Intergenerational Transmission of Family Influence

APPENDIX*

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A Data Description

This appendix presents the data sources for the empirical analysis in the paper and describes the analysis sample used in this study. It also discusses our imputation procedure for missing life-cycle data.

A.1 Data Sources

Danish Administrative Registers. For the empirical analysis in this paper, we use Danish register data.\(^1\) The register data include unique individual identifiers allowing us to link individuals across years from 1980 to 2019 (the last year of data availability). In addition, the data also include unique individual identifiers of spouses and parents allowing us to link families across generations.

Using the individual identifiers we link data from registers containing educational attainment (UDDA register), income, assets, transfers, homeownership (IND register), house prices (IND and EJSA registers), marital status, and fertility (BEF register) for each individual and his/her spouse and parents. These same identifiers allow us to link data containing information on educational attainment, income, assets, transfers, homeownership, house prices, marital status, and fertility for each individual and their spouse (and their parents).

Danish Household Expenditure Survey. To construct a consumption measure, we also make use of the Danish Household Expenditure Survey, which is a conventional diary based survey of expenditures within the household, collected by Statistics Denmark (Browning et al., 2021), which provides detailed information on various categories of consumption expenditures for a rotating sample of individuals between 1995 and 2012. We link the survey data to the administrative register information using individual unique identifiers.

Danish Longitudinal Survey of Children (DALSC). We also make use of the Danish Longitudinal Survey of Children born in 1995 (DALSC), which includes a representative group of over 6,000 children among all children born in Denmark in 1995 (around 70,000).\(^2\) These children and their parents were interviewed during five waves, from 1996 (6 months), 1999 (3 years), 2003 (7 years), 2007 (11 years) and 2011 (15 years), and 2014 (18 years old). We use information on children’s cognitive tests completed in different waves of the survey.\(^3\) The survey provides us with a measure of behavioral problems (Strengths and Difficulties

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\(^1\)For details, see [http://www.dst.dk/en](http://www.dst.dk/en).

\(^2\)The children in the survey were born between September 15 and October 31, 1995.

Questionnaire (SDQ test) at age 11 and a measure of child’s cognitive ability (Raven’s matrices) at age 15. We link the survey data to the administrative register information using individuals’ unique identifier.

A.2 Analysis Sample

In Section 4.3 of the paper, we present correlations between different measures of parental resources (i.e., wage income, disposable income, income with transfers, income without transfers, consumption, expected and realized lifetime wealth, expected and realized PDV) with the following child outcomes: birth weight, behavioral problems (SDQ), Raven test score, 9th-grade leaving exam grades in mathematics, 9th-grade leaving exam grades in Danish reading, college degree, ever committed a crime, years of schooling by age 30, and homeownership by age 30. Our main analysis sample is the 1981–1982 birth cohort. However, some of these outcomes are not observed for the 1981–1982 birth cohort. Therefore, we use the 1995–1997 birth cohort to analyze the influence of measures of parental resources on the birth weight, behavioral problems, Raven test score, 9th-grade leaving exam grades in mathematics, and 9th-grade leaving exam grades in Danish reading using this alternative sample. In what follows, we describe these two samples.

1981–1982 Cohort. We base our analysis of IGEs and intergenerational correlations on the sample of children born in 1981–1982 for whom we can establish a link to parents, whose parents did not migrate and who did not migrate themselves. We observe the birth cohorts of 1981 and 1982 from birth to age 38 and 37, respectively (in 2019). We have information on their parents in all years between 1980 and 2019.

For the IGE analysis in the paper, our log-log specification excludes individuals with zero or negative average income for the age range over which we measure their income and individuals with average income more than four standard deviations above or below the mean. In addition, we exclude individuals whom we observe for less than three years between age 30 and 35 (i.e., at least three non-missing observations). We start with a sample of 105,953 individuals who did not migrate and whose parents did not migrate for whom we can establish links with their parents. This reduces to 100,344 when dropping negative values and zeroes, and this reduces further down to 98,686 when we drop those children with fewer than three observations.

1995–1997 Cohort. We use the sample of children born in 1995–1997 for whom we can establish a link to parents, whose parents did not migrate, and who did not themselves migrate.
We have an initial sample of 209,603 child-parent pairs.\(^4\) After applying the additional selection rules described above, we end up with a sample size of 185,710. We observe the birth cohorts of 1995–1997 from birth to age 22–24 in 2019. It follows that we observe their parental resources during the whole childhood period and beyond (from age 0 to 22 for the 1997 cohort and from age 0 to 24 for the 1995 cohort).

### A.3 Imputation of Consumption

In order to estimate the stochastic discount factor, \(s_{i,t}\), in Equation (B.3), we use the ratio of marginal utilities of consumption. In practice, this becomes

\[
s_{i,t+1} = \mathbb{E}_{i,t} \left[ \beta \frac{U(c_{i,t+1})}{U(c_{i,t})} \mid I_{i,t} \right] = \mathbb{E}_{i,t} \left[ \beta \left( \frac{c_{i,t+1}}{c_{i,t}} \right)^{-\rho} \mid I_{i,t} \right],
\]

The SDF \(s_{i,t}\) is sensitive to individuals’ consumption growth. Classical methods estimate consumption use from panel data surveys. There is often a tradeoff in these surveys with respect to the amount of details provided and the length of the period over which the survey is conducted. Additionally, these data end up being available often only for a small subsample of individuals.

Another method has been applied to leverage changes in individuals assets and income to estimate individual level consumption data (Browning and Leth-Petersen, 2003). As detailed below, this method requires data on capital gains, which are measured with uncertainty. Due to this, there can be higher levels of measurement error, which makes this difficult to use for capturing individual level growth reliably.

**Survey Consumption.** The Danish Expenditure survey is conducted through a comprehensive interview, where households are asked about purchases of durables within the past twelve months from the interview date. It is comprised primarily of the following components: food and beverages, clothing, housing, electricity and heating, household services, medical products and services, transport, communications, recreatioinal equipment, entertainment and travel, and other goods and services. The survey is conducted through contacting households at different times of the year to have the observations distributed across the calendar year. Furthermore, each household is asked to keep a diary for two weeks, to get a record all expenditures in the household. This is then scaled to get an expression of annual consumption.

\(^4\)Note that birth cohorts in the 1980s were smaller than those in the 1990s.
Accounting Method of Consumption. As suggested by Browning and Leth-Petersen (2003), we start by the identity of purchases and revenues in period $t$ for a given individual:

$$c_t + \sum_k p_{k,t} A_{k,t} \equiv \left( y_t + \sum_k i_{k,t} A_{k,t-1} - \tau_t \right) + p_{k,t} A_{k,t-1}$$  \hspace{1cm} \text{(A.1)}

$$= y_t + p_{k,t} A_{k,t-1},$$ \hspace{1cm} \text{(A.2)}

where $c_t$ denotes consumption expenditures in year $t$ for a given individual, $y_t$ is the individual’s earnings including transfers, $-\tau_t$ is the amount of tax paid by the individual, $\{A_k\}$ denotes the portfolio of assets that the individual holds at the beginning of the period (assumed to be held throughout the period and may be sold out at that time), and $\sum_k i_{k,t} A_{k,t-1}$ is the returns on the portfolio. The first term on the right side in this equation is the disposable income. After rearranging terms and solving for consumption:

$$c_t = y_t - \sum_k (W_{k,t} - W_{k,t-1}) + \sum_k (p_{k,t} - p_{k,t-1}) A_{k,t-1},$$ \hspace{1cm} \text{(A.3)}

where $W_{k,s} = p_{k,s} A_{k,s}$ for $s \in \{t, t-1\}$ is the value of asset $k$ in the portfolio of individual at the end of period $s$. Define total wealth $W_s = \sum_k W_{k,s}$

$$c_t = y_t - (W_t - W_{t-1}) + \sum_k (p_{k,t} - p_{k,t-1}) A_{k,t-1}$$ \hspace{1cm} \text{(A.4)}

The last term in the last equation is the (unrealized) capital gain of the portfolio of assets at the end of period $t$. If there is no change in the price of asset $A_k$ in period $t$, i.e., no capital gain, then $(p_{k,t} - p_{k,t-1}) A_{k,t-1}$ would be zero. Equation (A.4) implies that in a given period $t$, if the capital gain is zero, then consumption expenditures can be obtained by subtracting observed changes in wealth during period $t$ from the realized disposable income. In case of a non-zero capital gain, we need to adjust for capital gain on each asset held throughout period $t$. The portfolio vector of assets, $A_t$ in equation above, consists of different types of assets including cash holdings, stock shares, and property values. When imputing consumption using Equation (A.4), one needs to take into account capital gains for stock shares and property values.

In practice, imputed consumption based on the accounting method produces volatile individual consumption profiles. This is due to a combination of the many changes in definitions of disposable income and assets, changes in household structure, the purchase of durables, idiosyncratic reporting to tax authorities, and updates to methods at Statistics Den-
mark for imputing rental and property values.

**Main Consumption Measure.** We impute total household expenditures from the relationship between total expenditures from Danish Expenditure Survey and the components of individuals consumption as discussed in the accounting measure: household disposable income and net assets in periods $t$ and $t-1$.

For the prediction, we use a random forest estimator with the number of trees selected by 5-fold cross-validation.

$$
\hat{\tau}_{rf}(x) = \frac{1}{B} \sum_{b=1}^{B} T(x, \{X_i, Y_i\}_i)
$$  \hspace{1cm} (A.5)

$$
Y_i = \text{Survey Cons}_t
$$  \hspace{1cm} (A.6)

$$
X_i = A_t, A_{t-1}, L_t, L_{t-1}, Y_t, Y_{t-1}
$$  \hspace{1cm} (A.7)

The random forest estimator proceeds by taking random samples from the training sample and predicting the relationship between the $X_i$ and $Y_i$ within these random splits, by recurrently splitting the sample into two daughter nodes and fitting the data via regression on each of these nodes and then averaging the $T_i(x)$. The $B$ is chosen through five-fold cross-validation, where the data is randomly split into 20%–80% training-validation sample and the estimation error is evaluated on the fitted model as the number of trees is increased until it is below a critical point.

We use household disposable income, $Y$, assets, $A$, and liabilities, $L$ in periods $t$ and $t-1$ to predict the total household consumption as reported in the Danish Expenditure survey. We then use household disposable income, assets and liabilities in the current and previous periods for the entire population to create a measure of predicted consumption. The correlation with the predicted consumption using the random forest estimator and the observed consumption in the Danish Expenditure Survey using a 20% training sample split is 0.95. We use equivalence scales for consumption to adjust for household composition.

**A.3.1 Performance and Statistics**

We split the data randomly into training (20%) and testing (80%) samples to measure the performance of the random forest predictor. Overall, we get a correlation of 0.95 with our imputed measure and the Danish Expenditure Survey data within our testing sample.
**Figure A.1:** Mean Consumption, Imputed vs. Survey Measure of Consumption

Notes: This figure shows the mean consumption, in 2010 USD, by age for the Survey Imputed Measure of consumption for households and for the total household consumption as reported by the Danish Expenditure Survey. The observations are from all individuals observed in the Danish Expenditure Survey between ages 25 and 70.
Figure A.2: Comparison of Imputed and True (Survey) Consumption

Notes: This figure shows a scatter plot of the household true (survey) consumption as reported in the Danish Expenditure Survey against the consumption measure we impute from the relationship between total expenditures from Danish Expenditure Survey and the components of individuals consumption as discussed in the accounting measure: household disposable income and net assets in periods $t$ and $t-1$ as discussed in Section A.3. The observations are from the testing sample, based on a 20% random sample of the individuals observed in the Danish Expenditure Survey between ages 25 and 70.
A.4 Summary Statistics

Tables A.1–A.3 provide summary statistics on our seven main measures of resources for the different generations and gender groups. Table A.4 presents the correlations across all measures of family resources (the sum of the mother’s and father’s resources). Tables A.5–A.7 present the correlations across all measures of resources for the sample of children. Figure A.3 presents the correlations between the expected lifetime measures (i.e., the expected PDV and expected lifetime wealth) and their realized counterparts by age. Table A.8 presents the Gini coefficients for all measures of resources. Inequality in lifetime wealth closely resembles inequality in disposable income. For ease of comparison this analysis is limited to family-level estimates of inequality.

