Intergenerational wealth mobility and the role of inheritance: Evidence from multiple generations

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Bank of Italy, Dec 4, 2015

Main questions

1. Does personal wealth status persist over more than two generations?

2. How important is inheritance as a driver of this persistence?

Previous research

Multigenerational effects

Importance of long-term social mobility over and above parents

- Lindahl et al. (2015), Clark and Cummins (2014), Boserup et al. (2014), Long and Ferrie (2013)

Wealth mobility

Two-generational intergenerational elasticities (IGEs):

- US: 0.4–0.8 (Menchik 1979; Charles and Hurst 2003; Wahl 2002)
- Britain: 0.5 (Harbury and Hitchens 1979)

Three-generational IGE

- 2-gen 0.3–0.8, 3-gen 0.1–0.3 (Wahl 2002; Arrondel and Grange 2006; Boserup et al 2014)

Role of inheritance in IG wealth mobility

- No direct tests. Boserup et al. find larger persistence when parents have died.

Data

Study population

- Survey of all third-graders in Sweden's third largest city, Malmö, in 1938
- Used by several studies, e.g., Lindahl et al (2015).
- Four linked generations
  - Index generation (1928) + spouses
  - Parents ($\sim$1898)
  - Children ($\sim$1957)
  - Grandchildren ($\sim$1986)
- Observe wealth, income, and education
- LHS always individual; RHS always family

Wealth data

Wealth

Non-financial assets + Financial assets - Debts

Mid-life wealth (gen 1–4)

- Taxable wealth (gen 1–3): by household/ind., measured at age 45–60
- Alternative measure for 1st gen — capitalized capital income ($\hat{w} = y_{cap}/r$)
- 2000s observations at market value (gen 3–4)
- Fourth generation very young — 20 years on average

Wealth at death (gen 1–2)

- Estate inventory reports
- Parents die at different times — use *peak midparent wealth*

Descriptive statistics

	Mean (s.d.)	p10	p25	p50	p75	p90	Obs.
1st generation							
Wealth	148.1 (3486.1)	0	0	0	38.06	171.3	1748
Wealth, censored	224.8 (3336.4)	0	0	0	38.06	171.3	1748
Wealth, capitalized	41.63 (540.6)	0	0	0	0	26.05	1809
Estate wealth	197.9 (548.8)	0	14.89	67.53	187.6	451.3	2168
2nd generation							
Wealth	251.0 (431.2)	-3.25	15.8	119.0	341.4	669.5	1356
Wealth, censored	262.0 (407.7)	0	18.8	121.0	342.5	670.5	1356
Estate wealth	453.4 (753.6)	0	7.48	154.8	627.1	1242.3	412
Inheritance	114.8 (207.0)	8.69	21.9	49.4	115.0	270.6	1075
3rd generation							
Wealth	870.4 (6947.4)	-165.9	-11.97	303.6	857.6	1757.7	4979
Wealth, censored	941.5 (6935.8)	0	14.50	331.7	865.7	1764.9	4979
Inheritance	298.5 (1176.0)	11.03	26.08	60.12	102.9	260.7	393
4th generation							
Wealth	95.41 (445.1)	-116.5	0	20.34	106.2	388.5	4657
Wealth, censored	135.0 (410.1)	0	0	20.34	106.2	388.5	4657

Estimating intergenerational wealth mobility

Standard two-generational estimation of IG mobility

$$w_{i,t} = \alpha_0 + \alpha_1 w_{i,t-1} + \delta' X + \varepsilon_{i,t}$$

- α_1 measures the extent of intergenerational persistence
- X is a vector of quadratic birth year controls
- w is *percentile ranked* within age groups (preferred transformation)
- We also run regressions where w is in IHS and in log

We estimate thre- and four-generational variants:

$$w_{i,t} = \alpha_0 + \alpha_1 w_{i,t-1} + \alpha_2 w_{i,t-2} + \delta' X + \varepsilon$$
$$w_{i,t} = \alpha_0 + \alpha_1 w_{i,t-1} + \alpha_2 w_{i,t-2} + \alpha_3 w_{i,t-3} + \delta' X + \varepsilon$$

