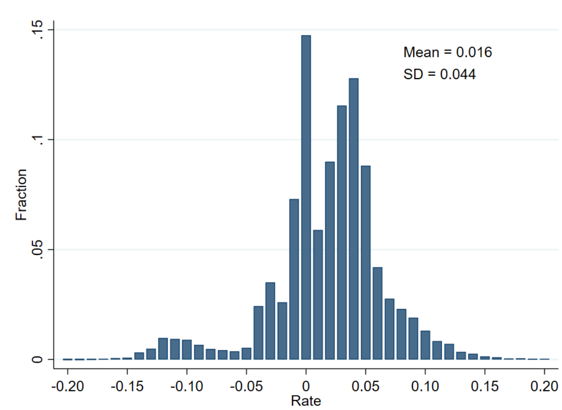
Figure 1: Distributions of returns on wealth of US households



(a) Rates of return on wealth



(b) Yield income component



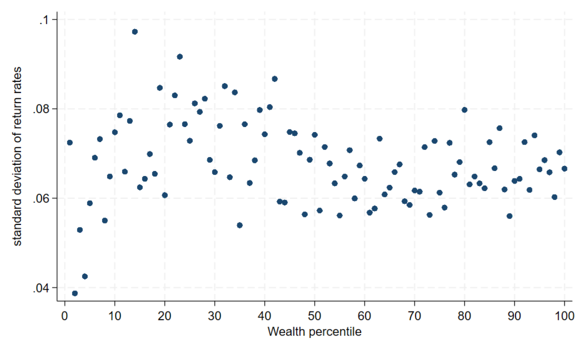
(c) Capital gain component

To highlight wealth distribution, we display the average rates of return for all households in each wealth percentile in Figure 2a. This figure clearly exhibits two properties. First, wealthy households achieve higher returns than relatively poor households. To be precise, households in the top 10 percentiles in our sample experience an average rate of return of 0.050, which is 3.3 times that of households in the bottom 10 percentiles, whose average rate of return is around 0.015. This property is consistent with the findings in Bach et al. (2020), Fagereng et al. (2020), and Xavier (2021). Second, Figure 2a indicates no significant differences in the rates of return from the 20th to the 80th percentiles of the wealth distribution. This property implies an extremely weak correlation between wealth and returns in the middle of the wealth distribution, consistent with the calculation in Xavier (2021) using SCF data. Figure 2b shows that the standard deviations of rates of return are fairly stable across the wealth distribution and decline slightly with wealth, possibly because wealthier households invest more robustly.

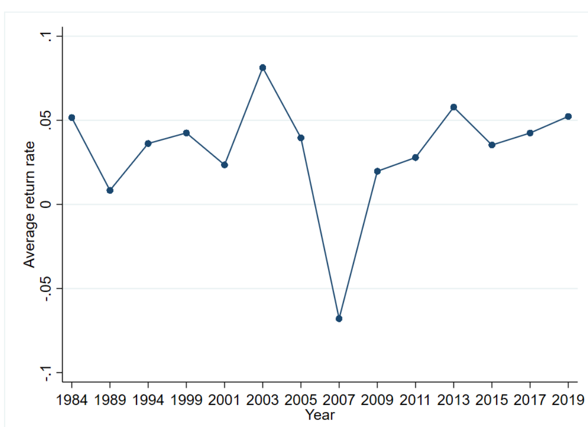
The average rate of return across households also varies over time, as shown in Figure 2c. It was highest at 0.081 from 2003 to 2004 and lowest at -0.068 from 2007 to 2008, during the onset of the Great Recession. We also find that more educated households achieve higher return rates on average, while the standard deviation of return rates declines significantly with age, as shown in Table A1 in the appendix.

Figure 2: Return Rates across Wealth Percentiles and over Survey Years

(a) Mean of returns by wealth percentiles



(b) SD of returns by wealth percentiles



(c) Average returns in sampled years

2.3 Individual fixed effects

This subsection presents the characteristics of households that achieve higher returns and accumulate more wealth than the average. For this purpose, we index each household by j and let $r_{j,t}$ denote the rate of return of household j in year t. Next, we construct a vector $X_{j,t}$, which includes the logarithm of wealth of household j in year t, the square of the logarithm of wealth, the representative individual's age, the square of age, a labor force participation indicator, and a marital status indicator equal to one if the representative individual is married or cohabiting; otherwise, it equals zero. Appendix A provides summary statistics of households' characteristics.

Following Fagereng et al. (2020), we take individual fixed effects into account and run the following panel regression:

$$r_{j,t} = X_{j,t}\psi + f_j + \lambda_t + e_{j,t}, \tag{2}$$

where f_j and λ_t capture individual and year fixed effects, respectively, and $e_{j,t}$ denotes the residual.[9] Our main variable of interest is the individual fixed effect. In principle, this term captures persistent or lifetime characteristics that influence returns, such as portfolio preferences, financial sophistication, and entrepreneurial productivity. Our regression results in Table 1 indicate that the individual fixed effect is an important determinant of returns.

In Column (1), including the individual fixed effect greatly improves the adjusted R^2, and the p-value for the fixed effect is less than 0.0001, indicating its necessity. Consistent with time series variation in Figure 2c, year fixed effects are also statistically significant. Other important determinants of returns are the logarithm of wealth and its square. Their estimated coefficients are 0.01471 and -0.00077, respectively, and both are statistically significant at the 1% level. These coefficients imply that increasing wealth initially improves returns, but beyond a certain threshold, returns begin to decline, indicating a non-monotonic relationship. This pattern differs from that in Figure 2a.

A plausible explanation is that the accumulation of wealth permits relatively poor households to improve their portfolio choices. By contrast, wealthy households hold a large share of their wealth in risky assets, particularly businesses, which exhibit decreasing returns to scale and declining marginal products of capital despite increases in capital income.[10] The result in Column (1) also has a direct implication for our modeling strategy. Since other variables beyond the wealth variables and individual fixed effects are not strongly significant, modeling the rate of return as a function of wealth, fixed effects, and stochastic factors is a reasonable approach.

Additionally, we report results of alternative regressions in Columns (2)–(4) to highlight the importance of the individual fixed effects. In particular, Column (2) reports the regression results without individual fixed effects; Columns (3) and (4) exclude the square of log wealth; and Column (4) also excludes individual fixed effects. These results suggest the following. First, both individual and year fixed effects are statistically

[9] Here, the individual fixed effect also refers to the representative individual of the household.

[10] In Table A2, we show that as households accumulate wealth, the wealth share of real estate first increases and then decreases, while the share of risky assets (stocks and businesses) first decreases, likely crowded out by real estate, and then increases. Wealthier households have better portfolios, which lead to higher capital gains, but decreasing returns to scale cause the yield income component to decline.

Table 1: Correlation between wealth and return rates

	(1)	(2)	(3)	(4)
Log wealth	1.4710***	0.1037	-0.2403***	0.5341***
	(0.4020)	(0.2313)	(0.0616)	(0.0310)
(Log wealth)^2	-0.0770***	0.0188*		
	(0.0182)	(0.0101)		
Age	0.1538	-0.0875***	0.1579	-0.0886***
	(0.1318)	(0.0249)	(0.1318)	(0.0250)
Age^2	-0.0002	0.0007***	-0.0003	0.0008***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Labor force	0.2358*	0.4628***	0.2546**	0.4563***
	(0.1269)	(0.1260)	(0.1268)	(0.1262)
Married	0.1127	-0.0349	0.1334	-0.0485
	(0.1925)	(0.1063)	(0.1923)	(0.1057)
Year effects	Yes	Yes	Yes	Yes
Individual FE	Yes	No	Yes	No
Observations	30,623	30,623	30,623	30,623
Adjusted R^2	0.3483	0.2183	0.3474	0.2182
p-value: year effects = 0	< 0.0001	< 0.0001	< 0.0001	< 0.0001
p-value: FE = 0	< 0.0001		< 0.0001	

Note: The regression reported in the table is adjusted, with the dependent variable defined as the rate of return multiplied by 100. This adjustment is for the sake of interpretation, as the scales of wealth coefficients are less than 0.02 if not presented in percentage terms. Standard errors (in parentheses) are clustered by household representative individual. $^{*}p \leq 0.10, ^{**} p \leq 0.05, ^{***} p \leq 0.01$

significant ($p < 0.0001$) in any specification. Second, individual fixed effects should be included in the regression because they improve the model's overall fit, and the p-value is significant. Third, once the individual fixed effect is included, it is better to also include the square of log wealth.[11] Finally, adding individual fixed effects reduces the effect of wealth on rates of return, consistent with Fagereng et al. (2020). Quantitatively, moving from the 10th to the 90th percentile is associated with a 1.37 percentage-point decrease in returns. For comparison, Figure 2a provides the baseline for unconditional wealth effects; moving from the 10th to the 90th percentile of the wealth distribution in this figure is associated with a 2.16 percentage-point increase in returns.[12]

Having established the important role of individual fixed effects, we examine its intergenerational transmission and the ICR in the next subsection.

[11] We also try adding the cube of log wealth, but all wealth terms become insignificant, as shown in Table A2.

[12] This result suggests that part of the positive correlation between wealth and rates of return may reflect that households with certain characteristics achieve higher rates of return and, subsequently, accumulate more wealth.

2.4 Intergenerational correlation in returns

From the main sample, we obtain 1,728 father-child pairs.[13] We are interested in each generation's relative position in the return distribution, which also allows us to include non-positive values. Hence, rank correlation, rather than unconditional correlation, is the appropriate measure. Equation 3 is used to estimate the intergenerational correlation in average rates of return.

$$\bar{r}_j = \rho_r \bar{r}_j^{fa} + u_j, \tag{3}$$

where $\bar{r}_j$ is the percentile rank of child j's average return over the sample among children's households, $\bar{r}_j^{fa}$ is the corresponding percentile rank of the father among fathers' households, and u_j is the residual.

