

Earnings Dynamics in Norway and Its Intergenerational Transmission

Elin Halvorsen

Statistics Norway

Serdar Ozkan

University Toronto

Sergio Salgado

University of Pennsylvania

Global Income Dynamics 2nd Conference

November, 2020

This Paper

Common Core

1. Trends in wage inequality over time, life cycle and cohorts with focus on **top income inequality**
2. Trends and Heterogeneity in the distribution income growth with a focus on **higher order moments**
3. Income mobility over 1-, 3-, 5-, 10-years
 - How persistent is top 1% or 0.1% state?

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 - How persistent is top 1% or 0.1% state?

Intergenerational Transmission of Income Dynamics between 1967 and 2017

1. How correlated are lifetime income **levels** and **growth** of fathers and children?
2. Do father and children have correlated properties of income changes:
 - Dispersion, Skewness, Kurtosis?
3. Intergenerational transition matrix for lifetime income

Institutional Setting and Data

Institutional Background

- A per capita GDP of \$81,700 and only 5.4 million people in 2020
- A welfare state with universal and equitable access to health care services, comprehensive social security benefits and redistributive economic policy as a fundament
- Financed by high level of taxes and Sovereign Oil Fund (currently three times GDP)
- A collective wage bargaining system contributes to compressed wage distribution and low unemployment
- High labor force participation for men (70%) and women (64%), of which 1/3 in public sector

Norwegian Registry Data

Administrative data covering the whole Norwegian population used between 1993 and 2017

- Derived from combination of administrative (e.g. annual tax records) and social security register
- No sample attrition (unless someone dies or emigrates) and no top coding
- Relevant variables: Wage and salary income, self employment income, benefits, education, etc.

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Longer Sample between 1967 and 2017

- Information on total income (sum of wage, self-employment income, and benefits), gender, education.
- Matched Parents-Children panel dataset

Sample Statistics

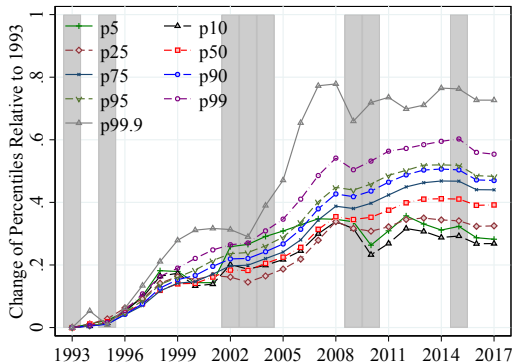
Year	Obs.	Mean Income		Women % Share	Education Shares %				Age Shares %		
		Men	Women		< HS	HS	CD	CD <	[25, 35]	[36, 45]	[46, 55]
1995	2.00	44,467	27,805	47.7	41.9	27.4	22.5	8.3	42.1	31.8	26.1
2015	1.96	65,509	46,094	48.1	23.8	32.7	29.6	13.9	36.4	32.3	31.3
Mean	2.05	57,282	38,823	47.8	32.3	30.7	26.0	11.1	38.9	32.9	28.2
Δ^{15-95}		50.1%	73.1%	0.4	-18.1	5.3	7.1	5.6	-5.7	0.5	5.2

Notes: This table shows sample statistics based on the CS sample for Norway. Number of observations (Obs.) in millions. Income in real US dollars. Education contains some missing values, added to lower education group. Mean taken over the 1993-2017 period. Income growth rates in percentage changes.

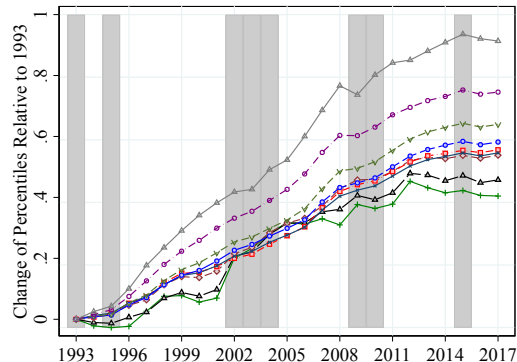
Earnings Distribution

Evolution of Earnings Inequality over Time

Men



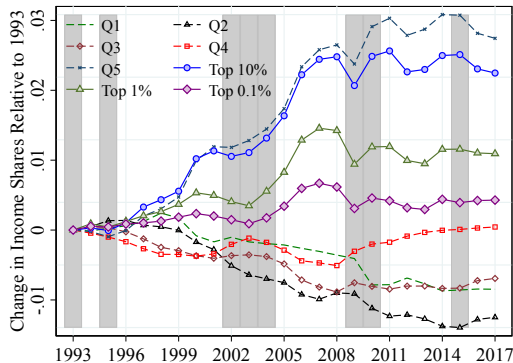
Women



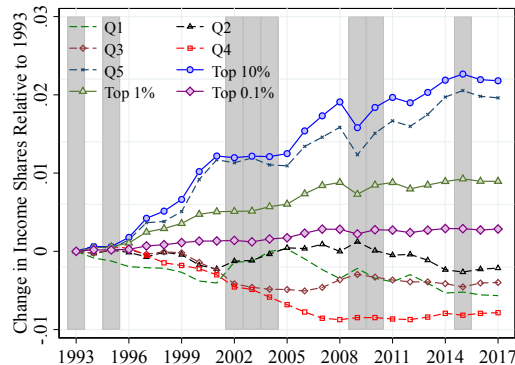
- **Men:** Median earnings grew 40 lpts vs. 60 lpts for the 99th vs. 25 lpts for 10th percentiles.
- **Women:** More steady growth in earnings with a similar increase in inequality.

Evolution of Top Income Share over Time

Men



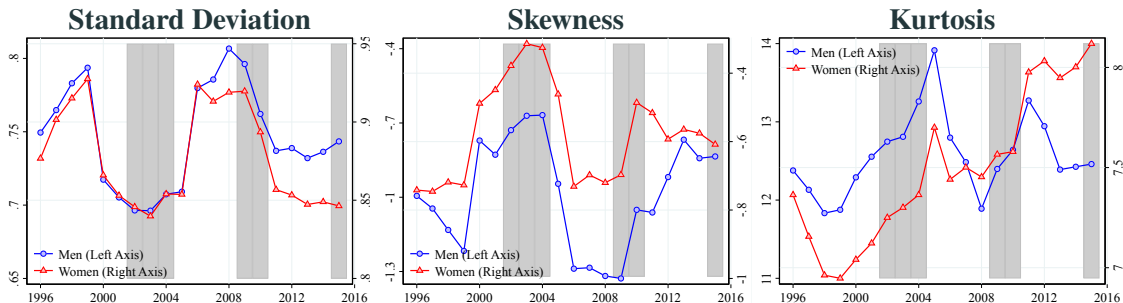
Women



- Norway is not immune to **the increase in top income** share/inequality seen in other countries.
- We find similar patterns if we control for education and age.

Distribution of Earnings Growth

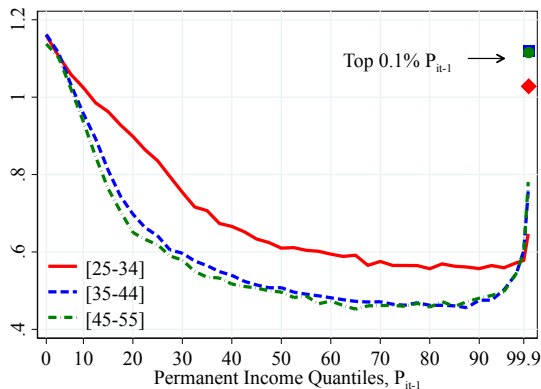
Evolution of Earnings Risk over Time: 5-Year Earnings Growth



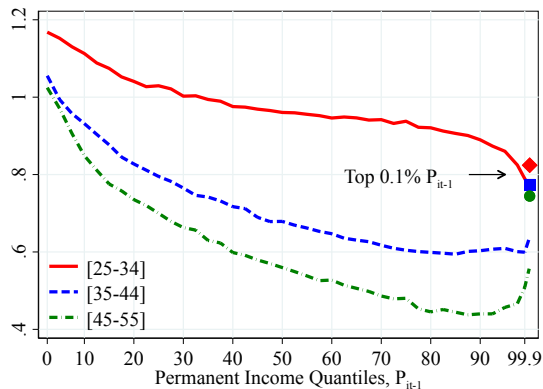
- No significant trend in moments of earnings growth between 1996 and 2015.
- No significant cyclical variation either.
- Similar results for one-year changes ▶ Go

Heterogeneity in Standard Deviation of 5-Year Earnings Growth

Men



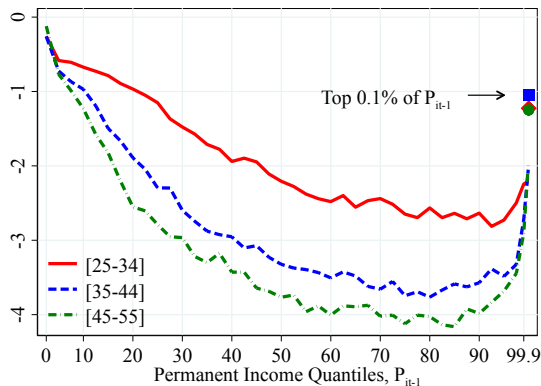
Women



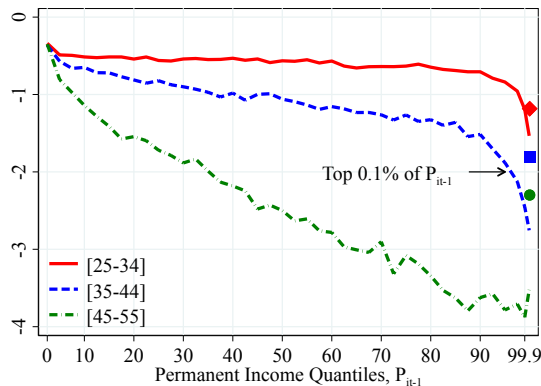
- Dispersion of income changes **declines** with age and income (except for men top earners).
- Similar to the US (Guvenen et. al. (2020))

