Intergenerational Income Mobility in Turkey

Nizam M. Demirtaş[†] **Orhan Torul**[‡]

† Arizona State University ‡Boğaziçi University

December 23rd, 2022

Koç University

XIV. Winter Workshop in Economics

Intergenerational Mobility

- Intergenerational mobility (*IGM*) is the extent to which descendants' economic outcomes are (*in*)dependent of their parents
- Low mobility/high persistence $\rightarrow$ Existing inequalities persist across generations
  - Growing interest in the link between cross-sectional inequalities (Piketty, 2014; Atkinson, 2015; Milanovic, 2016) and intergenerational mobility (Mogstad and Torsvik, 2021), Special Issues in *SJE* (2017) & *EJ* (2018)
    ▸ The *Great Gatsby* Curve
- Intergenerational earnings/income mobility is widely measured around the world as a result of better data availability

$$y_{i,c} = \alpha + \underbrace{\beta}_{\text{Intergenerational Elasticity (IGE) for Earnings}} y_{i,p} + \varepsilon_i$$

- Despite its sizable economic activity, high economic inequality, and distinct labor market, no previous accurate estimate for Turkey
  - Global Database on Intergenerational Mobility (*GDIM*) by Narayan et al. (2018) provide estimates for 75 countries, but *not* for Turkey ▸

Motivation

- Economic inequalities have been persistently high in Turkey
  - Wage Gini of 0.41–0.53, Income Gini of 0.39–0.46, and Consumption Gini of 0.35–0.38 between 2002 and 2018 (Tamkoç and Torul, 2020)
- Intergenerational mobility literature in Turkey is limited to intergenerational *educational* mobility (Aydemir and Yazıcı, 2019; Öztunalı and Torul, 2022)
  - Lack of cross-country comparable estimates for *IGE* of income due to data limitations

In This Paper

- We rely on the ***two-sample two-stage least-squares*** (*TS2SLS*) methodology to estimate *IGE* consistently under data limitations
  - We do **not** use *SILC panel* datasets, which feature co-residing parent-child pairs that do not accurately represent Turkey's population
  - We use *SILC* cross-sections and the transmission module instead to study mobility
- Labor market structure $\longleftrightarrow$ intergenerational mobility
- Heterogeneous mobility patterns over *gender*, *geography*, *time*, and *distribution*

Main Results

- *IGE* for *earnings* between fathers and sons is 0.51
  - Similar to the United States but more mobile than many developing countries
- *IGE* for *earnings* between fathers and daughters is 1.00
  - Low female labor force participation + Self-selection of women into employment
- *IGE* for *household income* between fathers and sons is 0.77 & fathers and daughters is 0.82
- Descendants residing in Turkey's more affluent regions are more likely to have experienced upward mobility
- A decline in intergenerational mobility for more recent birth cohorts
- Results via alternative mobility measures (e.g., rank-rank slope and transition matrices) are in support of our estimation results
  - More pronounced persistence at the two ends of the income distribution

Related Literature

- **Economic Inequality in Turkey**: Filiztekin (2015), Tansel et al. (2018), Torul and Öztunalı (2018), Tamkoç and Torul (2020), Aktuğ et al. (2021)
- **Intergenerational Educational Mobility in Turkey**: Tansel (2015), Aydemir and Yazıcı (2019), Öztunalı and Torul (2022)
- **Intergenerational Income Mobility in Turkey**: Mercan (2012), Mercan and Barlin (2016), Duman (2021)
  - All use co-residing father-son, thus suffering from unrepresentative datasets
- ***TS2SLS* & *TSIV* Estimation**: Björklund and Jäntti (1997), Inoue and Solon (2010), Dearden et al. (1997), Lefranc and Trannoy (2005), Angrist and Krueger (1992)
- **Heterogeneities in Intergenerational Mobility**:
  - Gender: Chadwick and Solon (2002), Ermisch et al. (2006)
  - Geography: Chetty et al. (2014), Chetty et al. (2016)
  - Time: Hertz et al. (2008), Davis and Mazumder (2017), Landersø and Heckman (2017)
  - Income Distribution: Bratberg et al. (2007), Jäntti et al. (2014), Palomino et al. (2018)

Estimation of *IGE*

- Canonical measure of mobility is the *intergenerational earnings elasticity* between fathers and sons (Becker and Tomes, 1986)

$$y_{i,c} = \alpha + \underbrace{\beta}\, y_{i,p} + \varepsilon_i$$

- *OLS* estimate is consistent when *lifetime* earnings of both generations are directly observed for a *representative* sample of families
- However, only *annual* earnings are observable

$$y_{ct} = \lambda_t y_c + \nu_{ct}$$

$$y_{pt} = \lambda_t y_p + \nu_{pt}$$

• Errors-in-variables Bias

Averaging earnings over multiple years (Solon, 1992)

• Lifecycle Bias

Earnings of children (*fathers*) are consistently observed earlier (*later*) in life. λ is closest to 1 around the age of 40 (Haider and Solon, 2006)

$$\text{plim}\,\hat{\beta} = \beta\,\overline{\lambda}_{ct}\overline{\lambda}_{pt}\frac{\sigma^2_{yp}}{\overline{\lambda^2}_{pt}\sigma^2_{yp} + \sigma^2_{vp}/T}$$

▸ Mazumder (2016) ▸ Haider and Solon (2006)

Estimation of *IGE*

IV Estimation

- The goal is to exploit variation in parents' earnings y_p by using parental education (e_p) and occupation (o_p) as instruments
  - Useful in the absence of representative panel data

TS2SLS Estimation (Angrist and Krueger, 1992; Björklund and Jäntti, 1997)

- Earnings of children and parents are available in two different datasets
- Equivalent to *IV* estimator when both samples are from the same population

First Sample [Child Earnings, Parental Characteristics]

$$\hat{\beta} = \overbrace{\frac{\mathrm{Cov}(y_c, \mathrm{X_p})}{\mathrm{Cov}(y_p, \mathrm{X_p})}}$$

Second Sample [Parental Earnings, Parental Characteristics]

$\mathrm{X_p}$: Vector of explanatory variables used to predict parental earnings

Data

Turkish Statistical Institute's (*TurkStat*) micro datasets:

- Survey of Income and Living Conditions (*SILC*) Cross-Sections
  - information about labor earnings income and income at individual and household level
  - covers the 2005-2017 period
  - on average 9,200 households surveyed each year

- Intergenerational Transmission of Disadvantages Module in 2010
  - attached to *SILC 2010*
  - 25,400 individuals surveyed
  - representative sample of individuals between the ages of 25 and 59
  - contains children's reports of their parents' *education* and *occupation* when they were 14 years old

▸ *SILC* Panel

Working Sample and Key Variable Definitions

- Nominal variables $\rightarrow$ Real variables via Turkish CPI
- Concentrate only on working-age individuals (25-60) who work at least 30 hours a week & whose annual earnings are above 244 Turkish liras in our estimations using earnings or income (Krueger et al., 2010; Tamkoç and Torul, 2020)
- *Annual earnings* calculated as follows:

$$ae_{i,t} = nw_{i,t} + rw_{i,t} + \alpha_t^{TR}(nse_{i,t} + rse_{i,t})$$

$ae_{i,t}$: annual earnings; $nw_{i,t}$ and $rw_{i,t}$: annual cash and other real payments; α_t^{TR}: share of labor income in national income at the year of observation; $nse_{i,t}$ and $rse_{i,t}$: the cash and other real incomes from self-employment

- *Hourly wage rate* calculated as follows:

$$w_{i,t} = \frac{ae_{i,t}}{ah_{i,t}}$$

$ah_{i,t}$: annual hours worked

- *Equivalized household income* via the modified *OECD* equivalence scale

Working Sample

Descriptive Statistics (*SILC* 2010 Cross-Section)

	Full Sample	Module Sample	Full-Time Workers	Live with Parents
Male				
Age	39.99 (17.04)	40.31 (9.70)	39.16 (8.91)	33.85 (7.93)
Secondary Education or Lower	0.69	0.64	0.62	0.61
High-School Graduate	0.20	0.21	0.22	0.26
University Graduate	0.12	0.15	0.17	0.14
$\log$(Earnings)	8.38 (1.10)	8.60 (0.93)	8.70 (0.85)	8.47 (0.78)
$\log$(Household Income)	8.74 (0.69)	8.82 (0.70)	8.89 (0.68)	8.77 (0.62)
Non-zero Earners	0.69	0.85		
Self-Employed	0.28	0.28	0.30	0.30
Number of Observations	**19633**	**12499**	**9583**	**2009**
Female				
Age	40.60 (17.73)	40.13 (9.70)	37.43 (8.34)	32.50 (6.60)
Secondary Education or Lower	0.80	0.78	0.47	0.27
High-School Graduate	0.13	0.13	0.18	0.27
University Graduate	0.07	0.09	0.35	0.45
$\log$(Earnings)	7.75 (1.52)	7.85 (1.56)	8.49 (1.09)	8.65 (0.87)
$\log$(Household Income)	8.72 (0.69)	8.80 (0.70)	9.24 (0.73)	9.16 (0.56)
Non-zero Earners	0.20	0.25		
Self-Employed	0.15	0.17	0.17	0.09
Number of Observations	**21046**	**12964**	**2120**	**379**
Total				
Age	40.31 (17.40)	40.22 (9.70)	38.85 (8.83)	33.64 (7.75)
Secondary Education or Lower	0.75	0.71	0.59	0.55
High-School Graduate	0.16	0.17	0.21	0.26
University Graduate	0.09	0.12	0.20	0.19
$\log$(Earnings)	8.23 (1.24)	8.43 (1.15)	8.67 (0.90)	8.50 (0.80)
$\log$(Household Income)	8.73 (0.69)	8.81 (0.70)	8.96 (0.70)	8.83 (0.62)
Non-zero Earners	0.43	0.54		
Self-Employed	0.25	0.26	0.28	0.27
Number of Observations	**40679**	**25463**	**11703**	**2388**

▸ *SILC* Pooled

▸ *SILC* Panel

Estimation Strategy

- Our main regression equation takes the form:

$$\widetilde{\log(y_{c,i})} = \alpha + \beta_{IGE}\, \widehat{\log(y_{p,i})} + \varepsilon_i$$

1. To proxy for age-corrected children income $\widetilde{\log(y_{c,i})}$ we first estimate:

$$\log(y_{c,i}) = \alpha_{lg} + \sum_{j=1}^{8} \beta_{lgj}\, \texttt{age}_{ij} + \sum_{k=2005}^{2017} \gamma_{lgk}\, \texttt{year}_{ik} + \epsilon_i \text{ if } \texttt{educ}_i = l \,\&\, \texttt{sex}_i = g$$

2. We use the resultant coefficients of age intervals and standard errors to construct children's age-corrected income for the age interval 35-39:

$$\widetilde{\log(y_{c,i})} = \hat{\alpha}_{lg} + \hat{\beta}_{lg4} + \hat{\gamma}_{lg2010} + \epsilon_i \frac{\hat{\sigma}_{lg4}}{\hat{\sigma}_{lgj}} \text{ if } \texttt{educ}_i = l \,\&\, \texttt{sex}_i = g \,\&\, \texttt{age}_i = j$$

1. We predict parental incomes via parents' education and occupation:

$$\log(y_{p,i}) = \alpha_g + \sum_{l=1}^{6} \beta_{1gl}\, \texttt{educ}_{il} + \sum_{m=1}^{9} \beta_{2gm}\, \texttt{occup}_{im} + \sum_{j=1}^{8} \beta_{3gj}\, \texttt{age}_{ij} + \sum_{k=2005}^{2017} \gamma_{gk}\, \texttt{year}_k + u_i \text{ if } \texttt{sex}_i = g$$

2. We use estimated coefficients to predict parental income for the age interval 35-39:

$$\widehat{\log(y_{p,i})} = \hat{\alpha}_g + \hat{\beta}_{1gl} + \hat{\beta}_{2gm} + \hat{\beta}_{3g4} + \hat{\gamma}_{g2010} \text{ if } \texttt{educ}_i = l \,\&\, \texttt{occup}_i = m \,\&\, \texttt{sex}_i = g$$

Estimation Datasets

First Stage

- We estimate the age effects on income measures of children using *SILC* cross-sectional datasets pooled over the period 2005-2017 ▸ Age-Correction Results
- We do this correction for *earnings*, *income*, *non-entrepreneurial income*, *hourly wage* and *equivalized household income*, which we use as dependent variables in *TS2SLS* estimations ▸ Income Definitions
- We estimate occupation and education effects using *SILC* cross-sectional datasets pooled over the period 2005-2017. We predict parental incomes using these coefficients ▸ Parental Income Results

Second Stage

- We obtain the *IGE* coefficient estimates in the second stage via *SILC*'s Intergenerational Transmission of Disadvantages Module in 2010

Results: Main Estimates

TS2SLS Estimates of Intergenerational Earnings Elasticity by Country

Country	Study	Elasticity
Sweden	Björklund and Jäntti (1997)	0.28
Japan	Lefranc et al. (2014)	0.33
France	Lefranc and Trannoy (2005)	0.41
Italy	Piraino (2007)	0.44
Turkey	**This study**	**0.51**
United States	Björklund and Jäntti (1997)	0.52
United Kingdom	Dearden et al. (1997)	0.58
Chile	Nunez and Miranda (2010)	0.59-0.73
Brazil	Dunn (2007)	0.85
Ecuador	Grawe (2004)	1.13

Notes: All estimates are based on samples of father-son pairs. Most studies report several estimates; among those, we pick the most comparable ones vis-à-vis our methods and sample specifications.

▸ Instruments to Predict Parental Income

Digression: Ibn Khaldun's *Muqaddimah*

"*Prestige lasts at best four generations in one lineage.*" (Ibn Khaldun, 1377)

''Prestige is an accident that affects human beings. It comes into being and decays inevitably...It reaches its end in a single family within four successive generations. This is as follows: The builder of the glory (of the family) knows what it cost him to do the work, and he keeps the qualities that created his glory and made it last. The son who comes after him had personal contact with his father and thus learned those things from him. However, he is inferior in this respect to (his father), in as much as a person who learns things through study is inferior to a person who knows them from practical application. The third generation must be content with imitation and, in particular, with reliance upon tradition. This member is inferior to that of the second generation, in as much as a person who relies (blindly) upon tradition is inferior to a person who exercises independent judgment.''