Table A.1: Summary Statistics

<table>
<thead>
<tr>
<th></th>
<th>Male children mean</th>
<th>Female Children mean</th>
<th>Father mean</th>
<th>Mother mean</th>
<th>Male children std</th>
<th>Female Children std</th>
<th>Father std</th>
<th>Mother std</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wage Income</td>
<td>39,500</td>
<td>30,613</td>
<td>35,809</td>
<td>21,579</td>
<td>24,921</td>
<td>18,691</td>
<td>20,057</td>
<td>13,611</td>
</tr>
<tr>
<td>Disposable Income</td>
<td>30,325</td>
<td>28,152</td>
<td>20,604</td>
<td>18,934</td>
<td>22,213</td>
<td>13,570</td>
<td>10,285</td>
<td>6,620</td>
</tr>
<tr>
<td>Income without Transfers</td>
<td>42,134</td>
<td>31,735</td>
<td>43,324</td>
<td>23,462</td>
<td>36,287</td>
<td>22,714</td>
<td>25,510</td>
<td>14,236</td>
</tr>
<tr>
<td>Income with Transfers</td>
<td>45,538</td>
<td>39,641</td>
<td>45,787</td>
<td>29,841</td>
<td>34,022</td>
<td>19,247</td>
<td>23,641</td>
<td>11,908</td>
</tr>
<tr>
<td>Household Consumption</td>
<td>39,542</td>
<td>42,210</td>
<td>35,539</td>
<td>36,303</td>
<td>10,902</td>
<td>11,228</td>
<td>5,650</td>
<td>5,991</td>
</tr>
<tr>
<td>Realized Lifetime Wealth</td>
<td>346,600</td>
<td>311,264</td>
<td>177,106</td>
<td>367,306</td>
<td>158,523</td>
<td>127,993</td>
<td>104,837</td>
<td>78,713</td>
</tr>
<tr>
<td>Realized PDV</td>
<td>691,709</td>
<td>611,873</td>
<td>441,879</td>
<td>429,238</td>
<td>465,030</td>
<td>268,010</td>
<td>308,607</td>
<td>160,950</td>
</tr>
<tr>
<td>Expected Lifetime Wealth</td>
<td>552,729</td>
<td>513,095</td>
<td>518,265</td>
<td>494,946</td>
<td>139,420</td>
<td>106,168</td>
<td>106,942</td>
<td>83,155</td>
</tr>
<tr>
<td>Expected PDV</td>
<td>615,240</td>
<td>578,368</td>
<td>611,014</td>
<td>447,670</td>
<td>187,498</td>
<td>144,517</td>
<td>147,670</td>
<td>109,890</td>
</tr>
</tbody>
</table>

Notes: This table presents summary statistics for empirical measures evaluated between ages 30 and 35 for children (1981–1982 birth cohorts) and their parents (in 2010 USD). We observe a full income stream for parents, so we do not have to impute their income. But, in order to calculate the realized PDV and realized lifetime wealth we impute children’s income after age 37.
### Table A.2: Summary Statistics (Child Attended College)

<table>
<thead>
<tr>
<th></th>
<th>Male children mean</th>
<th>std</th>
<th>Female Children mean</th>
<th>std</th>
<th>Father mean</th>
<th>std</th>
<th>Mother mean</th>
<th>std</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wage Income</td>
<td>49,955</td>
<td>26,131</td>
<td>37,570</td>
<td>17,366</td>
<td>39,429</td>
<td>20,732</td>
<td>24,462</td>
<td>13,654</td>
</tr>
<tr>
<td>Disposable Income</td>
<td>35,798</td>
<td>30,774</td>
<td>31,088</td>
<td>10,627</td>
<td>21,486</td>
<td>10,678</td>
<td>19,283</td>
<td>6,961</td>
</tr>
<tr>
<td>Income without Transfers</td>
<td>52,866</td>
<td>49,148</td>
<td>38,662</td>
<td>18,387</td>
<td>48,062</td>
<td>25,054</td>
<td>26,578</td>
<td>14,685</td>
</tr>
<tr>
<td>Income with Transfers</td>
<td>54,486</td>
<td>48,268</td>
<td>44,408</td>
<td>16,005</td>
<td>49,722</td>
<td>23,670</td>
<td>31,344</td>
<td>13,061</td>
</tr>
<tr>
<td>Household Consumption</td>
<td>43,599</td>
<td>11,166</td>
<td>44,851</td>
<td>11,324</td>
<td>36,610</td>
<td>5,662</td>
<td>37,410</td>
<td>6,121</td>
</tr>
<tr>
<td>Realized Lifetime Wealth</td>
<td>428,184</td>
<td>187,273</td>
<td>357,184</td>
<td>130,887</td>
<td>188,278</td>
<td>114,085</td>
<td>171,518</td>
<td>79,824</td>
</tr>
<tr>
<td>Realized PDV</td>
<td>892,894</td>
<td>646,061</td>
<td>711,604</td>
<td>286,474</td>
<td>503,594</td>
<td>350,575</td>
<td>403,714</td>
<td>162,580</td>
</tr>
<tr>
<td>Expected Lifetime Wealth</td>
<td>678,813</td>
<td>117,429</td>
<td>580,920</td>
<td>88,167</td>
<td>554,167</td>
<td>116,955</td>
<td>453,264</td>
<td>90,942</td>
</tr>
<tr>
<td>Expected PDV</td>
<td>796,244</td>
<td>160,351</td>
<td>673,560</td>
<td>121,966</td>
<td>660,629</td>
<td>162,795</td>
<td>528,959</td>
<td>120,809</td>
</tr>
</tbody>
</table>

**Notes:** This table presents summary statistics for empirical measures evaluated between ages 30 and 35 for children (1981–1982 birth cohorts) and their parents (in 2010 USD), for children who did attend college. We observe a full income stream for parents, so we do not have to impute their income. But, in order to calculate the realized PDV and realized lifetime wealth we impute children’s income after age 37.

### Table A.3: Summary Statistics (Child Did Not Attend College)

<table>
<thead>
<tr>
<th></th>
<th>Male children mean</th>
<th>std</th>
<th>Female Children mean</th>
<th>std</th>
<th>Father mean</th>
<th>std</th>
<th>Mother mean</th>
<th>std</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wage Income</td>
<td>34,301</td>
<td>22,267</td>
<td>22,995</td>
<td>16,911</td>
<td>33,086</td>
<td>18,823</td>
<td>19,561</td>
<td>13,102</td>
</tr>
<tr>
<td>Disposable Income</td>
<td>27,582</td>
<td>15,258</td>
<td>24,957</td>
<td>15,618</td>
<td>19,933</td>
<td>9,926</td>
<td>18,781</td>
<td>6,218</td>
</tr>
<tr>
<td>Income without Transfers</td>
<td>36,822</td>
<td>25,428</td>
<td>24,153</td>
<td>24,533</td>
<td>39,777</td>
<td>24,878</td>
<td>21,255</td>
<td>13,291</td>
</tr>
<tr>
<td>Income with Transfers</td>
<td>41,059</td>
<td>21,917</td>
<td>34,446</td>
<td>21,090</td>
<td>42,816</td>
<td>22,799</td>
<td>28,865</td>
<td>10,613</td>
</tr>
<tr>
<td>Household Consumption</td>
<td>37,524</td>
<td>10,112</td>
<td>39,331</td>
<td>10,324</td>
<td>34,770</td>
<td>5,484</td>
<td>35,508</td>
<td>5,719</td>
</tr>
<tr>
<td>Realized Lifetime Wealth</td>
<td>304,144</td>
<td>121,966</td>
<td>260,138</td>
<td>102,893</td>
<td>170,163</td>
<td>96,108</td>
<td>159,612</td>
<td>76,539</td>
</tr>
<tr>
<td>Realized PDV</td>
<td>587,012</td>
<td>282,069</td>
<td>500,836</td>
<td>192,433</td>
<td>397,580</td>
<td>261,738</td>
<td>342,259</td>
<td>153,544</td>
</tr>
<tr>
<td>Expected Lifetime Wealth</td>
<td>485,981</td>
<td>97,744</td>
<td>436,403</td>
<td>64,377</td>
<td>490,194</td>
<td>87,640</td>
<td>410,589</td>
<td>70,407</td>
</tr>
<tr>
<td>Expected PDV</td>
<td>519,380</td>
<td>116,670</td>
<td>469,486</td>
<td>74,423</td>
<td>572,281</td>
<td>119,531</td>
<td>468,530</td>
<td>91,172</td>
</tr>
</tbody>
</table>

**Notes:** This table presents summary statistics for empirical measures evaluated between ages 30 and 35 for children (1981–1982 birth cohorts) and their parents (in 2010 USD), for children who did not attend college. We observe a full income stream for parents, so we do not have to impute their income. But, in order to calculate the realized PDV and realized lifetime wealth we impute children’s income after age 37.
### Table A.4: Correlation of Measures- Family (Mother plus Father)

<table>
<thead>
<tr>
<th></th>
<th>Wage Income</th>
<th>Income without Transfers</th>
<th>Income with Transfers</th>
<th>Disposable Income</th>
<th>Household Consumption</th>
<th>Realized Lifetime Wealth</th>
<th>Realized PDV</th>
<th>Expected Lifetime Wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income without Transfers</td>
<td>0.70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income with Transfers</td>
<td>0.62</td>
<td>0.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disposable Income</td>
<td>0.59</td>
<td>0.55</td>
<td>0.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household Consumption</td>
<td>0.54</td>
<td>0.72</td>
<td>0.71</td>
<td>0.49</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realized Lifetime Wealth</td>
<td>0.45</td>
<td>0.45</td>
<td>0.47</td>
<td>0.59</td>
<td>0.47</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realized PDV</td>
<td>0.45</td>
<td>0.57</td>
<td>0.55</td>
<td>0.43</td>
<td>0.50</td>
<td>0.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected Lifetime Wealth</td>
<td>0.56</td>
<td>0.62</td>
<td>0.60</td>
<td>0.48</td>
<td>0.63</td>
<td>0.44</td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>Expected PDV</td>
<td>0.51</td>
<td>0.53</td>
<td>0.50</td>
<td>0.38</td>
<td>0.53</td>
<td>0.36</td>
<td>0.50</td>
<td>0.96</td>
</tr>
</tbody>
</table>

**Notes:** The table shows correlations between various measures used of mean values between 30 and 35 for families of the 1981–1982 cohorts. Family-level measures are computed by adding father’s and mother’s income measure.
Table A.5: Correlation of Measures (Child)

<table>
<thead>
<tr>
<th></th>
<th>Wage Income</th>
<th>Disposable Income</th>
<th>Income without Transfers</th>
<th>Income with Transfers</th>
<th>Household Consumption</th>
<th>Realized Lifetime Wealth</th>
<th>Realized PDV</th>
<th>Expected Lifetime Wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposable Income</td>
<td>0.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income without Transfers</td>
<td>0.70</td>
<td>0.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income with Transfers</td>
<td>0.60</td>
<td>0.96</td>
<td>0.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household Consumption</td>
<td>0.54</td>
<td>0.43</td>
<td>0.46</td>
<td>0.42</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realized Lifetime Wealth</td>
<td>0.50</td>
<td>0.40</td>
<td>0.47</td>
<td>0.43</td>
<td>0.42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realized PDV</td>
<td>0.40</td>
<td>0.22</td>
<td>0.29</td>
<td>0.25</td>
<td>0.37</td>
<td>0.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected Lifetime Wealth</td>
<td>0.64</td>
<td>0.39</td>
<td>0.48</td>
<td>0.41</td>
<td>0.62</td>
<td>0.57</td>
<td>0.52</td>
<td></td>
</tr>
<tr>
<td>Expected PDV</td>
<td>0.57</td>
<td>0.35</td>
<td>0.43</td>
<td>0.36</td>
<td>0.58</td>
<td>0.54</td>
<td>0.51</td>
<td>0.97</td>
</tr>
</tbody>
</table>

Notes: This table shows the correlation between various measures used of mean values between 30 and 35 for children of 1981–1982 cohorts. In order to calculate the realized PDV and realized lifetime wealth we impute children’s income after age 37.