Likewise, the intergenerational correlation in individual fixed effects, which is obtained from the previous subsection, is estimated as the coefficient ρ_f from the following regression:

$$\bar{f}_j = \rho_f \bar{f}_j^{fa} + v_j \tag{4}$$

where $\bar{f}_j$ and $\bar{f}_j^{fa}$ are the rank percentiles of fixed effects of the child's and the father's households, respectively, and v_j is the residual.

Table 2: Regression results for intergenerational correlations

	Average rates	**Individual FE**
Father's percentile	0.1681^{***}	0.2838^{***}
	(0.0236)	(0.0226)
Observations	1,728	1,728
R^2	0.0285	0.0849

Note: The intergenerational correlations in columns (1) and (2) refer to the average returns and individual fixed effects, respectively. Robust standard errors are in parentheses. $^{*}p \leq 0.10, ^{**}p \leq 0.05, ^{***}p \leq 0.01$

Table 2 reports the estimation results. The correlation in average returns is approximately 0.17, indicating that, on average, a 10-percentile increase in the father's rank is associated with a 1.7-percentile rise in the child's rank. The correlation for individual fixed effects is stronger, at around 0.28. These correlations are similar to those estimated by Fagereng et al. (2020), who find a return correlation of 0.16 and a fixed-effect correlation of 0.22. As shown in Table A4, the correlations in the average yield income and capital gain components are 0.18 and 0.09, respectively, and the correlations in the corresponding fixed effects are 0.31 and 0.26. These results suggest that the intergenerational correlation in the yield income component is stronger than that in the capital gain component.[14]

[13] Table A3 provides summary statistics for fathers' and children's households. Following Fagereng et al. (2020), we focus on the father–child correlation.

[14] We provide additional results, including father-son and father-daughter intergenerational correla-

Ideally, we would like to observe parents and children at the same age. However, the available PSID waves for calculating rates of return are not long enough to provide sufficient observations of parents and children at the same age. To partially address this issue, we restrict both parents' and children's ages to 25-45, then calculate the ICR. The results are shown in Table A6. The number of parent-child pairs drops to 419, but the correlations for average rates of return and return fixed effects increase to 0.22 and 0.33, respectively.

The influence of parents on their children's portfolio decisions (Chiteji and Stafford, 1999; Barnea et al., 2010; Lindquist et al., 2015; Black et al., 2017; Fagereng et al., 2021; Knüpfer et al., 2023) is a potentially important explanation for the ICR. These studies also suggest that both pre-birth factors, such as genetic influences, and post-birth factors, such as communication, imitation among family members, and involvement in family businesses, significantly shape the child's portfolio decisions.[15] Since returns are affected by stochastic factors, such as luck and shocks to portfolio choices, the intergenerational correlation in average returns may understate the ICR. Therefore, in the rest of the chapter, we use the intergenerational correlation in individual fixed effects to represent and capture the ICR.

Table 3: Intergenerational transition matrix

Panel A: Average return rates					
Fathers quintiles	Children quintiles				
	1	2	3	4	5
1	26.34%	26.08%	18.01%	16.67%	12.90%
2	22.63%	21.10%	21.71%	18.35%	16.21%
3	16.87%	19.88%	21.69%	21.39%	20.18%
4	18.26%	16.01%	19.38%	23.88%	22.47%
5	15.54%	16.72%	19.35%	19.94%	28.45%
Panel B: Individual fixed effects					
Fathers quintiles	Children quintiles				
	1	2	3	4	5
1	37.35%	20.09%	16.78%	13.95%	11.82%
2	21.26%	25.00%	17.24%	20.69%	15.80%
3	16.46%	19.62%	23.73%	22.47%	17.72%
4	10.38%	20.44%	22.01%	19.50%	27.67%
5	8.98%	14.55%	21.36%	25.39%	29.72%

Note: The number π_{fc} represents the probability of being in cth quintile given that one's father is in fth quintile.

Next, we report the intergenerational transition matrix of the average returns and individual fixed effects in Table 3. Hypothetically, perfect intergenerational mobility would correspond to a symmetric probability of 20% in all elements of the matrix. However, this is not the case. In particular, the diagonal elements of the matrix are well above 20% in the lowest and highest quintiles, reflecting polarization in the intergenerational persistence of rates of return. Specifically, if the father's average return is in the bottom quintile, there is a 26% probability that his child remains in the same quintile; if the

tions, in Appendix A.

[15] We also report the intergenerational portfolio correlation in Table A7.

father's average return is in the top quintile, the corresponding probability is 28%. For fixed effects, the corresponding probabilities are 37% for the bottom quintile and 30% for the top quintile.

Overall, our empirical results provide strong evidence of weak intergenerational mobility in individual fixed effects and returns to wealth of U.S. households. This evidence motivates the main assumptions in our model in the next section.

3 The Model

This section describes our dynamic macroeconomic model. In addition to the ICR, it also features intergenerational linkages in earnings and bequests. Each agent in the economy has a finite and deterministic lifespan of T years. Time is discrete, and each period is one year. Agents enter the economy at $t = 1$ and leave after $t = T$. When they leave the economy, their offspring enter the economy and inherit the bequests they left.

3.1 Preferences

Each agent derives the period utility from consumption c:

$$u(c) = \frac{c^{1-\sigma}}{1-\sigma}$$

where σ denotes the coefficient of relative risk aversion. In the final period ($t = T$), agents also derive utility from the after-tax bequest (b) left to their descendants. Following the *warm glow* bequest motive in De Nardi (2004), the bequest utility function $v(b)$ is:

$$v(b) = \chi\frac{(b + b_0)^{1-\sigma}}{1-\sigma}$$

where χ captures the strength of the bequest motive, and b_0 captures the extent to which bequests are luxury goods. When $b_0 > 0$, the marginal utility from small bequests is bounded, leading poorer agents to leave minimal or no bequests. In contrast, the marginal utility of a large estate diminishes at a slower rate compared to that of consumption, encouraging wealthier agents to save more for bequests.

3.2 Earnings and capital income

Agents have two independent sources of income: earnings and capital income. The exogenous earnings process is characterized by $y_t = z\epsilon_t\xi_t$, where z is lifetime labor productivity, ϵ_t is the age-deterministic component, and ξ_t is the stochastic component. The lifetime labor productivity z is imperfectly inherited from parents:

$$log(z) = \rho_z log(z^{pa}) + v_z$$

where ρ_z denotes the intergenerational correlation of labor productivity and $v_z \sim N(0, \sigma^2_{v_z})$. The superscript pa denotes the corresponding parent variables. The transmission of lifetime labor productivity ($\rho_z > 0$) increases the likelihood that parents with high labor productivity will have children with similarly high labor productivity. Following Storesletten et al. (2004), the stochastic component ξ_t is modeled as:

$$log(\xi_t) = \mu_t + \iota_t$$
$$\mu_t = \rho_\mu \mu_{t-1} + \eta_t$$

The stochastic component includes a persistent shock (μ_t) and a transitory shock (ι_t). Persistent shock follows an AR(1) process with persistence ρ_μ and variance σ^2_η. The transitory shock ι_t is distributed as $N(0, \sigma^2_\iota)$.

Agents receive capital income from investment activities, and the rate of return (r) is determined by:

$$r = \alpha_r + f + g(a) + v_r$$

where α_r is a constant term, f is the lifetime fixed effect, $g(a)$ is a function of wealth at the beginning of the current period, a, and $v_r \sim N(0, \sigma^2_r)$ is an idiosyncratic shock independent of any other state variable. The lifetime fixed effect captures a comprehensive skill that encompasses financial sophistication, entrepreneurial productivity, and other related factors. A greater fixed effect enables agents to achieve higher returns on wealth and is partially transmitted from parents, as specified by the intergenerational transition matrix $\Pi(f|f^{pa})$. This structure implies that parents with high fixed effects are more likely to have children with high fixed effects, serving as the main channel through which the model captures the ICR. The term $g(a)$ captures all direct and indirect sources of wealth effects on returns, and v_r refers to the luck factor in investment.

In the model, achieving high capital income requires both high rates of return and substantial wealth accumulation; thus, intergenerational transfers are particularly important for agents with high fixed effects to earn substantial capital income, especially during their younger years. Additionally, both labor productivity and fixed effects link children and parents. In this setting, the two links are independent, allowing for the study of the economic effects of each intergenerational correlation separately.

3.3 The government

The government taxes labor income (τ_y), capital income (τ_r), and estates (τ_b). Following Cagetti and De Nardi (2009) and De Nardi and Yang (2016), we assume that the government only taxes estates on the portion exceeding a given threshold (x_b) at a rate of τ_b. If estates are no more than x_b, the tax rate is zero. This setting reflects the structure of the U.S. estate tax system. Intuitively, a higher estate tax rate reduces intergenerational transfers, which in turn prevents agents, especially those with high fixed effects, from earning substantial capital income and accumulating wealth. In each period, the government spends all the tax revenue on government expenditure G, which does not enter household utility.

3.4 Households' problem

In each period, agents make decisions regarding consumption and savings (a') to maximize their utility, with savings becoming bequests only in the final period. The vector of state variables facing households is denoted by $x \equiv (t, z, \xi, f, v_r, a)$, where t is age; z and ξ are permanent labor productivity and idiosyncratic productivity shock, respectively; f and v_r are the fixed effect and the idiosyncratic component in the rate of return; and a is household wealth. Households at age $t < T$ face the following value function problem:

$$V(t, z, \xi, f, v_r, a) = \max_{c,a'} u(c) + \beta E(V(t+1, z, \xi', f, v_r', a')), \tag{5}$$

subject to,

$$a' = (1 - \tau_y)y + (1 + (1 - \tau_r)r(f, a, v_r))a - c, \tag{6}$$

and $a' \geq 0$, $c > 0$.