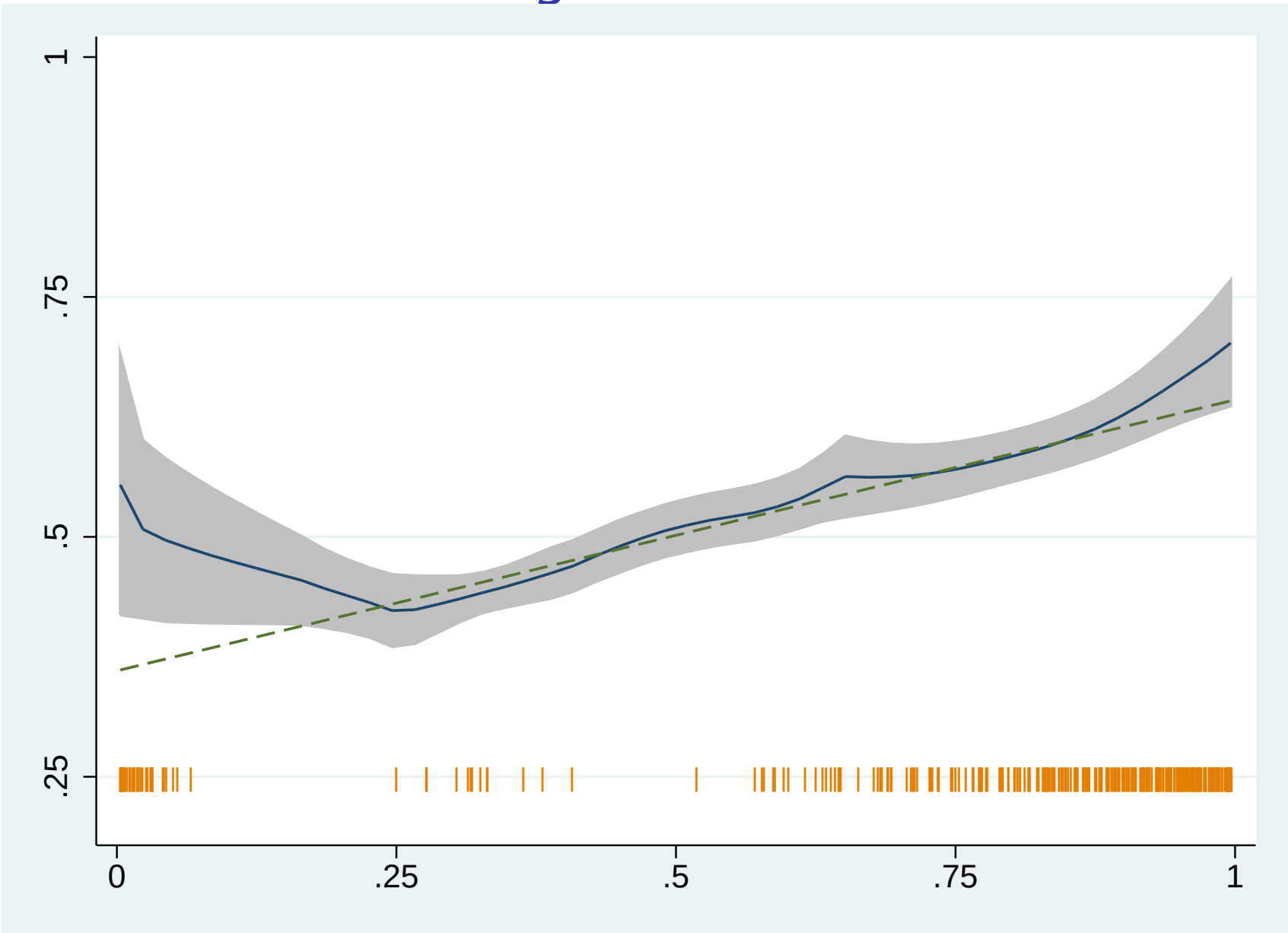
Wealth regressions

	2nd generation	3rd generation		
	(1)	(2)	(3)	(4)
Panel A				
Parents	0.283***	0.379***		0.379***
	(0.033)	(0.022)		(0.025)
Grandparents			0.145***	0.034
			(0.031)	(0.028)
R^2	0.070	0.140	0.024	0.152
Panel B: Capitalized wealth for 1st generation				
Parents	0.317***			0.380***
	(0.040)			(0.025)
Grandparents			0.178***	0.037
			(0.040)	(0.036)
R^2	0.060		0.024	0.152
Obs.	1147	2579	2128	2100