Table A.6: Correlation of Measures (Child, Attended College)

<table>
<thead>
<tr>
<th></th>
<th>Wage Income</th>
<th>Disposable Income</th>
<th>Income without Transfers</th>
<th>Income with Transfers</th>
<th>Household Consumption</th>
<th>Realized Lifetime Wealth</th>
<th>Realized PDV</th>
<th>Expected Lifetime Wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposable Income</td>
<td>0.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income without Transfers</td>
<td>0.61</td>
<td>0.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income with Transfers</td>
<td>0.56</td>
<td>0.98</td>
<td>0.99</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household Consumption</td>
<td>0.49</td>
<td>0.39</td>
<td>0.36</td>
<td>0.36</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realized Lifetime Wealth</td>
<td>0.42</td>
<td>0.26</td>
<td>0.32</td>
<td>0.30</td>
<td>0.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realized PDV</td>
<td>0.28</td>
<td>0.07</td>
<td>0.12</td>
<td>0.10</td>
<td>0.24</td>
<td>0.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected Lifetime Wealth</td>
<td>0.54</td>
<td>0.30</td>
<td>0.36</td>
<td>0.32</td>
<td>0.48</td>
<td>0.46</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>Expected PDV</td>
<td>0.46</td>
<td>0.26</td>
<td>0.30</td>
<td>0.27</td>
<td>0.43</td>
<td>0.44</td>
<td>0.40</td>
<td>0.96</td>
</tr>
</tbody>
</table>

Notes: This table shows the correlation between various measures used of mean values between 30 and 35 for children of 1981–1982 cohorts who attended college. In order to calculate the realized PDV and realized lifetime wealth we impute children’s income after age 37.
### Table A.7: Correlation of Measures (Child, Did Not Attend College)

<table>
<thead>
<tr>
<th></th>
<th>Wage Income</th>
<th>Disposable Income</th>
<th>Income without Transfers</th>
<th>Income with Transfers</th>
<th>Household Consumption</th>
<th>Realized Lifetime Wealth</th>
<th>Realized PDV</th>
<th>Expected Lifetime Wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposable Income</td>
<td>0.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income without Transfers</td>
<td>0.77</td>
<td>0.86</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income with Transfers</td>
<td>0.64</td>
<td>0.92</td>
<td>0.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household Consumption</td>
<td>0.51</td>
<td>0.44</td>
<td>0.51</td>
<td>0.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realized Lifetime Wealth</td>
<td>0.50</td>
<td>0.54</td>
<td>0.58</td>
<td>0.56</td>
<td>0.41</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realized PDV</td>
<td>0.47</td>
<td>0.43</td>
<td>0.49</td>
<td>0.44</td>
<td>0.45</td>
<td>0.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected Lifetime Wealth</td>
<td>0.67</td>
<td>0.43</td>
<td>0.60</td>
<td>0.48</td>
<td>0.70</td>
<td>0.51</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td>Expected PDV</td>
<td>0.61</td>
<td>0.39</td>
<td>0.53</td>
<td>0.43</td>
<td>0.69</td>
<td>0.46</td>
<td>0.53</td>
<td>0.95</td>
</tr>
</tbody>
</table>

*Notes: This table shows the correlation between various measures used of mean values between 30 and 35 for children of 1981–1982 cohorts, who did not attend college. In order to calculate the realized PDV and realized lifetime wealth we impute children’s income after age 37.*
**Figure A.3:** Correlations of Realized Lifetime Measures with the Expected Lifetime Measures by Age

(a) Fathers

(b) Children

**Notes:** This figure presents the correlation between the expected and realized lifetime measures over the age range of 30–37 for children and 30-55 for fathers. We use our main sample: the 1981—1982 cohorts of native Danes and their fathers. Figure (a) shows results for the sample of fathers. Figure (b) presents the results for the sample of children.
Table A.8: Gini Coefficients

<table>
<thead>
<tr>
<th></th>
<th>Male Children</th>
<th>Female Children</th>
<th>Father</th>
<th>Mother</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wage Income</td>
<td>0.338</td>
<td>0.340</td>
<td>0.301</td>
<td>0.356</td>
</tr>
<tr>
<td>Disposable Income</td>
<td>0.235</td>
<td>0.183</td>
<td>0.178</td>
<td>0.168</td>
</tr>
<tr>
<td>Income without Transfers</td>
<td>0.293</td>
<td>0.293</td>
<td>0.254</td>
<td>0.321</td>
</tr>
<tr>
<td>Income with Transfers</td>
<td>0.251</td>
<td>0.198</td>
<td>0.212</td>
<td>0.205</td>
</tr>
<tr>
<td>Household Consumption</td>
<td>0.154</td>
<td>0.148</td>
<td>0.086</td>
<td>0.089</td>
</tr>
<tr>
<td>Realized Lifetime Wealth</td>
<td>0.216</td>
<td>0.192</td>
<td>0.274</td>
<td>0.222</td>
</tr>
<tr>
<td>Realized PDV</td>
<td>0.251</td>
<td>0.200</td>
<td>0.259</td>
<td>0.190</td>
</tr>
<tr>
<td>Expected Lifetime Wealth</td>
<td>0.139</td>
<td>0.112</td>
<td>0.110</td>
<td>0.104</td>
</tr>
<tr>
<td>Expected PDV</td>
<td>0.169</td>
<td>0.135</td>
<td>0.128</td>
<td>0.119</td>
</tr>
</tbody>
</table>

Notes: This figure depicts the Gini coefficient calculated for income measures using the 1981–1982 cohort of children, and their parents. The Gini coefficient is calculated using the mean income over ages 30–35 for each of the income and family types denoted here. The family measures used in this table are the sum of the mother’s and father’s measures as defined in Appendix A.

Interest Rate in Denmark. We plot the three-month (ex post) real interbank rates for Denmark, for reference. In the early 90s, annual interest rates in Denmark were as high as 15%. By contrast, interest rates in the last decade were so low as to even be negative in the last five years. These patterns also help explain the high absolute mobility in consumption, as shown in Figure 12.
Figure A.4: Three-Month Nominal Interbank Rates for Denmark

Notes: This figure plots the change in real interest rates over the last three decades in Denmark. Source: Organization for Economic Co-operation and Development, 3-Month or 90-day Rates and Yields: Interbank Rates for Denmark [IR3TIB01DKQ156N], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/IR3TIB01DKQ156N, October 9, 2021.
B  Lifetime Measures

This appendix explains in detail the lifetime measures that we develop and estimate in this paper. We define and estimate two measures of lifetime resources, the expected present value of future income, and the lifetime wealth. We apply and extend the approach of Huggett and Kaplan (2011, 2012, 2016), incorporating forms of uncertainty and credit constraints using stochastic discount factors. We estimate individual expected lifetime wealth at period $t$ ($LW_{i,t}$) by evaluating future income streams while taking into account both uncertainty and liquidity constraints.

The rest of this appendix is organized as follows. Section B.1 provides a formal definition of our lifetime measures. Section B.2 discusses identification and estimation. Section B.3 further elaborates the estimation process for the stochastic discount factors. Section B.4 reports the summary statistics of our estimates of the stochastic discount factors by education level over age, separately for different birth cohorts. Section B.5 reports a set of robustness checks. Finally, section B.6 presents further details on our specification test for agent information sets.

B.1  Definitions

B.1.1  Expected Present Discounted Value (PDV)

For a given information set $I_{i,t}$, the expected PDV is:

$$PDV_{i,t} = E_{i,t} \left[ \sum_{\tau=1}^{T-t} \beta^{\tau} y_{i,t+\tau} \mid I_{i,t} \right],$$  \hspace{1cm} (B.1)

where $\beta$ is a fixed risk-free discount factor, and $y_{i,t}$ is the income of individual $i$ in period $t$.\(^5\) PDV is the risk-free expected present value of future income flows ignoring credit constraints and uncertainties. We also construct PDV based on realized values.

B.1.2  Expected Lifetime Wealth

Building on work by Lucas (1978) on the valuation of non-traded assets, Huggett and Kaplan (2011, 2012, 2016) discuss lifetime measures of welfare that incorporate uncertainty and credit constraints using stochastic discount factors. They define an individual’s expected life-

\(^5\)In our empirical setting, we set $\beta$ to 0.96 following Ogaki and Reinhart (1998).
time wealth at period \( t \) (LW\(_{i,t}\)) as:

\[
LW_{i,t} = \mathbb{E}_{i,t} \left[ \sum_{\tau=1}^{T-t} s_{i,t+\tau} y_{i,t+\tau} \mid I_{i,t} \right] 
= \mathbb{E}_{i,t} \left[ s_{i,t+1} (y_{i,t+1} + LW_{i,t+1}) \mid I_{i,t} \right],
\]

(B.2)

where \( s_{i,t} \) is individual \( i \)'s stochastic discount factor at age \( t \) when expectations are taken with respect to the information set of individual \( i \) at age \( t \) (\( I_{i,t} \)).

Stochastic discount factors can be estimated nonparametrically using panel data on consumption (see, e.g., Escanciano et al., 2021). From the first-order condition for optimal consumption:

\[
s_{i,t+1} = \mathbb{E}_{i,t} \left[ \beta \frac{U(c_{i,t+1})}{U'(c_{i,t})} \mid I_{i,t} \right],
\]

(B.3)

where \( c_{i,t} \) is individual \( i \)'s current consumption, \( c_{i,t+1} \) is consumption at age \( t + 1 \), \( U(c_{i,t}) \) denotes utility at time \( t \), and \( U' \) denotes the marginal utility of consumption.

### B.2 Identification and Estimation

We estimate the expected PDV and lifetime wealth measures. When needed, we adapt a nonparametric synthetic cohort strategy due to Abbott and Gallipoli (2022). In this paper, we take a conventional parametric position on preferences. We approximate the information set \( I_{i,t} \) by a vector of time-varying and time-invariant individual characteristics, which we denote by \( Z_{i,t} \). We check the validity of the information sets used.

As a first step, let \( Z_{i,t} \) be an empirical approximation of the information set of individual \( i \) in period \( t \), \( I_{i,t} \). We assume that individuals form expectations about their future income streams based solely on the information set as proxied by \( Z_{i,t} \). Formally,

\[
PDV(z_{i,t}) = \mathbb{E}_{i,t} \left[ \sum_{\tau=1}^{T-t} \beta^\tau y_{i,t+\tau} \mid I_{i,t} \right] 
= \mathbb{E} \left[ \sum_{\tau=1}^{T-t} \beta^\tau y_{i,t+\tau} \mid Z = z_{i,t} \right],
\]

(B.4)

where \( \mathbb{E}_{i,t} \) denotes the expectation of agent \( i \) at time \( t \) with characteristics \( Z = z_{i,t} \). These information sets govern agent anticipations. They are also useful because we only have data on limited stretches of the life cycles we observe. To address this problem, we invoke a synthetic cohort assumption and estimate the expected PDV and lifetime wealth from information on

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6Abbott and Gallipoli (2022) show that Equation (B.2) provides a general expression for evaluating the returns to lifetime earnings.
realized income streams of individuals with the same characteristics (captured by vector $z_{i,t}$) but born in different years. We test for the validity of our constructed information sets in Section 3.3.