For households at age $t = T$, the value function is simply given as:

$$V(t, z, \xi, f, v_r, a) = \max_{c,a'} u(c) + v(b), \tag{7}$$

subject to Equation 6 and,

$$b = \begin{cases} a', & \text{if } a' \leq x_b \\ (1 - \tau_b)(a' - x_b) + x_b. & \text{otherwise} \end{cases} \tag{8}$$

The budget constraint is affected by taxation in two ways. First, savings in the final period are considered before-tax bequests, and offspring inherit the bequests net of estate tax. Second, an agent's gross income comprises after-tax labor earnings and after-tax capital income.

3.5 Stationary distribution

Let $\phi(x)$ denote the stationary distribution of households. It should satisfy the stationary condition, $\phi = \phi'$, with ϕ' being defined as follows:

- $\forall z, \xi', f, v_r', a', t < T$,

$$\phi'(t+1, z, \xi', f, v_r', a') = \int_{\xi, v_r, a; a'=a'(x)} \Phi_{v_r}(v_r') Tr(\xi, \xi') d\phi(t, z, \xi, f, v_r, a), \tag{9}$$

- and $\forall z, \xi', f, v_r', a', t = T$,

$$\phi'(1, z, \xi', f, v_r', a') = \int_{\xi, v_r, a; a'=b(x)} \Phi_{v_r}(v_r') \Phi_\xi(\xi') d\phi(t, z, \xi, f, v_r, a). \tag{10}$$

Here Φ_{v_r} and Φ_ξ denote the stationary probability distributions of v_r and ξ, respectively.

Given the stationary population distribution, the aggregates of the economy, aggregate consumption C, labor L, and capital K can be expressed as follows:

$$C = \int_x c(x) d\phi(x), \quad L = \int_x z\epsilon\xi d\phi(x), \quad K = \int_x a d\phi_(x), \tag{11}$$

and the government expenditure G is equal to the total tax revenue:

$$G = \int_x \left[\tau_r r(f, a, v_r) a + \tau_y z\epsilon\xi\right] d\phi(x) + \int_{x;t=T} [a'(x) - b(x)] d\phi(x) \tag{12}$$

All model and experiment results refer to values in the stationary state.

4 Calibration

We calibrate the model to the current U.S. economy. Our calibration strategy comprises two stages. In the first stage, we determine the values of certain parameters using independent estimates from the data or the existing literature. In the second stage, we jointly calibrate the remaining parameters by minimizing the distance between the data targets and their model counterparts.

4.1 Demographics and preferences

Agents enter the economy at age 25 ($t = 1$) and leave after age 64 ($t = T = 40$). The risk aversion coefficient (σ) is set to 1.5. We calibrate the time discount factor ($\beta = 0.994$) to match a wealth-to-earnings ratio of 3.2, as is standard in the literature.[16] The scale parameter (χ) and the luxury good parameter (b_0) in the bequest motive function control the overall level of bequests and the skewness of the cross-sectional distribution of bequests. Therefore, based on the estimates provided in De Nardi and Yang (2016) and Hurd and Smith (2002), we calibrate them to match two related empirical moments: (1) a bequest-to-wealth ratio of 1.2%, and (2) the bequest-earnings ratio of 6.2 at the 95th percentile of the bequest distribution. Our calibration strategy yields $\chi = 127$ and $b_0 = 79$. The depreciation rate δ is set to 0.07 based on the calculation of Gomme and Rupert (2007).

4.2 Labor productivity and capital depreciation

The age-specific productivity component (ϵ) is calculated using the 1999–2019 PSID sample.[17] The intergenerational correlation of labor productivity ρ_z is set to 0.4, following

[16] See Hong and Ríos-Rull, 2012, Imrohoroglu and Zhao (2024), and Hosseini et al. (2026), among others.

[17] In the data, earnings are defined as the sum of the household's labor income and unemployment compensation. We further restrict the sample to households whose heads are male, married, and aged

Solon (1992) and Zimmerman (1992). We calibrate $\sigma^2_{v_z}$ to reflect that the top 5% of the labor income distribution accounts for 20% of the total labor income in the data, resulting in a $\sigma^2_{v_z}$ of 0.1640. We convert the AR(1) intergenerational productivity process into a 6-state lifetime labor productivity Markov chain using Tauchen (1986) method. The intergenerational transition matrix of labor productivity is shown in Table A8. The parameters in the idiosyncratic productivity shock process are from Heathcote et al. (2010) for 2000, where ρ_μ, σ^2_η, and σ^2_ι are 0.9733, 0.0212, and 0.0872, respectively. We discretize this process into a 9-state Markov Chain, with three states for each of the persistent and transitory shocks.[18]

Table 4: Parametrization

Parameters	Description	Values
Preferences		
σ	Risk aversion	1.50
β	Time discount	0.994
χ	Bequest motive	127
b_0	Bequest luxury	79
Labor income		
ρ_z,$\sigma^2_{v_z}$	Earnings correlation parameters	0.40, 0.1640
$\rho_\mu, \sigma^2_\eta, \sigma^2_\iota$	Earnings shock parameters	0.9733, 0.0212, 0.0872
γ_1,γ_2	Age comp. of earnings	0.1097, -0.0012
Returns		
α_r	Return constant	-0.0296
σ^2_r	Return idiosyncratic term	0.0028
ψ_1, ψ_2	Return wealth effects	0.0147, -0.0008
Tax system		
τ_y	Labor income tax	0.228
τ_r	Capital income tax	0.266
τ_b, x_b	Estate tax	0.20, 20.83

4.3 The rates of return on wealth

We calibrate the parameters for rates of return based on the results of our empirical analysis. Specifically, α_r is set to -0.0296 to match a mean rate of return of 0.033, and σ^2_r is set to 0.0028 to match a standard deviation of return rates of 0.069, as observed in the data. The function form of $g(a)$ is assumed to be $g(a) = \psi_1 log(a) + \psi_2(log(a))^2$,

between 25 and 64, and run the following regression:

$$y_{j,t} = \gamma + \gamma_1 age_{j,t} + \gamma_2 age^2_{j,t} + \lambda_t + e_{j,t} \tag{13}$$

where $y_{j,t}$ is the logarithm of the earnings of household j in year t, γ is a constant, $e_{j,t}$ is the residual, λ_t captures year fixed effects, and $age_{j,t}$ refers to the age of the household head. The coefficients γ_1 and γ_2 are estimated at 0.1097 and -0.0012, with robust standard errors of 0.0039 and less than 0.0001, respectively. The age-deterministic component of earnings ϵ_t is estimated based on $\gamma_1 age_{j,t} + \gamma_2 age^2_{j,t}$.

[18] The persistent shock is approximated using the method of Rouwenhorst (1995), while the transitory shock is approximated using the method of Tauchen (1986). As suggested by Kopecky and Suen (2010), the Rouwenhorst (1995) method is more reliable than the Tauchen (1986) method for approximating highly persistent processes.

and the estimates of the coefficients ψ_1 and ψ_2 are from our empirical analysis.[19] The fixed effect is divided into five states, corresponding to the average values in the $(0, 50]$, $(50, 65]$, $(65, 80]$, $(80, 90]$, and $(90, 100]$ percentiles of the fixed effect distribution in the main sample. Table A9 presents the intergenerational transition matrix of fixed effects, together with its stationary distribution and state values.

4.4 The government

We set the tax rates in the model to mimick the actual tax rates in the U.S. economy. Following Carey and Rabesona (2004), the tax rate on labor income is $\tau_y = 0.228$, and the tax rate on capital income is $\tau_r = 0.266$.[20] Following Benhabib et al. (2011), the marginal estate tax rate (τ_b) is set at 0.20, which corresponds to the average tax rate on bequests. The estate tax exemption threshold x_b is calibrated to be 20.83, so that the bottom 98% of the bequest distribution is exempt from taxation (Gale and Slemrod, 2001 and Gale et al., 2001). Government expenditure G is endogenously determined by the government's budget constraint.

4.5 Additional assessment of the model

Table 5: Distributions of wealth, earnings, and return rates: Data vs. Model

	Panel A: Wealth shares by wealth distributions(%)							
	Q1	Q2	Q3	Q4	Q5	Top 10	Top 5	Top 1
Data	0.62	2.91	6.94	15.44	74.09	58.39	44.64	23.05
Benchmark	0.34	2.09	5.96	14.45	77.16	62.06	48.67	24.76
	Panel B: Labor income shares by labor income distributions (%)							
	Q1	Q2	Q3	Q4	Q5	Top 10	Top 5	Top 1
Data	6.32	11.76	16.13	21.77	44.02	29.33	19.75	8.56
Benchmark	4.48	8.95	14.12	22.62	49.83	32.44	20.36	6.50
	Panel C: Average return rates by wealth distributions							
	Q1	Q2	Q3	Q4	Q5	Top 10	Top 5	Top 1
Data	0.021	0.033	0.033	0.034	0.040	0.047	0.050	0.058
Benchmark	0.017	0.031	0.034	0.038	0.047	0.052	0.056	0.062

Note: In Panels A and C, Quintiles 1 to 5, as well as the top distributions, all refer to wealth distribution. In Panel B, they refer to labor income distribution. Moments of wealth and rates of return are from the main sample, and moments of labor income are based on the 1999–2019 PSID SRC sample.

In this section, we provide additional assessments of the calibrated model by showing that it matches key empirical moments, including skewed distributions of wealth, earnings, and rates of return observed in the data, even without directly targeting them in our calibration.

[19] In the model, we rescale wealth to align with the data when calculating the wealth effect on rates of return.

[20] The τ_y and τ_r are calculated as the average labor income tax rate and average capital income tax rate, respectively, between 1980 and 2000 for the United states.

According to Table 5, the wealth distribution in the data has a thick right tail, with the top 10% owning approximately 60% of total wealth while the bottom quintile holds less than 1%. The model closely matches this distribution, and also generates an earnings distribution similar to that observed in the data. Earnings are less skewed than wealth, with the top 10% accounting for around 30% of earnings. Finally, the positive relationship between wealth and returns is reasonably well captured by our model. In the data, the average rate of return increases from 2.1% to 5.8% as wealth moves from the bottom quintile to the top 1% of the wealth distribution. In our calibrated model, the rate of return rises from 1.7% to 6.2% along the wealth distribution. Overall, the model matches these non-targeted key moments reasonably well. Henceforth, we proceed to use the calibrated model for counterfactual experiments to assess the aggregate and distributional implications of the ICR, as well as its policy implications.