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

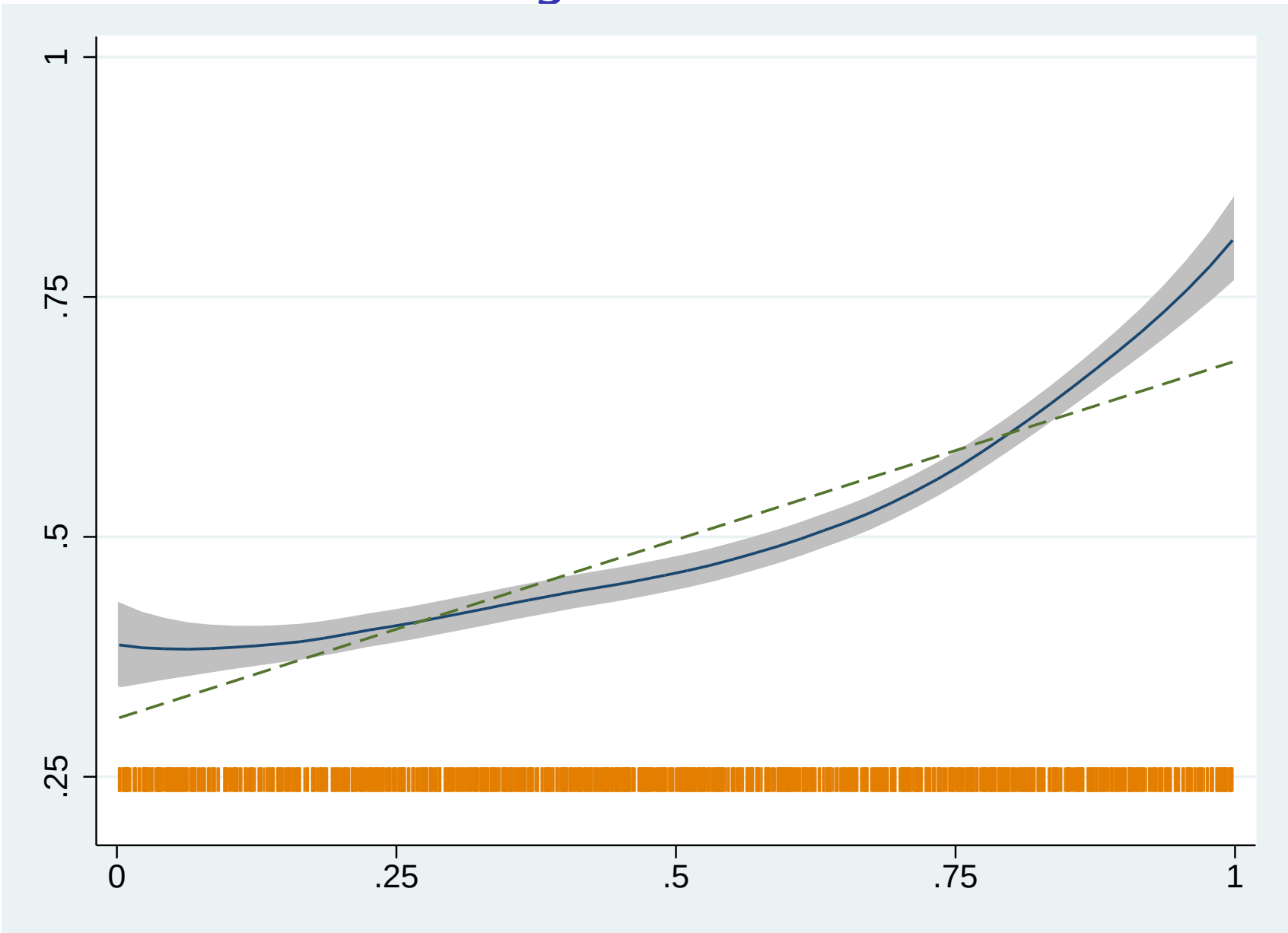
▸ Alternative transformations

Non-linearities: kernel regression



2nd generation on parents

Non-linearities: kernel regression



3rd generation on parents

Four-generational persistence

	(1)	(2)	(3)	(4)	(5)
Parents	0.376***			0.347***	0.351***
	(0.019)			(0.020)	(0.023)
Grandparents		0.206***		0.093***	0.107***
		(0.023)		(0.021)	(0.025)
Great grandparents			0.088**		−0.002
			(0.030)		(0.025)
R^2	0.140	0.041	0.008	0.148	0.155
Obs.	4657	4599	3801	4592	3755

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

▸ Alternative transformations

By age

	(1)	(2)	(3)	(4)	(5)
Panel A: Age 18 and younger					
Parents	0.498***			0.457***	0.477***
	(0.028)			(0.030)	(0.033)
Grandparents		0.274***		0.120***	0.145***
		(0.036)		(0.031)	(0.036)
Great grandparents			0.125**		−0.015
			(0.042)		(0.035)
R^2	0.259	0.079	0.018	0.273	0.299
Obs.	2014	1996	1668	1996	1657
Panel B: Older than 18					
Parents	0.277***			0.257***	0.245***
	(0.023)			(0.024)	(0.028)
Grandparents		0.146***		0.065**	0.073*
		(0.025)		(0.025)	(0.029)
Great grandparents			0.049		−0.003
			(0.033)		(0.030)
R^2	0.072	0.019	0.003	0.075	0.070
Obs.	2643	2603	2133	2596	2098

$^{*}\ p < 0.05,\ ^{**}\ p < 0.01,\ ^{***}\ p < 0.001$