From Equation (B.4), we can write Equation (1) recursively as

$$PDV(Z_t) = E[\beta y_{t+1} \mid Z_t] + \int \beta PDV(Z_{t+1}) \times f_{Z_{t+1}}(Z_{t+1} \mid Z_t)dZ_{t+1},$$

where $f_{Z_{t+1}}(Z_{t+1} \mid Z_t)$ is the conditional density of $Z_{t+1}$, where for simplicity we use the fact that the $Z_{i,t}$ predicts the expected PDV of an agent $i$ to drop the subscript $i$ from our notation. It can be estimated directly from state-transition probabilities observed in the data. Importantly, these transitions are allowed to vary across cohorts to capture cohort differences. $E[\beta y_{t+1} \mid Z_t]$ is the expected income flow in the next period for individuals with the same characteristics, which also can be estimated directly from the data once we specify $\beta$. We estimate the expected PDV and lifetime wealth nonparametrically by forming the approximation of information set $Z_{i,t}$, and taking expectations by weighting information across years.\footnote{See Abbott and Gallipoli (2022); Escanciano et al. (2021). Thus, for example, from the expected PDV beginning at the terminal period, we obtain earlier periods’ PDV based on backward recursion. This is slightly different than the method of Abbott and Gallipoli (2022), who construct and invert a large matrix to solve this recursive formula in one step. Our recursive method is more suitable for empirical implementation for unbalanced panel data sets (i.e., not all individuals are observed at all ages). We assume that the expected PDV is zero at age 85 for all individuals ($PDV(Z_{85}) = 0$ for all $z \in Z$), and we then compute the expected PDV at age 84 by computing the expected income flow for each information set group at age 84. We continue this recursion until we have recovered the expected PDV for all ages and all realizations of $Z$ observed in the data (to age 20). Our procedure for computing the lifetime wealth measure is similar, with the additional step that we compute the SDF for each individual in each period, to which we return below. We use the Nadaraya-Watson estimator to obtain estimates of the expected income flow at the next period: $E[\beta y_{t+1} \mid Z_t] = \sum_{j=1}^{N} \beta y_{j,t+1} \gamma_{j,t}(Z_{j,t})$, where $N$ is the sample size, $j$ denotes individuals in the sample, and $\gamma_{j,t}(Z_{j,t})$ is a weighting function that accounts for similarity in the observed characteristics of different individuals. Individuals born in cohorts of close proximity, for example, receive greater weight than those born further apart. Thus, the procedure accounts for potentially important cohort effects. Appendix B.2–B.6 present further details on our estimation procedure, and Appendix B.3 describes the weighting function. Expected income flows are then a sample average of all individuals in the full population. A similar procedure is done to compute the conditional density $f_{Z_{t+1}}(Z_{t+1} \mid Z_t)$. When computing the expected income flow at the next period, we also take into account the possibility of death by allowing transitions from any given $Z$ to death at the end of the period.}
August 19, 2022

Intergenerational Transmission of Family Influence

point by presenting the relationship between the SDF and income uncertainty.\textsuperscript{8} The SDF also accounts for the insurance value of public transfers (cash and in-kind) through their impacts on consumption expenditures. We estimate agent information sets using the procedure of Cunha et al. (2005) and Cunha and Heckman (2016), which is developed in detail in Section 3.3 in the text.

\textbf{Figure B.1: SDF and Uncertainty (Standardized with Mean=0)}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure_b1.png}
\caption{SDF and Uncertainty (Standardized with Mean=0)}
\end{figure}

\textit{Notes:} This figure presents the relationship between the SDF and income uncertainty (see Section 2 for a description of the data and Section 3 for a description of the SDF and the information set). We measure uncertainty as the standard deviation of the next period’s income conditional on the information set of individuals in the current period. The values of both the x-axis and y-axis are expressed as deviations from the mean in standard deviation units. The slope of the linear fit is -0.31 and statistically significant. The figure is based on the full population of Danes aged 30 in 2015.

We assume individuals make expectations about their future income streams based solely on the information set $\mathcal{I}_{i,t}$ proxied by $\mathcal{Z}_{i,t}$. The realized earnings of older cohorts with the same characteristics are the expected earnings of the younger cohorts. Two individuals with the same observed characteristics at the same age and born in the same year have the same expected income streams. Formally,

$$
\mathbb{E}_{i,t} \left[ \sum_{\tau=1}^{T-t} \beta^\tau y_{i,t+\tau} \mid \mathcal{I}_{i,t} \right] = \mathbb{E} \left[ \sum_{\tau=1}^{T-t} \beta^\tau y_{i,t+\tau} \mid \mathcal{Z}_{i,t} = z_{i,t} \right],
$$

(B.5)

where $\mathbb{E}_{i,t}$ denotes the expectation of agent $i$ at time $t$ with characteristics $\mathcal{Z} = z_{i,t}$.

\textsuperscript{8}See also Huggett and Kaplan (2016).
This means that the vector of observed characteristics $z_{i,t}$ suffices to predict agent $i$’s expected PDV and lifetime wealth at age $t$. This assumption is key to our estimation procedure. It allows us to estimate the expected PDV and lifetime wealth from information on realized income streams of individuals with similar characteristics (captured by vector $z_{i,t}$) born in different years. This assumption is also partially testable for any given set $Z$ as we show in Section B.6. Because of likely cohort differences, we conduct a robustness analysis under different scenarios for the evolution of future incomes, discount rates, and constraints.

Under assumption (B.5), we can write Equation (B.1) recursively as:

$$\text{PDV}(z_t) = \mathbb{E} \left[ \beta y_{t+1} \mid Z_t \right] + \int \beta \text{PDV}(Z_{t+1}) \times f_{Z_{t+1}|Z_t}(Z_{t+1} \mid Z_t) dZ_{t+1},$$

where $f_{Z_{t+1}|Z_t}(Z_{t+1} \mid Z_t)$ is the conditional density of $Z_{t+1}$, where for simplicity we use the fact that the $Z_{i,t}$ predicts the expected PDV of an agent $i$ to drop the subscript $i$ from our notation. It can be estimated directly from state-transition probabilities observed in the data. Importantly, these transitions are allowed to vary across cohorts to capture differences across cohorts. Similarly, $\mathbb{E} \left[ \beta y_{t+1} \mid Z_t \right]$ is the expected income flow at the next period for individuals with the same characteristics, which also can be estimated directly from the data once we specify $\beta$. We estimate both components nonparametrically.

We solve recursively for the expected PDV beginning at the terminal period. We assume that the expected PDV is zero at age 85 for all individuals regardless of their information set ($\text{PDV}(Z_{85}) = 0$ for all $z \in Z$). We then compute the expected PDV at age 84 by computing the expected income flow for each information set group at age 84. We continue this recursion until we have recovered the expected PDV for all ages and all realizations of $Z$ observed in the data starting at age 20. Our procedure for computing lifetime wealth is similar with the additional step that we compute the stochastic discount factor for each individual in each period.

**Specification of the $Z$ vector:** Assumption (B.5) requires that the vector of observed characteristics $Z_{i,t}$ accurately predicts expected PDV and lifetime wealth. This assumption is partially testable from the data. Section B.6 presents tests for the candidate $Z$ set in the empirical setting using a method similar to the one proposed in Cunha et al. (2005) and Cunha and Heckman (2016). The main idea is that by producing forecasts of future earnings based on $Z$, one can check if the forecast error is correlated with choices that depend on these forecasts. A lack of dependence suggests $Z$ is correctly specified. If the $Z$ set is defined

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9This is slightly different than the method of Abbott and Gallipoli (2022), who construct and invert a large matrix to solve this recursive formula in one step. Our recursive method is more suitable for empirical implementation for unbalanced panel data sets (i.e., not all individuals are observed at all ages).
correctly, then for example, we expect that the residualized earnings at age 60 (or age 50) using the set of $Z$ characteristics at age 30, is uncorrelated with the consumption (or other choices) at age 30. The vector of individual characteristics that survives these tests for a given year and age is specified in Section 3.3.

**Utility Function and Risk Aversion Parameter:** For our main empirical analysis, we use a CRRA utility function; i.e., $U(c_{i,t}) = \frac{c_{i,t}^{1-\rho} - 1}{1-\rho}$, where $c_{i,t}$ denotes the adult-equivalence consumption (to adjust for family size and composition) of individual $i$ at time $t$.\(^{10}\) We set the risk aversion parameter at 0.67 estimated by Szpiro (1986) on Danish data using property/liability insurance. Section B.5 presents results using alternative values for the relative risk aversion parameter as a robustness check.

**Income Flow Measure:** In our empirical setting, the income measure, $y_{i,t}$, in Equations (B.1) and (B.2) is equal to total income, including interest on assets, minus taxes and interest expenses. It also includes public transfers and the estimated rental value of the family’s home for owner-occupied dwellings. We also include unrealized capital gains from housing stock for individuals who are homeowners.\(^{11}\)

### B.3 SDF: Estimation Procedure

In our empirical work, we set the discount rate $\beta$ to 0.96 following Ogaki and Reinhart (1998). Similar to the estimation process described above for the expected income flow, we use the Nadaraya-Watson estimator to obtain estimates of the stochastic discount factor, $s_{i,t+1}$ in Equation (B.6):

$$\hat{s}_{i,t+1}(Z) = \sum_{i=1}^{N} \sum_{t \in \tau_j(i)} \beta \frac{U_c(c_{i,t+1})}{U_c(c_{i,t})} \gamma_{i,t}(Z),$$

where $\tau_j(i)$ indicates the year in which individual $i$ is $j$ years old, and $\gamma_{i,t}$ is a weighting function that accounts for similarity in the observed characteristics of different individuals as explained below. Our estimate of the stochastic discount factor is then a sample average of the expected marginal rate of intertemporal substitution of consumption where we take the average over all individuals in the full population with observed income and consumption

\(^{10}\)We take the survey imputed household consumption measure and use the OECD equivalence scale to adjust for household composition. The OECD equivalence scale assigns a value of 1 to the first household member, a value of 0.5 to each additional adult, and a value of 0.3 to each child (Hagenaars et al., 1994).

\(^{11}\)In other words, we use disposable income adjusted for the unrealized capital gain from housing stock. As a robustness check, we also use other income measures such as disposable income. The main results of the paper do not vary appreciably when we use this alternative measure of income flow.
at a given age \((t + 1)\).^{12}

Let \(\tau_{j(i,t)}(m)\) be the year in which another individual \(m\) was the same age as individual \(i\) in period \(t\). Weights \(\gamma_{i,t}\) are computed as follows:

\[
\gamma_{i,t}(z) = \frac{K_{i,t}^z(z)}{\sum_{m=1}^{N} \sum_{t \in \tau_{j(i,t)}(m)} K_{m,t}^z(z)},
\]

where \(K_{i,t}^z(z)\) is a multivariate kernel function, suggested by Li and Racine (2007), defined as

\[
K_{i,t}^z(z) = (\prod_{z_s \in z^c} K_h(z_s - z_{s,i,t})) \times (\prod_{z_s \in z^d} \mathbb{1}_{\{z_s = z_{s,i,t}\}}),
\]

where \(z^c\) and \(z^d\) are defined as the subvector of continuous and discrete variables contained in vector \(z\). Thus, \(\hat{g}(j, z)\) is a sample average of everyone in the data with age \(j\) and vector \(z\) for whom we observe future income and consumption. Individuals within this group are weighted differently depending on their value of \(z^c\), yearly GDP growth.

**Lifetime Wealth and Risk Aversion:** Given a CRRA utility function, we can analytically investigate the relationship between the risk aversion parameter and the lifetime wealth, through its impact on the stochastic discount factor. For a CRRA utility function, it can be shown that when consumption is increasing (i.e., \(\frac{c_t}{c_{t+1}} < 1\)), the more risk averse an individual, the lower the stochastic discount factor, and so the lifetime wealth is lower. If \(U(c_{i,t}) = c_{1-\rho_{i,t}} - 1\), then stochastic discount factor is proportional to \(\mathbb{E}[(\frac{c_{i,t}}{c_{i,t+1}})^\rho]\). Assuming continuity, by taking derivative with respect to \(\rho\), we have:

\[
\frac{\partial}{\partial \rho} \mathbb{E}[(\frac{c_{i,t}}{c_{i,t+1}})^\rho] = \mathbb{E}[(\frac{c_{i,t}}{c_{i,t+1}})^\rho \ln(\frac{c_{i,t}}{c_{i,t+1}})] < 0 \quad \text{if} \quad (\frac{c_{i,t}}{c_{i,t+1}}) < 1.
\]

**B.4 SDF by Education Level, Cohort, and Age**

Figure B.2 shows the mean SDF over five-year age intervals by education level for the sample of individuals born in 1965 for whom we have data until age 54. This extends Figure 4 in the text, which shows the SDF for several cohorts over ages by education, showing a similar trend. Figure B.2 shows that the SDF increases in age especially for those individuals with a higher education level. This is not surprising given that higher educated individuals tend to have a steeper income trajectory and impediments to access to the expected future income.