5 Quantitative Results

In this section, we use the calibrated model to quantitatively evaluate the role of the ICR in shaping wealth inequality, wealth-to-earnings ratios, and intergenerational social mobility.

5.1 Wealth inequality

To evaluate the impact of the ICR on wealth inequality, we construct a counterfactual economy in which the ICR is absent. In other words, in this economy, the rates of return for parents and their children are independent.[21] We refer to this counterfactual economy as No ICR economy.

Table 6: Wealth Inequality: Benchmark vs. Counterfactuals

			Wealth shares (%)							
	Gini	CV	Q1	Q2	Q3	Q4	Q5	Top 10	Top 5	Top 1
Benchmark	0.75	3.43	0.34	2.09	5.96	14.45	77.16	62.06	48.67	24.76
No ICR	0.72	2.69	0.39	2.34	6.66	16.05	74.57	58.01	43.68	19.92
No ICL	0.74	3.31	0.35	2.13	6.09	14.73	76.70	61.36	47.81	23.91

Note: Quintile 1 to Quintile 5, as well as the Top distributions, all refer to wealth distribution. Wealth shares in the Panel A are represented as percentage values. The average wealth numbers in the Panel B are normalized by the average labor income.

As shown in Table 6, eliminating the ICR significantly reduces wealth inequality. While the Gini index decreases from 0.75 to 0.72, the coefficient of variation (CV) of the wealth distribution decreases from 3.43 to 2.69, a 21.49% decrease.[22] The wealth share of the wealthiest 5% decreases from 48.67% to 43.68%, a 5 percentage point decrease. For

[21]For each fixed effect of parents, the probability of giving birth to a specific type is equal to the distribution of that type in the stationary distribution. This experiment does not affect the heterogeneity of fixed effects.

[22]Compared to the Gini index, the CV is more sensitive to extreme values in both the left and right tails of the distribution.

the bottom 60%, their share of wealth increases by only 1 percentage point. Therefore, the reduction in the Gini index is mainly attributed to the shrinking wealth shares of the wealthy. The average wealth of the top 10%, 5%, and 1% decreases by 16.38%, 19.74%, and 28.07%, respectively. As a result, shutting down the ICR makes it more difficult for households at the top to accumulate wealth and leads to a decline in top wealth shares. Nonetheless, for those at the bottom, their average wealth remains nearly unchanged.

Next, we construct another counterfactual economy by eliminating the intergenerational correlation in labor productivity (ICL), which we refer to as the No ICL economy. The results in Table 6 indicate that eliminating the ICL also reduces wealth inequality, although the effect is smaller than assuming away the ICR. While its impact on the bottom 80% of the wealth distribution is a slightly larger, the ICL has a much smaller effect on the top of the distribution than the ICR. These findings are consistent with findings in the literature (see De Nardi and Yang (2014), for example).

Table 7: Bequests and Average Wealth: Benchmark vs. Counterfactuals

	Panel A: Average received bequests				
Fixed effects (f)	1	2	3	4	5
Benchmark	1.166	1.618	1.675	2.098	2.626
No ICR	1.263	1.263	1.263	1.263	1.263
	Panel B: Average wealth				
Fixed effects (f)	1	2	3	4	5
Benchmark	1.610	2.537	3.093	4.399	10.601
No ICR	1.646	2.357	2.852	3.776	8.381

Note: The values of fixed effects (f) increase with the numbers, so agents with $f = 5$ have higher fixed effects than those with $f = 1$. All numbers in the table are normalized by the average labor income.

Bequests hold the key to understanding why the ICR generates such effects on wealth inequality. In Table 7, agents with higher fixed effects in return receive more bequests in the benchmark economy because their parents, on average, also have higher fixed effects in return due to the ICR. Quantitatively, agents with the highest fixed effects receive approximately 2.25 times the bequests of those with the lowest fixed effects; shutting down the ICR eliminates this gap. Since high fixed effects allow these agents to convert parental transfers into substantial capital income and rapid wealth accumulation, shutting down the ICR affects agents with higher fixed effects more than those with lower fixed effects. As a result, it reduces the wealth shares of the wealthy.

On the other hand, wealth accumulation at the lower end of the distribution shows almost no increase. The reason is that households at the bottom of the distribution generally have low fixed effects, so they do not save significantly more over the life cycle when given more bequests. Together with the significant decline in wealth accumulation of the wealthy, shutting down the ICR results in a 10.57% decline in aggregate wealth and an 18.83% decline in received bequests. As a result, agents with low fixed effects also receive less in parental transfers in the No ICR economy.

It is also interesting to investigate the impact of the ICR on wealth-to-earnings ratios across the distribution. As shown in Table 8, shutting down the ICR significantly reduces the wealth-to-earnings ratios for the top groups in the wealth distribution. The wealth-to-earnings ratio for the top 1% declines from 56.4 to 35.1, a substantial 38% decrease.

The reductions for the top 5% and 10% are 23.6% and 18.1%, respectively, both of which are also significant. In other words, in the absence of the ICR, wealthy households rely more on labor income and less on capital income for wealth accumulation than in the benchmark economy.

Table 8: Wealth-To-Earnings Ratios: Benchmark vs. Counterfactuals

		Wealth-earnings ratio across the wealth distribution							
	Overall	Q1	Q2	Q3	Q4	Q5	Top 10	Top 5	Top 1
Benchmark	3.178	0.158	0.650	1.427	2.494	8.634	12.580	19.467	56.414
No ICR	2.842	0.158	0.653	1.431	2.493	7.413	10.298	14.866	35.095
No ICL	3.153	0.158	0.651	1.433	2.510	8.655	12.686	19.779	58.227

Note: Numbers are the ratios of wealth to labor income in each wealth group.

When the ICL is eliminated, wealth-to-earnings ratios increase for top agents, high-labor-productivity agents accumulate less wealth, and their wealth shares at the top of the distribution decline. As a result, high-return agents account for a larger share of the wealth distribution's skewness. Wealth-to-earnings ratios also rise slightly at the lower end, mainly because low- and lower-middle-productivity agents accumulate more wealth through larger inheritances.[23] Quantitatively, however, the overall effect is weaker because the distribution of capital income is only modestly affected.

5.2 Intergenerational social mobility

In this section, we assess the implications of the ICR for the intergenerational persistence of wealth. Here, we refer to ρ_w in the following regression as the measure of the intergenerational persistence of wealth:

$$\bar{w}_j = \rho_w \bar{w}_j^{pa} + \mu_j, \tag{14}$$

We estimate this regression in both the data and the calibrated model. In the data, $\bar{w}_j$ is the percentile rank of child j's average wealth over the sample among children's households, $\bar{w}_j^{fa}$ is the corresponding percentile rank of the father among fathers' households, and μ_j is the residual. In the benchmark model, we simulate 50,000 parent-child pairs and calculate the average wealth of each agent over the life cycle. We then regress children's average lifetime wealth ranks on their parents' ranks. Additionally, because the data generally capture children at younger ages and parents at older ages, we also regress the percentile rank of children's average wealth in the first 20 years of the simulation on the percentile rank of their parents' average wealth in the last 20 years. The results are reported in Table 9

According to Column (1) of Table 9, the intergenerational persistence of wealth is estimated to be around 0.44 in our sample, slightly higher than the estimate of 0.37 reported by Charles and Hurst (2003). The intergenerational persistence in our simulation

[23] Although the wealth-to-earnings ratio rises within each wealth group, the aggregate ratio declines because eliminating the ICL changes the composition of agents across wealth groups. Since wealth groups are reranked in the No ICL economy and, in particular, high-labor-productivity agents lose wealth shares at the top, the within-group increases do not translate into a higher aggregate ratio.

Table 9: Regression results for intergenerational social mobility

	(1) Data	(2) BC Lifetime	(3) BC Alter	(4) No ICR Lifetime	(5) No ICR Alter
Parents	0.4365***	0.2220***	0.2497***	0.1862***	0.2158***
	(0.0214)	(0.0044)	(0.0044)	(0.0045)	(0.0045)
Obs	1,728	50,000	50,000	50,000	50,000
R^2	0.1894	0.0493	0.0623	0.0347	0.0466

Note: Column (1) refers to intergenerational social mobility in the data. Columns (2) and (4) refer to the regression of average lifetime wealth ranks in the benchmark model and the No ICR economy, respectively. Columns (3) and (5) regress the mean wealth rank of children in the first half of life on the mean wealth rank of their parents in the second half of life in the benchmark model and the No ICR economy, respectively. Robust standard errors are in parentheses. $^{*}p \leq 0.10, ^{**}p \leq 0.05, ^{***}p \leq 0.01$

is 0.22 when using average lifetime wealth ranks, and 0.25 when using children's average wealth ranks in the first 20 years and parents' average wealth ranks in the last 20 years. While the overall intergenerational persistence of wealth in our model is lower than in the data, it captures the high persistence for households at the top of the distribution reasonably well. Table 10 shows that when parents are in the top quintile of the wealth distribution, the probability that their children remain in the top quintile exceeds 40% in both the data and the model.

Table 10: Intergenerational transition matrix of wealth: Data vs. Model (%)

Parents: quintiles	Children: quintiles 1	2	3	4	5
1	24.43	22.22	21.2	19.43	12.72
	[40.67]	[28.13]	[17.74]	[8.26]	[5.2]
2	22.68	21.99	20.35	20.76	14.22
	[29.17]	[24.68]	[19.55]	[18.59]	[8.01]
3	21.67	21.76	20.97	20.32	15.28
	[13.25]	[19.48]	[26.49]	[22.6]	[18.18]
4	20.07	20.85	21.82	20.14	17.12
	[11.18]	[19.12]	[20.29]	[25.88]	[23.53]
5	11.15	13.18	15.66	19.35	40.66
	[9.07]	[10.16]	[15.11]	[23.63]	[42.03]

Note: Numbers without square brackets report intergenerational wealth persistence in the Benchmark model, measured using average lifetime wealth, while numbers in square brackets report social mobility in the data.