Heterogeneity in Skewness of 5-Year Earnings Growth

Men



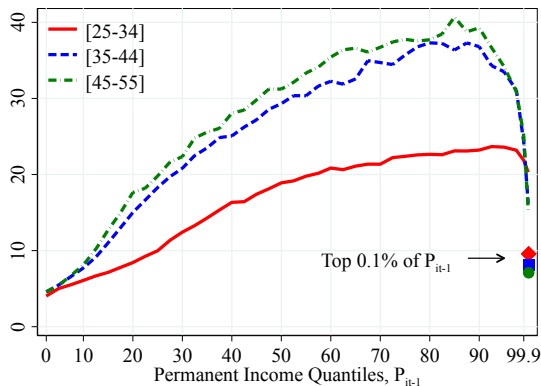
Women



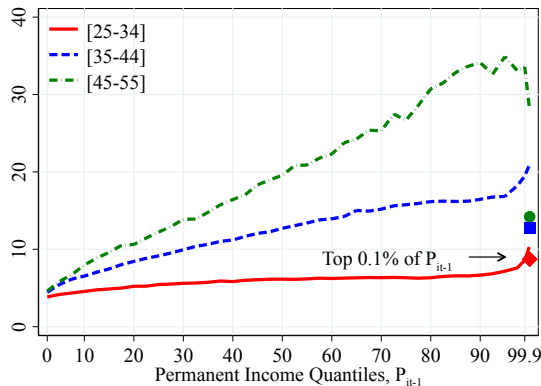
- Distribution of income changes become **more left-skewed** by age and income
 - except for top earners for men

Heterogeneity in Kurtosis of 5-Year Earnings Growth

Men



Women



- Distribution of income changes become **more leptokurtic** with age and income
 - except for top earners for men.

Earnings Mobility

Average Rank-Rank Earnings Mobility

- Divide each gender into three age groups: 25-34, 35-44, and 45-55.
- Sort individuals into 40 quantiles w.r.t. their permanent income:

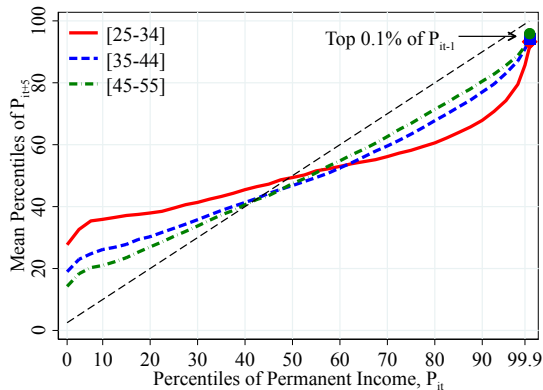
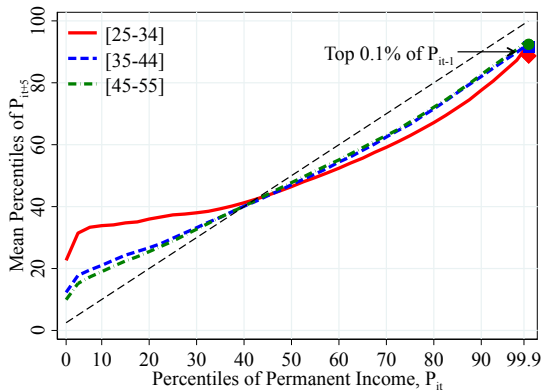
$$\hat{P}_t^i = \frac{1}{3} \sum_{j=0}^2 y_{it-j},$$

where y_{it} denotes earnings in year t including zeros or incomes below minimum threshold.

- The average rank (out of 100) with respect to future permanent income in $t + k$, \hat{P}_{t+k}^i , for $k = 1, 3, 5$, and 10.

Next: Rank-Rank plot between years t and $t + 5$

Average Rank-Rank Mobility between t and $t + 5$



- Income mobility declines significantly after the first decade of the working life.
- Mobility is highest around the bottom and top 10th percentile (low for top earners).
- Women experience higher income mobility relative to men.

Rank-Rank correlation mask important differences across income distribution

- Where individuals end up in the income distribution in year $t + k$ conditional on their rank in year t ?
 - In sample: 10% of males have very little permanent earnings ($\leq \$1,500$).
 - Other sources of income such as self-employment income or social security benefits?

Rank-Rank correlation mask important differences across income distribution

- Where individuals end up in the income distribution in year $t + k$ conditional on their rank in year t ?
 - In sample: 10% of males have very little permanent earnings ($\leq \$1,500$).
 - Other sources of income such as self-employment income or social security benefits?

Construct Transition Matrices

- Rank workers with \hat{P}_t^i above minimum threshold into:
 - first 4 quintiles, 81-95th percentiles, and 96-99th percentiles,
 - top 1% excluding the top 0.1%, and top 0.1%.
- Separate workers with \hat{P}_t^i below minimum threshold into:
 - No significant income, self-employed, or receiving social security benefits.

35–44-Year Old Top Earners: Permanent Earnings $t + 5$

	Percentile in year $t+5$								No Emp	SE	Bnfts
	[0-20]	[21-40]	[41-60]	[61-80]	[81-95]	[96-99]	[99.1-99.9]	Top 0.1%			
[0-20]	49.2	17.8	7.5	3.9	1.3	0.2	0.0	0.0	1.2	7.3	11.6
[21-40]	21.9	46.5	20.4	6.5	1.4	0.1	0.0	0.0	0.2	1.5	1.5
[41-60]	8.2	23.4	43.4	20.4	3.1	0.2	0.0	0.0	0.1	0.8	0.4
[61-80]	4.3	6.6	22.3	49.0	16.1	0.7	0.1	0.0	0.1	0.5	0.2
[81-95]	2.4	2.0	3.9	22.2	58.7	9.5	0.6	0.0	0.1	0.5	0.1
[96-99]	2.0	1.0	1.2	3.9	34.0	48.1	8.5	0.3	0.1	0.8	0.1
[99.1-99.9]	2.1	0.9	1.1	2.3	10.4	34.7	41.9	5.0	0.2	1.2	0.1
Top 0.1%	3.4	1.4	1.2	2.4	5.6	11.7	37.7	34.4	0.5	1.7	0.1
No Emp	25.7	4.2	2.3	1.6	1.3	0.5	0.2	0.0	42.9	12.4	8.9
SE	25.5	5.6	3.5	2.4	1.1	0.2	0.1	0.0	1.4	57.5	2.8
Bnfts	21.1	2.3	0.9	0.4	0.1	0.0	0.0	0.0	1.0	1.4	72.7

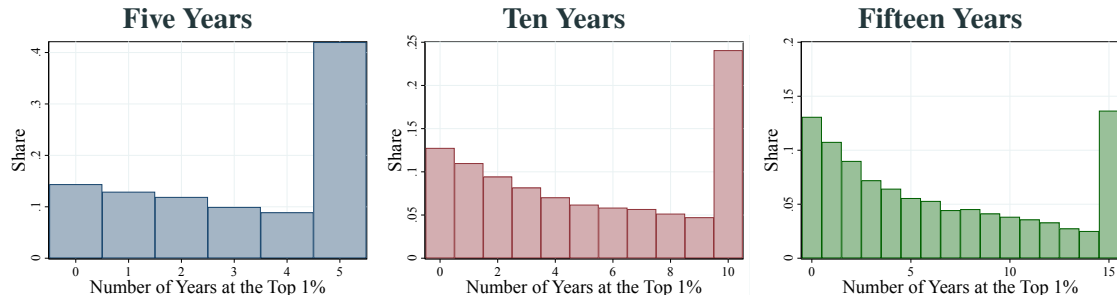
- 49.4% (19%) of workers who are in the top 1% in year t are still in the top 1% after 5 (15) years
- Almost all (more than 99.5% of) workers in the top 0.1% of the distribution in $t + 5$ were already in the top 5% in t .
- Less than 15% of the top 0.1% earners fell below the 95th percentile in $t + 5$.
- Similar results for women (Go), if we divide distribution in deciles (Go), for annual earnings (Go) and (Go)

35–44-Year Old Bottom Wage Earners: Permanent Earnings $t + 5$

Percentile in year t	Percentile in year $t+5$								No Emp	SE	Bnfts
	[0-20]	[21-40]	[41-60]	[61-80]	[81-95]	[96-99]	[99.1-99.9]	Top 0.1%			
[0-20]	49.2	17.8	7.5	3.9	1.3	0.2	0.0	0.0	1.2	7.3	11.6
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[41-60]	8.2	23.4	43.4	20.4	3.1	0.2	0.0	0.0	0.1	0.8	0.4
[61-80]	4.3	6.6	22.3	49.0	16.1	0.7	0.1	0.0	0.1	0.5	0.2
[81-95]	2.4	2.0	3.9	22.2	58.7	9.5	0.6	0.0	0.1	0.5	0.1
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- Individuals with permanent earnings below min income threshold are ~11% of sample
 - 1.8% have self employment income,
 - 9.0% percent receive social security benefits
 - only 0.5% have no significant income.
- Self-employment follows a hockey-stick shaped pattern over the earnings distribution.
 - Switching to SE declines by wage except at the top end.
- Benefits recipients decline by wage income.