---

^{12}Similar to our estimation procedure for the expected income flow, we use the Nadaraya-Watson estimator to obtain estimates of the SDF, \(\hat{s}_{i,t+1}\):

\[
\hat{s}_{i+1}(Z_t) = \sum_{j=1}^{N} \beta \frac{U(c_{j,t+1})}{U(c_{j,t})} \gamma_{j,t}(Z_{j,t}).
\]

Our estimate of the SDF is then a sample average of the marginal rate of intertemporal substitution of consumption where we take the average over all individuals in the full population.
leads to lower SDFs. We also include the *ex post* real interest rates faced by the individuals in the sample at the corresponding ages. As Figure B.2 suggests, there is a negative association between the *ex post* real interest rate and the mean SDF. Figure B.3 presents the mean SDF over five-year age intervals for various birth cohorts from 1950 to 1975.

**Figure B.2: SDF Age-Profile by Education Level**

![Figure B.2: SDF Age-Profile by Education Level](image)

*Notes:* This figure presents the mean SDF over 5-year age intervals by education level for the left y-axis. The right y-axis shows the real interest rate faced by individuals born in 1965 at the corresponding ages. This is for the sample of individuals born in 1965 for whom we have data until age 54.
Notes: This figure presents the mean SDF over 5-year age intervals by birth cohort. The analysis includes individuals born between 1950–1975. The figure shows the mean SDF for these cohorts over 5-year age intervals between ages 30 and 50.

B.5 Robustness Checks

This section reports a variety of sensitivity tests for alternative specifications of the model with (a) bequests added and (b) risk aversion parameters adjusted.

**De Nardi Adjustment to Lifetime Wealth Measures.** This appendix compares different lifetime wealth variables for a model with bequests computed using different terminal functions. In the main text, all of these measures were calculated assuming the terminal value at age 85 is zero.

In this section, we compare three different specifications of bequests. The first is the one used in the text with terminal value set to be zero. The second follows De Nardi (2004) and allows the terminal value to depend on the level of assets, which are assumed to be bequests left for children. The third lifetime wealth specification extends the framework proposed by De Nardi (2004) to include the valuation of the child’s human capital (proxied by their PDV at age 35). Formal definitions for the three specifications are given below.

The original lifetime wealth is defined as:

\[
\text{Lifetime Wealth}_{i,t} = \mathbb{E}_{i,t} \left[ s_{i,t+1}(y_{i,t+1} + LW_{i,t+1}) \mid \mathcal{I}_{i,t} \right], \quad 1 \leq t \leq T - 1
\]

\[
= 0, \quad \text{for} \ t = T.
\]
The lifetime wealth with assets (De Nardi 1) is defined as:

\[
\text{Lifetime Wealth DN 1}_{i,t} = \mathbb{E}_{i,t} \left[ s_{i,t+1}(y_{i,t+1} + LW_{i,t+1}) \mid I_{i,t} \right], \quad 1 \leq t \leq T - 1
\]

\[
= \mathbb{E}_{i,t} \left[ \frac{\Psi'(A_{T+1})}{u'(C_T)} (A_{T+1}) \mid I_{i,t} \right], \quad \text{for } t = T.
\]

where \(\Psi\) is the De Nardi function and \(u'(C_T)\) is the partial derivative of \(u(C_T)\). The lifetime wealth with the child’s human capital (De Nardi 2) is defined as:

\[
\text{Lifetime Wealth DN 2}_{i,t} = \mathbb{E}_{i,t} \left[ s_{i,t+1}(y_{i,t+1} + LW_{i,t+1}) \mid I_{i,t} \right], \quad 1 \leq t \leq T - 1
\]

\[
= \mathbb{E}_{i,t} \left[ \frac{\Psi'(w'h' + A_{T+1})}{u'(C_T)} (w'h' + A_{T+1}) \mid I_{i,t} \right], \quad \text{for } t = T.
\]

where \(\Psi\) is the De Nardi terminal period value function, \(A_{T+1}\) denotes assets left behind at the end of period \(T\), \(w'\) is the child’s hourly wage, and \(h'\) is the child’s hours of working. In the following figures we specify \(\Psi\) using the functional form proposed by De Nardi (2004) along the parameters she estimates using Swedish data. Also, we use the expected PDV of children at age 35 to proxy for \(w'h'\).

Figure B.4 correlates the original lifetime wealth variable with the two new measures when these are evaluated at different child ages. The correlation is always high, around 0.96. Also, the two new measures are very similar, so they are not distinguishable from each other in Figure B.4.
**Figure B.4: Correlation of Lifetime Wealth Measures across Child Ages**

Notes: This figure presents the correlation between the two new measures, with the De Nardi (2004) evaluation in the terminal period, and the original measure that assumes the value function at the terminal period is zero. It plots the correlation evaluated at different child ages. At any given age, the two dots overlap.

**IGE Estimates.** For completeness, we also show the IGEs for the three lifetime wealth measures when evaluated at age 35. We plot these alongside the Expected PDV in Figure B.5. The effect of using these different specifications on the IGE is negligible. It is not surprising, given the high correlations, that the IGEs are very similar across measures.
Notes: This figure depicts IGE estimates for different measures of resources. The sample of children is restricted to the 1981–1982 cohort of native Danes. Family outcomes are the sum of mother’s and father’s outcome. The expected PDV and lifetime wealth are computed as before. Lifetime Wealth (De Nardi 1) is the lifetime wealth after adjusting the terminal period values for bequest motives following the functional form in De Nardi (2004). Lifetime Wealth (De Nardi 2) modifies the lifetime measures to also incorporate the expected PDV of children at age 35 (using the same functional form used for bequests).

Lifetime Measures with Different Risk Aversion Parameters. For the results in the main paper, we present a measure of lifetime wealth where we assume the coefficient of relative risk aversion ($\rho$) to be 0.67. In this section of the appendix, we study the sensitivity of our estimates to changes in $\rho$. Figure B.6 presents the correlation between the lifetime wealth measures and child outcomes under different values of $\rho$. We find that lifetime wealth measures computed using ($\rho = 0.67$) as the value of the relative risk aversion parameter have a higher correlation with child outcomes (both at father and family level) compared to lifetime wealth measures computed with other values of $\rho$. Figure B.7 compares the estimated values of the IGE for lifetime wealth measures computed with alternative values of $\rho$. Higher levels of $\rho$ are related to higher relative mobility.
Figure B.6: Lifetime Wealth, $\rho$, and Intergenerational Correlations

(a) Mathematics Problem Solving

(b) Danish Reading

Notes: This figure shows the correlation between child outcomes and the different lifetime wealth variables constructed using different values for the coefficient of relative risk aversion $\rho$. Family measures are the sum of mother’s and father’s measures. Academic achievement is based on the 1995–1997 birth cohorts of native Danes. The remaining child outcome measures use the 1981–1982 cohort of native Danes. Academic achievement is measured using 9th-grade leaving exam grades in Mathematics and Danish. College attainment and years of schooling were measured when children were 35 years old.
Figure B.6: Lifetime Wealth, $\rho$, and Intergenerational Correlations (Cont’d)

(c) College Attainment

(d) Years of Schooling

Notes: This figure shows the correlation between child outcomes and the different lifetime wealth variables constructed using different values for the coefficient of relative risk aversion $\rho$. Family measures are the sum of mother’s and father’s measures. Academic achievement is based on the 1995–1997 birth cohorts of native Danes. The remaining child outcome measures use the 1981—1982 cohort of native Danes. Academic achievement is measured using 9th-grade leaving exam grades in Mathematics and Danish. College attainment and years of schooling were measured when children were 35 years old.
Notes: This figure shows the log-log IGE estimates for different lifetime wealth variables constructed using a range of values for the coefficient of relative risk aversion $\rho$. The sample of children is restricted to the 1981–1982 cohort of native Danes. Family measures are the sum of mother’s and father’s measures.

B.6 Specifying the Information Set

This subsection discuss the test used to determine whether the information set used is specified correctly. Individual choices at early ages reveal agent information sets about future income streams. We can use these choices to separate the impact of predictable heterogeneity from uncertainty in earnings. To fix ideas, suppose that individuals are deciding whether to go to college. If agents possess information about the rate of return of going to college (which may be heterogeneous across agents), then they act upon that information when making their educational decisions in the current period. However, they cannot base their decision on the rate of return to higher education that is realized after their decisions are made, which corresponds to the uncertainty about rate of return.

Formally, let $y_{ij}$ denote disposable income at age $j$, $Z_j$ the information set of the individual at age $j$, and $c_j$ the consumption at age $j$. We test (1) whether agents’ decisions today with regard to consumption have predictive power for their future income and (2) whether the information set $Z_j$ is uncorrelated with unexpected component of realized future income (conditional on the defined information set). Thus, let $Z_{30}$ be the assumed correct informa-
tion set. Then \( y_{50} - \mathbb{E}(y_{50} \mid Z_{30}) \) is uncorrelated with \( c_{30} \).

\[
\text{Cov}(y_{50} - \mathbb{E}(y_{50} \mid Z_{30}), c_{30}) = 0. \tag{B.7}
\]

A test based on (B.7) examines whether the information set \( Z_{30} \) captures all forward-looking information that individuals use when making current decisions.
C  IGEs and Intergenerational Correlations: Alternative Specifications

This appendix explores whether the IGE estimates reported in Section 5 change once we consider alternative definitions of family units or the age range used to measure parents and children. Moreover, this appendix extends the analysis of intergenerational correlations (i.e., correlations between parental resources and children’s exam scores presented in Figure 6) to a three-generation framework by analyzing the relationship between child outcomes and resources of grandparents.

C.1  Alternative Family Units

In this section, we show that the patterns documented in Figure 7 are robust across gender groups (Figure C.1), first and second born children (Figure C.2), and also when we consider children’s household income (the child’s plus her partner’s income) instead of individual income (Figure C.3). We also report IGEs for different parental ages in Figure C.5.

Figure C.1: Log-Log IGE Estimates, Sons and Daughters

(a) Parent-Child IGEs for Sons

(b) Parent-Child IGEs for Daughters

Notes: This figure depicts the IGE estimates for different parent-child combinations. Panel (a) presents IGE estimates for the different measures for sons and their fathers and mothers. Panel (b) presents a similar exercise for daughters.
Figure C.2: Log-log IGE Estimates, First and Second Children

(a) IGEs First Child

(b) IGEs Second Child

Notes: This figure depicts the IGE estimates by order of child’s birth for children of two child families. Panel (a) presents IGE estimates for the different measures for the first child for fathers and households. Panel (b) presents a similar exercise for the second child.

Figure C.3: Log-Log IGE Estimates, Child’s Household

Notes: This figure depicts the IGE estimates when using child’s household resources in place of individual measures. The parental measure used is father’s individual or household, defined as the sum of the resources of the child’s father and mother. The sample of children is restricted to the 1981–1982 cohort of native Danes. The child’s household resources are the sum of the child and her partner’s resources at the child’s ages 30–35.
Figure C.4: Log-Log IGE Estimates (Different Cohorts)

(a) Father-Child IGE

(b) Family-Child IGE

Notes: This figure depicts the IGE estimates for different cohorts and ages at measurement. The sample includes parents and children of different birth cohorts. Selected child birth cohorts are spaced every six years from 1956–1957 to 1981–1982 so that outcomes are measured every six-year interval from ages 55–60 (for the 1956–1957 birth cohort) to ages 30–35 (for the 1981–1982 birth cohort). Panel (a) compares the father-child IGE estimates, and Panel (b) compares the family-child IGE estimates across cohorts and measures of resources.
Figure C.5: Family-Child IGE Estimates, Same Cohort

(a) Father-Child IGE

Notes: This figure depicts the family-child IGE estimates for different ages at measurement for the parents, while keeping the child information fixed at 30–35. The sample includes parents and children of different birth cohorts. Selected children birth cohorts are from the 1981–1982 cohort.