Next, we examine the impact of the ICR on intergenerational wealth mobility. According to Table 11, as the ICR is assumed away, intergenerational persistence in average lifetime wealth decreases from 0.222 to 0.186 in the model, representing a 16% reduction. The effect is primarily concentrated at the top of the distribution, where the persistence among the top 5% decreases by 5 percentage points.[24] In contrast, persistence among households at the bottom of the distribution does not change substantially. This result is consistent with the effect on the cross-sectional wealth distribution.

[24] We show detailed results of wealth mobility in Table A13.

Table 11: Intergenerational social mobility: Benchmark vs. Experiments

	Persistence	Diagonal of the social mobility matrix (%) Q1	Q2	Q3	Q4	Q5	Top 10	Top 5	Top 1
Benchmark	0.222	24.43	21.99	20.97	20.14	40.66	46.02	50.56	42.40
No ICR	0.186	23.12	21.66	20.91	20.28	38.44	41.94	45.24	39.00
No ICL	0.192	22.95	21.84	21.39	20.16	39.16	44.88	49.16	45.00

Except for the persistence column, all numbers are probabilities of remaining in the same wealth rank percentile group as the parents.

6 Estate Tax Policy Reforms

In this section, we examine the effects of potential estate tax reforms by varying the marginal estate tax rate in the calibrated model. To assess the role of the ICR in shaping the effects of estate taxation, we conduct the same policy experiments in both the benchmark economy and an alternative economy without the ICR. In the remainder of this section, we present two versions of the results corresponding to different approaches to government budget adjustment: one in which the budget is not balanced, and another in which it is balanced by adjusting the capital income tax rate.[25]

6.1 No adjustments in other taxes

The first reform experiment varies the marginal estate tax rate while holding other taxes constant to maintain a balanced government budget. Since a higher estate tax lowers the return to leaving bequests for sufficiently wealthy households who make active bequests, both their bequest motives and savings incentives decline substantially. Additionally, children from wealthy families receive smaller transfers early in life. Although all households are negatively affected by the higher estate tax, the welfare losses are larger for wealthy households than for poorer ones. Consequently, as shown in Figure 3, wealth inequality, aggregate outcomes, and welfare (measured by ex-ante consumption equivalent variation, CEV) all decline as the estate tax increases.[26] To evaluate the role of the ICR in shaping the effects of estate tax reforms, we also recalibrate an alternative economy without ICR using the same calibration strategy as in the benchmark economy. We refer to this as the NICR economy.[27] We find that the magnitudes of the reform effects differ between the benchmark and NICR economies.

The percentage change in the Gini index is larger in the benchmark economy than in the NICR economy.[28] Eliminating the estate tax increases the Gini index by 4.05% in the

[25]We also study alternative scenarios in which other forms of taxation are used to balance the government budget. The results from these cases are reported in Appendix B.4.

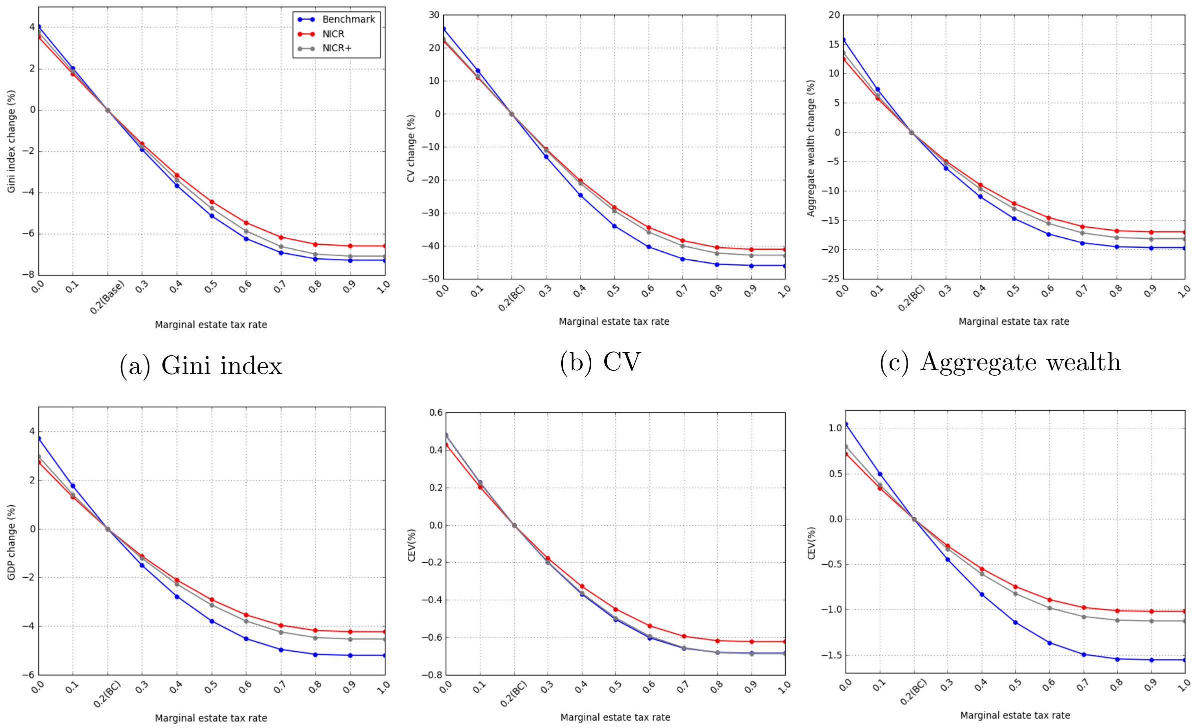
[26]Following Jones and Li (2018), the CEV in each economy is calculated as

$$100\% \times \left(\left(\frac{\text{Lifetime utility}_{\text{reform}} - \text{utility from bequests}_{\text{tax}=0.2}}{\text{Lifetime utility}_{\text{tax}=0.2} - \text{utility from bequests}_{\text{tax}=0.2}} \right)^{\frac{1}{1-\sigma}} - 1 \right)$$

[27]The NICR is different from the No ICR economy in the last section, where we shut down ICR without recalibrating the economy.

[28]The additional calibration results are reported in Table A10.

Figure 3: Effects of reforming estate taxation without adjustments to other taxes



(a) Gini index

(b) CV

(c) Aggregate wealth

(d) GDP

(e) CEV

(f) CEV-$f = 5$

benchmark economy, compared with 3.54% in the NICR economy. Conversely, setting the marginal estate tax rate to 100% reduces the Gini index by 7.28% in the benchmark economy, exceeding the corresponding decline of 6.60% in the NICR economy.

The ICR amplifies the effect of estate tax reforms mainly because the distribution of bequests in the NICR economy differs from that in the benchmark economy. First, the ICR generates inequality in received bequests across agents with different fixed effects, making estate tax reforms more effective in targeting agents with the highest fixed effects in the benchmark than in the NICR. When the estate tax increases from 20% to 100%, their average inheritance declines from 2.63 to 1.34; however, in the NICR, it declines from 1.52 to 0.86.[29] As a result, high-fixed-effect agents experience a larger reduction in inheritance in the benchmark economy. Correspondingly, when the estate tax rate is set at 100%, their CEV equals -1.56% in the benchmark economy, compared with -1.02% in the NICR economy.

Second, the distribution of bequests is more unequal in the benchmark economy than in the NICR economy. Consequently, the benchmark economy contains a larger volume of taxable bequests, so changes in the estate tax rate affect a broader tax base. To isolate this channel, we construct an alternative economy, denoted NICR+, in which taxable bequests are kept at the benchmark level while the marginal estate tax rate varies.[30]

[29]Setting the estate tax at 100% will not eliminate all bequests, because bequests below the exemption level are not taxed.

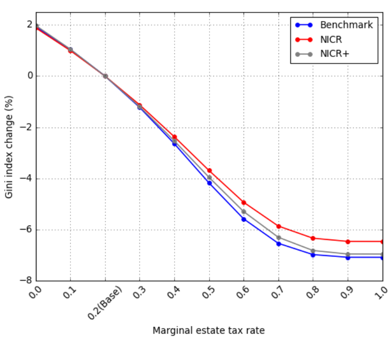
[30]In the NICR+ economy, the estate tax exemption is calibrated to match the benchmark economy's ratio of estate tax revenue to GDP. The other parameters are calibrated in the same way as in the benchmark. The calibration results are shown in Table A10.

After controlling for this channel, the differences in reform effects shrink substantially, particularly for the Gini index and aggregate welfare.

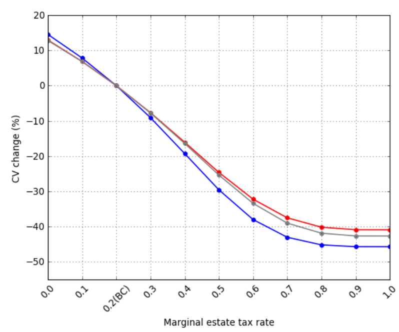
6.2 With capital income tax adjustments

Figure 4 presents the results of estate tax reforms accompanied by adjustments in the capital income tax rate to balance the government budget. As the estate tax rate increases from 0 to 100%, wealth inequality and aggregate outcomes both decline, despite the accompanying reduction in the capital income tax rate. Raising the estate tax rate reduces the return to leaving bequests, while the associated decline in the capital income tax rate increases the return to savings. Within the framework, particularly for wealthy households, the former effect dominates the latter. As a result, both wealth inequality and aggregate wealth accumulation decline. It is worth noting that once the estate tax rate exceeds 50%, further increases in the rate actually reduce estate tax revenue because taxable bequests become sufficiently small. Consequently, as shown in Figure A1, the capital income tax rate must be raised to maintain budget balance, thereby further reducing both wealth inequality and aggregate wealth accumulation.