- When $\hat{\beta}$=0.51, 100% above the mean $\downarrow\downarrow\downarrow$ 6.7% in four generations

Results: Main Estimates

TS2SLS Estimates of Intergenerational Elasticity in Turkey

Pairs	Number of Obs.	Earnings	Income	Non-Entrepreneurial Income	Hourly Wage
Father-Son	[7809]	0.51 (0.018)	0.61 (0.021)	0.40 (0.017) [5673]	0.49 (0.019)
Father-Daughter	[1743]	1.00 (0.042)	1.09 (0.048)	0.72 (0.038) [1451]	0.88 (0.040)
Mother-Son	[3101]	0.35 (0.025)	0.52 (0.039)	0.29 (0.026) [2037]	0.31 (0.025)
Mother-Daughter	[670]	0.80 (0.042)	0.99 (0.055)	0.61 (0.042) [509]	0.72 (0.042)

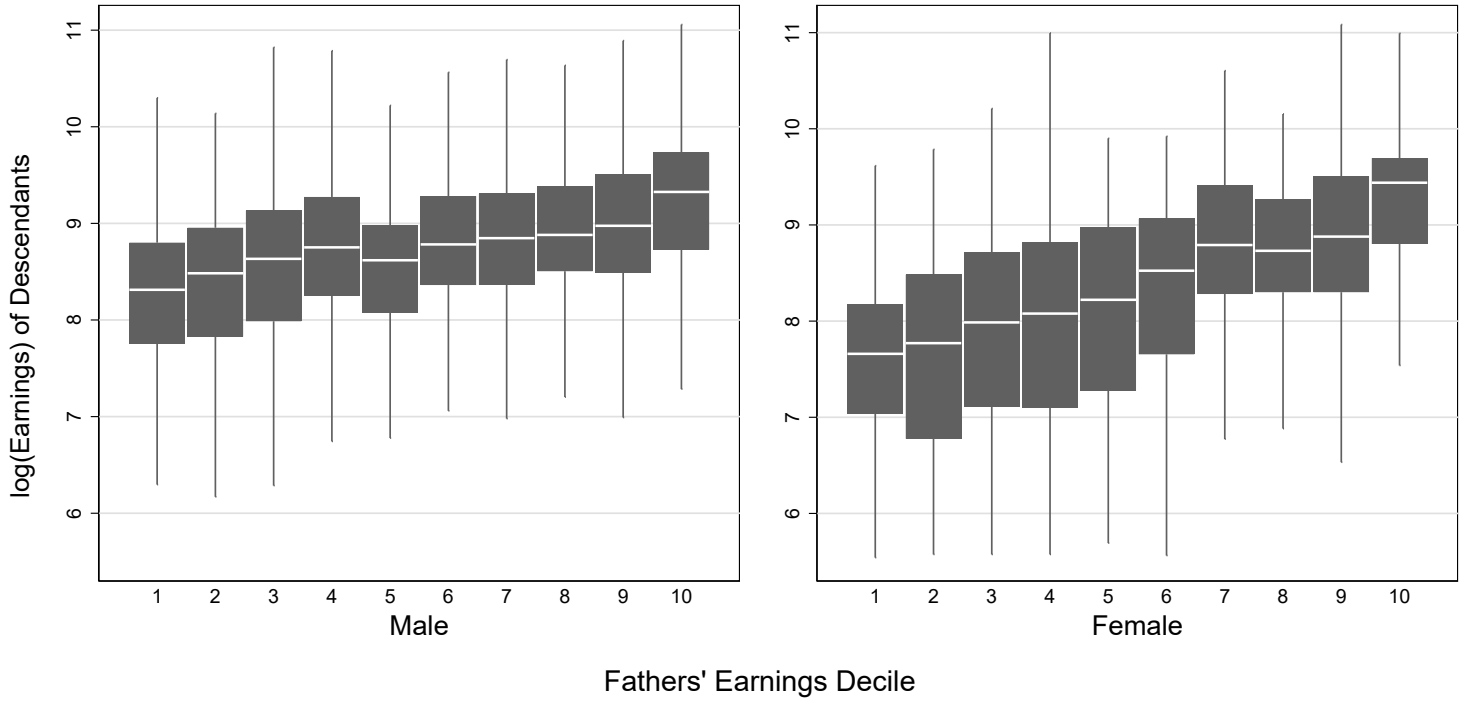
Notes: Bootstrap standard errors are in parentheses. The numbers in brackets denote the sample size.

- Intergenerational elasticity estimates are higher for broader income definitions (Lee and Solon, 2009)
- Intergenerational elasticity estimates for parent-daughter pairs are larger

▸ Income Definitions ▸ Educational Mobility ▸ Robustness

Intergenerational Mobility and Gender

Earnings of Male and Female Descendants over Father's Earnings Distribution



- Steeper females' earnings growth over father's income rank
- Earnings growth over education is also steeper for women

	48%	Secondary school or lower
Gender Pay Gap $\rightarrow$	21%	High school
	13%	University

▸ Logit

Intergenerational Mobility and Gender

- Decomposition of *IGE* into *within-group* & *between-group* by Hertz (2008)

Decomposition of Intergenerational Earnings Elasticity by Educational Attainment

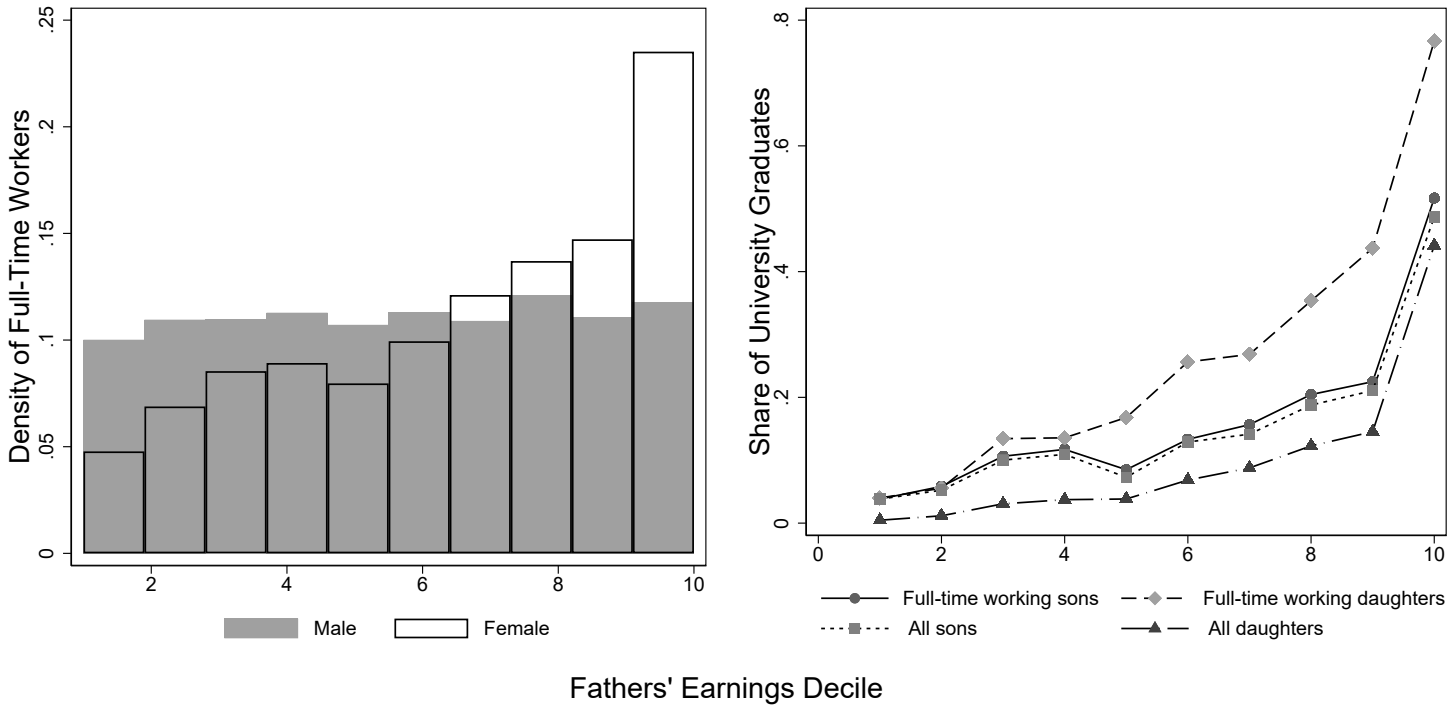
		Male			Female		
		Secondary or Lower	High School	University	Secondary or Lower	High School	University
	Shares	0.609	0.223	0.168	0.467	0.178	0.355
	Mean log Earnings of Children	8.51	8.97	9.58	7.83	8.72	9.47
	Mean log Earnings of Fathers	8.16	8.49	8.68	8.20	8.66	8.88
	Pooled *IGE*		**0.514**			**0.997**	
	Within-group *IGE*	0.280	0.139	0.135	0.412	0.207	0.143
A	Contribution of within-group *IGE*	0.120	0.026 $\sum$ =0.173	0.027	0.115	0.017 $\sum$ =0.173	0.041
	Between-group effects	0.189	0.126	1.176	0.804	0.097	1.214
B	Contribution of between-group effects	0.115	0.028 $\sum$ =0.341	0.198	0.376	0.017 $\sum$ =0.824	0.431
	Group-specific persistence: **A**+**B**	0.236	0.054 $\sum$ =0.514	0.225	0.491	0.034 $\sum$ =0.997	0.472

▸ Details

Intergenerational Mobility and Gender

- Self-selection of women into the labor force amplifies intergenerational persistence

Labor Force Participation and University Graduate Rates by Gender



- Household income is available for females who do not work (Chadwick and Solon, 2002)

▸ Heckit

Intergenerational Mobility and Gender

TS2SLS Estimates of Household Income

Pairs	Parent & Child Household Income		Parents' Personal Earnings	
	Full Sample	Only Full-Time Working Children	Full Sample	Only Full-Time Working Children
Father-Son	0.77 (0.018) [10170]	0.79 (0.020) [7809]	0.57 (0.014) [10170]	0.59 (0.015) [7809]
Father-Daughter	0.82 (0.018) [10426]	0.99 (0.034) [1743]	0.62 (0.014) [10426]	0.82 (0.028) [1743]
Mother-Son	0.98 (0.032) [4109]	0.99 (0.035) [3101]	0.41 (0.018) [4109]	0.43 (0.019) [3101]
Mother-Daughter	1.03 (0.033) [4350]	1.12 (0.046) [670]	0.44 (0.019) [4350]	0.60 (0.028) [670]

- Household income elasticities are similar for sons and daughters
- *IGE* estimates of household income are larger than other income measures
- Children of higher-earning parents tend to marry partners who earn more

▸ Non-Equivalized Household Income ▸ Assortative Mating

Rank Mobility

- *IGE* is sensitive to changes in inequality: *IGE*=$\frac{\sigma_{yc}}{\sigma_{yp}}\rho$
- Subgroup elasticities may not be informative

- Rank-based measures are used extensively in the geographic analysis of mobility (Chetty et al., 2014)
- Rank-rank slope:

$$R_c = \alpha + \beta R_p + \epsilon$$

  where R_c and R_p: rank of child and parent in the national distribution

- Absolute Upward Mobility:

$$E[R_c|R_p < 50]$$

  - $E[R_c|R_p < 50] = 0.50$ if $\beta = 0$
  - $E[R_c|R_p < 50] = 0.25$ if $\beta = 1$

Rank Mobility

Estimated Household Income Rank-Rank Slopes

	Father's Rank		Mother's Rank	
Sons	0.410		0.386	
	(.009)		(.016)	
	[10170]	0.416	[4109]	0.384
		(.009)		(.015)
Daughters	0.421	[20596]	0.385	[8459]
	(.006)		(.011)	
	[10426]		[4350]	

Notes: Sons and daughters are ranked together, while fathers and mothers are ranked separately.

- Household income rank-rank slope is 0.34 for the US (Chetty et al., 2014) and around 0.20 for the Nordic countries (Bratberg et al., 2017)

▸ Rank Slopes via Individual Earnings

Rank Mobility by Residence

Rank Mobility across Rural and Urban Residences

	Rural		Urban	
Rank-Rank Slope	Father's Rank	Mother's Rank	Father's Rank	Mother's Rank
Sons	0.35 (.017) [3352]	0.29 (.025) [2095]	0.36 (.011) [6818]	0.37 (.020) [2014]
Daughters	0.33 (.017) [3432]	0.28 (.025) [2135]	0.39 (.011) [6994]	0.38 (.019) [2215]
Absolute Upward Mobility $E[R_c \mid R_p < 50]$				
Sons	35.50 (.47)	34.11 (.69)	46.70 (.47)	43.97 (.89)
Daughters	32.65 (.44)	31.01 (.66)	43.07 (.44)	39.64 (.81)

Notes: *Urban* and *rural* denote children's place of residence at the time of the survey.