(b) Family-Child IGE
C.2 Equivalence Scale Adjustments

This appendix presents the IGE estimates at the family level (individual measure plus spouse’s measure) adjusted for the family size and composition using adult equivalence scales. Figure C.6 replicates Figure 7 in the paper but, instead of individual measures, we use equivalized family measures for children and fathers. For comparison, Figure C.6 also presents the child-father (at the individual level) IGE estimates, which are the same as the child-father IGE estimates in Figure C.6.

**Figure C.6: Log-Log IGE Estimates of Equivalized Measures**

Notes: This figure depicts IGE estimates for different measures of resources where we use adult equivalence scales to adjust for family size and composition. The sample of children is restricted to the 1981–1982 cohort of native Danes. The IGE is the slope coefficient from the log-log regression of equivalized child’s family measure (child’s measure plus their spouse’s measure) on equivalized parent’s family measure (father’s measure plus mother’s measure): \( \log(\bar{y}_{eq_c}) = \alpha + \beta \log(\bar{y}_{eq_f}) \), where \( \bar{y}_{eq_c} \) denotes the average (over ages 30–35) of equivalized child’s family measure, and \( \bar{y}_{eq_f} \) denotes the average of equivalized father’s family measure over ages 30–35. To calculate the family level resources, we include spouse’s resources for married individuals. We include partner’s resources for those who are cohabiting but not legally married. We use the OECD equivalence scale to adjust for household composition. The OECD equivalence scale assigns a value of 1 to the first household member, a value of 0.5 to each additional adult, and a value of 0.3 to each child. As a benchmark for comparison, the unequivalized IGE estimates are also reported.
### C.3 IGE Estimates Using a Single Age

Figure C.7 replicates Figure 7 in the paper but, instead of taking averages over ages 30–35, we measure both parents and children at a single age. Figure C.7 presents the IGE estimates when we measure parents and children at ages 30, 31, 32, 33, 34, and 35, separately. The emerging pattern is similar to that of Figure 7 in the paper when we use averages over ages 30–35 for both parents and children.

![Figure C.7: Age 30–35 IGEs vs. Realized PDV IGEs](image)

**Notes:** This figure depicts IGE estimates for different measures of resources. The sample of children is restricted to the 1981–1982 cohort of native Danes. The IGE is the slope coefficient from the log-log regression of child measure on father (family) measure: \( \log(y_c^j) = \alpha + \beta \cdot \log(y_f^j) \), where \( y_c^j \) denotes the child measure at age \( j \), \( y_f^j \) denotes the father (family) measure at age \( j \), and \( j \in \{30, 31, \ldots, 35\} \).

### C.4 Grandparental Resources and Child Outcomes

Figure C.8 depicts the correlations between different measures of grandparental resources and children’s exam scores in mathematics compared to analogous measures of parental resources. Figure C.9 presents the results of a similar exercise using children’s exam scores.
in Danish reading (instead of mathematics).

**Figure C.8:** Grandparental Resources and Children’s Exam Scores in Mathematics

(a) Father and Grandfather  
(b) Mother and Grandmother  
(c) Family and Grandparents  
(d) Family and All Grandparents

Notes: This figure shows the correlation between children’s 9th-grade leaving exam scores in mathematics and measures of resources of grandparents (using the measures specified in Table 1 and Figure 6 of the main paper), comparing them to the analogous correlation with parental resources. Figure (a) shows the correlation of test scores with father’s resources compared to (paternal) grandfather’s resources. Figure (b) shows the correlation of test scores with family (father plus mother) resources compared to (paternal) grandparents’ (grandfather plus grandmother) resources. Figure (c) shows the correlation of test scores with family (father and mother) resources compared to grandparents’ (maternal and paternal grandparents) resources. Figure (d) shows the correlation of test scores with family (father and mother) resources compared to grandparents’ (sum of all four grandparents) resources. We use children of the 1995–1997 cohorts and their grandparents (parents of the 1995–1997 cohorts). We measure parents’ and grandparents’ resources over ages 40–45.
Figure C.9: Grandparental Resources and Children’s Exam Scores in Danish Reading

(a) Father and Grandfather

(b) Mother and Grandmother

(c) Family and Grandparents

(d) Family and All Grandparents

Notes: This figure shows the correlation between children’s 9th-grade leaving exam scores in Danish reading and measures of resources of grandparents (using the measures specified in Table 1 and Figure 6 of the main paper), comparing them to the analogous correlation with parental resources. Figure (a) shows the correlation of test scores with father’s resources compared to (paternal) grandfather’s resources. Figure (b) shows the correlation of test scores with family (father plus mother) resources compared to (paternal) grandparents’ (grandfather plus grandmother) resources. Figure (c) shows the correlation of test scores with family (father and mother) resources compared to grandparents’ (maternal and paternal grandparents) resources. Figure (d) shows the correlation of test scores with family (father and mother) resources compared to grandparents’ (sum of all four grandparents) resources. We use children of the 1995–1997 cohorts and their grandparents (parents of the 1995–1997 cohorts). We measure parents’ and grandparents’ resources over ages 40–45.
D  Time Trends and Differences across Generations

This section presents differences in income trajectories, asset trajectories, and timing of key life events for both younger and older generations in Denmark.

D.1  Life-Cycle Profiles of the 1981–1982 Child Cohort and That of Their Parents

D.1.1  Demographics

Figure D.1: Marriage Profile by Education Level for the 1981–1982 Child Cohort and that of Their Parents

Notes: This figure shows the fraction of individuals legally married over their age profile separately for Danish birth cohorts of 1981–1982 and their parents, by education level. We focus on four different education levels: primary school, high school, college, and universities (college plus). Males and females are plotted separately.
Figure D.2: Cohabitation Profile by Education Level for the 1981–1982 Cohort and Their Parents

Notes: This figure shows the fraction of individuals cohabiting over their age profile separately for Danish birth cohorts of 1981–1982 and their parents, by education level. Note that cohabitation is inclusive of marriage, meaning that almost all married individuals in our sample cohabit. We focus on four different education levels: primary school, high school, college, and universities (college plus). Males and females are plotted separately.
Figure D.3: Homeownership Profile by Education Level for the 1981–1982 Cohort and Their Parents

(a) Female

(b) Male

Notes: This figure shows the fraction of individuals who are homeowners over their age profile separately for Danish birth cohorts of 1981–1982 and their parents, by education level. We focus on four different education levels: primary school, high school, college, and universities (college plus). Males and females are plotted separately.
Figure D.4: Gap in Years between Age of First Birth vs. Age of Graduation (Age of First Birth minus Age of Graduation)

Notes: This figure shows the distribution of the age relative to individuals’ final graduation at which individuals have their first child for the 1981–1982 birth cohorts (children) compared to that of their parents, for each level of education. We get the age individuals have their first child and subtract from that the latest age individuals were enrolled in schooling. The vertical axis reports the fraction of individuals who had their first child at a given age relative to their final graduation age.
**Figure D.4:** Age of First Birth Relative to Final Graduation by Education, Cont’d

(Gap in Years between Age of First Birth and Age of Graduation)

(e) Female, College

(f) Male, College

(g) Female, College Plus

(h) Male, College Plus

**Notes:** This figure shows the distribution of the age relative to individuals’ final graduation at which individuals have their first child for the 1981–1982 birth cohorts (children) compared to that of their parents, for each level of education. We get the age individuals have their first child and subtract from that the latest age individuals were enrolled in schooling. The vertical axis reports the fraction of individuals who had their first child at a given age relative to their final graduation age.
D.1.2 Resources

Figure D.5: Mean Real Wage Income Profile by Education Level for the 1981–1982 Cohort and Their Parents

Notes: This figure shows the mean wage income over their age profile separately for Danish birth cohorts of 1981–1982 and their parents, by education level. We focus on four different education levels: primary school, high school, college, and universities (college plus). Males and females are plotted separately. Units are thousands of 2010 USD.
Figure D.6: Mean Disposable Income Profile by Education Level for the 1981–1982 Cohort and Their Parents

(a) Female

(b) Male

Notes: This figure shows the mean disposable income over their age profile separately for Danish birth cohorts of 1981–1982 and their parents, by education level. We focus on four different education levels: primary school, high school, college, and universities (college plus). Males and females are plotted separately. Units are thousands of 2010 USD.
Figure D.7: Mean Income without Transfers Profile by Education Level for the 1981–1982 Cohort and Their Parents

Notes: This figure shows the mean income without transfers over their age separately for Danish birth cohorts of 1981–1982 and their parents, by education level. We focus on four different education levels: primary school, high school, college, and universities (college plus). Males and females are plotted separately. Units are thousands of 2010 USD.
Figure D.8: Mean Income with Transfers Profile by Education Level for the 1981–1982 Cohort and Their Parents

(a) Female

(b) Male

Notes: This figure shows the mean income with transfers over their age separately for Danish birth cohorts of 1981–1982 and their parents, by education level. We focus on four different education levels: primary school, high school, college, and universities (college plus). Males and females are plotted separately. Units are thousands of 2010 USD.
**Figure D.9:** Mean Assets Profile by Education Level for the 1981–1982 Cohort and Their Parents

(a) Female  
(b) Male

**Notes:** This figure shows the mean assets over their age separately for Danish birth cohorts of 1981–1982 and their parents, by education level. We focus on four different education levels: primary school, high school, college, and universities (college plus). Males and females are plotted separately. Units are thousands of 2010 USD.
**Figure D.10:** Mean Liabilities Profile by Education Level for the 1981–1982 Cohort and Their Parents

(a) Female

(b) Male

Notes: This figure shows the mean liabilities over their age separately for Danish birth cohorts of 1981–1982 and their parents, by education level. We focus on four different education levels: primary school, high school, college, and universities (college plus). Males and females are plotted separately. Units are thousands of 2010 USD.
Figure D.11: Mean Net Wealth Profile by Education Level for the 1981–1982 Cohort and Their Parents

Notes: This figure shows the mean net wealth over their age profile separately for Danish birth cohorts of 1981–1982 and their parents, by education level. We focus on four different education levels: primary school, high school, college, and universities (college plus). Males and females are plotted separately. Units are thousands of 2010 USD.
E  Imputation of Children’s Realized Lifetime Income

For our main analyses in this paper, we use the sample of 1981–1982 Danish birth cohorts. We observe different income measures of the 1981 (1982) birth cohort up to age 38 (37) in the last year of our panel data in 2019. This appendix discusses how we impute future income streams of 1981–1982 birth cohorts. In what follows, we discuss the step-by-step procedure we follow to impute future income (after age 38) of our sample of children from the realized income streams observed for older cohorts.

1. **Expected Future Incomes for Previous Cohorts:** First, we use the estimation sample for the previous cohorts (whom we observe up to age 60) and compute the expected future income conditional on the conditioning set, $E[Y_{a'} | Z_a]$, for all ages $a'$ and $a$ ($a' > a$) as described in the main paper (we match around 94% of children in our sample).

2. **Definition of Residuals, $U$:** For each individual $i$ with characteristics $z_{i,a}$ who is observed at age $a + 1 \in [38, 60]$, we define the residual as follows:

   $$u_{i,a+1}(z_{i,a}, y_{i,a}) = y_{i,a+1} - E[Y_{a+1} | z_{i,a}].$$

3. **Impute Future Income Trajectories:** For each child $i$ with realized conditioning set $z_{i,37}$, we randomly draw an individual $i'$ from the set $O_{i,60} = \{i' | z'_{i',37} = z_{i,37} \text{ and } y_{i',a} \text{ is observed for all } a \in [38, \ldots, 60] \}$. So, $O_{i,60}$ is the set of all people similar to individual (child) $i$ at age 37 and for whom we observe a continuous income stream up to age 60. We then define the child’s imputed future income, i.e., $\tilde{y}_{i,a}$ where $a > 37$, from the older individual randomly chosen from the set $O_{i,60}$ defined above. The child’s expected income and residual are defined analogously.