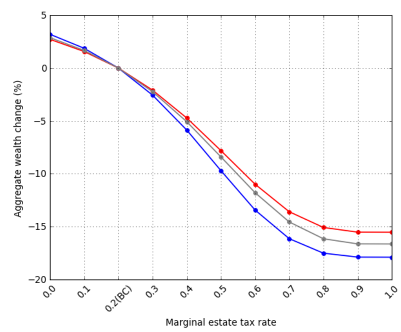
Figure 4: Effects of reforming estate taxation with adjustments to the capital income tax.



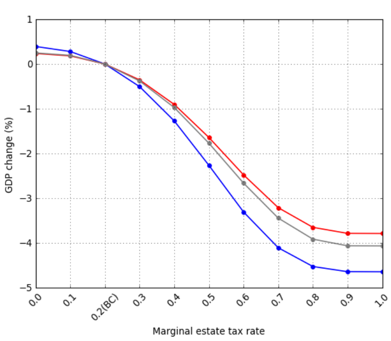
(a) Gini index



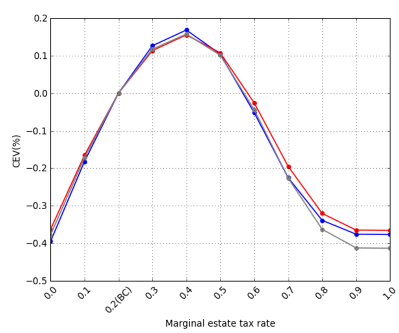
(b) CV



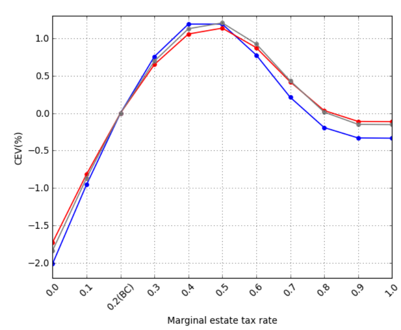
(c) Aggregate wealth



(d) GDP



(e) CEV



(f) CEV-$f = 5$

Note: In each type of economy, we keep the ratio of total tax revenue to GDP fixed across all reforms. The ratios in the benchmark, NICR, and NICR+ economies are 19.848%, 19.777%, and 19.798%, respectively. When the estate tax is reduced, the capital income tax is adjusted upward to balance the government budget.

Increasing the estate tax rate from 0 to 40% improves overall welfare, whereas further increases beyond 40% reduce welfare. Agents with low fixed effects are largely unaffected, as they typically have neither substantial capital income nor significant bequests. For agents with higher return types, raising the estate tax rate from 0 to 40% still leaves the return to bequests sufficiently high for them to maintain strong saving incentives. In this range, the accompanying reduction in the capital income tax rate increases their capital income and improves consumption smoothing, thereby enhancing their welfare. When the estate tax rate rises from 40% to 50%, aggregate welfare begins to decline. In this interval, only agents with the highest fixed effects benefit meaningfully from the lower capital income tax rate. In contrast, most other agents are affected primarily by the reduction in inheritance. Once the estate tax rate exceeds 50%, welfare declines across all return types, as both the estate tax rate and the capital income tax rate increase.

Consistent with the above results, estate tax reforms in an economy with the ICR generate larger effects on inequality and aggregate outcomes than in economies without such a correlation. An interesting finding is that the differences in the effects are relatively small when the estate tax rate is reduced. As shown in Figure A1, when the rate is set to zero, the capital income tax rate rises from 0.266 to approximately 0.300 in all economies. In the benchmark economy, high-return-type agents receive a larger increase in inheritance when the estate tax is eliminated, but the higher capital income tax limits their wealth accumulation. Thus, the differences in effects are less pronounced. Additionally, they suffer a greater welfare loss in the benchmark economy due to higher capital income tax payments. As the estate tax rate rises, the differences in effects become more pronounced, primarily because lower capital income tax rates amplify the effect of inheritance on wealth accumulation.

7 Conclusion

We examine the implications of the ICR for wealth inequality, intergenerational mobility, and estate taxation. First, we document that rates of return on wealth among U.S. households are both heterogeneous and intergenerationally correlated. Specifically, a 10-percentile increase in the father's return rank is associated with a 2.8-percentile increase in the child's return rank. We then incorporate the ICR into a dynamic macroeconomic model and quantitatively evaluate its effects on wealth inequality, intergenerational mobility, and estate taxation.

We find that the ICR contributes significantly to wealth inequality, particularly by increasing the thickness of the right tail of the wealth distribution. We also show that the ICR increases the intergenerational persistence of wealth, thereby reducing intergenerational mobility. This effect is especially pronounced among households at the top of the wealth distribution. Moreover, we find that the ICR has important implications for the effects of estate tax reforms. In particular, the ICR amplifies both the distributional and aggregate effects of estate taxation. Our findings, therefore, suggest that models that omit the ICR may underestimate the impact of estate tax reforms.

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A Additional empirical results

Table A1: Summary statistics of return rates across demographic groups

Statistics	Mean	St.Dev.	P10	Median	P90	N
Education:						
LTHS	0.024	0.063	-0.021	0.009	0.080	3,148
HSG	0.030	0.068	-0.021	0.024	0.088	15,045
CLG	0.039	0.071	-0.022	0.033	0.105	12,430
Race:						
White	0.034	0.070	-0.022	0.028	0.095	27,823
Black	0.018	0.055	-0.015	0.000	0.059	2,067
Others	0.036	0.078	-0.026	0.027	0.099	733
Age groups:						
25-34	0.030	0.075	-0.015	0.013	0.090	6,314
35-44	0.034	0.073	-0.021	0.026	0.093	7,397
45-54	0.032	0.068	-0.030	0.029	0.097	6,967
55-64	0.033	0.064	-0.023	0.031	0.093	6,049
64+	0.037	0.059	-0.011	0.036	0.092	3,896
Labor force:						
In LF	0.033	0.071	-0.022	0.026	0.096	24,619
Out of LF	0.032	0.060	-0.017	0.030	0.088	6,004
Marital Status:						
Married/Cohab.	0.034	0.070	-0.025	0.030	0.096	22,374
Others	0.029	0.067	-0.008	0.015	0.088	8,249

Note: All of the above categories refer to the representative individual.

Table A2: Additional regression results

	Real estate	**Stock**	**Business**	**Capital**	**Yield**	**Gross**
Log wealth	0.6597***	-0.1062***	-0.1230***	-0.5867***	2.0578***	3.1064
	(0.0193)	(0.0113)	(0.0108)	(0.1912)	(0.3598)	(2.1373)
(Log wealth)^2	-0.0277***	0.0061***	0.0067***	0.0424***	-0.1194***	-0.2240
	(0.0009)	(0.0005)	(0.0005)	(0.0088)	(0.0162)	(0.1920)
(Log wealth)^3						0.0043
						(0.0057)
Age	0.0087	-0.0017	-0.0010	0.0267	0.1272	0.1561
	(0.0057)	(0.0031)	(0.0027)	(0.0688)	(0.1144)	(0.1319)
Age^2/100	-0.0104***	0.0018**	-0.0019***	0.0457***	-0.0666**	-0.0235
	(0.0014)	(0.0008)	(0.0007)	(0.0132)	(0.0279)	(0.0310)
Labor force	0.0150**	-0.0109***	0.0102***	0.1953***	0.0405	0.2353*
	(0.0060)	(0.0039)	(0.0027)	(0.0674)	(0.1074)	(0.1269)
Married	0.0706***	-0.0171***	-0.0088**	-0.0419	0.1546	0.1196
	(0.0087)	(0.0048)	(0.0038)	(0.0851)	(0.1717)	(0.1932)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	30,623	30,623	30,623	30,623	30,623	30,623
Adjusted R^2	0.5268	0.4916	0.4833	0.5572	0.2011	0.3483
p-value: year effects = 0	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
p-value: FE = 0	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001

Note: The dependent variables in the first three columns are the shares of real estate, stocks, and businesses in total wealth. The dependent variables in the last three columns are the capital gain component, the yield income component, and the gross return rate, all multiplied by 100. Standard errors (in parentheses) are clustered at the household representative individual level. $^{*}p \leq 0.10,^{**} p \leq 0.05,^{***} p \leq 0.01$

Table A3: Summary statistics of fathers and children

	Child		**Father**	
Statistics	**Mean**	**St.Dev.**	**Mean**	**St.Dev.**
Wealth	342699.92	970394.22	645837.10	1621740.60
Return	0.035	0.040	0.034	0.034
Capital comp.	0.018	0.019	0.015	0.016
Yield comp.	0.017	0.034	0.019	0.029
Birthyear mean	1970.89		1944.88	
Birthyear median	1972		1947	
Birthyear St.Dev.	10.87		10.86	
Education(%):				
LTHS	6.02		15.44	
HSG	46.41		48.88	
CLG	47.57		35.69	
Race(%):				
White	95.20		94.79	
Black	3.07		3.27	
Others	1.74		1.94	

Note: The statistics for wealth, returns, and the capital gain and yield income components refer to the mean and standard deviation of the main-sample averages for fathers and children. For example, for wealth, we report the mean and standard deviation of average wealth in the main sample. There are 1,728 children and 978 father households, respectively.