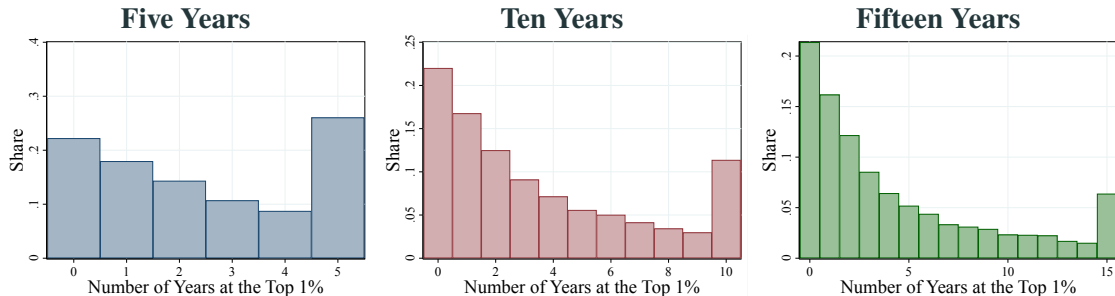
Persistence at Top 1% of Permanent Income for Men between 35-44 years old



Notes: Share of workers in top 1% between t and $t+k$ conditional on being in top 1% in year t . Plot shows the average across years between 1993 and 2012 (left), 2007 (center), and 2002 (right). Total individual-year observations 228K.

- Histogram shows number of years workers stay in top 1% between $t+1$ and $t+k$ conditional on being in top 1% in t .
- 24% (13%) of individuals stay all 10 (15) years at top 1% of income.
- **Results stronger for women** (Go), and similar for top 0.1% (Go), and for annual earnings (Go)

Persistence at Top 1% of Permanent Income for Men between 25-34 years old



Notes: Share of workers in top 1% between t and $t+k$ conditional on being in top 1% in year t . Plot shows the average across years between 1993 and 2012 (left), 2007 (center), and 2002 (right). Total individual-year observations 228K.

- Lower persistence for younger individuals, especially after 15 years
- Linked to fast decline in income inequality between 25 and 35 years (Go)

Intergenerational Income Dynamics

Intergenerational Persistence in Income Dynamics

- Intergenerational persistence in earnings has been a long-standing question
Harrington (1962), Behrman and Taubman (1985), Solon (1992,1999), Black and Devereux (2011) Jäntti and Jenkins (2013)
- Most of the literature focuses on intergenerational income elasticities
- We focus on the intergenerational transmission of **earnings dynamics** to answer:
 1. Do fathers with high **lifetime income (& growth)** have high lifetime income (& growth) children?
 2. Do fathers with more **dispersed** incomes changes have children with riskier incomes?
 3. Intergenerational persistence in **skewness and kurtosis** of income growth?
 4. Intergenerational transition matrix for income (rather than single earnings elasticity)
- Use a different dataset dating back to 1967 with a slightly different income measure

Data and Sample Selection

- Parents-children matched panel dataset that covers the entire Norwegian population between 1967-2017.
- Income measure: sum of wage and salary, self-employment income, and government transfers.
- Sample selection:
 - Individuals between ages 20 and 60.
 - Keep only those who are matched to their fathers.
 - Drop individuals who have less than 3 years of positive income.
 - Drop income observations for those who live abroad.

First approach: Fathers' Income Growth and Children Income Growth

- Require at least 30 years of data with at least 3/4 of them are above minimum income threshold.
 - ~ 250K individuals.
- Compare properties of fathers' and children's income shocks.
 1. Distribution of log-income growth over life-cycle for each individual
 2. For each individual regress log earnings on a quadratic function of age and aggregate income:

$$\log y_{it} = \alpha_i + \beta_i Y_t + \gamma_i h + \lambda_i h^2 + \epsilon_{it}$$

- Calculate **individual-level measures**: dispersion, skewness, and kurtosis of income growth
- Drawback: Estimating higher order moments with 30 to 40 observations.

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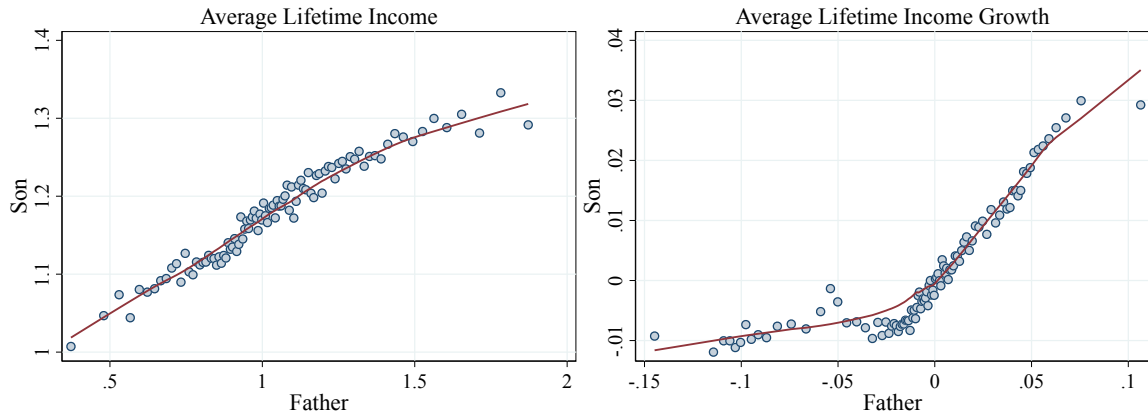
Second approach: Fathers' Income and Children Income Growth

- Sort fathers' into quantile of the lifetime income distribution
- Lifetime income is the average of residual earnings

Intergenerational Income Dynamics

Fathers and Children Income Growth

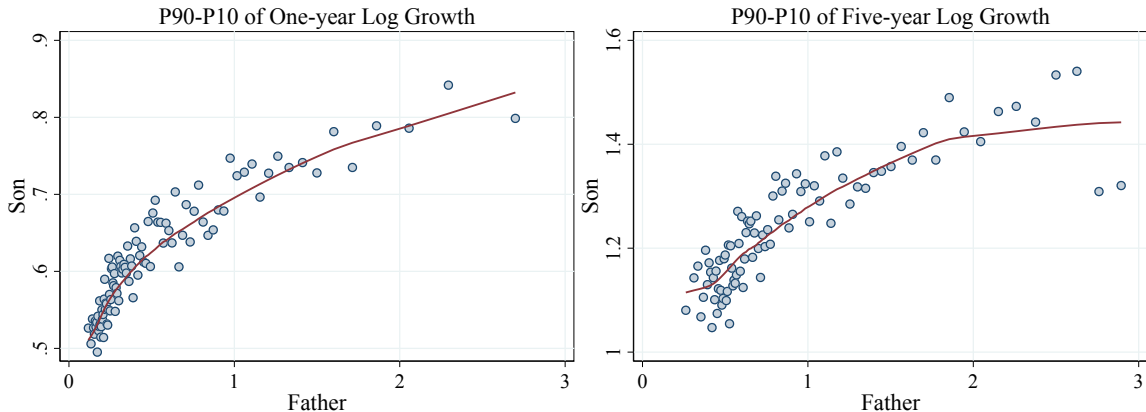
Lifetime incomes and the average growth are positively correlated



Notes: Individual-level lifetime income and growth. Binscatter calculated over 100 bins. N = 130 fathers-son pairs

- High income fathers have high income sons. Elasticity: 0.16 (similar to Bratberg et al. (2005) for Norway)
- Higher growth fathers have higher growth sons: elasticity of 0.14. Similar results for women (Go)

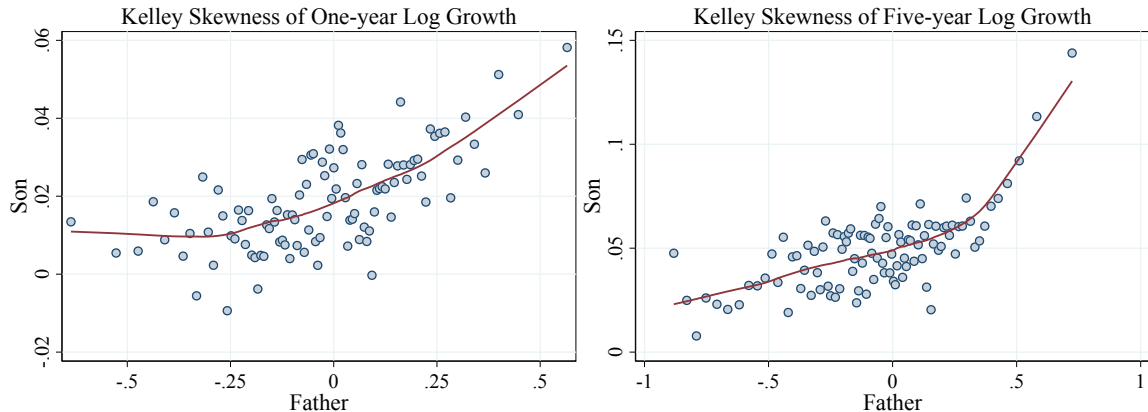
Fathers with more volatile incomes have Sons with riskier incomes