▸ Alternative transformations

Life-cycle effects: Mid-life vs. Terminal wealth

	Wealth in life				Estate wealth	
			Matched estate wealth sample			
	(1)	(2)	(3)	(4)	(5)	(6)
Parents	0.285***		0.284***		0.214***	
	(0.034)		(0.057)		(0.061)	
Parents, estate		0.321***		0.257***		0.152**
		(0.030)		(0.049)		(0.053)
R^2	0.072	0.106	0.078	0.085	0.045	0.035
Obs.	1093	1093	412	412	412	412

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Estimating the role of inheritance

Main approach: Purge child wealth from inheritance

$$w_{i,y} = \alpha_0 + c_1 B_{i,y-t} + \delta(t \cdot B_{i,y-t}) + \lambda(t \cdot B^2_{i,y-t}) + u_{i,t}$$

- B is linear in w_{child} at time of payout.
- Use residuals plus intercept as w_{child} in IG regressions.

Role of inheritance: Wealth without inheritance

	(1) Full	(2) Excluding inheritance	(3) Full	(4) Excluding inheritance
Panel A: 2nd generation				
Parents' wealth	0.246***	0.0429		
	(0.0386)	(0.0412)		
Parents' wealth, capitalized			0.284***	0.0813
			(0.0444)	(0.0501)
R2	0.063	0.006	0.060	0.008
Obs.	810	810	810	810
Panel B: 3rd generation				
	Only parental inheritance		Parental and grandparental inheritance	
Parents' wealth	0.380***	0.298***	0.432***	0.230**
	(0.069)	(0.075)	(0.054)	(0.080)
R2	0.167	0.101	0.206	0.061
Obs.	224	224	374	374