- Mothers' rank in the income distribution more decisive on the outcomes of children who reside in **urban** areas
- Children who reside in urban areas are more likely to have experienced upward mobility

▸ Urban-Rural Decomposition

Rank Mobility by Geography

Rank Mobility across Regions

	East		West		North		South		Central	
Rank-Rank Slope	Father's Rank	Mother's Rank	Father's Rank	Mother's Rank	Father's Rank	Mother's Rank	Father's Rank	Mother's Rank	Father's Rank	Mother's Rank
Sons	0.36	0.40	0.38	0.32	0.30	0.23	0.34	0.25	0.35	0.38
	(.019)	(.050)	(.013)	(.024)	(.026)	(.039)	(.027)	(.058)	(.025)	(.045)
	[2299]	[975]	[4233]	[1605]	[1159]	[727]	[1063]	[417]	[1416]	[385]
Daughters	0.34	0.23	0.39	0.35	0.33	0.26	0.36	0.36	0.43	0.37
	(.019)	(.048)	(.013)	(.024)	(.024)	(.038)	(.025)	(.049)	(.023)	(.045)
	[2321]	[961]	[4222]	[1659]	[1222]	[790]	[1183]	[496]	[1478]	[444]
Absolute Upward Mobility										
Sons	32.10	29.11	47.95	43.47	43.44	43.05	41.93	40.59	46.67	43.13
	(.53)	(.84)	(.57)	(1.05)	(1.03)	(1.15)	(1.03)	(2.20)	(1.01)	(1.88)
Daughters	29.00	27.18	45.22	39.33	39.01	39.03	39.13	33.14	41.03	36.94
	(.52)	(.85)	(.57)	(1.03)	(.84)	(.96)	(.95)	(2.04)	(.98)	(1.77)

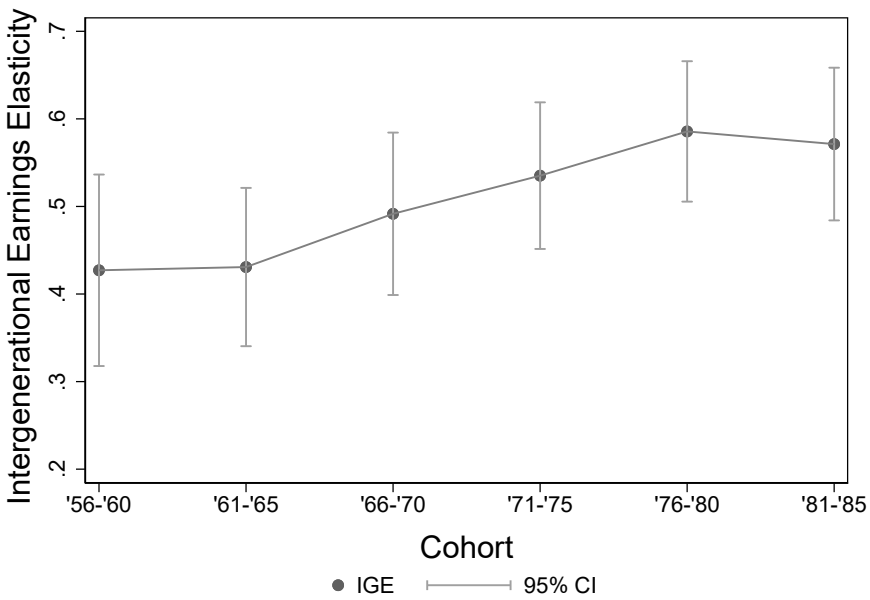
- Rank mobility is higher in the North
- Mobility is lowest for daughters residing in the Central
- Absolute upward mobility increases over regional GDP per capita

NUTS-1

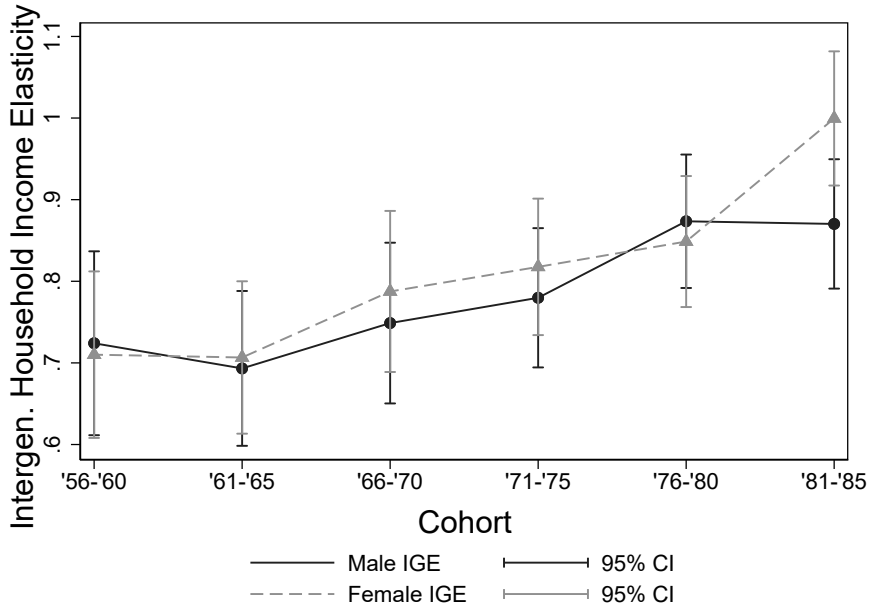
Intergenerational Mobility over Time

Evolution of Intergenerational Earnings and Household Income Elasticity

Earnings Elasticity



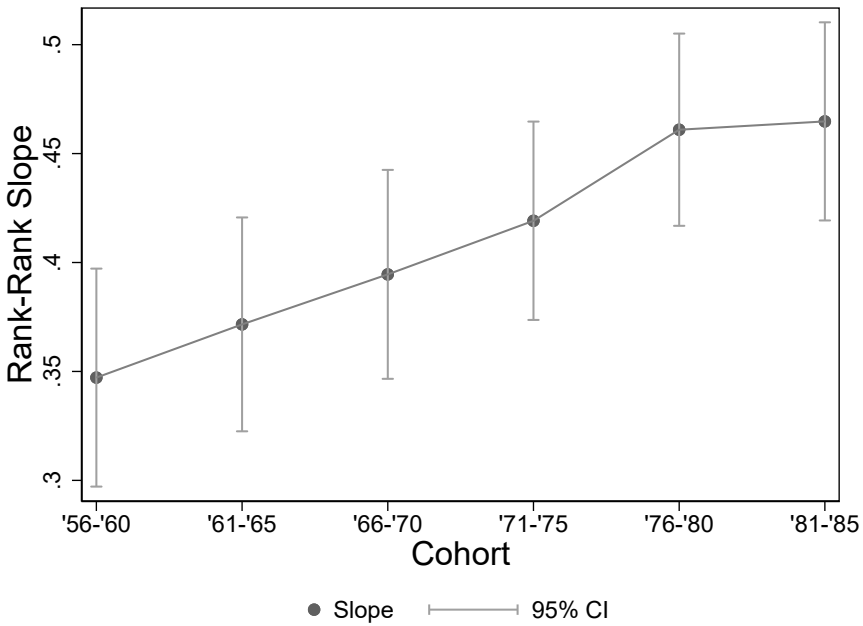
Household Income Elasticity



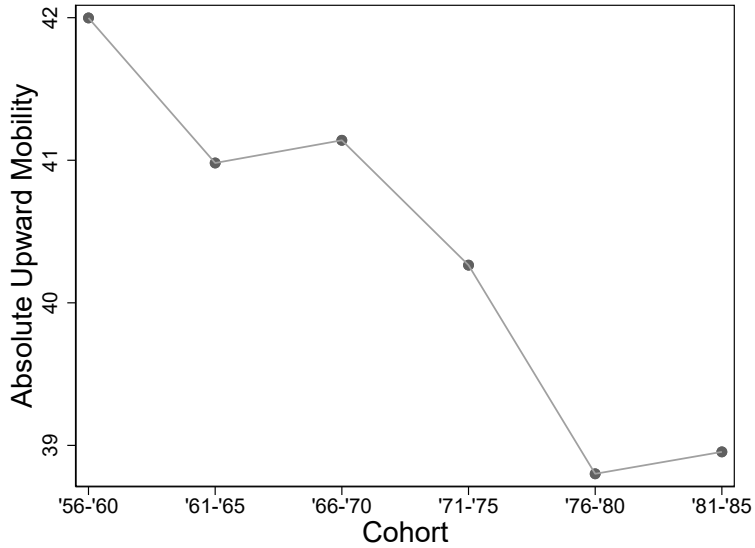
Intergenerational Mobility over Time (*cont'd*)

Positional Household Income Mobility by Birth Cohorts of Sons

Rank-Rank Slope

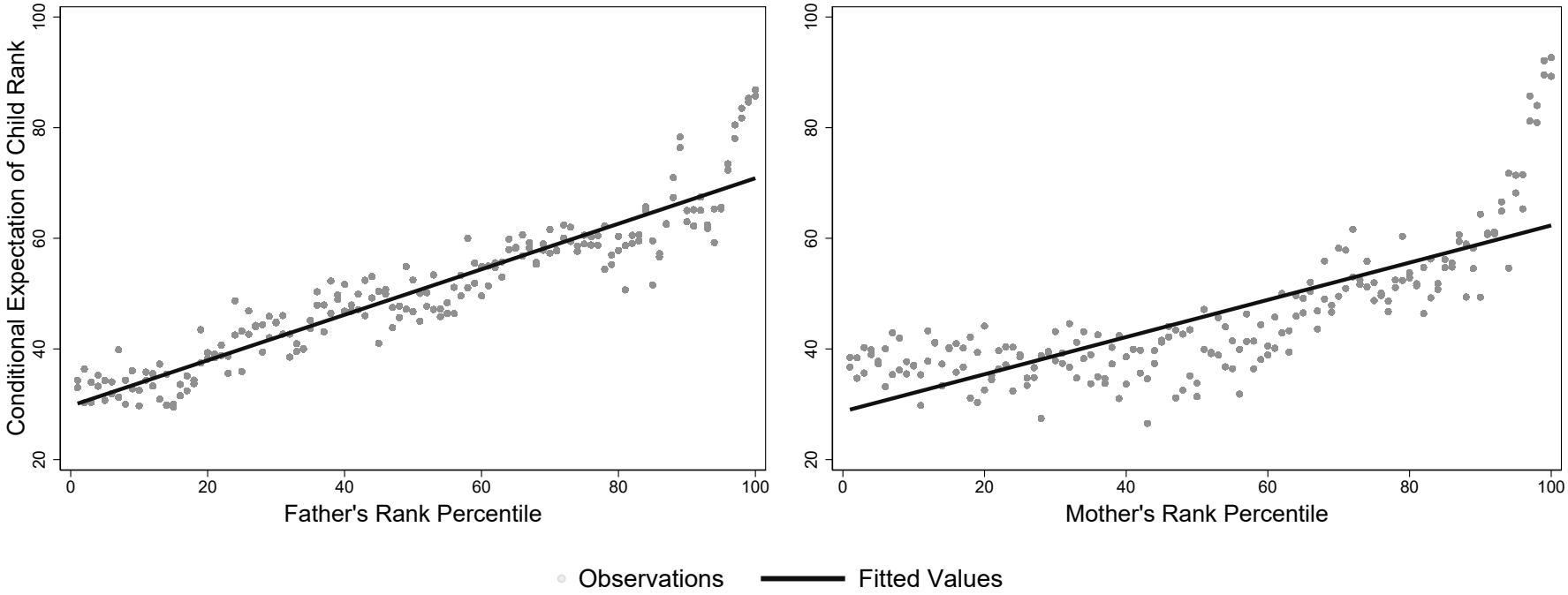


Absolute Upward Mobility



Intergenerational Mobility over Income Distribution

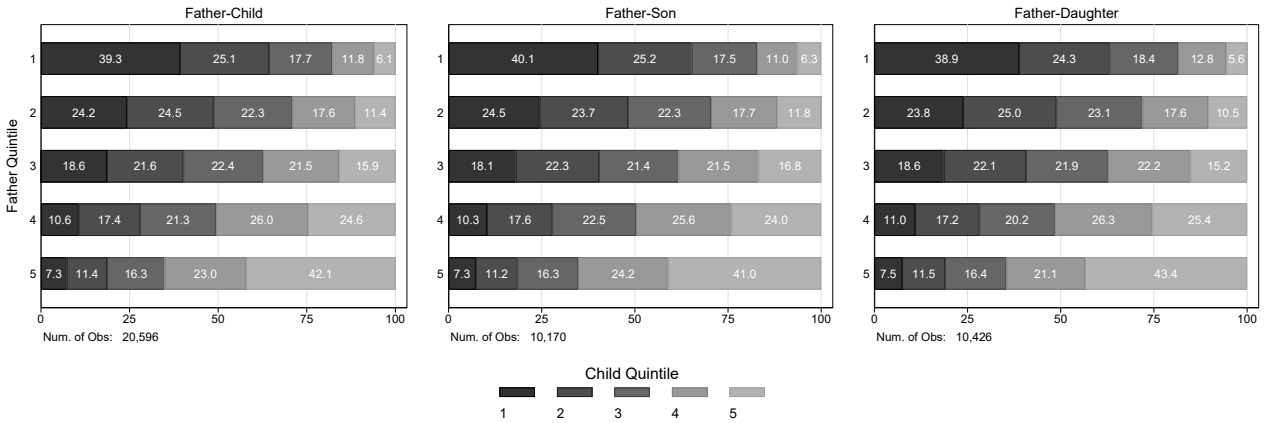
Expected Child Rank Conditional on Parental Rank



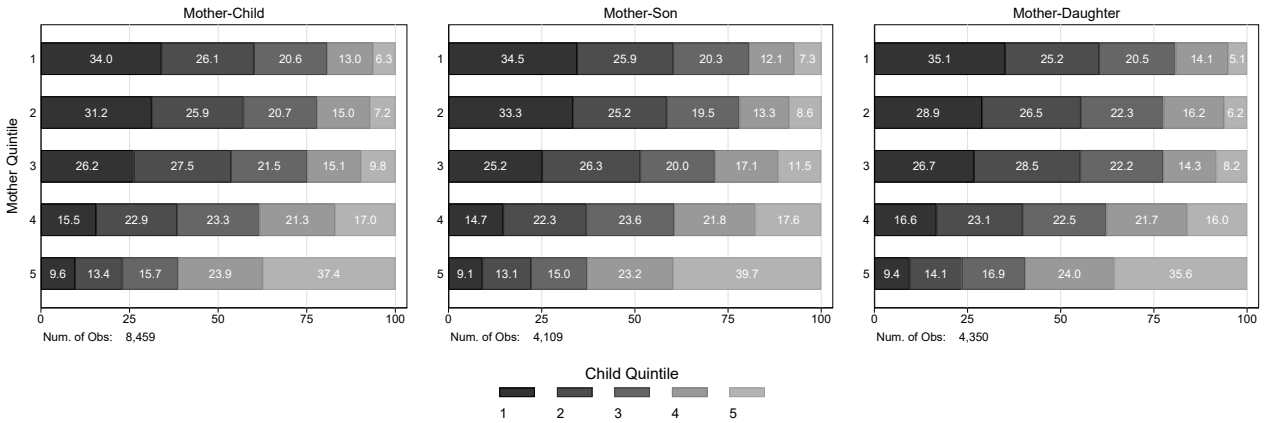
Transition Matrices

- Both *IGE* and rank-rank slope measures persistence around the population mean

Household Income Transition Matrices for Fathers



Household Income Transition Matrices for Mothers



- Each cell represents the percentage of children in the quintile given by the column conditional on having parents in the quintile given by the row