Notes: Individual-level P90-P10 of log earnings growth. Binscatter calculated over 100 bins controlling for father and son lifetime income. N = 130 fathers-son pairs

- Both short term (1-year) and longer-term (5-year) growth
- Similar patterns for residual earnings (Go) and for daughters (Go)

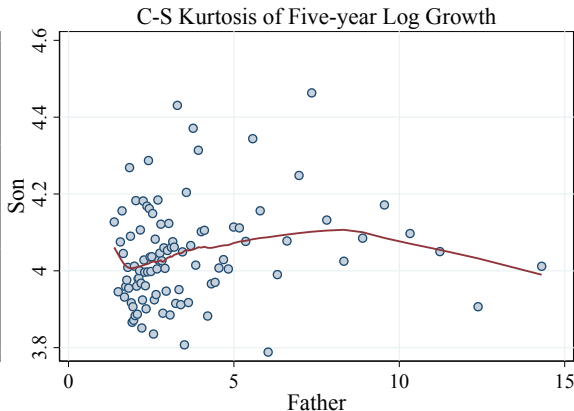
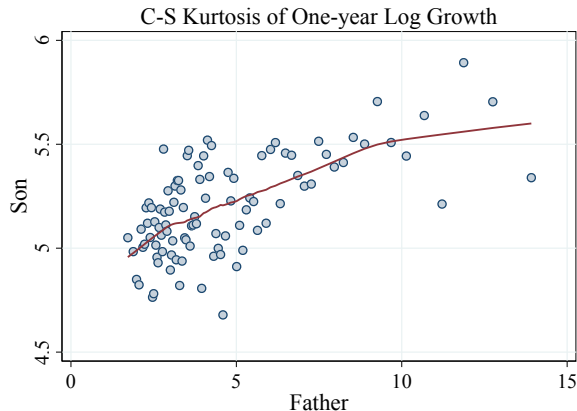
Fathers' and Sons' skewness of income growth is positively correlated



Notes: Individual-level Kelley Skewness of log earnings growth. Binscatter calculated over 100 bins controlling for father and son lifetime income. N = 130 fathers-son pairs

- Both short term (1-year) and longer-term (5-year) growth
- Similar patterns for residual earnings (Go) but weaker relation for daughters (Go)

Kurtosis of Fathers' and Sons' income growth



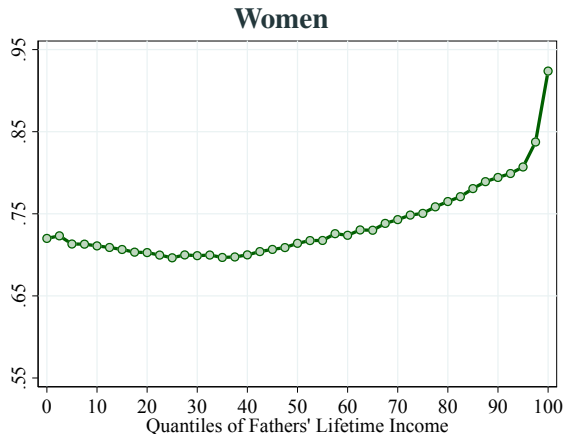
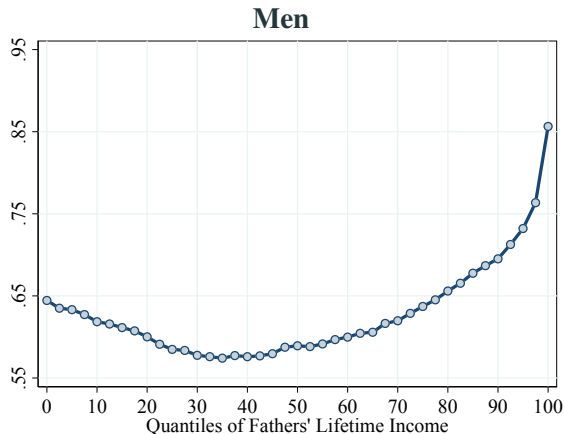
Notes: Individual-level C-S Kurtosis of log earnings growth. Binscatter calculated over 100 bins controlling for father and son lifetime income. N = 130 fathers-son pairs

- There does not seem to be strong relationship with fathers' and sons' kurtosis.
- Similar patterns for residual earnings (Go) and for daughters (Go)

Intergenerational Income Dynamics

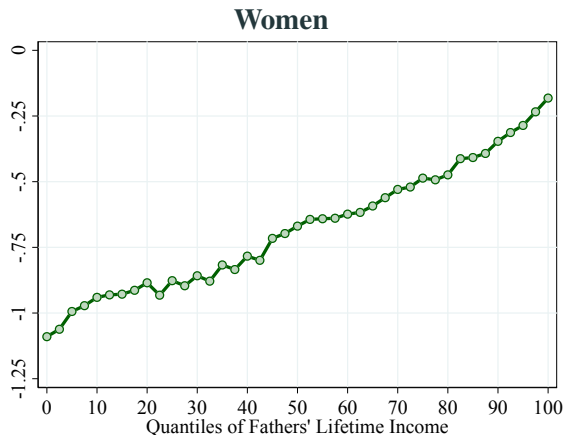
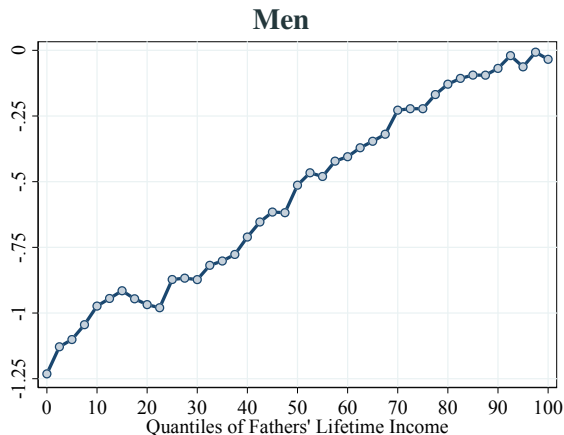
Fathers Income and Children Income Growth

Standard Deviation of 5-Year Income Growth by Fathers' Permanent Income



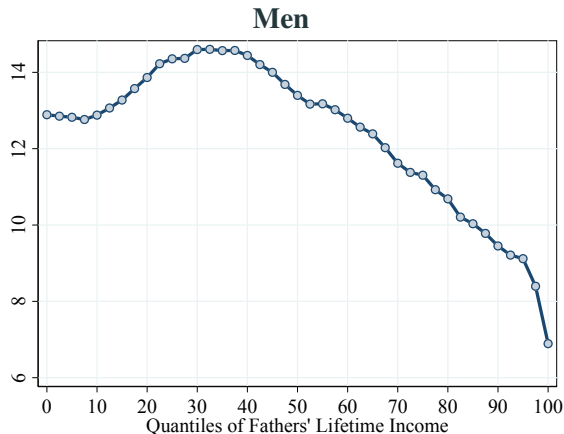
- High-income fathers have sons with more volatile incomes.
- Even after controlling for sons' permanent income (Go).

Skewness of 5-Year Income Growth by Fathers' Permanent Income



- Skewness increases by father's permanent income even if control for sons' permanent income (Go)
 - Higher volatility of children's income of rich parents are due to longer right tail.

Kurtosis of 5-Year Income Growth by Fathers' Permanent Income



- Kurtosis by father's permanent income shows hump-shaped pattern even if control for sons' permanent income (Go)
 - Kurtosis peaks at higher percentiles of own permanent income.

Intergenerational Lifetime Income Mobility For Men

	Percentiles of Sons' Permanent Income							
	[0-20]	[21-40]	[41-60]	[61-80]	[81-95]	[96-99]	[99.1-99.9]	Top 0.1%
[0-20]	30.9	23.4	19.0	15.6	8.9	1.8	0.3	0.0
[21-40]	20.7	22.8	21.7	19.6	12.2	2.5	0.5	0.0
[41-60]	17.4	20.7	21.9	21.5	14.5	3.3	0.6	0.0
[61-80]	15.8	18.4	20.7	22.4	17.2	4.4	0.9	0.1
[81-95]	15.1	15.6	17.7	21.7	21.3	6.8	1.6	0.2
[96-99]	14.7	12.3	14.0	19.4	24.9	10.8	3.5	0.5
[99.1-99.9]	15.7	10.6	11.3	16.6	25.9	13.5	5.4	0.9
Top 0.1%	18.9	10.2	8.2	16.5	22.2	13.1	7.9	2.9

- Top earner men are mainly coming from richer families.
- Sons of poor fathers rarely reach the top.
- But around 20% of children from top-income fathers fall to the bottom quintile of the distribution of permanent income.
- Similar results for Women (Go)

Conclusions

Conclusions

Common Core

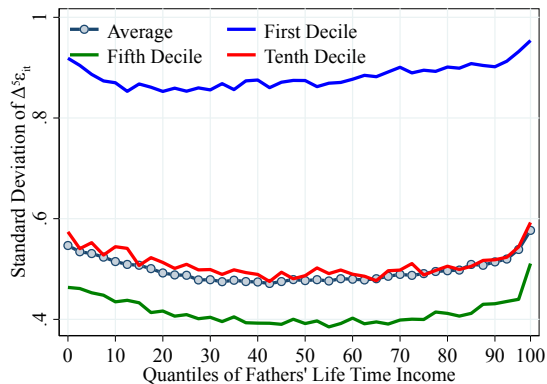
- Norway is a country of equality and stability.
 - Though Norway is not immune to the recent increase in top income inequality.
 - Higher order moments of income changes similar to those from the US, France, Netherlands, etc.
- Top earnings states (top 1% or top 0.1%) are quite persistent.