Table A4: Regression results for intergenerational correlations: Sons and daughters

	Average rates		**Fixed effects**	
	Son	Daughter	Son	Daughter
Father's perc.	0.1774***	0.1589***	0.2497***	0.3217***
	(0.0333)	(0.0334)	(0.0326)	(0.0313)
Observations	878	850	878	850
R^2	0.0313	0.0258	0.0650	0.1103

Note: Son and Daughter columns show Father-Son and Father-Daughter intergenerational correlations, respectively. Robust standard errors are in parentheses. $^{*}p \leq 0.10,^{**}p \leq 0.05,^{***}p \leq 0.01$

Table A5: Intergenerational correlations of yield income and capital gain components

	Yield income component					
	Average yield income components			**Fixed effects**		
	Child	Son	Daughter	Child	Son	Daughter
Father's perc.	0.1796***	0.2014***	0.1561***	0.3052***	0.2914***	0.3200***
	(0.0252)	(0.0352)	(0.0361)	(0.0232)	(0.0329)	(0.0328)
Observations	1,728	878	850	1,728	878	850
R^2	0.0308	0.0392	0.0229	0.0955	0.0873	0.1048
	Capital gain component					
	Average capital gain components			**Fixed effects**		
	Child	Son	Daughter	Child	Son	Daughter
Father's perc.	0.0882***	0.0779**	0.1013***	0.2590***	0.2316***	0.2854***
	(0.0236)	(0.0338)	(0.0331)	(0.0226)	(0.0321)	(0.0321)
Observations	1,728	878	850	1,728	878	850
R^2	0.0079	0.0061	0.0106	0.0683	0.0551	0.0821

Note: Robust standard errors are in parentheses. $^{*}p \leq 0.10,^{**} p \leq 0.05,^{***} p \leq 0.01$

Table A6: Intergenerational correlation of returns: Age 25-45

	Gross		Yield		Capital	
	Average	FE	Average	FE	Average	FE
Father	0.2188***	0.3327***	0.1945***	0.3718***	0.1090**	0.0856*
	(0.0476)	(0.0454)	(0.0482)	(0.0452)	(0.0490)	(0.0483)
Obs	419	419	419	419	419	419
R^2	0.0476	0.1127	0.0396	0.1426	0.0119	0.0073

Note: All measures are calculated using observations of parents and children aged 25–45. Robust standard errors are in parentheses. $^{*}p \leq 0.10,^{**} p \leq 0.05,^{***} p \leq 0.01$

Table A7: Intergenerational correlation of asset ownership

	Stock		Business		Real Estate	
	(1)	(2)	(3)	(4)	(5)	(6)
Father	0.2925***	0.3391***	0.1113***	0.1287***	0.1724***	0.1440***
	(0.0230)	(0.0282)	(0.0265)	(0.0323)	(0.0504)	(0.0279)
Obs	1,728	1,728	1,728	1,728	1,728	1,728
R^2	0.0829	0.1103	0.0176	0.0202	0.0092	0.0151

Note: Columns (1), (3), and (5) refer to ownership indicator regressions, that is, whether a household in the main sample owns a specific asset for at least one period. For example, column (1) shows that if the father's household owns stocks for at least one period, the child household is 29 percentage points more likely to own stocks for at least one period than child households whose fathers do not own stocks. Columns (2), (4), and (6) refer to regressions using the average asset share over the main sample period. The coefficient in column (2) shows that a 1 percentage point increase in the father's average stock share is associated with a 0.34 percentage point increase in the child's average stock share. Robust standard errors are reported in parentheses. $^{*}p \leq 0.10,^{**} p \leq 0.05,^{***} p \leq 0.01$

B Additional Details of the Quantitative Analysis

B.1 Algorithm

The steps of the solution algorithm are as follows:

1. For each type of agent, solve for $V(t, z, \xi, f, v_r, a)$ as well as the consumption and savings decisions recursively, starting from the final period T and going back to the first period.

2. Guess the population distribution of the youngest agents ($t = 1$). More specifically, their distributions of labor productivity, labor shocks, fixed effects, and return shocks are computed according to the corresponding (intergenerational) transition matrices. Their wealth distributions are guessed.

3. Generate the population distributions for the remaining agents ($t = 2...T$) based on the consumption and savings decisions, the earnings-shock transition matrix, and the return-shock transition matrix.

4. We obtain the bequest distribution of the oldest agents ($t = T$). Since children's initial wealth, labor productivity, and fixed effects are inherited from their parents, we obtain a new distribution for the youngest agents. If the new distribution is consistent with the guessed population distribution in Step 2, then we are done. If not, we update our guess of the population distribution of the youngest agents and come back to Step 2, until the dynamics converge.

B.2 Additional calibration results

Table A8: Intergenerational transition matrix of labor productivity

	Labor productivity values					
State	1	2	3	4	5	6
	0.3313	0.5154	0.8018	1.2473	1.9403	3.0184
	Intergenerational transition matrix					
	Children					
Parents	1	2	3	4	5	6
1	13.76%	36.24%	36.24%	12.31%	1.40%	0.05%
2	6.33%	26.79%	41.24%	21.59%	3.81%	0.23%
3	2.48%	16.66%	39.50%	31.84%	8.70%	0.82%
4	0.82%	8.70%	31.84%	39.50%	16.66%	2.48%
5	0.23%	3.81%	21.59%	41.24%	26.79%	6.33%
6	0.05%	1.40%	12.31%	36.24%	36.24%	13.76%
	Stationary distribution					
State	1	2	3	4	5	6
	2.34%	13.69%	33.97%	33.97%	13.69%	2.34%

Table A9: Intergenerational transition matrix of fixed effects

	Fixed effect values				
State	1	2	3	4	5
	-0.0263	-0.0019	0.0114	0.0312	0.0859
	Intergenerational transition matrix				
	Children				
Parents	1	2	3	4	5
1	59.03%	13.62%	12.76%	7.35%	7.24%
2	44.63%	17.36%	19.01%	10.33%	8.68%
3	42.02%	14.71%	14.71%	15.97%	12.61%
4	33.77%	20.13%	21.43%	11.04%	13.64%
5	34.32%	15.38%	15.98%	14.79%	19.53%
	Stationary distribution				
State	1	2	3	4	5
	49.15%	15.20%	15.22%	10.25%	10.18%

Table A10: Calibration results for the NICR and NICR+ economies

Parameters	**Description**	**Values**	
Preference		NICR	NICR+
β	Time discount	0.9968	0.9967
χ	Bequest motive	173	182
b_o	Bequest luxury	99.5	103
Returns			
α_r	Return constant	-0.0295	-0.0295
Tax system			
x_b	Estate tax exemption	21.17	19.40

Note: Values of all other variables not listed in the table are the same as in the benchmark model and are shown in Table 4.

B.3 Additional quantitative results

Table A11: Bequests and wealth by labor productivity: Benchmark vs. Experiment

	Panel A: Average received bequests					
Labor productivity (z)	1	2	3	4	5	6
Benchmark	0.564	0.821	1.196	1.749	2.527	3.625
No ICL	1.517	1.517	1.517	1.517	1.517	1.517
	Panel B: Average wealth					
Labor productivity (z)	1	2	3	4	5	6
Benchmark	1.026	1.522	2.284	3.491	5.588	9.355
No ICL	1.688	2.001	2.501	3.332	4.906	7.951

Note: The values of labor productivity (z) increase as the numbers rise, so agents with $z = 6$ have higher labor productivity than those with $z = 1$. All numbers in the table are normalized by the average pre-tax labor income.

Table A12: Average capital income by distributions: Benchmark vs. Experiment

		Capital income distributions							
	CV	Q1	Q2	Q3	Q4	Q5	Top 10	Top 5	Top 1
Benchmark	6.520	-0.114	0.002	0.009	0.051	0.630	1.093	1.813	5.036
No ICR	5.500	-0.107	0.002	0.009	0.050	0.541	0.921	1.485	3.811
No ICL	6.317	-0.113	0.002	0.009	0.051	0.625	1.082	1.787	4.897

Note: All numbers in the table are normalized by the average labor income.

Table A13: Intergenerational social mobility: Benchmark vs. Experiments (%)

Parents	Children							
	0 − 20	20 − 40	40 − 60	60 − 80	80 − 90	90 − 95	95 − 99	99 − 100
0 − 20	24.43	22.22	21.20	19.43	8.21	2.86	1.54	0.11
	(23.12)	(21.39)	(21.59)	(19.88)	(8.64)	(3.24)	(1.84)	(0.30)
	[22.95]	[21.72]	[20.91]	[20.01]	[9.16]	[3.25]	[1.88]	[0.12]
20 − 40	22.68	21.99	20.35	20.76	8.79	3.48	1.76	0.19
	(22.05)	(21.66)	(20.42)	(20.66)	(9.15)	(3.53)	(2.21)	(0.32)
	[22.14]	[21.84]	[20.45]	[20.76]	[8.84]	[3.66]	[2.10]	[0.21]
40 − 60	21.67	21.76	20.97	20.32	9.56	3.80	1.77	0.15
	(21.76)	(21.77)	(20.91)	(19.97)	(9.40)	(3.78)	(2.19)	(0.22)
	[22.06]	[21.46]	[21.39]	[19.98]	[9.53]	[3.62]	[1.85]	[0.11]
60 − 80	20.07	20.85	21.82	20.14	10.37	4.14	2.43	0.18
	(20.75)	(21.52)	(20.71)	(20.28)	(9.79)	(4.01)	(2.65)	(0.29)
	[20.64]	[21.27]	[21.42]	[20.16]	[9.83]	[4.11]	[2.38]	[0.19]
80 − 90	15.44	18.42	20.34	24.20	12.44	5.78	3.18	0.20
	(16.98)	(18.84)	(20.90)	(22.88)	(11.50)	(5.66)	(2.70)	(0.54)
	[16.88]	[19.26]	[20.66]	[23.50]	[11.54]	[5.00]	[2.90]	[0.26]
90 − 95	9.40	10.56	13.96	20.88	18.80	16.24	9.16	1.00
	(9.88)	(11.44)	(15.28)	(21.88)	(19.80)	(13.52)	(7.12)	(1.08)
	[10.00]	[10.60]	[14.48]	[20.72]	[19.20]	[15.84]	[8.40]	[0.76]
95 − 99	5.15	6.30	9.20	9.00	9.40	17.60	33.85	9.50
	(6.25)	(6.40)	(9.15)	(10.00)	(10.25)	(19.55)	(31.50)	(6.90)
	[5.90]	[6.85]	[8.40]	[9.55]	[9.25]	[18.05]	[33.00]	[9.00]
99 − 100	1.00	1.40	3.20	4.60	5.40	5.00	37.00	42.40
	(2.20)	(2.00)	(5.40)	(6.00)	(5.40)	(6.40)	(33.60)	(39.00)
	[1.80]	[1.20]	[4.00]	[5.00]	[4.40]	[5.80]	[32.80]	[45.00]

Note: Numbers without parentheses or square brackets report social mobility in the Benchmark economy, numbers in parentheses report social mobility in the No ICR economy, and numbers in square brackets report social mobility in the No ICL economy.