4. **Multiple Imputation:** We repeat step 3 for 100 times to obtain multiple imputation of future income stream for children in our sample after age of 37.

5. **Adjustment for Economic Growth:** To adjust for economic growth, we apply the imputation procedure (described above) by using characteristics of individuals at age 30 (instead of age 37), and we obtain imputed values for ages 30–37 for each individual. Then, we calculate the mean percent error in imputation over ages 30–37 by the child’s education where we use four education categories (primary school, high school, college, and college plus). Finally, we adjust the imputed income streams (for ages 38–60) by the mean percent error factor obtained obtained from 30–37 by education level.
Using the procedure described above, we impute 100 future income streams for ages 38–60 for our sample of children born in 1981–1982. We use these values to analyze the relationship between parents and children in terms of the PDV of realized income stream.

### E.1 Goodness of Fit

We apply the imputation procedure described in the previous section to the age range over which our sample of children (i.e., the 1981–1982 cohorts) are observed. To this end, we match children at age 30 to individuals with similar characteristics in older cohorts, and we impute income for children over ages 31–37. We then adjust for imputation error as discussed above. Figure E.1 compares the mean true (realized) incomes to the imputed incomes adjusted for economic growth (as described above). Figure E.2 presents the results as percentages of realized incomes. Finally, Figure E.3 shows the variance of imputed incomes as fractions of the variance of realized (true) incomes over the age range in which realized incomes are observed for the sample of 1981–1982 cohorts.
**Figure E.1:** Mean Imputed vs Mean Realized Income by Education Level

(a) Primary

(b) High School

(c) College

(d) College Plus

Notes: The figure depicts the mean imputed income trajectory (after adjusting for the mean imputation error rate by education level) vs. the mean true (realized) values for the sample of 1981–1982 cohorts over the age range observed in the data. Panel (a) plots income trajectories for primary education level. Panel (b) shows income trajectories for high school education level. Panel (c) plots income trajectories for college education level. Panel (d) plots income trajectories for individuals with a college plus degree. The imputed values are calculated by matching on the information set at age 30. The procedure and the adjustment of the mean error rate is described in further detail in the introduction to Appendix E.
Figure E.2: Difference between Mean Imputed vs Mean Realized Income by Education Level

(a) Primary

(b) High School

(c) College

(d) College Plus

Notes: The figure depicts the mean difference between the imputed income (after adjusting for the mean imputation error rate by education level) and true (realized) income as percentages of realized incomes, for the sample of 1981–1982 cohorts over the age range observed in the data after adjusting for the mean error rate between the true income streams and imputed income streams by education level. Panel (a) plots income trajectories for primary education level. Panel (b) shows income trajectories for high school education level. Panel (c) plots income trajectories for college education level. Panel (d) plots income trajectories for individuals with a college plus degree. We include the 95% confidence interval for the mean over each of the iterations. The procedure and the adjustment of the mean error rate is described in further detail in the introduction to Appendix E.
Figure E.3: Dispersion of Imputed Incomes by Education Level

(a) Primary

(b) High School

(c) College

(d) College Plus

Notes: The figure depicts the variance of imputed incomes (after adjusting for the mean imputation error rate), normalized (divided) by the variance of corresponding realized income, for the sample of 1981–1982 cohorts over the age range observed in the data. Panel (a) plots income trajectories for primary education level. Panel (b) shows income trajectories for high school education level. Panel (c) plots income trajectories for college education level. Panel (d) plots income trajectories for individuals with a college plus degree. The procedure and the adjustment of the mean error rate is described in further detail in the introduction to Appendix E.
E.2 Rank-Rank Relationship for Realized Lifetime Measures

Figure E.4 presents rank-rank estimates for both *ex ante* and *ex post* measures of lifetime resources. The results suggest that rank-rank associations are significantly higher for *ex ante* lifetime measures.

**Figure E.4: Rank-Rank Estimates of Realized vs. Expected Lifetime Measures**

![Rank-Rank Estimates](image)

Notes: This figure depicts rank-rank estimates for both *ex ante* and *ex post* measures of lifetime resources. The sample of children is restricted to the 1981–1982 cohort of native Danes. The rank-rank estimate is the slope coefficient from the rank-rank regression of child measure on father (family) measure: \( \bar{r}_c^i = \alpha + \beta \bar{r}_f^i \), where \( \bar{r}_c^i \) denotes the average percentile rank of the child for each measure averaged over ages 30 and 35, and \( \bar{r}_f^i \) denotes the average percentile rank of the father (family) for each measure averaged over ages 30 and 35. The realized lifetime measures for children are computed using the imputed income measures of children following the imputation framework of Appendix E. Family outcomes are the percentile rank of the sum of the mother’s and father’s outcomes.
E.3 Non-Linear Intergenerational Income Elasticities for Realized Lifetime Measures

Figure E.5 presents local linear IGE estimates for both *ex ante* and *ex post* measures of lifetime resources. The results suggest that rank-rank associations are higher for *ex ante* lifetime measures. The results suggest that IGE estimates are significantly higher for *ex ante* lifetime measures. This might be partly due to using imputed values for the sample of children whose income measures after age 37 (for the 1982 cohorts) or 38 (for the 1981 cohort) are not observed yet.
Figure E.5: Local-Linear IGEs for Lifetime Measures

Notes: The figure depicts estimated nonlinear intergenerational income elasticities of disposable income, consumption, expected PDV, and lifetime wealth. The NL-IGEs are estimated using local linear regression slopes as formulated in Landerse and Heckman (2017). Dotted lines represent the 95% confidence interval from 60 bootstraps. The vertical lines indicate the 5th and 95th percentiles in the parental resource distributions. The realized lifetime measures for children are computed using the imputed income measures of children following the imputation framework of Appendix E.
E.4 Decomposing the IGE of Realized Lifetime Measures

Figure E.6 presents the key results from the simple linear decomposition exercise of Equation (6), with Figure 11(a) showing the share of the covariance between fathers and their sons’ resources that can be explained by each of the child’s four observable groups as well as the unexplained component, and Figure 11(b) showing the corresponding estimates by IGE levels. The results suggest that, similar to the expected lifetime measures, a significant share of the realized lifetime IGEs can be explained by the role of education.
**Figure E.6: Covariance Decomposition of Realized Lifetime Measures**

**(a) Covariance Share**

![Covariance Share Chart]

**(b) IGE Decomposition**

![IGE Decomposition Chart]

**Notes:** This figure depicts the covariance decomposition. Panel (a) plots the share of the intergenerational covariance that can be explained by each of the child’s observables $\text{Cov}(\beta c'Xc, y_{pi,b})$ and the child’s unexplained component $\text{Cov}(\mu c, y_{pi,b})$. Panel (b) decomposes the estimated father-son IGEs into each of the components depicted in Panel (a). The realized lifetime measures for children are computed using the imputed income measures of children following the imputation framework of Appendix E.
Additional Details on the Covariance Decomposition

In this appendix, we present additional results and details from the decomposition exercise presented in Section 6. Table F.1 presents the summary statistics for measures we use in the decomposition exercise. Table F.2 presents the empirical estimate of Equation (5) for each of the seven measures of resources used in the paper. Lifetime measures are much better explained than short-term measures. Table F.3 presents the share of father-son covariance that is explained by each of the child’s and parent’s components. These numbers are summarized in Figure 11 in the main paper. Figure F.1 presents a similar exercise, decomposing the father-son IGE into explained and unexplained components of the father’s income.

Table F.1: Mean of Decomposition Measures (Proportions and Levels)

<table>
<thead>
<tr>
<th>Decomposition Category</th>
<th>Measure</th>
<th>Son</th>
<th>Father</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Primary/Lower Secondary School</td>
<td>0.21</td>
<td>0.27</td>
<td>-0.06***</td>
</tr>
<tr>
<td></td>
<td>High School (Academic or Vocational)</td>
<td>0.45</td>
<td>0.49</td>
<td>-0.04***</td>
</tr>
<tr>
<td></td>
<td>College</td>
<td>0.22</td>
<td>0.16</td>
<td>0.06***</td>
</tr>
<tr>
<td></td>
<td>University (Master’s Degree)</td>
<td>0.12</td>
<td>0.08</td>
<td>0.04***</td>
</tr>
<tr>
<td>Experience</td>
<td>Years of Work Experience</td>
<td>11.41</td>
<td>13.31</td>
<td>-1.90***</td>
</tr>
<tr>
<td>Marriage</td>
<td>Married</td>
<td>0.34</td>
<td>0.75</td>
<td>-0.41***</td>
</tr>
<tr>
<td></td>
<td>Age at First Marriage</td>
<td>28.84</td>
<td>26.81</td>
<td>2.03***</td>
</tr>
<tr>
<td></td>
<td>Cohabitation</td>
<td>0.29</td>
<td>0.16</td>
<td>0.13***</td>
</tr>
<tr>
<td></td>
<td>Age at First Cohabitation</td>
<td>24.86</td>
<td>24.26</td>
<td>0.60***</td>
</tr>
<tr>
<td>Fertility</td>
<td>Any Children</td>
<td>0.46</td>
<td>1.00</td>
<td>-0.54***</td>
</tr>
<tr>
<td></td>
<td>Age at First Birth</td>
<td>28.50</td>
<td>25.50</td>
<td>3.00***</td>
</tr>
<tr>
<td></td>
<td>Number of Children by Age 35</td>
<td>0.89</td>
<td>2.15</td>
<td>-1.26***</td>
</tr>
</tbody>
</table>

Notes: This table presents the mean (the means and fractions) for the variables used in the decomposition analysis. The fraction of individuals in each education group, the mean years of work experience, the fraction of married individuals, the mean age at first marriage, the fraction of cohabitating individuals, the mean age at first cohabitation, the fraction of individuals with any child, the mean age at first birth, and the mean number of children by age 35 are reported separately for fathers and sons. The sample of children is restricted to the 1981–1982 cohort of native Danes.
Table F.2: Parameter Estimates in Decomposition