Robustness

- We check the validity of our main estimates by running alternative regressions
- We detect limited variation in estimates under different income definitions

TS2SLS Estimates for Different Income Criteria

Pairs	Includes Part-Time, Annual Earnings>244 Liras					Everyone with Non-zero Income			
	Number of Obs.	Earnings	Income	Labor Income	Hourly Wage	Earnings	Income	Labor Income	Hourly Wage
Father-Son	[7992]	0.52 (0.018)	0.61 (0.021)	0.40 (0.017) [5772]	0.50 (0.019)	0.52 (0.018) [8634]	0.60 (0.021) [9520]	0.40 (0.017) [6297]	0.51 (0.019) [8016]
Father-Daughter	[1950]	1.04 (0.042)	1.11 (0.047)	0.76 (0.038) [1581]	0.89 (0.038)	1.23 (0.048) [2649]	1.11 (0.046) [3499]	0.96 (0.043) [2127]	0.96 (0.041) [2041]
Mother-Son	[3195]	0.37 (0.026)	0.55 (0.040)	0.31 (0.027) [2080]	0.33 (0.026)	0.37 (0.027) [3452]	0.57 (0.039) [3795]	0.31 (0.027) [2284]	0.33 (0.026) [3209]
Mother-Daughter	[763]	0.83 (0.043)	0.99 (0.055)	0.63 (0.044) [561]	0.75 (0.041)	0.91 (0.053) [1056]	1.07 (0.059) [1388]	0.78 (0.049) [782]	0.79 (0.047) [823]

Robustness (*cont'd*)

- We detect limited variation under different coding of top/bottom incomes

TS2SLS Estimates for Sons with Different Outlier Treatments

	Benchmark		Bottom-Coded		Top-Coded		Both	
Sample	Earnings	Income	Earnings	Income	Earnings	Income	Earnings	Income
Complete Sample	0.53 (0.022) [5241]	0.59 (0.026) [5241]	0.53 (0.022) [5641]	0.59 (0.026) [6230]	0.52 (0.021) [5241]	0.59 (0.026) [5241]	0.53 (0.022) [5641]	0.59 (0.026) [6230]
Age 30-34	0.53 (0.053) [1027]	0.70 (0.064) [1027]	0.54 (0.051) [1083]	0.75 (0.062) [1091]	0.52 (0.051) [1027]	0.68 (0.062) [1027]	0.53 (0.050) [1083]	0.73 (0.061) [1091]
Age 35-39	0.54 (0.054) [884]	0.60 (0.059) [884]	0.54 (0.055) [930]	0.62 (0.067) [946]	0.53 (0.053) [884]	0.60 (0.058) [884]	0.53 (0.055) [930]	0.61 (0.065) [946]

▸ Further Robustness Checks

Robustness (*cont'd*)

- We detect limited variation when different (single) years are used in the first stage

Intergenerational Elasticity Estimates for Different First-Stage Sample Years

Pairs	Father-Son			Father-Daughter			Mother-Son			Mother-Daughter		
Year of 1st Stage Sample	Earnings	Income	Non-Entrepreneurial Income	Earnings	Income	Non-Entrepreneurial Income	Earnings	Income	Non-Entrepreneurial Income	Earnings	Income	Non-Entrepreneurial Income
2005	0.455	0.565	0.380	0.902	1.034	0.685	0.376	0.524	0.268	0.827	0.995	0.553
2006	0.464	0.596	0.375	0.930	1.076	0.682	0.371	0.530	0.270	0.790	0.955	0.549
2007	0.476	0.571	0.343	0.931	1.042	0.629	0.324	0.457	0.252	0.746	0.901	0.532
2008	0.460	0.552	0.357	0.898	1.027	0.652	0.327	0.449	0.272	0.738	0.878	0.553
2009	0.488	0.565	0.345	0.923	1.019	0.626	0.347	0.472	0.279	0.764	0.886	0.560
2010	0.530	0.646	0.354	0.994	1.106	0.650	0.377	0.554	0.321	0.830	0.982	0.641
2011	0.520	0.595	0.399	0.978	1.038	0.701	0.359	0.519	0.302	0.794	0.941	0.609
2012	0.509	0.603	0.406	0.964	1.055	0.715	0.361	0.534	0.282	0.817	0.996	0.595
2013	0.524	0.638	0.433	0.999	1.111	0.758	0.345	0.492	0.290	0.781	0.927	0.599
2014	0.541	0.623	0.454	1.028	1.096	0.786	0.355	0.486	0.342	0.823	0.969	0.695
2015	0.538	0.632	0.429	1.033	1.091	0.759	0.369	0.594	0.302	0.892	1.115	0.648
2016	0.511	0.621	0.442	1.015	1.111	0.787	0.311	0.500	0.320	0.792	1.015	0.683
2017	0.488	0.580	0.444	0.977	1.059	0.793	0.321	0.529	0.308	0.817	1.087	0.673

- Intergenerational earnings elasticity estimates are between 0.455-0.541
  - variation of at most 17% (13% in Dunn 2007)

▸ Results via *HBS*

Robustness (*cont'd*)

TS2SLS Estimates via Predicted Incomes for Both Generations

Pairs	Number of Obs.	Earnings	Income	Non-Entrepreneurial Income	Hourly Wage
Father-Son	[7642]	0.48 (0.009)	0.45 (0.010)	0.42 (0.009)	0.47 (0.010)
Father-Daughter	[1613]	0.88 (0.026)	0.88 (0.027)	0.74 (0.027)	0.80 (0.027)
Mother-Son	[3028]	0.28 (0.013)	0.37 (0.016)	0.28 (0.015)	0.25 (0.014)
Mother-Daughter	[629]	0.69 (0.024)	0.79 (0.025)	0.65 (0.025)	0.65 (0.026)

Estimated Elasticities via a Single Instrument for Parental Income

	Instrument: *Education*					Instrument: *Occupation*				
Pairs	Number of Obs.	Earnings	Income	Non-Entrepreneurial Income	Hourly Wage	Number of Obs.	Earnings	Income	Non-Entrepreneurial Income	Hourly Wage
Father-Son	[7642]	0.92 (0.033)	0.79 (0.029)	0.95 (0.040) [6618]	1.01 (0.038)	[7751]	0.45 (0.019)	0.52 (0.025)	0.35 (0.017) [5631]	0.43 (0.019)
Father-Daughter	[1613]	1.39 (0.064)	1.35 (0.062)	1.24 (0.067) [1584]	1.33 (0.063)	[1642]	0.95 (0.047)	1.04 (0.059)	0.65 (0.039) [1364]	0.83 (0.043)
Mother-Son	[3028]	0.75 (0.047)	0.74 (0.053)	0.83 (0.064) [6699]	0.84 (0.050)	[3061]	0.31 (0.025)	0.45 (0.043)	0.26 (0.026) [2022]	0.27 (0.025)
Mother-Daughter	[629]	1.26 (0.067)	1.24 (0.072)	1.22 (0.079) [1594]	1.29 (0.069)	[639]	0.79 (0.045)	0.99 (0.062)	0.59 (0.046) [482]	0.70 (0.044)

▸ Further Robustness Checks

Conclusion

- Our study provides a detailed analysis of intergenerational economic mobility in Turkey & complements the studies on
  - cross-sectional inequalities in Turkey
  - intergenerational educational mobility in Turkey
- Main findings:
  - Turkey is less mobile than developed countries (e.g., United States) but more mobile than most developing (*e.g.*, *Latin American* countries)
  - Low female labor force participation, selective employment & assortative mating

    ⇕

    Intergenerational economic mobility
  - Immense heterogeneity over *gender*, *geography*, *time*, and *distribution*
- Future research:

  If suitable data becomes available
  - Trends and regional differences in *IGM*
  - Causal inference of *IGM*

References I

Aktuğ, E., Kuzubaş, T. U., and Torul, O. (2021). Heterogeneity in labor income profiles: evidence from turkey. *Empirical Economics*, 60(5):2557–2587.

Angrist, J. D. and Krueger, A. B. (1992). The effect of age at school entry on educational attainment: An application of instrumental variables with moments from two samples. *Journal of the American Statistical Association*, 87(418):328–336.

Atkinson, A. B. (2015). *Inequality*. Harvard University Press.

Aydemir, A. B. and Yazıcı, H. (2019). Intergenerational education mobility and the level of development. *European Economic Review*, 116:160 – 185.

Becker, G. S. and Tomes, N. (1986). Human capital and the rise and fall of families. *Journal of Labor Economics*, 4:S1–S39.

Björklund, A. and Jäntti, M. (1997). Intergenerational income mobility in sweden compared to the united states. *The American Economic Review*, 87(5):1009–1018.

Bratberg, E., Davis, J., Mazumder, B., Nybom, M., Schnitzlein, D. D., and Vaage, K. (2017). A comparison of intergenerational mobility curves in germany, norway, sweden, and the us. *The Scandinavian Journal of Economics*, 119(1):72–101.

Bratberg, E., Nilsen, O. A., and Vaage, K. (2007). Trends in intergenerational mobility across offspring's earnings distribution in norway. *Industrial Relations: A Journal of Economy and Society*, 46(1):112–129.

References II

Chadwick, L. and Solon, G. (2002). Intergenerational income mobility among daughters. *American Economic Review*, 92(1):335–344.

Chetty, R., Hendren, N., and Katz, L. F. (2016). The effects of exposure to better neighborhoods on children: New evidence from the moving to opportunity experiment. *American Economic Review*, 106(4):855–902.

Chetty, R., Hendren, N., Kline, P., and Saez, E. (2014). Where is the land of opportunity? the geography of intergenerational mobility in the united states. *The Quarterly Journal of Economics*, 129(4):1553–1623.

Corak, M. (2013). Income inequality, equality of opportunity, and intergenerational mobility. *Journal of Economic Perspectives*, 27:79–102.

Davis, J. and Mazumder, B. (2017). The decline in intergenerational mobility after 1980. Working Paper 2017-05, Federal Reserve Bank of Chicago, Chicago, IL.

Dearden, L., Machin, S., and Reed, H. (1997). Intergenerational mobility in britain.

Duman, E. (2021). Intergenerational income mobility in turkey. *Optimum Ekonomi ve Yönetim Bilimleri Dergisi*, 8(2):223 – 238.

Dunn, C. E. (2007). The intergenerational transmission of lifetime earnings: Evidence from brazil. *The B.E. Journal of Economic Analysis & Policy*, 7.

Ermisch, J., Francesconi, M., and Siedler, T. (2006). Intergenerational Mobility and Marital Sorting. *The Economic Journal*, 116(513):659–679.

References III

Filiztekin, A. (2015). Income inequality trends in turkey. *Iktisat Isletme ve Finans*, 30(350):63–92.

GDIM (2018). Global database on intergenerational mobility. Technical report, World Bank Group., Washington, D.C.

Grawe, N. D. (2004). Intergenerational mobility for whom? the experience of high- and low-earning sons in international perspective.

Haider, S. and Solon, G. (2006). Life-cycle variation in the association between current and lifetime earnings. *American Economic Review*, 96:1308–1320.

Hertz, T. (2008). A group-specific measure of intergenerational persistence. *Economics Letters*, 100(3):415–417.

Hertz, T., Jayasundera, T., Piraino, P., Selcuk, S., Smith, N., and Verashchagina, A. (2008). The inheritance of educational inequality: International comparisons and fifty-year trends. *The B.E. Journal of Economic Analysis & Policy*, 7.

Inoue, A. and Solon, G. (2010). Two-sample instrumental variables estimators. *The Review of Economics and Statistics*, 92(3):557–561.

Jäntti, M., Bratsberg, B., Røed, K., Raaum, O., Naylor, R., Österbacka, E., Björklund, A., and Eriksson, T. (2014). American Exceptionalism in a New Light: A Comparison of Intergenerational Earnings Mobility in the Nordic Countries, the United Kingdom and the United States. *IZA Discussion Paper No. 1938*.

References IV

Krueger, D., Perri, F., Pistaferri, L., and Violante, G. (2010). Cross sectional facts for macroeconomists. *Review of Economic Dynamics*, 13(1):1–14.

Landersø, R. and Heckman, J. J. (2017). The scandinavian fantasy: The sources of intergenerational mobility in denmark and the us. *The Scandinavian Journal of Economics*, 119(1):178–230.

Lee, C.-I. and Solon, G. (2009). Trends in intergenerational income mobility. *The Review of Economics and Statistics*, 91(4):766–772.

Lefranc and Trannoy (2005). Intergenerational earnings mobility in france: Is france more mobile than the us? *Annales d'Économie et de Statistique*, page 57.

Lefranc, A., Ojima, F., and Yoshida, T. (2014). Intergenerational earnings mobility in japan among sons and daughters: levels and trends. *Journal of Population Economics*, 27:91–134.

Mazumder, B. (2016). Estimating the Intergenerational Elasticity and Rank Association in the United States: Overcoming the Current Limitations of Tax Data. *Research in Labor Economics*, 129:43–83.

Mercan, M. (2012). Intergenerational income mobility in turkey. *İktisat İşletme ve Finans*, 27.

Mercan, M. and Barlin, H. (2016). Intergenerational income elasticity in turkey. *International Journal of Research in Business and Social Science (2147- 4478)*, 5(3).

Milanovic, B. (2016). *Global inequality: A new approach for the age of globalization*. Harvard University Press.

References V

Mogstad, M. and Torsvik, G. (2021). Family background, neighborhoods and intergenerational mobility. Technical report, NBER Working Paper No: 28874.

Narayan, A., Van der Weide, R., Cojocaru, A., Lakner, C., Redaelli, S., Mahler, D. G., Ramasubbaiah, R. G. N., and Thewissen, S. (2018). *Fair Progress?: Economic Mobility across Generations around the World*. The World Bank.

Nunez, J. I. and Miranda, L. (2010). Intergenerational income mobility in a less-developed, high-inequality context: The case of chile. *The B.E. Journal of Economic Analysis & Policy*, 10.

Öztunalı, O. and Torul, O. (2022). The evolution of intergenerational educational mobility in turkey. *Emerging Markets Finance and Trade*, Forthcoming.