B.4 Additional estate tax reform results

Figure A1: Capital income tax adjustments corresponding to estate tax reform.

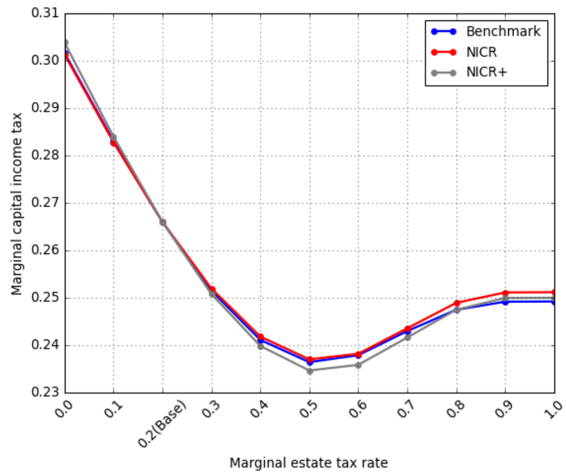


Figure A2: Labor income tax adjustments corresponding to estate tax reform

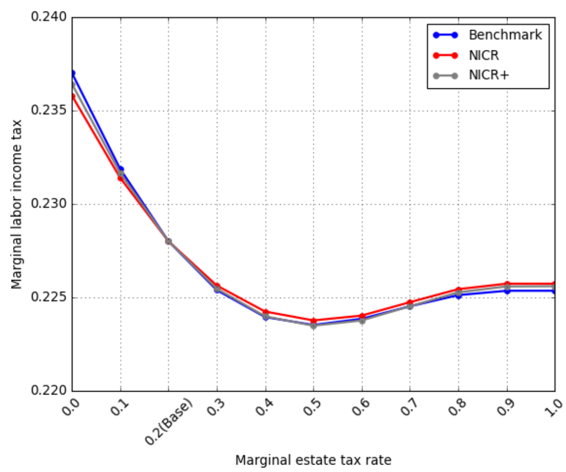


Figure A3: Lump-sum tax adjustments corresponding to estate tax reform.

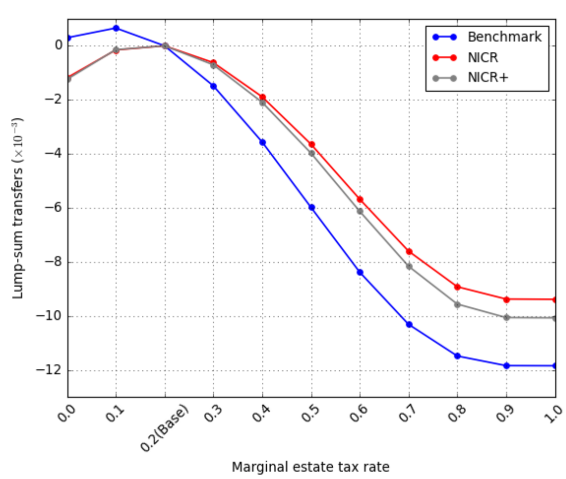
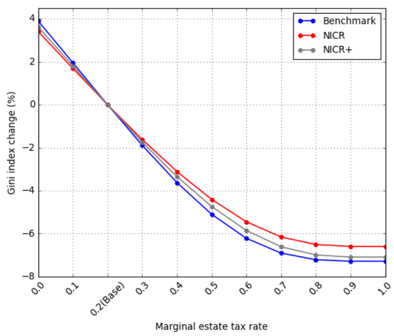
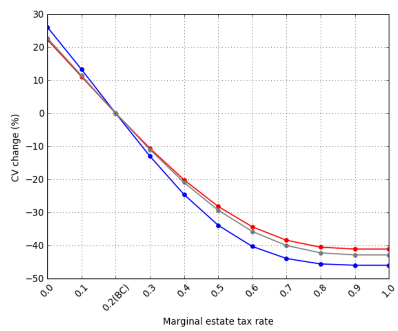


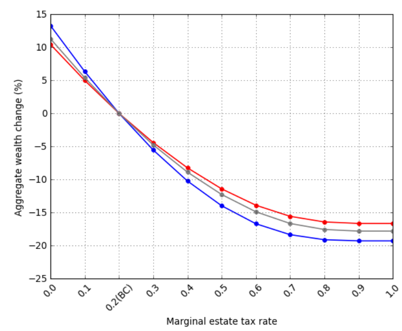
Figure A4: Effects of reforming estate taxation with adjustments in the labor income tax.



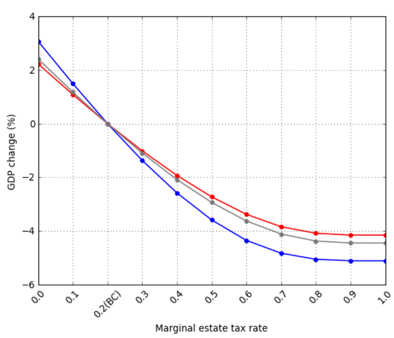
(a) Gini index



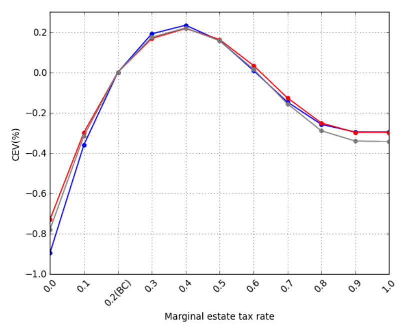
(b) CV



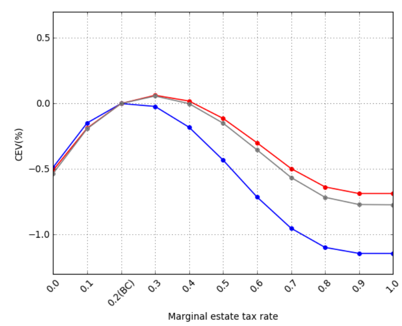
(c) Aggregate wealth



(d) GDP

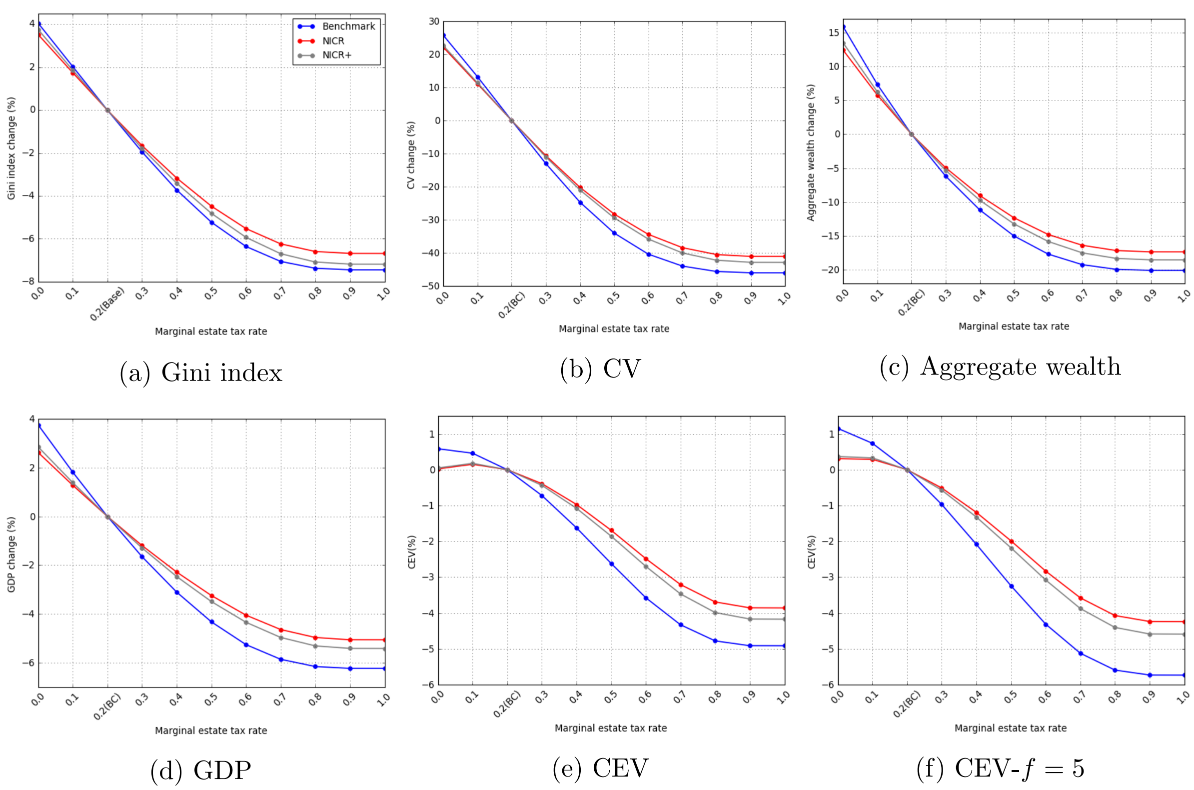


(e) CEV



(f) CEV-$f = 5$

Figure A5: Effects of reforming estate taxation with adjustments in the lump-sum tax.



(a) Gini index

(b) CV

(c) Aggregate wealth

(d) GDP

(e) CEV

(f) CEV-$f = 5$

Note: The level of government purchases is fixed at 0.273831, 0.270933, and 0.271201 units for the benchmark, NICR, and NICR+ economies, respectively. Any increase (reduction) in tax revenue generated through estate tax reforms is redistributed to all agents through a lump-sum transfer (tax).