Intergenerational Transmission of Income Dynamics

- Fathers and sons have correlated distribution of income growth: average, dispersion, skewness.
- Children of high-income parents have riskier incomes and more positively skewed income changes.
- Top earner men are mainly coming from richer families.

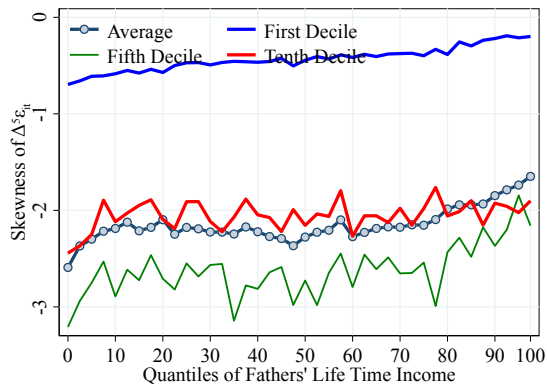
Appendix

Dispersion of Income Growth by Fathers' and Own Permanent Income [► Back](#)



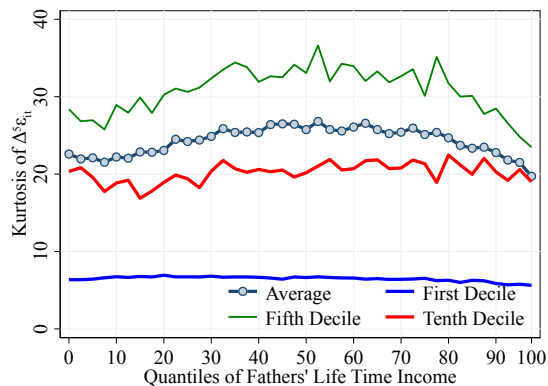
- High-income fathers have sons with more volatile incomes—even after controlling for sons' permanent income.
 - Do their kids choose high-risk high return careers?

Skewness of Income Growth by Fathers' and Own Permanent Income [► Back](#)



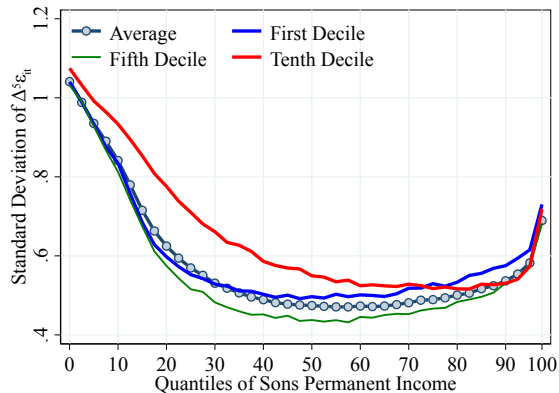
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 - Do their kids choose high-risk high return careers?

Kurtosis of Income Growth by Fathers' and Own Permanent Income ▶ [Back](#)



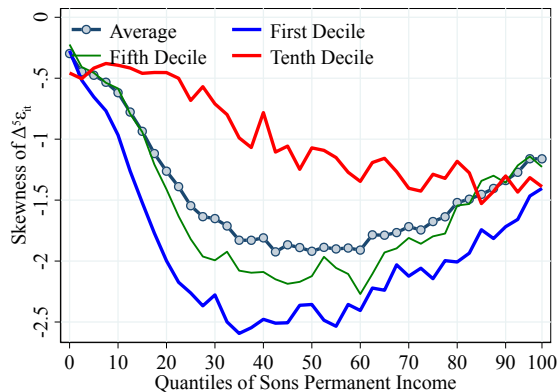
- High-income fathers have sons with more volatile incomes—even after controlling for sons' permanent income.
 - Do their kids choose high-risk high return careers?

Dispersion of Income Growth by Fathers' and Own Permanent Income



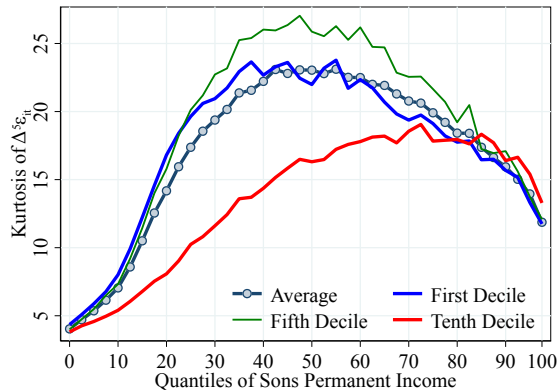
- Variance display U-shaped pattern over father's income even after controlling for own's permanent income.

Skewness of Income Growth by Fathers' and Own Permanent Income



- Skewness increase by father's permanent income.
 - Higher volatility of children's income of rich parents are due to longer right tail.

Kurtosis of Income Growth by Fathers' and Own Permanent Income



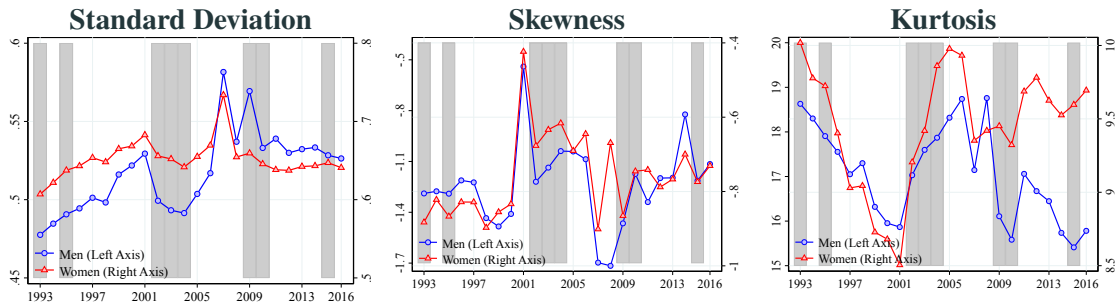
- Variation in kurtosis by father's permanent income displays hump-shaped pattern.

Distribution of Individual-Level Moments [► Back](#)



- Large dispersion of individual-level moments

Evolution of Earnings Risk over Time: 1-Year Earnings Growth [► Back](#)



- No significant trend in moments of earnings growth between 1996 and 2015.
- No significant cyclical variation either.

Top Earners: Permanent Earnings $t + 5$ [► Back](#)

Percentile in year t

		Percentile in year $t+5$															
		P10	P20	P30	P40	P50	P60	P70	P80	P90	P95	P99	P99.9	+0.1%	No Emp	SE	Bnfts
P10		35.2	15.8	6.8	4.2	3.0	2.2	1.7	1.3	0.8	0.3	0.2	0.0	0.0	1.7	10.5	16.4
P20		20.2	27.2	15.7	8.8	5.7	4.0	2.8	2.0	1.2	0.4	0.2	0.0	0.0	0.7	4.2	6.9
P30		8.6	19.9	29.4	16.7	9.1	5.3	3.3	2.0	1.0	0.3	0.1	0.0	0.0	0.2	1.8	2.2
P40		4.8	10.5	20.6	26.2	16.9	9.5	5.1	2.7	1.2	0.3	0.1	0.0	0.0	0.1	1.1	0.9
P50		3.3	6.4	10.2	20.2	24.7	17.4	9.5	4.5	1.9	0.4	0.1	0.0	0.0	0.1	0.8	0.5
P60		2.4	4.3	5.7	10.6	20.1	24.8	17.9	8.9	3.4	0.6	0.2	0.0	0.0	0.1	0.7	0.3
P70		1.9	3.1	3.4	5.3	10.4	20.2	26.6	18.9	7.5	1.3	0.4	0.0	0.0	0.1	0.6	0.2
P80		1.5	2.1	2.0	2.6	4.5	9.5	21.2	31.3	19.8	3.6	1.1	0.1	0.0	0.1	0.5	0.2
P90		1.1	1.4	1.1	1.2	1.8	3.1	7.4	21.5	41.3	14.4	4.6	0.3	0.0	0.1	0.5	0.1
P95		1.0	1.0	0.7	0.6	0.8	1.2	2.4	6.5	30.0	34.6	19.1	1.3	0.0	0.1	0.5	0.1
P99		1.0	0.9	0.5	0.5	0.5	0.7	1.2	2.7	10.2	23.8	48.1	8.5	0.3	0.1	0.8	0.1
P99.9		1.3	0.9	0.5	0.5	0.5	0.6	0.8	1.5	4.0	6.4	34.7	41.9	5.0	0.2	1.2	0.1
+0.1%		2.1	1.3	0.8	0.6	0.5	0.7	0.8	1.6	2.8	2.8	11.7	37.7	34.4	0.5	1.7	0.1
No Emp		18.0	7.6	2.7	1.5	1.3	1.0	0.8	0.8	0.9	0.4	0.5	0.2	0.0	42.9	12.4	8.9
SE		18.1	7.3	3.3	2.3	1.9	1.6	1.3	1.1	0.8	0.3	0.2	0.1	0.0	1.4	57.5	2.8
Bnfts		16.9	4.3	1.5	0.8	0.5	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	1.0	1.4	72.7

- 53.8% (22.4%) of workers who are in the top 1% in year t are still in the top 1% after 5 (15) years
- Almost all (more than 99.5% of) workers in the top 0.1% of the distribution in $t + 5$ were already in the top 1% in t .
- Less than 15% of the top 0.1% earners fell below the 99th percentile in $t + 5$.