Palomino, J. C., Marrero, G. A., and Rodríguez, J. G. (2018). One size doesn't fit all: A quantile analysis of intergenerational income mobility in the us (1980–2010). *The Journal of Economic Inequality*, 16(3):347–367.

Piketty, T. (2014). *Capital in the Twenty-First Century*. Harvard University Press.

Piraino, P. (2007). Comparable estimates of intergenerational income mobility in italy. *The B.E. Journal of Economic Analysis & Policy*, 7.

Solon, G. (1992). Intergenerational income mobility in the united states. *The American Economic Review*, 82(3):393–408.

Tamkoç, M. N. and Torul, O. (2020). Cross-sectional facts for macroeconomists: Wage, income and consumption inequality in turkey. *The Journal of Economic Inequality*, 18(2):239–259.

References VI

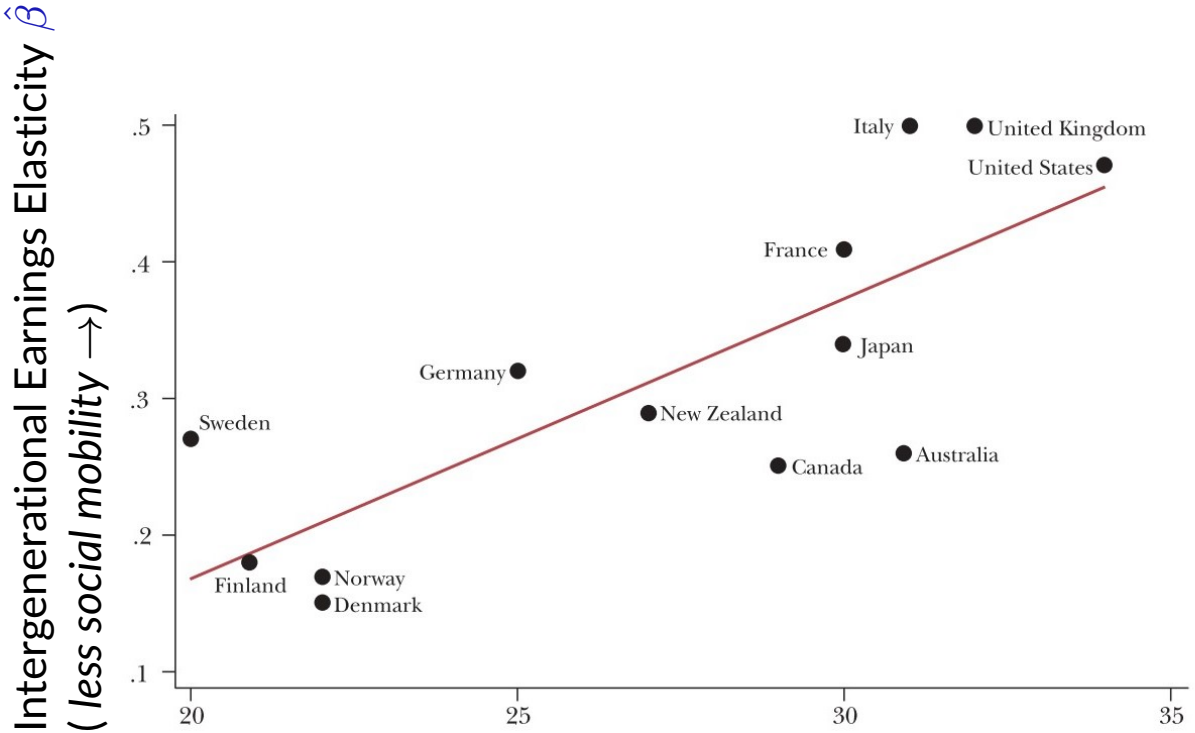
Tansel, A. (2015). Intergenerational educational mobility in turkey. *IZA Discussion Paper No. 9590*.

Tansel, A., Dalgıç, B., and Güven, A. (2018). Wage Inequality and Wage Mobility in Turkey. *Social Indicators Research*.

Torul, O. and Öztunalı, O. (2018). On income and wealth inequality in turkey. *Central Bank Review*, 18(3):95–106.

The *Great Gatsby* Curve

- *Cross-sectional inequality* and *intergenerational mobility* are negatively correlated across countries.



$$y_{i,c} = \alpha + \beta y_{i,p} + \varepsilon_i$$

Source: Corak (2013)

▸ via GDIM ▸ Back

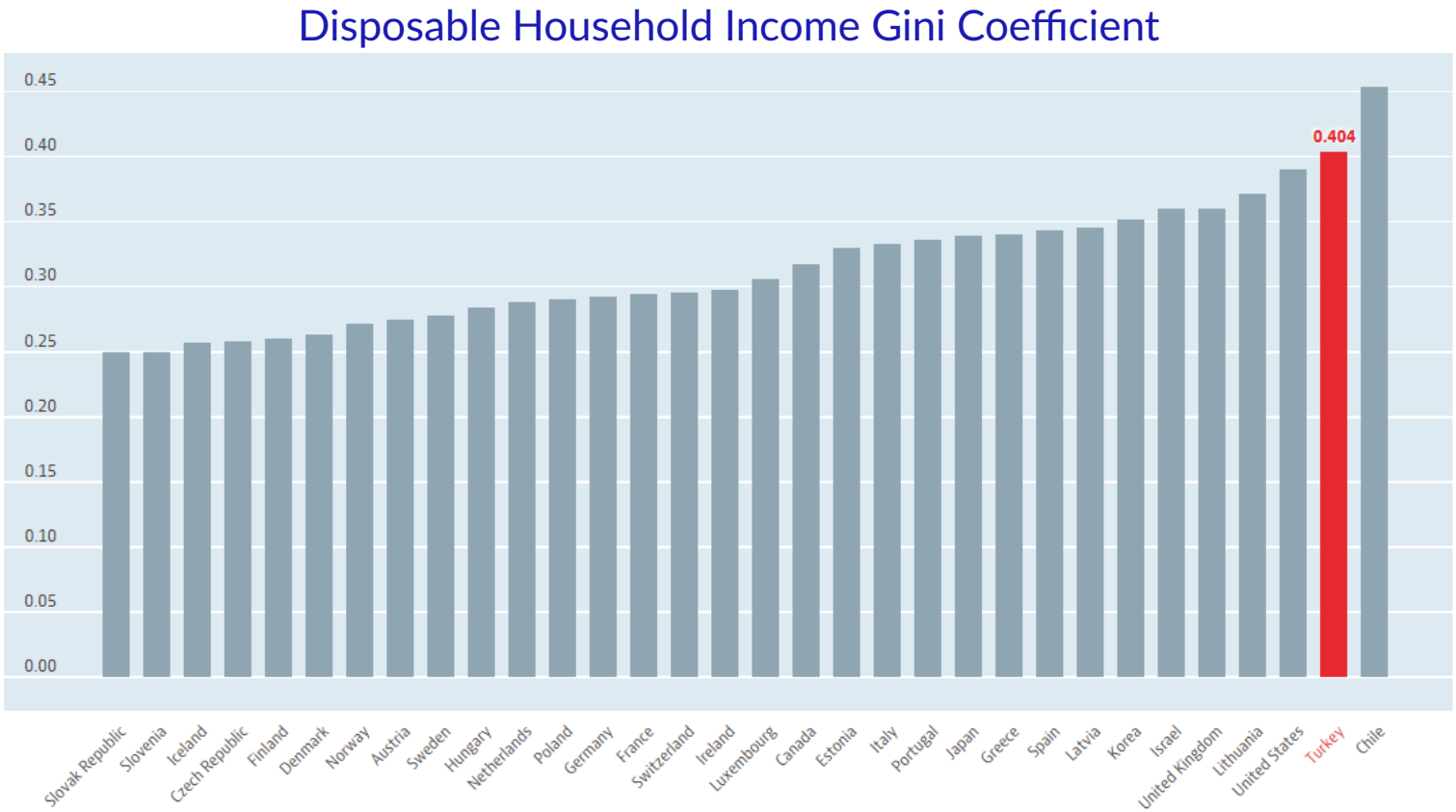
Updated *Great Gatsby* Curve



Source: Narayan et al. (2018)

◂ Back ◂ Main

Income Inequality

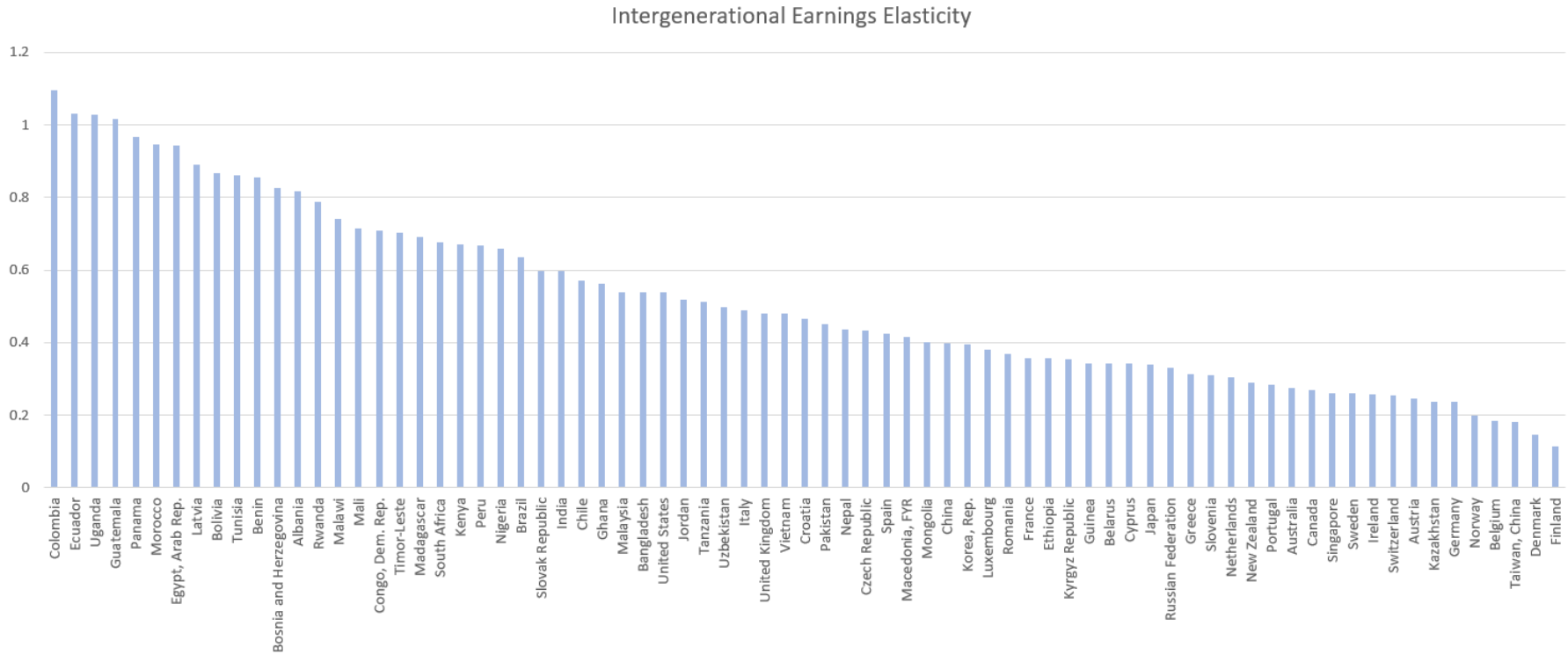


Source: *OECD, 2015*

Back

Intergenerational Earnings Mobility Around the World

Intergenerational Earnings Elasticity by Country



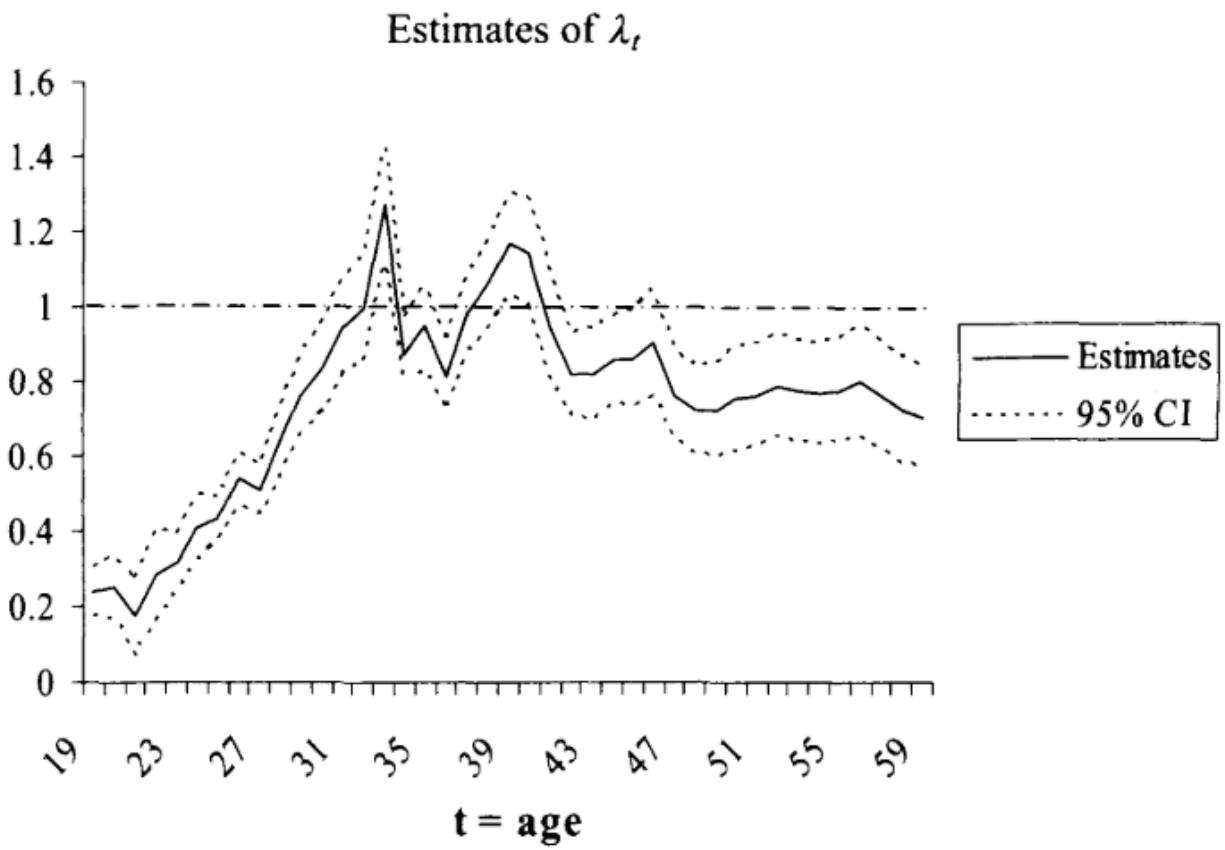
Source: GDIM (2018)

Back

Life-cycle Multiplier Coefficient by Age

- Estimates of λ start as low as .2 at age 20, monotonically rising to 1 until age 40, then falls again to about .6-.8 later in life.