<table>
<thead>
<tr>
<th>Income Measure</th>
<th>Wage Income</th>
<th>Disposable Income</th>
<th>Income without Transfers</th>
<th>Income with Transfers</th>
<th>Consumption</th>
<th>Expected Lifetime Wealth</th>
<th>Expected PDV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[S]</td>
<td>[F]</td>
<td>[S]</td>
<td>[F]</td>
<td>[S]</td>
<td>[F]</td>
<td>[S]</td>
</tr>
<tr>
<td>High School</td>
<td>0.435</td>
<td>0.016</td>
<td>0.193</td>
<td>0.063</td>
<td>0.758</td>
<td>0.166</td>
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</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.03)</td>
<td>(0.02)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>College</td>
<td>0.519</td>
<td>0.277</td>
<td>0.265</td>
<td>0.141</td>
<td>0.814</td>
<td>0.223</td>
<td>0.272</td>
</tr>
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<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>College Plus</td>
<td>0.648</td>
<td>0.423</td>
<td>0.337</td>
<td>0.231</td>
<td>0.953</td>
<td>0.467</td>
<td>0.359</td>
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<tr>
<td></td>
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<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Experience</td>
<td>0.089</td>
<td>0.081</td>
<td>0.013</td>
<td>0.059</td>
<td>0.020</td>
<td>0.095</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
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<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Experience Squared</td>
<td>-0.001</td>
<td>-0.003</td>
<td>-0.001</td>
<td>-0.002</td>
<td>0.000</td>
<td>-0.004</td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Married</td>
<td>0.274</td>
<td>0.398</td>
<td>0.179</td>
<td>0.174</td>
<td>0.349</td>
<td>0.731</td>
<td>0.195</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.02)</td>
<td>(0.03)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Age at First Marriage</td>
<td>0.019</td>
<td>0.002</td>
<td>0.012</td>
<td>0.001</td>
<td>0.017</td>
<td>0.002</td>
<td>0.015</td>
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<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Cohabitation</td>
<td>0.200</td>
<td>0.266</td>
<td>0.130</td>
<td>0.112</td>
<td>0.292</td>
<td>0.636</td>
<td>0.154</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.03)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Age at First Cohabitation</td>
<td>-0.011</td>
<td>-0.015</td>
<td>-0.007</td>
<td>-0.005</td>
<td>-0.011</td>
<td>-0.047</td>
<td>-0.009</td>
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<td>(0.00)</td>
</tr>
<tr>
<td>Any Children</td>
<td>-0.088</td>
<td>-0.057</td>
<td>-0.066</td>
<td>-0.065</td>
<td>-0.033</td>
<td>-0.056</td>
<td>-0.046</td>
</tr>
<tr>
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<td>(0.02)</td>
<td>(0.01)</td>
<td>(0.02)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.01)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Age at First Birth</td>
<td>0.023</td>
<td>0.004</td>
<td>0.018</td>
<td>0.001</td>
<td>0.030</td>
<td>0.049</td>
<td>0.018</td>
</tr>
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<td></td>
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<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Number of Children</td>
<td>0.048</td>
<td>-0.073</td>
<td>-0.053</td>
<td>-0.016</td>
<td>0.078</td>
<td>-0.120</td>
<td>-0.053</td>
</tr>
<tr>
<td></td>
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<td>(0.01)</td>
<td>(0.01)</td>
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<tr>
<td></td>
<td>(0.09)</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.04)</td>
<td>(0.11)</td>
<td>(0.09)</td>
<td>(0.06)</td>
</tr>
</tbody>
</table>

R²: 0.084 0.052 0.105 0.048 0.102 0.071 0.096 0.072 0.140 0.155 0.425 0.395 0.664 0.663

Notes: This table presents the parameter estimates for Equation (5) (repeated below) for each of our main income measures separately for fathers [F] and sons [S]. \(y_{k,i,t} = \lambda_k + (\beta^k)X_{k,i,t}^k + \mu_{i,k} + \epsilon_{k,i,t}\), where \(y\) denotes income measure (wage income, disposable income, income without transfers, income with transfers, consumption, expected lifetime wealth, or expected PDV); \(k \in \{F, S\}\) represents the fathers [F] or sons [S]; \(\lambda_k\) denotes an aggregate generational effect; and \(\beta\) is a vector of parameters associated with the vector of observables \(X_{k,i,t}\), which are listed in the first column of the table, i.e., dummies for education categories (high school, college, and college plus), work experience and its square, dummies for marital status, cohabitating status, and whether the individual has any children, age at first marriage, age at first cohabitating, age at first childbearing, and the number of children. The additive shock term consists of an individual permanent component \(\mu_{i,k}\) and shocks \(\epsilon_{k,i,t}\). The estimates of \(\beta\) for each of the observable characteristics mentioned above and for each of our income (consumption) measures are reported in the table, separately for the sample of fathers and sons.
### Table F.3: Intergenerational Covariance: Partial Covariances Attributable to Each Variable

<table>
<thead>
<tr>
<th>Fathers</th>
<th>Sons</th>
<th>Wage Income</th>
<th>Disposable Income</th>
<th>Income without Transfers</th>
<th>Income with Transfers</th>
<th>Consumption</th>
<th>Expected Lifetime Wealth</th>
<th>Expected PDV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Education</td>
<td>11%</td>
<td>9%</td>
<td>4%</td>
<td>8%</td>
<td>24%</td>
<td>28%</td>
<td>28%</td>
</tr>
<tr>
<td>Education</td>
<td>Experience</td>
<td>6%</td>
<td>11%</td>
<td>6%</td>
<td>7%</td>
<td>14%</td>
<td>9%</td>
<td>3%</td>
</tr>
<tr>
<td>Education</td>
<td>Marriage</td>
<td>4%</td>
<td>4%</td>
<td>3%</td>
<td>4%</td>
<td>-12%</td>
<td>2%</td>
<td>8%</td>
</tr>
<tr>
<td>Education</td>
<td>Fertility</td>
<td>2%</td>
<td>1%</td>
<td>5%</td>
<td>2%</td>
<td>1%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Education</td>
<td>Unexplained Component</td>
<td>9%</td>
<td>11%</td>
<td>9%</td>
<td>9%</td>
<td>15%</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>Experience</td>
<td>Experience</td>
<td>4%</td>
<td>2%</td>
<td>1%</td>
<td>3%</td>
<td>3%</td>
<td>14%</td>
<td>15%</td>
</tr>
<tr>
<td>Experience</td>
<td>Marriage</td>
<td>2%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>-2%</td>
<td>2%</td>
<td>7%</td>
</tr>
<tr>
<td>Experience</td>
<td>Fertility</td>
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<td>0%</td>
<td>1%</td>
<td>1%</td>
<td>0%</td>
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</tr>
<tr>
<td>Experience</td>
<td>Unexplained Component</td>
<td>2%</td>
<td>2%</td>
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<td>3%</td>
<td>2%</td>
<td>7%</td>
<td>9%</td>
</tr>
<tr>
<td>Marriage</td>
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<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>-2%</td>
<td>0%</td>
<td>1%</td>
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<tr>
<td>Marriage</td>
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<td>5%</td>
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<tr>
<td>Marriage</td>
<td>Fertility</td>
<td>0%</td>
<td>0%</td>
<td>-1%</td>
<td>0%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Marriage</td>
<td>Unexplained Component</td>
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<td>3%</td>
<td>4%</td>
<td>5%</td>
<td>3%</td>
<td>2%</td>
<td>3%</td>
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<tr>
<td>Fertility</td>
<td>Education</td>
<td>1%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>5%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Fertility</td>
<td>Experience</td>
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<td>1%</td>
<td>1%</td>
<td>4%</td>
<td>-6%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Fertility</td>
<td>Marriage</td>
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<td>2%</td>
<td>1%</td>
<td>2%</td>
<td>-2%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Fertility</td>
<td>Fertility</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>3%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Fertility</td>
<td>Unexplained Component</td>
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<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>3%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
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<td>2%</td>
<td>1%</td>
<td>0%</td>
<td>6%</td>
<td>-1%</td>
<td>-2%</td>
</tr>
<tr>
<td>Unexplained Component</td>
<td>Experience</td>
<td>-26%</td>
<td>-9%</td>
<td>-12%</td>
<td>-13%</td>
<td>-10%</td>
<td>-5%</td>
<td>-2%</td>
</tr>
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<td>8%</td>
<td>11%</td>
<td>8%</td>
<td>-12%</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>Unexplained Component</td>
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<td>2%</td>
<td>4%</td>
<td>3%</td>
<td>7%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Unexplained Component</td>
<td>Unexplained Component</td>
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<td>36%</td>
<td>46%</td>
<td>38%</td>
<td>51%</td>
<td>17%</td>
<td>9%</td>
</tr>
</tbody>
</table>

Notes: This table displays the share of the intergenerational covariance that is explained by each pair for the five components for fathers and their sons for each of our main measures of resources.
Figure F.1: Covariance Decomposition (Father)

(a) Covariance Share (Father)

Notes: Panel (a) plots the share of the intergenerational covariance that can be explained by each of the parent’s observables $\text{Cov}(\tilde{y}_{i,b}^c, \beta' X_i^p)$ and the parent’s residual fixed effect $\text{Cov}(\tilde{y}_{i,b}^c, \mu_i^p)$. Panel (b) decomposes the estimated father-son IGEs into each of the components depicted in Panel (a).
G Absolute Mobility: Alternative Family Units and Robustness Checks

This appendix presents absolute upward mobility estimates for alternative family units, genders, and absolute mobility patterns for lifetime wealth with different risk aversion parameters ($\rho$). Section G.1 presents absolute mobility patterns for the father-son and mother-daughter pairs separately when we measure each individual at the family level. Section G.2 presents absolute mobility estimates at both individual and family levels.

G.1 Absolute Mobility at the Family Level

Figure G.1 presents the absolute mobility for father-son pairs. It shows the percentage of male children (of 1981–1982 birth cohorts) whose measure of resources at the family level are greater than their father’s measure of resources at the family level, by percentile of fathers’ family wage income distribution. We calculate family-level resources as the sum of respective individual and their spouse. We find very similar patterns of absolute mobility for mother-daughter pairs as for father-son pairs. However, the level of absolute mobility for females is higher than that for men across all measures. Absolute mobility is significantly higher for measures of disposable income and consumption than for the income without transfers measure that is commonly used in the literature.
G.1.1 Father-Son Relationship (Measured at the Family Level)

**Figure G.1:** Absolute Mobility for Father-Son Relationship at Family Level

(a) Traditional Measures

(b) Lifetime Measures

*Notes:* These figures show the percentage of male children (of 1981–1982 birth cohorts) whose measure of resources (at the family level) is greater than that of their father (at the family level), by percentile of fathers’ family wage income distribution. Resources are averaged over ages 30–35 for both parents and children. Panel (a) compares the absolute mobility pattern for conventional measures. Panel (b) compares the absolute mobility pattern for lifetime measures.
G.2 Absolute Mobility at the Individual Level

Figure 12 in Section 7 presents the absolute upward mobility pattern for father-son relationships at the individual level. We find very similar patterns of absolute mobility for females as the ones estimated for males. Absolute mobility is significantly higher when we use measures of disposable income and consumption in comparison to the income without transfers measure that is commonly used in the literature. Figure G.2 depicts the percentage of male children (of the 1981–1982 birth cohort) whose measured assets, liabilities, and net assets are greater than those of their fathers.

G.2.1 Father-Son Absolute Mobility of Assets (Measured at the Individual Level)

Figure G.2: Absolute Mobility of Liabilities and Assets

Notes: This figure shows the percentage of male children (of the 1981–1982 birth cohort) whose measured resources are greater than those of their parents (fathers), by percentile of the fathers’ wage income distribution. Resources are averaged over ages 30–35 for both parents and children. This figure compares the absolute mobility pattern for assets, liabilities, and net assets (i.e., assets minus liabilities).
G.3 Risk Aversion and Absolute Mobility, Alternative Family Units

In this section, we show absolute mobility estimates for lifetime wealth measures computed under different assumptions on the level of relative risk aversion for the father-son relationship at the individual level. Figure G.3 presents the results for alternative family units, including estimates for father-son relationship computed at the family level.

Figure G.3: Lifetime Wealth, $\rho$, and Absolute Mobility

Father-Son at Family Level

| Note | These figures compare the absolute mobility pattern for lifetime measures with different risk aversion parameters ($\rho$). Each panel shows the percentage of children (of 1981–1982 birth cohorts) whose measure of resources is greater than that of their parents, by percentile of parents’ wage income distribution. Resources are averaged over ages 30–35 for both parents and children. |
G.4 Absolute Mobility Patterns for Realized Lifetime Measures

Figure G.4 compares absolute mobility patterns of ex ante lifetime measures to those of ex post lifetime measures. The results suggest that the absolute mobility estimates are higher for ex post lifetime measures. The patterns for absolute mobility of ex post lifetime measures resemble the absolute mobility of disposable income in Figure 12.

Figure G.4: Absolute Mobility for Fathers and Sons (Realized vs. Expected Lifetime Measures)

Notes: The figure compares the absolute mobility patterns for ex ante lifetime measures to those for ex post measures of lifetime resources. It shows the percentage of male children (of the 1981–1982 birth cohort) whose measured resources are greater than those of their fathers. The figures show upward mobility by percentile in the fathers’ wage income distribution. The realized lifetime measures for children are computed using the imputed income measures of children following the imputation framework of Appendix E. Resources are averaged over ages 30–35 for both parents and children.
References


August 19, 2022

Intergenerational Transmission of Family Influence