Top Earners: Permanent Earnings $t + 5$ for Women [► Back](#)

		Percentile in year t+5								SE	Bnfts	
		[0-20]	[21-40]	[41-60]	[61-80]	[81-95]	[96-99]	[99.1-99.9]	Top 0.1%			
Percentile in year t	[0-20]	40.3	22.8	11.3	6.1	2.0	0.2	0.0	0.0	0.5	2.3	14.4
	[21-40]	22.9	34.0	22.2	11.9	3.7	0.3	0.0	0.0	0.1	0.7	4.1
	[41-60]	11.1	24.0	33.6	21.0	7.5	0.6	0.0	0.0	0.1	0.4	1.7
	[61-80]	5.8	10.5	24.3	39.6	17.3	1.4	0.1	0.0	0.0	0.3	0.7
	[81-95]	3.1	4.7	7.7	25.3	49.8	8.2	0.5	0.0	0.0	0.2	0.4
	[96-99]	2.1	1.9	2.6	5.4	30.7	48.1	8.2	0.3	0.0	0.4	0.3
	[99.1-99.9]	1.6	1.0	1.1	1.7	7.1	34.7	47.1	4.7	0.1	0.7	0.2
	Top 0.1%	2.0	0.9	1.1	0.9	3.3	9.6	39.6	41.1	0.1	0.9	0.4
	No Emp	20.9	5.4	2.8	1.7	0.9	0.1	0.0	0.0	51.5	4.3	12.3
	SE	25.2	7.7	4.1	2.8	2.0	0.5	0.1	0.0	0.9	51.1	5.7
Bnfts	27.7	7.0	3.0	1.5	0.5	0.1	0.0	0.0	1.4	1.8	56.9	

- 53.8% (22.4%) of workers who are in the top 1% in year t are still in the top 1% after 5 (15) years
- Almost all (more than 99.5% of) workers in the top 0.1% of the distribution in $t + 5$ were already in the top 1% in t .
- Less than 15% of the top 0.1% earners fell below the 99th percentile in $t + 5$.

Top Earners: Markov Transition Matrix between t and $t + 5$ ► [Back](#)

	Percentiles of ε_{it} in year $t+5$															
	P10	P20	P30	P40	P50	P60	P70	P80	P90	P95	P99	P99.9	+0.1%	No Emp	SE	Bnfts
P10	31.5	14.3	7.0	4.8	3.6	2.8	2.2	1.7	1.2	0.4	0.3	0.1	0.0	2.8	9.7	17.6
P20	16.9	26.2	16.1	9.1	6.1	4.3	3.1	2.1	1.3	0.4	0.2	0.0	0.0	1.3	3.7	9.2
P30	8.6	19.3	27.8	16.7	9.3	5.6	3.4	2.0	1.0	0.3	0.1	0.0	0.0	0.5	2.0	3.5
P40	5.7	10.3	19.2	23.8	16.6	10.0	5.7	3.0	1.3	0.3	0.1	0.0	0.0	0.4	1.6	1.9
P50	4.2	6.6	10.2	18.6	22.5	17.0	10.0	5.1	2.1	0.4	0.2	0.0	0.0	0.3	1.3	1.3
P60	3.4	4.8	5.9	10.8	18.4	22.4	17.3	9.5	3.9	0.8	0.3	0.0	0.0	0.3	1.1	1.0
P70	2.7	3.4	3.6	5.8	10.5	18.6	24.3	18.5	8.2	1.6	0.5	0.1	0.0	0.3	1.0	0.8
P80	2.1	2.5	2.1	3.0	5.0	9.7	19.6	28.6	19.9	4.1	1.4	0.1	0.0	0.3	1.0	0.6
P90	1.6	1.6	1.2	1.4	2.1	3.6	7.9	20.3	38.1	14.6	5.4	0.4	0.0	0.4	0.9	0.4
P95	1.4	1.2	0.7	0.7	1.0	1.5	2.9	7.5	28.5	31.6	19.5	1.7	0.1	0.4	0.9	0.3
P99	1.5	1.0	0.5	0.5	0.7	1.0	1.5	3.4	11.9	22.4	44.0	8.8	0.4	0.6	1.4	0.3
P99.9	1.9	1.0	0.5	0.5	0.7	0.7	1.1	2.0	5.4	8.1	33.0	36.8	5.2	1.0	1.9	0.3
+0.1%	2.0	1.3	0.5	0.5	0.8	1.0	1.0	1.8	3.3	4.1	14.7	35.5	28.0	1.9	3.2	0.4
No Emp	15.6	7.4	3.6	2.6	2.2	1.9	1.7	1.9	2.1	1.2	1.0	0.4	0.1	32.8	14.5	11.1
SE	13.9	6.1	3.6	3.0	2.8	2.4	2.0	1.7	1.3	0.5	0.4	0.1	0.0	3.4	54.5	4.2
Bnfts	15.0	5.3	2.3	1.5	1.0	0.8	0.6	0.4	0.2	0.1	0.1	0.0	0.0	1.7	2.0	69.0

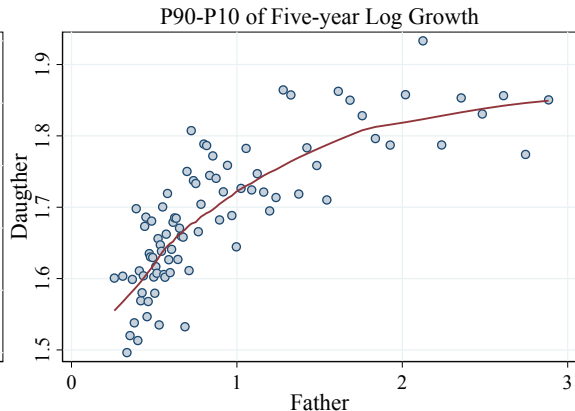
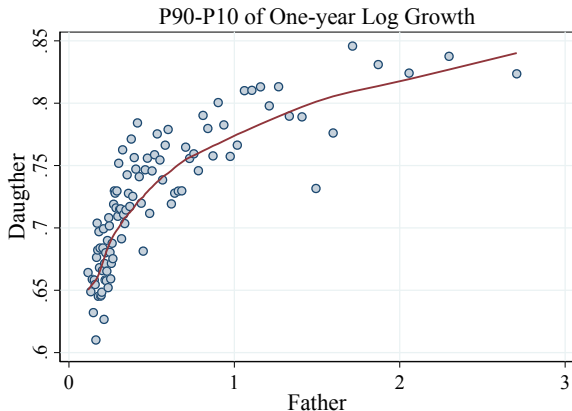
- 53.8% (22.4%) of workers who are in the top 1% in year t are still in the top 1% after 5 (15) years
- Almost all (more than 99.5% of) workers in the top 0.1% of the distribution in $t + 5$ were already in the top 1% in t .
- Less than 15% of the top 0.1% earners fell below the 99th percentile in $t + 5$.

Top Earners: Markov Transition Matrix between t and $t + 5$ ► [Back](#)

	Percentile in year $t+5$										
	[0-20]	[21-40]	[41-60]	[61-80]	[81-95]	[96-99]	[99.1-99.9]	Top 0.1%	No Emp	SE	Bnfts
[0-20]	44.4	18.5	8.4	4.5	1.7	0.3	0.1	0.0	2.1	6.7	13.3
[21-40]	21.9	43.7	20.7	7.1	1.5	0.1	0.0	0.0	0.5	1.8	2.7
[41-60]	9.5	22.7	40.2	21.0	3.6	0.3	0.0	0.0	0.3	1.2	1.2
[61-80]	5.4	7.3	21.9	45.5	16.9	1.0	0.1	0.0	0.3	1.0	0.7
[81-95]	3.0	2.2	4.7	22.3	55.2	10.1	0.9	0.0	0.4	0.9	0.4
[96-99]	2.5	1.1	1.7	4.9	34.3	44.0	8.8	0.4	0.6	1.4	0.3
[99.1-99.9]	2.9	0.9	1.4	3.0	13.4	33.0	36.8	5.2	1.0	1.9	0.3
Top 0.1%	3.2	1.0	1.8	2.8	7.4	14.7	35.5	28.0	1.9	3.2	0.4
No Emp	23.0	6.2	4.0	3.6	3.2	1.0	0.4	0.1	32.8	14.5	11.1
SE	20.0	6.6	5.1	3.7	1.8	0.4	0.1	0.0	3.4	54.5	4.2
Bnfts	20.3	3.7	1.8	1.0	0.3	0.1	0.0	0.0	1.7	2.0	69.0

- 53.8% (22.4%) of workers who are in the top 1% in year t are still in the top 1% after 5 (15) years
- Almost all (more than 99.5% of) workers in the top 0.1% of the distribution in $t + 5$ were already in the top 1% in t .
- Less than 15% of the top 0.1% earners fell below the 99th percentile in $t + 5$.