Life-cycle Multiplier Coefficient Estimate by Age



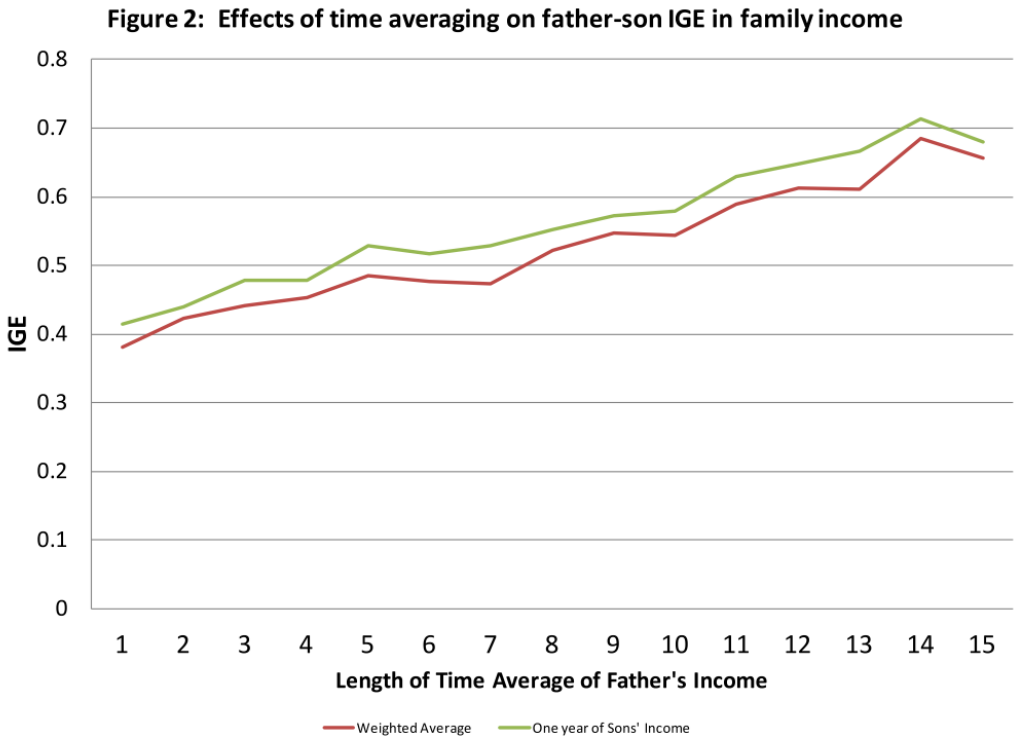
Source: Haider and Solon (2006)

Back

IGE Estimate by Years of Averaging

- *IGE* estimate for the US rises from 0.25 when T=2 to 0.45 when T=7, and up to 0.61 when T=16.

IGE Estimate by Years of Averaging



Source: Mazumder (2016)

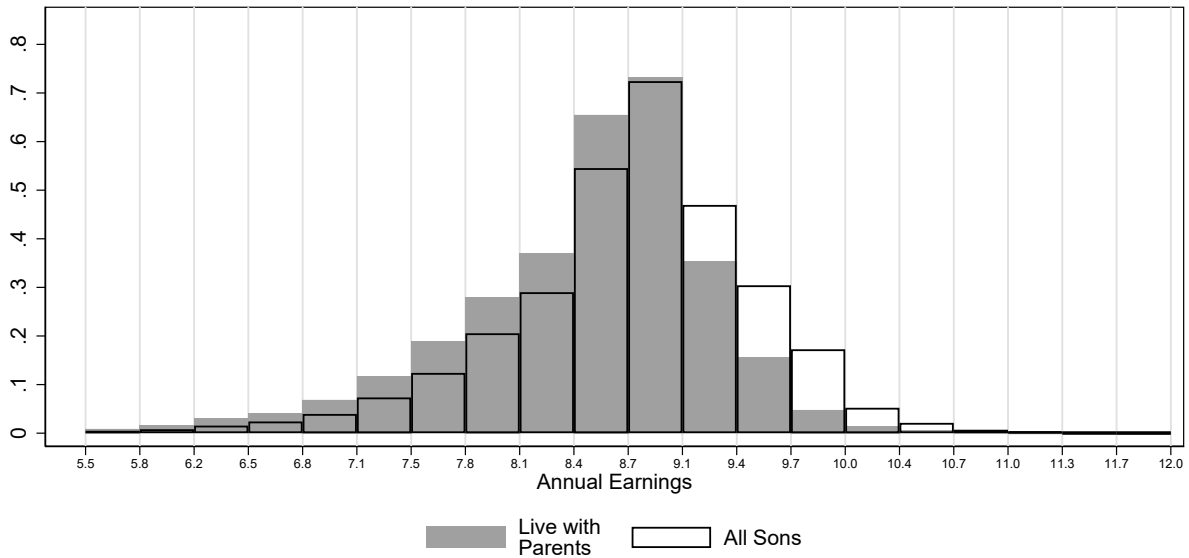
$$\text{plim } R = \frac{\beta\sigma_{yp}^2}{\sqrt{(\sigma_{yp}^2 + \sigma_{vp}^2)(\sigma_{yp}^2 + \sigma_{vc}^2)}}$$

Back

SILC Panel Dataset

- *SILC* panel datasets follow individuals for at most 4 years.
- Children and parents are linked in the data *if* and *only if* they belong to the same household at the time of the survey.
- *OLS* estimator of *IGE* using panel data is biased due to **unrepresentative** samples. e.g., Mercan and Barlin (2016), Mercan (2012), Duman (2021)

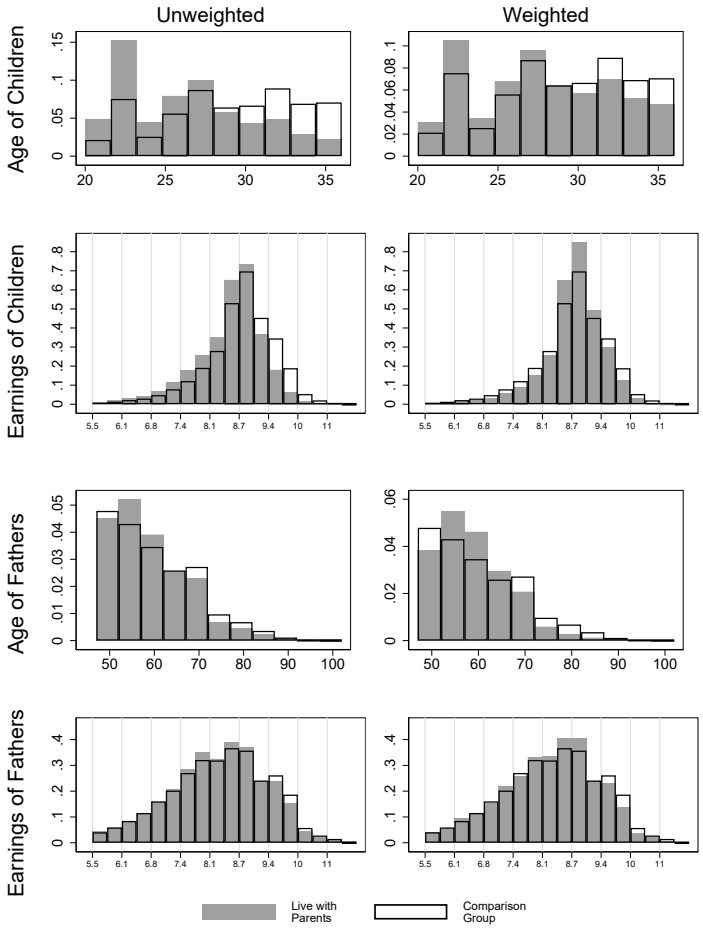
Earnings Histogram of Males

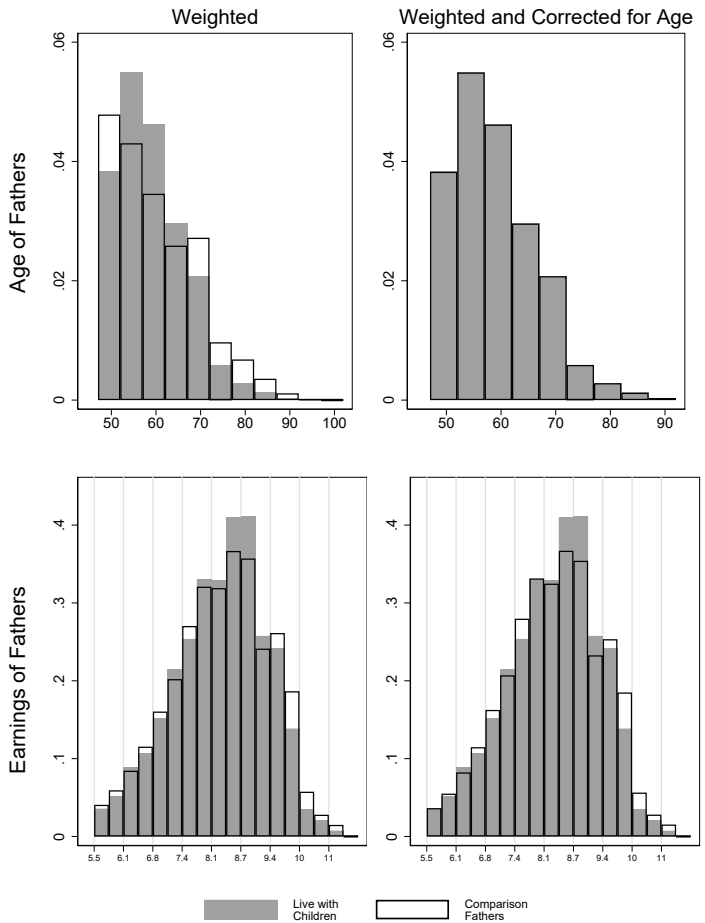


Notes: The frequency of earnings of children who live with their parents and the earnings of all individuals between ages 20 and 36 that report positive income are overlaid.

Back to Data | Back to Working Sample | Descriptive Statics | Excluding Co-Residing Child-Parents

Data Set Comparison





Notes: The left panel provides a comparison between unweighted and *inverse probability weighted* distributions of children's and father's age and earnings via overlaid densities of those who live in the same household and synthetic comparison groups. The right panel provides a comparison of only weighted distributions and weighted and corrected for age distributions.

Back

Estimates Excluding Co-Residing Parent-Child Pairs

TS2SLS Estimates of Intergenerational Elasticity of Equivalized Household Income Excluding Co-Residing Parent-Child Pairs

Pairs	**Parent & Child Household Income**		**Parents' Personal Earnings**	
	Full Sample	Only Full-Time Working Children	Full Sample	Only Full-Time Working Children
Father-Son	0.76 (0.022) [7705]	0.77 (0.022) [6112]	0.56 (0.017) [7705]	0.57 (0.018) [6112]
Father-Daughter	0.83 (0.019) [9379]	1.05 (0.038) [1423]	0.62 (0.015) [9379]	0.86 (0.031) [1423]
Mother-Son	0.95 (0.040) [2964]	0.95 (0.044) [2316]	0.38 (0.022) [2964]	0.40 (0.023) [2316]
Mother-Daughter	1.05 (0.038) [3993]	1.18 (0.054) [578]	0.43 (0.021) [3993]	0.62 (0.032) [578]

Back

Income Measure Definitions

Detailed Definitions of Income Measures

Non-Entrepreneurial Income	Income	Household Income
•Net employee cash or near cash income •Net employee in-kind income	•Net employee cash or near cash income •Net employee in-kind income •Self-employment income in cash •Self-employment income in kind •Unemployment, old-age and disability benefits •Education related allowances •Retirement grants – voluntary retirement premiums	•Net employee cash or near cash income •Net employee in-kind income •Self-employment income in cash •Self-employment income in kind •Unemployment, old-age and disability benefits •Education related allowances •Retirement grants – voluntary retirement premiums •Annual rental value of the dwelling according to current market prices •Children related and other social allowances •Property and rental income

Back to Estimation Datasets ▸ Back to Main Estimates

Labor Income Profiles

OLS Estimates for Labor Income Based on Education and Gender

	Aktuğ et al. (2021)						*SILC* Cross-Sectional					
	Male			Female			Male			Female		
	Primary	High School	University	Primary	High School	University	Primary	High School	University	Primary	High School	University
Age												
25 to 29	0.066***	0.097***	0.266***	0.039***	0.072***	0.253***	0.245***	0.402***	0.561***	0.0115	0.322***	0.559***
	(0.002)	(0.003)	(0.005)	(0.004)	(0.004)	(0.005)	(0.011)	(0.015)	(0.019)	(0.033)	(0.024)	(0.020)
30 to 34	0.092***	0.156***	0.429***	0.040***	0.109***	0.381***	0.326***	0.560***	0.843***	-0.0700*	0.347***	0.769***
	(0.002)	(0.003)	(0.005)	(0.004)	(0.004)	(0.005)	(0.011)	(0.015)	(0.019)	(0.030)	(0.026)	(0.020)
35 to 39	0.098***	0.183***	0.531***	0.034***	0.111***	0.447***	0.342***	0.667***	0.969***	-0.000254	0.324***	0.887***
	(0.002)	(0.003)	(0.005)	(0.004)	(0.005)	(0.006)	(0.011)	(0.015)	(0.019)	(0.028)	(0.029)	(0.021)
40 to 44	0.099***	0.197***	0.578***	0.015***	0.082***	0.478***	0.394***	0.771***	1.086***	-0.0838**	0.388***	1.007***
	(0.002)	(0.004)	(0.006)	(0.004)	(0.005)	(0.008)	(0.011)	(0.017)	(0.019)	(0.028)	(0.031)	(0.022)
45 to 49	0.093***	0.169***	0.571***	-0.013***	0.020**	0.457***	0.329***	0.819***	1.091***	-0.0724*	0.339***	1.020***
	(0.002)	(0.004)	(0.007)	(0.004)	(0.007)	(0.010)	(0.012)	(0.017)	(0.020)	(0.029)	(0.040)	(0.025)
50 to 54	0.052***	0.111***	0.536***	-0.035***	0.003	0.449***	0.181***	0.753***	1.072***	-0.217***	0.270***	0.900***
	(0.003)	(0.005)	(0.008)	(0.005)	(0.011)	(0.012)	(0.014)	(0.021)	(0.022)	(0.034)	(0.058)	(0.033)
55 to 59	-0.001	0.059***	0.507***	-0.072***	0.044*	0.416***	-0.0278	0.589***	1.007***	-0.267***	0.460***	0.892***
	(0.004)	(0.007)	(0.011)	(0.007)	(0.021)	(0.018)	(0.020)	(0.035)	(0.030)	(0.042)	(0.115)	(0.055)
60 to 64							-0.180***	0.652***	1.002***	-0.329***	0.352	0.741***
							(0.030)	(0.056)	(0.044)	(0.057)	(0.223)	(0.118)
Sector(Public=1)	0.264***	0.341***	0.277***	0.170***	0.336***	0.303***						
	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(0.004)						
Tenure	0.011***	0.016***	0.004***	0.014***	0.021***	0.007***						
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)						
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Obs.	296,302	161,101	141,980	60,806	45,448	79,968	61,785	27,368	29,690	14,850	7,361	16,250
R-squared	0.21	0.38	0.28	0.29	0.38	0.33	0.0604	0.135	0.200	0.0500	0.0408	0.189
F-statistic	4,140	7,779	4,035	1,445	1,829	3,294	193.0	180.0	293.8	38.31	15.74	153.7

Back to Estimation Datasets ▸ Back to Main Estimates

First-Stage Results

First-Stage Estimation Results

	Earnings		Income		Non-Entrepreneurial Income		Hourly Wage		Household Income	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Highest Educational Attainment										
Literate & without diploma	0.165***	0.129***	0.218***	0.157***	0.182***	0.170***	0.128***	0.100***	0.121***	0.227***
	(0.017)	(0.028)	(0.016)	(0.028)	(0.021)	(0.034)	(0.019)	(0.026)	(0.012)	(0.010)
Primary school	0.304***	0.183***	0.441***	0.197***	0.262***	0.226***	0.235***	0.162***	0.392***	0.341***
	(0.015)	(0.019)	(0.013)	(0.020)	(0.018)	(0.023)	(0.016)	(0.018)	(0.010)	(0.007)
Secondary school	0.460***	0.458***	0.578***	0.511***	0.443***	0.512***	0.384***	0.358***	0.538***	0.570***
	(0.015)	(0.024)	(0.014)	(0.024)	(0.019)	(0.026)	(0.017)	(0.023)	(0.010)	(0.011)
High school	0.527***	0.543***	0.632***	0.582***	0.501***	0.592***	0.472***	0.488***	0.629***	0.633***
	(0.016)	(0.022)	(0.014)	(0.022)	(0.019)	(0.025)	(0.017)	(0.021)	(0.011)	(0.011)
Vocational or technical high school	0.616***	0.613***	0.703***	0.636***	0.572***	0.654***	0.574***	0.591***	0.699***	0.680***
	(0.016)	(0.022)	(0.014)	(0.022)	(0.019)	(0.025)	(0.017)	(0.022)	(0.011)	(0.011)
University or higher education	0.872***	0.857***	0.878***	0.847***	0.796***	0.871***	0.902***	0.884***	0.943***	0.893***
	(0.016)	(0.022)	(0.014)	(0.022)	(0.019)	(0.025)	(0.017)	(0.021)	(0.011)	(0.011)
Occupational Code (ISCO-88)										
Legislators, senior officials and managers	0.408***	0.721***	0.801***	0.977***	0.645***	0.990***	0.163***	0.411***	0.690***	0.723***
	(0.009)	(0.025)	(0.008)	(0.022)	(0.012)	(0.026)	(0.010)	(0.026)	(0.007)	(0.017)
Professionals	0.623***	0.744***	0.691***	0.784***	0.665***	0.786***	0.572***	0.589***	0.619***	0.571***
	(0.009)	(0.017)	(0.008)	(0.017)	(0.009)	(0.017)	(0.010)	(0.016)	(0.007)	(0.011)
Technicians and associate professionals	0.415***	0.575***	0.481***	0.593***	0.454***	0.591***	0.320***	0.364***	0.438***	0.419***
	(0.009)	(0.018)	(0.008)	(0.017)	(0.008)	(0.018)	(0.009)	(0.017)	(0.007)	(0.012)
Clerks	0.375***	0.446***	0.338***	0.444***	0.346***	0.450***	0.331***	0.213***	0.312***	0.349***
	(0.008)	(0.016)	(0.007)	(0.016)	(0.008)	(0.016)	(0.009)	(0.015)	(0.007)	(0.011)
Service & sale workers	0.156***	0.165***	0.302***	0.212***	0.215***	0.196***	-0.0671***	-0.153***	0.248***	0.115***
	(0.006)	(0.013)	(0.006)	(0.013)	(0.006)	(0.013)	(0.007)	(0.012)	(0.005)	(0.007)
Skilled agricultural workers	-0.487***	-0.934***	0.0866***	-0.277***	-0.762***	-1.130***	-0.651***	-1.179***	-0.0364***	-0.115***
	(0.008)	(0.018)	(0.007)	(0.020)	(0.013)	(0.035)	(0.008)	(0.018)	(0.005)	(0.007)
Craft workers	0.150***	0.0579*	0.234***	0.183***	0.207***	0.206***	0.0652***	-0.106***	0.171***	0.0394***
	(0.006)	(0.023)	(0.006)	(0.021)	(0.006)	(0.023)	(0.007)	(0.022)	(0.005)	(0.010)
Plant and machine operators	0.254***	0.473***	0.313***	0.475***	0.290***	0.468***	0.136***	0.263***	0.236***	0.237***
	(0.006)	(0.018)	(0.006)	(0.017)	(0.006)	(0.018)	(0.007)	(0.017)	(0.005)	(0.011)
Constant	8.147***	7.804***	8.146***	7.858***	8.234***	7.816***	0.478***	0.357***	8.103***	8.373***
	(0.017)	(0.027)	(0.015)	(0.027)	(0.020)	(0.029)	(0.018)	(0.025)	(0.011)	(0.012)
Age Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Obs.	153,695	38,161	153,695	38,161	114,207	33,228	153,695	38,161	171,606	75,970
R-squared	0.362	0.509	0.331	0.424	0.400	0.463	0.346	0.547	0.364	0.457
F-statistic	2403.9	1103.4	2226.4	825.0	1991.9	784.1	2373.3	1283.4	2645.8	1875.7

Back

Logit Coefficients

Effect of Father's Earnings on Children's Educational Outcomes: Conditional Logit Coefficients

	Female		Male	
	$\log(P_{high}/P_{sec})$	$\log(P_{uni}/P_{sec})$	$\log(P_{high}/P_{sec})$	$\log(P_{uni}/P_{sec})$
Intercept	-23.05	-32.60	-14.06	-21.60
	(0.668)	(0.866)	(0.477)	(0.588)
log Earnings of Fathers	2.52	3.58	1.56	2.40
	(0.077)	(0.099)	(0.056)	(0.068)
Number of Obs.	10,426		10,170	
Pseudo R^2	0.1920		0.0997	

Notes: P_{sec}, P_{high} and P_{uni} denote the probability of having educational attainment level of secondary education or lower, high school graduate and university graduate respectively. Coefficients are estimated using the multinomial logit model. The standard errors are in parentheses.

Back

Decomposition of *IGE*

Hertz (2008) shows that intergenerational elasticity estimated in the pooled regression can be written as:

$$\hat{\beta} = \sum_i \hat{\pi}_i \left(\hat{\beta}_i \frac{\hat{\sigma}^2_{yp,i}}{\hat{\sigma}^2_{yp}} + \frac{\left(\overline{y}_{p,i} - \overline{y}_p\right)\left(\overline{y}_{c,i} - \overline{y}_c\right)}{\hat{\sigma}^2_{yp}} \right) \tag{1}$$

where each group is indexed by $i = 1, \ldots, I$; the share of the parent-child pairs belonging to group i in the whole sample is denoted by $\hat{\pi}_i$; the relevant income measure for parents and children are represented by y_p and y_c with sample means $\overline{y_p}$ and $\overline{y_c}$, and with variances $\hat{\sigma}^2_{yp}$ $\hat{\sigma}^2_{yp}$; the within-group estimate of intergenerational elasticity is represented by $\hat{\beta}_i$.

Back

Heckman Selection Model

Heckman Two-Step Correction for Selection

	Male	Female
Father's Earnings	0.518***	0.362***
	(0.044)	(0.070)
Constant	4.830***	7.037***
	(0.383)	(0.655)
Employed		
Spouse's Earnings	-0.00527	-0.0862**
	(0.027)	(0.026)
Father's Earnings	-0.0647	0.00306
	(0.084)	(0.050)
Highest Educational Attainment		
Literate	0.205	0.112
	(0.328)	(0.109)
Primary school	0.607*	0.273***
	(0.248)	(0.074)
Secondary school	0.651*	0.533***
	(0.268)	(0.104)
High School	0.661*	0.672***
	(0.276)	(0.102)
Vocational or technical High School	0.951***	0.987***
	(0.279)	(0.105)
University or higher education	1.140***	2.000***
	(0.271)	(0.101)
Age		
30 to 34	-0.574**	0.132*
	(0.219)	(0.065)
35 to 39	-0.634**	0.343***
	(0.216)	(0.065)
40 yo 44	-0.809***	0.371***
	(0.212)	(0.069)
45 to 49	-1.259***	0.245***
	(0.211)	(0.074)
50 to 54	-1.686***	0.0275
	(0.217)	(0.090)
55 to 59	-2.034***	-0.253
	(0.237)	(0.132)
Constant	1.768*	-1.070*
	(0.756)	(0.435)
Inverse Mills Ratio λ	-0.919***	-1.208***
	(0.105)	(0.072)
Observations	1911	7074

Back

Assortative Mating

Earnings Elasticities with respect to Parents-in-Law

	Father-in-Law Earnings	Mother-in-Law Earnings
Female	0.89 (0.049) [1202]	0.55 (0.020) [466]
Male	0.62 (0.056) [6371]	0.38 (0.027) [2654]

Earnings and Income Elasticities/Correlations between Married Couples

Generation	**Children**				**Parents**			
Dependent Variable	*Earnings*		*Income*		*Earnings*		*Income*	
	Elasticity	Correlation	Elasticity	Correlation	Elasticity	Correlation	Elasticity	Correlation
Female	0.75 (0.037)	0.558	0.77 (0.040)	0.568	0.80 (0.022)	0.616	0.69 (0.026)	0.639
Male	0.41 (0.018)		0.42 (0.018)		0.47 (0.011)		0.59 (0.015)	
Number of Obs.	[1274]				[7774]			

Back

Geographical Units

NUTS Geographic Categorization

NUTS-1 Code	Name of the Region	Geographical Unit
TR1	Istanbul	West
TR2	Batı Marmara	
TR3	Ege	
TR4	Doğu Marmara	
TR5	Batı Anadolu	Central
TR7	Orta Anadolu	
TR6	Akdeniz	South
TR8	Batı Karadeniz	North
TR9	Doğu Karadeniz	
TR10	Kuzey Doğu Anadolu	East
TR11	Orta Doğu Anadolu	
TR12	Güney Doğu Anadolu	

Back

Further Robustness Checks

TS2SLS Estimates for Different Child Income Definitions

Pairs	Reported Child Income					Age Corrected Child Income, Age<35					Reported Child Income, Age<35				
	Number of Obs.	Earnings	Income	Labor Income	Hourly Wage	Number of Obs.	Earnings	Income	Labor Income	Hourly Wage	Earnings	Income	Labor Income	Hourly Wage	
Father-Son	[7642]	0.522 (0.020)	0.614 (0.023)	0.395 (0.018) [5558]	0.497 (0.021)	[3040]	0.563 (0.029)	0.66 (0.034)	0.441 (0.026) [2517]	0.503 (0.030)	0.499 (0.029)	0.601 (0.034) [2517]	0.393 (0.026)	0.453 (0.030)	
Father-Daughter	[1613]	0.961 (0.045)	1.035 (0.049)	0.701 (0.040) [1341]	0.867 (0.042)	[740]	0.913 (0.067)	0.955 (0.071)	0.692 (0.060) [684]	0.828 (0.060)	0.806 (0.066)	0.839 (0.070) [684]	0.609 (0.059)	0.746 (0.060)	
Mother-Son	[3028]	0.0.334 (0.024)	0.511 (0.039)	0.277 (0.025) [2001]	0.279 (0.025)	[1023]	0.376 (0.032)	0.508 (0.049)	0.31 (0.031) [820]	0.328 (0.033)	0.339 (0.032)	0.461 (0.049) [820]	0.277 (0.032)	0.298 (0.033)	
Mother-Daughter	[629]	0.698 (0.048)	0.888 (0.063)	0.518 (0.045) [475]	0.629 (0.047)	[235]	0.693 (0.059)	0.805 (0.072)	0.568 (0.058) [217]	0.639 (0.055)	0.617 (0.059)	0.704 (0.071) [217]	0.507 (0.058)	0.578 (0.055)	

TS2SLS Estimates using age 30-34 for Age-Correction

Pairs	Number of Obs.	Earnings	Income	Non-Entrepreneurial Income	Hourly Wage
Father-Son	[7809]	0.47 (0.017)	0.57 (0.020)	0.37 (0.016) [5673]	0.46 (0.018)
Father-Daughter	[1743]	0.96 (0.042)	1.04 (0.047)	0.70 (0.038) [1451]	0.85 (0.039)
Mother-Son	[3101]	0.32 (0.024)	0.49 (0.039)	0.27 (0.025) [2037]	0.29 (0.024)
Mother-Daughter	[670]	0.78 (0.041)	0.94 (0.054)	0.59 (0.043) [509]	0.69 (0.040)