Fathers with more volatile incomes have Daughters with riskier incomes ▶ [Back](#)

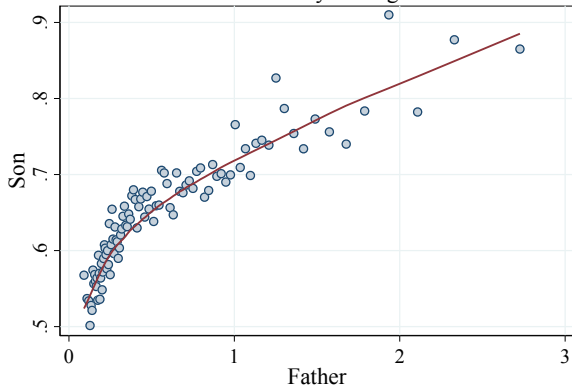


Notes: Individual-level P90-P10 of log earnings growth. Binscatter calculated over 100 bins controlling for father and son lifetime income. N = 130 fathers-son pairs

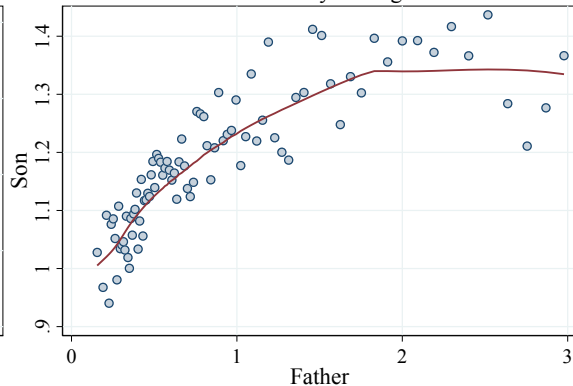
- Both short term (1-year) and longer-term (5-year) growth

Fathers with more volatile incomes have Sons with riskier incomes ▶ [Back](#)

P90-P10 of One-year Log Growth



P90-P10 of Five-year Log Growth

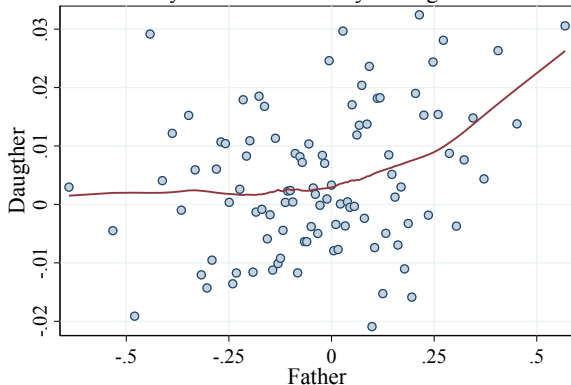


Notes: Individual-level P90-P10 of log earnings growth. Binscatter calculated over 100 bins controlling for father and son lifetime income. N = 130 fathers-son pairs

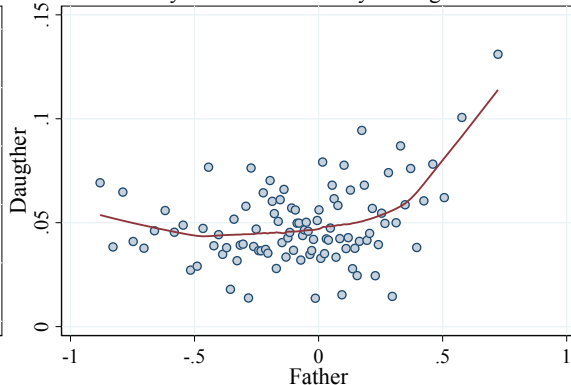
- Both short term (1-year) and longer-term (5-year) growth on **residual earnings**

Fathers' and daughters' skewness is positively correlated [► Back](#)

Kelley Skewness of One-year Log Growth



Kelley Skewness of Five-year Log Growth

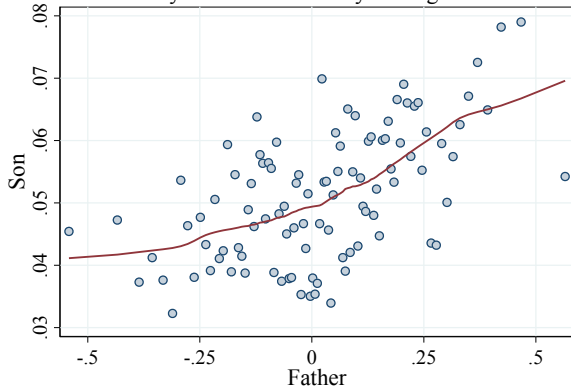


Notes: Individual-level Kelley skewness of log earnings growth. Binscatter calculated over 100 bins controlling for father and son lifetime income. N = 280K.

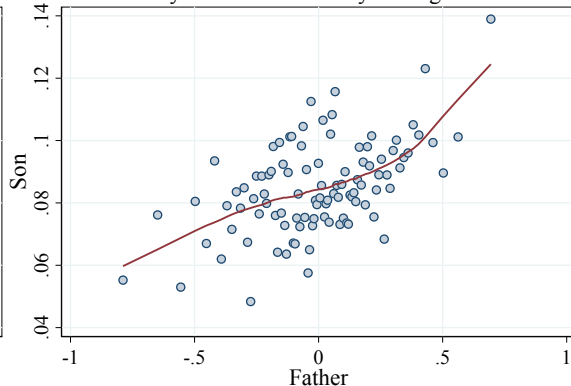
- Both short term (1-year) and longer-term (5-year) growth on **residual earnings**

Skewness of positively correlated between fathers and sons [► Back](#)

Kelley Skewness of One-year Log Growth



Kelley Skewness of Five-year Log Growth

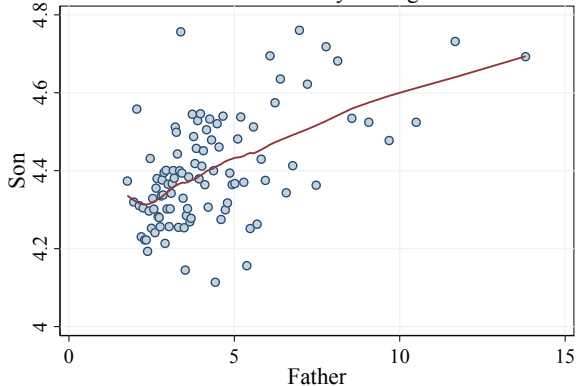


Notes: Individual-level P90-P10 of log earnings growth. Binscatter calculated over 100 bins controlling for father and son lifetime income. N = 280K.

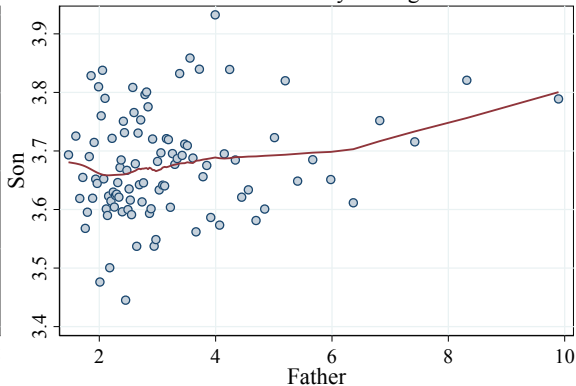
- Both short term (1-year) and longer-term (5-year) growth on **residual earnings**

Fathers' and Sons' income growth kurtosis [► Back](#)

C-S Kurtosis of One-year Log Growth



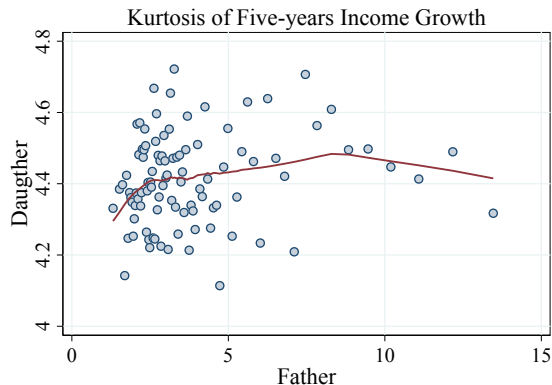
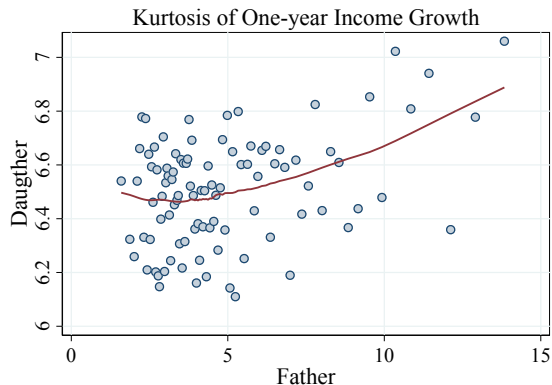
C-S Kurtosis of Five-year Log Growth



Notes: Individual-level P90-P10 of log earnings growth. Binscatter calculated over 100 bins controlling for father and son lifetime income. N = 280K.