Top/Bottom Coding Predicted Incomes

Instruments to Predict Parental Income

Instruments to Predict Parental Income

Country	Study	Estimate	Instruments to Predict Fathers' Earnings	Birth Cohort of Sons
Sweden	Björklund and Jäntti (1997)	0.28	*Higher than compulsory education*(**D**) *Occupation*(EG), *Living in Stockholm*(**D**)	*1952-1961*
Japan	Lefranc et al. (2014)	0.33	*Education*, *Occupation*(EGP), *Firm Size*(**D**), *Residential Area*	*1935-1975*
France	Lefranc and Trannoy (2005)	0.41	*Education*, *Occupation*(EG)	*1953-1963*
Italy	Piraino (2007)	0.44	*Education*, *Sector of Employment*, *Work Status*, *Residential Area*(**D**)	*1955-1974*
Turkey	**This study**	**0.51**	*Education*, *Occupation*(ISCO-88)	*1951-1985*
		0.53		*1976-1980*
		0.54		*1971-1975*
United States	Björklund and Jäntti (1997)	0.52	*Education*, *Occupation*	*1951-1959*
United Kingdom	Dearden et al. (1997)	0.58	*Education*, *Occupation*(EG)	*1958*
Chile	Nunez and Miranda (2010)	0.63	*Education*, *Work Status*	*1966-1975*
Brazil	Dunn (2007)	0.85	*Education*	*1962-1971*
Ecuador	Grawe (2004)	1.13	*Education*	*1955-1981*

Back

Estimation Results via Household Budget Survey

Intergenerational Elasticity Estimates via *HBS*

Pairs	Father-Son			Father-Daughter			Mother-Son			Mother-Daughter		
Year of 1st Stage Sample	Earnings	Income	Non-Entrepreneurial Income	Earnings	Income	Non-Entrepreneurial Income	Earnings	Income	Non-Entrepreneurial Income	Earnings	Income	Non-Entrepreneurial Income
2002	0.541	0.608	0.516	1.019	1.046	0.863	0.356	0.580	0.205	0.765	1.015	0.445
2003	0.547	0.635	0.371	1.027	1.066	0.675	0.413	0.526	0.379	0.844	0.964	0.699
2004	0.485	0.575	0.308	0.961	1.033	0.585	0.355	0.527	0.448	0.770	0.929	0.881
2005	0.512	0.609	0.450	1.012	1.082	0.800	0.368	0.489	0.424	0.824	0.967	0.800
2006	0.477	0.605	0.433	0.962	1.105	0.776	0.357	0.535	0.303	0.803	0.969	0.606
2007	0.464	0.559	0.430	0.931	1.031	0.762	0.324	0.465	0.279	0.743	0.890	0.588
2008	0.427	0.547	0.325	0.887	1.028	0.612	0.354	0.484	0.248	0.759	0.880	0.512
2009	0.440	0.583	0.325	0.871	1.055	0.604	0.330	0.448	0.278	0.752	0.868	0.559
2010	0.471	0.556	0.316	0.919	1.007	0.584	0.367	0.547	0.222	0.780	0.934	0.462
2011	0.489	0.563	0.364	0.943	0.999	0.660	0.339	0.503	0.219	0.768	0.928	0.478
2012	0.474	0.559	0.326	0.927	1.026	0.603	0.310	0.425	0.220	0.707	0.830	0.471
2013	0.492	0.611	0.315	0.963	1.087	0.585	0.326	0.476	0.257	0.754	0.939	0.541
2014	0.529	0.656	0.323	1.027	1.143	0.607	0.321	0.440	0.234	0.759	0.902	0.507

Back

Non-equivalized Household Income Estimates

TS2SLS Estimates of Non-equivalized Household Income

Pairs	**Parent & Child Household Income**		**Parents' Personal Earnings**	
	Full Sample	Only Full-Time Working Children	Full Sample	Only Full-Time Working Children
Father-Son	0.79 (0.023) [10170]	0.81 (0.024) [7809]	0.47 (0.014) [10170]	0.49 (0.015) [7809]
Father-Daughter	0.80 (0.022) [10426]	0.99 (0.041) [1743]	0.49 (0.014) [10426]	0.69 (0.028) [1743]
Mother-Son	1.08 (0.044) [4109]	1.08 (0.050) [3101]	0.34 (0.018) [4109]	0.36 (0.019) [3101]
Mother-Daughter	1.10 (0.043) [4350]	1.18 (0.061) [670]	0.35 (0.018) [4350]	0.50 (0.029) [670]

Back

Estimated Rank-Rank Slopes via Earnings

Estimated Rank-Rank Slopes via Individual Earnings

	Earnings Rank of		**Household Inc. Rank of**	
	Father	Mother	Father	Mother
Sons	0.326 (0.011) [7809]	0.284 (0.019) [3101]	0.334 (0.010) [7809]	0.299 (0.018) [3101]
Daughters	0.503 (0.019) [1743]	0.567 (0.031) [670]	0.509 (0.020) [1743]	0.568 (0.030) [670]

Back

Urban-Rural Decomposition

Decomposition of Intergenerational Household Income Elasticity by Rural and Urban Residences

		Male		Female	
		Rural	Urban	Rural	Urban
Shares	$\hat{\pi}_i$	0.33	0.67	0.33	0.67
Mean log Earnings of Children	$\overline{y}_{c,i}$	8.59	9.01	8.51	8.95
Mean log Earnings of Fathers	$\overline{y}_{c,i}$	8.39	8.60	8.39	8.59
Pooled *IGE*	$\hat{\beta}$	**0.774**		**0.822**	
Within-Group *IGE*	$\hat{\beta}_i$	0.697	0.686	0.687	0.751
Contribution of Within-Group *IGE*	$\hat{\pi}_i\hat{\beta}_i\frac{\hat{\sigma}^2_{yp,i}}{\hat{\sigma}^2_{yp}}$	0.153	0.491	0.155	0.534
		$\sum$ =0.644		$\sum$ =0.689	
Between-Group effects	$\frac{(\overline{y}_{p,i}-\overline{y}_p)(\overline{y}_{c,i}-\overline{y}_c)}{\hat{\sigma}^2_{yp}}$	0.264	0.064	0.270	0.065
Contribution of Between-Group effects	$\hat{\pi}_i\frac{(\overline{y}_{p,i}-\overline{y}_p)(\overline{y}_{c,i}-\overline{y}_c)}{\hat{\sigma}^2_{yp}}$	0.087	0.043	0.089	0.044
		$\sum$ =0.130		$\sum$ =0.132	
Group-Specific Persistence	$\hat{\pi}_i\left(\hat{\beta}_i\frac{\hat{\sigma}^2_{yp,i}}{\hat{\sigma}^2_{yp}}+\frac{(\overline{y}_{p,i}-\overline{y}_p)(\overline{y}_{c,i}-\overline{y}_c)}{\hat{\sigma}^2_{yp}}\right)$	0.240	0.534	0.244	0.578
		$\sum$ =0.774		$\sum$ =0.822	

▸ Back

SILC Descriptive Statics (Cross-Section)

Descriptive Statistics (*SILC* Pooled Cross-Sections 2005-2017)

	Full Sample	Usable Sample	Living with Parents
Male			
Age	40.468 (16.935)	38.992 (10.542)	31.620 (9.026)
Secondary Education or Lower	0.625	0.571	0.562
High-School Graduate	0.215	0.218	0.253
University Graduate	0.160	0.211	0.185
$\log$(Earnings)	8.495 (1.094)	8.756 (0.848)	8.517 (0.780)
Non-zero Earners	0.685		
Number of Observations	**287,638**	**157,212**	**39,277**
Female			
Age	41.185 (17.605)	36.181 (9.840)	28.814 (7.792)
Secondary Education or Lower	0.749	0.426	0.256
High-School Graduate	0.145	0.188	0.286
University Graduate	0.106	0.386	0.457
$\log$(Earnings)	7.973 (1.464)	8.595 (1.013)	8.608 (0.831)
Non-zero Earners	0.213		
Number of Observations	**309,173**	**40,840**	**9,668**
Total			
Age	40.840 (17.289)	38.412 (10.463)	31.066 (8.867)
Secondary Education or Lower	0.689	0.541	0.502
High-School Graduate	0.179	0.212	0.259
University Graduate	0.132	0.247	0.239
$\log$(Earnings)	8.364 (1.219)	8.723 (0.887)	8.535 (0.791)
Non-zero Earners	0.440		
Number of Observations	**596,811**	**198,052**	**48,945**

▸ Back

SILC Descriptive Statics (Panel)

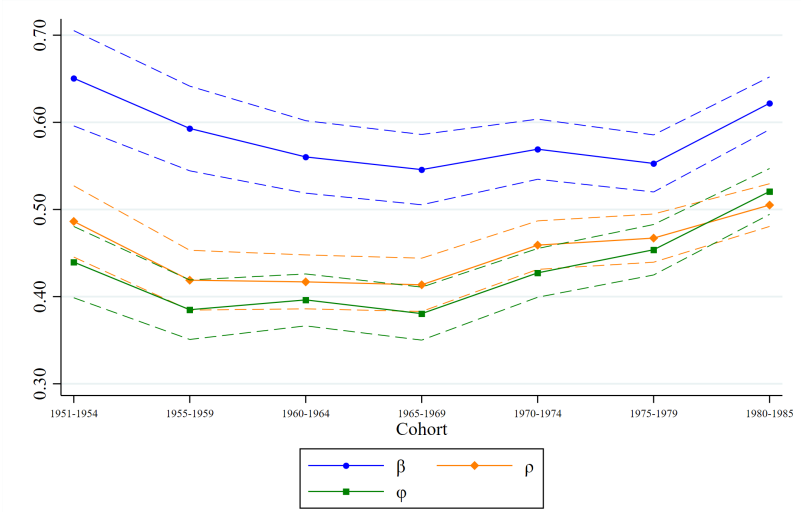
Descriptive Statistics (*SILC* Pooled Panels 2005-2017)

	Full Sample		Usable Sample		Observed 4 Years		Living with Parents	
Male								
Age	40.34	(17.662)	38.56	(10.697)	41.03	(9.940)	27.36	(5.184)
Secondary Education or Lower	0.58		0.58		0.60		0.51	
High-School Graduate	0.22		0.23		0.22		0.30	
University Graduate	0.19		0.18		0.16		0.17	
$\log$(Earnings)	8.78	(1.098)	8.8	(0.829)	8.82	(0.823)	8.56	(0.738)
Non-zero Earners	0.67							
Number of Observations	**90862**		**46,358**		**23,754**		**8,395**	
Female								
Age	41.19	(18.435)	35.95	(10.006)	37.62	(9.691)	26.50	(5.259)
Secondary Education or Lower	0.76		0.43		0.48		0.24	
High-School Graduate	0.14		0.21		0.20		0.31	
University Graduate	0.09		0.35		0.30		0.43	
$\log$(Earnings)	8.04	(1.428)	8.66	(0.954)	8.63	(0.977)	8.66	(0.770)
Non-zero Earners	0.21							
Number of Observations	**95,374**		**11,853**		**6,027**		**2,445**	
Total								
Age	40.64	(18.071)	38.03	(10.612)	40.34	(9.985)	27.17	(5.213)
Secondary Education or Lower	0.71		0.55		0.58		0.45	
High-School Graduate	0.17		0.22		0.22		0.31	
University Graduate	0.11		0.21		0.19		0.23	
$\log$(Earnings)	8.39	(1.208)	8.77	(0.857)	8.78	(0.860)	8.58	(0.746)
Non-zero Earners	0.43							
Number of Observations	**186,236**		**58,211**		**29,781**		**10840**	

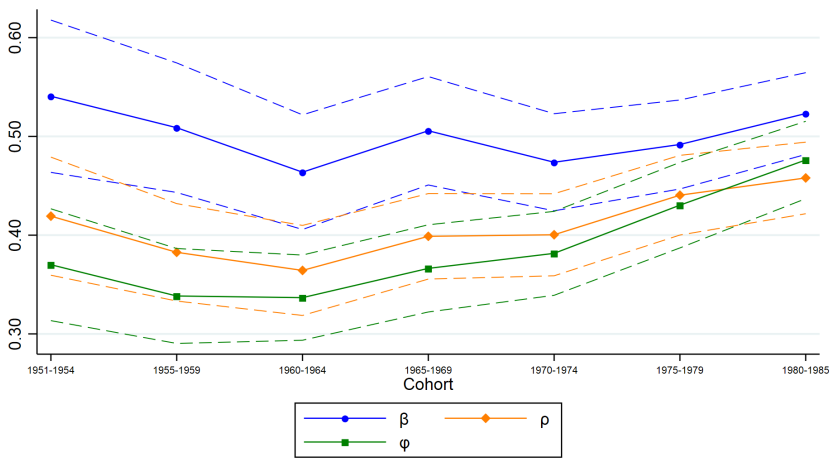
Back

Intergenerational Educational Mobility

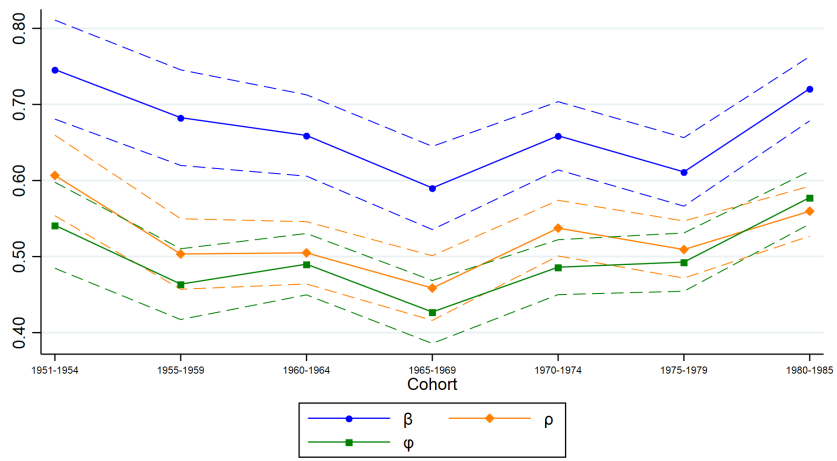
Overall Population



Males



Females



Source: Öztunalı and Torul (2022)

Back