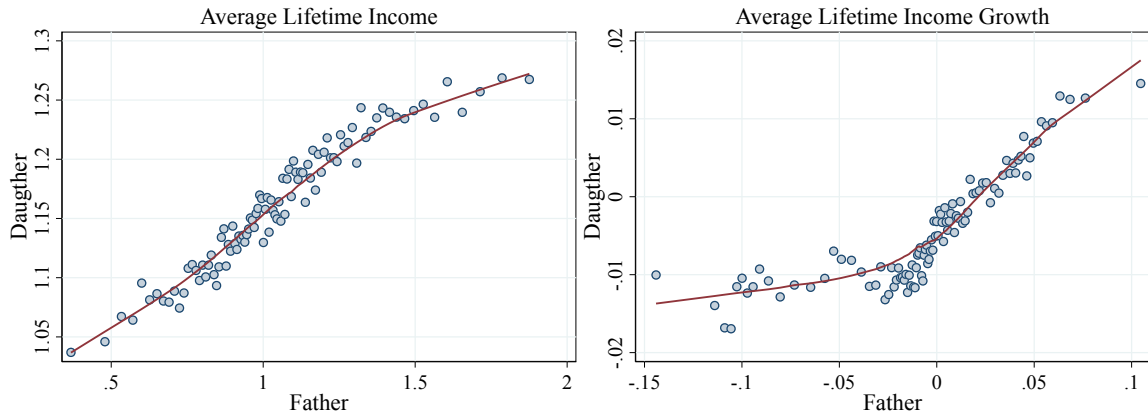
- Both short term (1-year) and longer-term (5-year) growth on **residual earnings**

Fathers' and Daughters' Income Growth Kurtosis [► Back](#)



Notes: Individual-level Crow-Siddiqui kurtosis of log earnings growth. Binscatter calculated over 100 bins controlling for father and son lifetime income. N = 280K.

Fathers and Daughters: Lifetime income and growth [► Back](#)



Notes: Left panel (right panel) shows the average (growth rate) life-time earnings for fathers and sons. Binscatter calculated over 100 bins. N = 280K father-son pairs.

Intergenerational Lifetime Income Mobility For Women ▶ Back

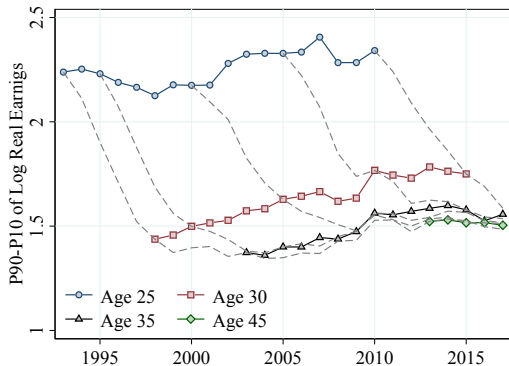
	Percentiles of Daughters' Lifetime Income						
	[0-20]	[21-40]	[41-60]	[61-80]	[81-95]	[96-99]	Top 0.1%
Percentiles of Fathers' Lifetime Income							
[0-20]	29.0	22.8	19.5	16.2	10.1	2.1	0.4
[21-40]	21.0	22.3	21.9	19.8	12.2	2.4	0.4
[41-60]	18.9	20.7	21.2	21.1	14.3	3.1	0.6
[61-80]	16.9	18.9	20.0	21.7	17.1	4.4	0.9
[81-95]	14.5	16.1	18.0	21.7	20.6	7.1	1.8
[96-99]	13.4	13.2	15.3	20.2	23.1	10.6	3.6
[99.1-99.9]	13.9	13.2	15.5	19.3	22.2	11.1	4.2
Top 0.1%	17.8	14.4	12.9	18.2	20.4	11.5	4.0

- Top earner women are mainly coming from richer families.
- Daughters of poor fathers rarely reach the top
- But around 20% of top-income fathers fall to the bottom quintile of the distribution of permanent income

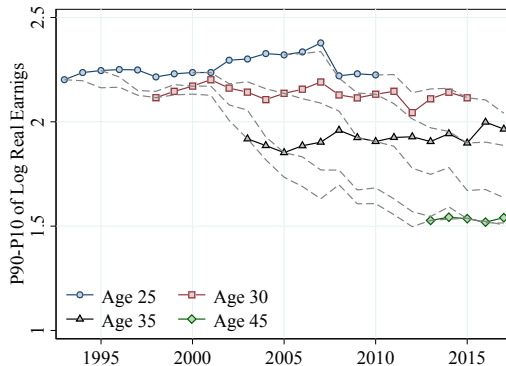
Life Cycle Inequality Experienced by 18 Cohorts

► [Back](#)

Men



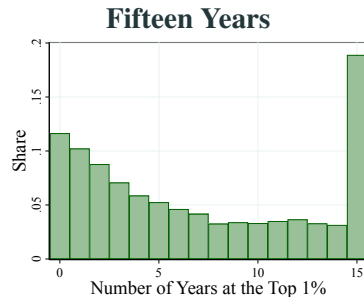
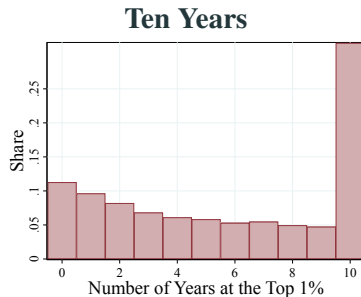
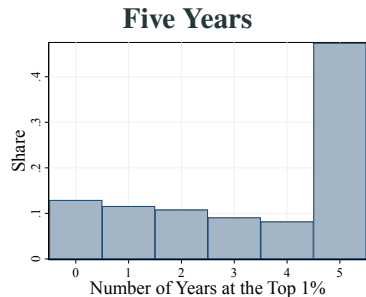
Women



- **Men:** Inequality declines sharply until 35, mainly due to the compression in P50-10.
- **Women:** Higher inequality and it keeps declining over the life cycle.
- Slight increase in inequality for younger cohorts for **men**.

Persistence at Top 1% of Permanent Income for **Women** between 35-44 years old

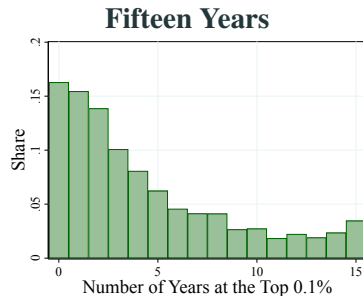
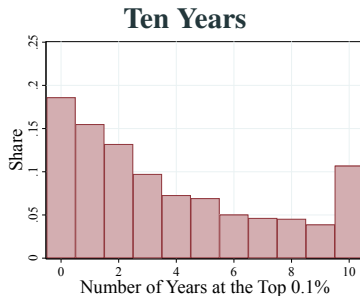
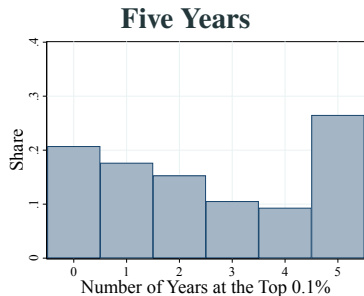
► [Back](#)



Notes: Share of workers in top 1% between t and $t+k$ conditional on being in top 1% in year t . Plot shows the average across years between 1993 and 2012 (left), 2007 (center), and 2002 (right). Total individual-year observations 228K.

- Results are stronger for women

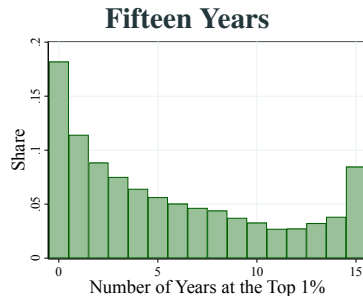
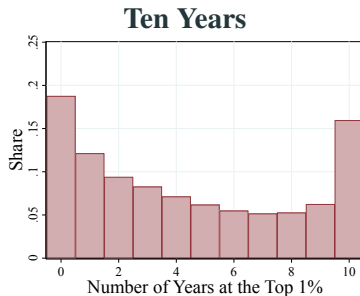
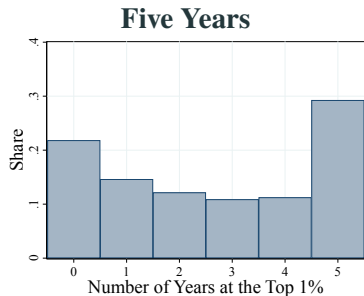
Persistence at Top 0.1% of Permanent Income for Men between 35-44 years old [► Back](#)



Notes: Share of workers in top 1% between t and $t+k$ conditional on being in top 1% in year t . Plot shows the average across years between 1993 and 2012 (left), 2007 (center), and 2002 (right). Total individual-year observations 228K.

- Similar results for men at top 0.1% of income distribution

Persistence at **Top 1% of Labor Income** for Men between 35-44 years old [► Back](#)



Notes: Share of workers in top 1% between t and $t+k$ conditional on being in top 1% in year t . Plot shows the average across years between 1993 and 2012 (left), 2007 (center), and 2002 (right). Total individual-year observations 228K.

- Similar results for labor income