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Alternative approach

Estimate the role of inheritance B as:

$$w_{i,t} = \alpha_0 + \rho_1 w_{i,t-1} + \delta X + \varepsilon_{it} \quad (1)$$

$$w_{i,t} = \alpha_0' + \rho_2 w_{i,t-1} + \gamma B_{i,t} + \delta' X + \nu_{i,t} \quad (2)$$

$$B_{i,t} = \alpha_0'' + \rho_3 w_{i,t-1} + \delta' X + e_{i,t} \quad (3)$$

- Mediated effect: $\rho_3 \cdot \gamma = \rho_1 - \rho_2$
- But are $\nu_{i,t}$ and $e_{i,t}$ uncorrelated? Overestimate if B correlated with other mediators
- Underestimate if B is not linear — we try flexibel functional form

In practice we estimate (2) and compare to (1)

Role of inheritance: Flexible controls

	(1) None	(2) 1st	(3) 2nd	(4) 3rd	(5) 4th
Panel A: 2nd generation					
Parents' wealth	0.248***	0.140***	0.101*	0.0837*	0.0800
	(0.0379)	(0.0406)	(0.0417)	(0.0414)	(0.0417)
R^2	0.061	0.110	0.122	0.127	0.128
Obs.	861	861	861	861	861
Panel B: 3rd generation, only parental inheritance					
Parents' wealth	0.380***	0.363***	0.327***	0.311***	0.312***
	(0.069)	(0.070)	(0.076)	(0.079)	(0.079)
R^2	0.167	0.177	0.186	0.191	0.200
Obs.	224	224	224	224	224
Panel C: 3rd generation, parental and grandparental inheritance					
Parent's wealth	0.432***	0.400***	0.374***	0.377***	0.379***
	(0.054)	(0.061)	(0.066)	(0.072)	(0.072)
R^2	0.206	0.223	0.228	0.232	0.239
Obs.	374	374	374	374	374

$^{*}\ p < 0.05,\ ^{**}\ p < 0.01,\ ^{***}\ p < 0.001$

Role of other factors: Human capital, labor market productivity

Dependent variables: 2nd generation

	Wealth	Income	Schooling	Wealth		
	(1)	(2)	(3)	(4)	(5)	(6)
Parents' wealth	0.274***			0.226***	0.223***	0.210***
	(0.034)			(0.034)	(0.034)	(0.034)
Parents' income		0.183***		0.075*		0.041
		(0.031)		(0.032)		(0.033)
Parents' schooling			0.298***		0.046	0.030
			(0.031)		(0.033)	(0.033)
Own income				0.231***		0.193***
				(0.030)		(0.031)
Own schooling					0.195***	0.121***
					(0.031)	(0.032)
R^2	0.065	0.036	0.100	0.127	0.106	0.140
Obs.	1103	1103	1103	1103	1103	1103

$^{*}\ p < 0.05, ^{**}\ p < 0.01, ^{***}\ p < 0.001$

Role of other factors: Human capital, labor market productivity

Dependent variables: 3rd generation

	Wealth	Income	Schooling	Wealth		
	(1)	(2)	(3)	(4)	(5)	(6)
Parents' wealth	0.388***			0.315***	0.322***	0.294***
	(0.022)			(0.023)	(0.024)	(0.024)
Parents' income		0.232***		0.028		0.011
		(0.023)		(0.023)		(0.024)
Parents' schooling			0.390***		−0.001	−0.010
			(0.022)		(0.023)	(0.023)
Own income				0.261***		0.225***
				(0.019)		(0.021)
Own schooling					0.204***	0.126***
					(0.023)	(0.024)
R^2	0.148	0.052	0.157	0.216	0.183	0.227
Obs.	2490	2490	2490	2490	2490	2490

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Robustness checks

Results are roughly robust to using:

- Wealth censored at zero ▸ Table
- Wealth in IHS, log and level ▸ Tables
- Adjusted taxable wealth values ▸ Table
- Single wealth year for 2nd generation ▸ Table

Concluding remarks

Main conclusions

1. Most IG wealth transmission comes from parents; cannot reject AR(1)-type model
2. Direct inheritances accounts for most (50–75 %) of the intergenerational wealth persistence

Additional contributions

1. Mid-life wealth captures more of transmission than wealth at death
2. Wealth persistence patterns visible even at young ages
3. Non-linear relationship — more persistance in the top
4. Some evidence of increasing persistence over time

Non-linearities: transition matrices

Wealth quintile,	Wealth quintile, 2nd generation					
parents	1	2	3	4	5	Total
1	21.21	15.15	21.21	24.24	18.18	100.00
2	26.35	22.16	20.24	18.15	13.09	100.00
3	19.13	15.65	29.57	17.39	18.26	100.00
4	13.16	16.84	21.58	24.74	23.68	100.00
5	8.47	17.37	16.53	22.46	35.17	100.00

Wealth quintile,	Wealth quintile, 3rd generation					
parents	1	2	3	4	5	Total
1	28.54	29.72	20.08	12.20	9.45	100.00
2	25.54	26.52	23.58	14.15	10.22	100.00
3	23.67	18.37	21.02	23.30	13.64	100.00
4	15.86	17.41	21.66	26.11	18.96	100.00
5	5.42	13.54	11.99	22.82	46.23	100.00

Wealth regressions, IHS

	2nd generation	3rd generation		
	(1)	(2)	(3)	(4)
Panel A				
Parents	0.187***	0.266***		0.261***
	(0.034)	(0.031)		(0.036)
Grandparents			0.095*	0.048
			(0.043)	(0.041)
R^2	0.030	0.045	0.014	0.050
Panel B: Capitalized wealth for 1st generation				
Parents	0.268***			0.259***
	(0.041)			(0.036)
Grandparents			0.167**	0.082
			(0.062)	(0.061)
R^2	0.030		0.015	0.050
Obs.	1147	2579	2128	2100

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Back

Wealth regressions, log

	2nd generation	3rd generation		
	(1)	(2)	(3)	(4)
Panel A				
Parents	0.181***	0.319***		0.310***
	(0.047)	(0.030)		(0.055)
Grandparents			0.306***	0.179***
			(0.064)	(0.047)
R^2	0.070	0.105	0.109	0.154
Obs.	407	1609	607	562
Panel B: Capitalized wealth for 1st generation				
Parents	0.203***			0.327***
	(0.052)			(0.065)
Grandparents			0.193**	0.099*
			(0.068)	(0.048)
R^2	0.078		0.075	0.139
Obs.	242		359	338

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Back Back 2

Four-generational persistence, IHS

	(1)	(2)	(3)	(4)	(5)
Parents	0.190***			0.182***	0.186***
	(0.015)			(0.015)	(0.017)
Grandparents		0.100***		0.062**	0.060*
		(0.023)		(0.022)	(0.025)
Great grandparents			0.056*		0.020
			(0.028)		(0.025)
R^2	0.164	0.124	0.119	0.164	0.166
Obs.	4657	4599	3801	4592	3755

$^{*}\ p < 0.05,\ ^{**}\ p < 0.01,\ ^{***}\ p < 0.001$

Back

Four-generational persistence, log

	(1)	(2)	(3)	(4)	(5)
Parents	0.449***			0.426***	0.461***
	(0.037)			(0.043)	(0.072)
Grandparents		0.199***		0.066*	0.211**
		(0.034)		(0.030)	(0.076)
Great grandparents			0.165**		−0.021
			(0.055)		(0.048)
R^2	0.256	0.176	0.122	0.248	0.229
Obs.	2561	2583	987	2234	828

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Back

By age, IHS

	(1)	(2)	(3)	(4)	(5)
Panel A: Age 18 and younger					
Parents	0.156***			0.151***	0.159***
	(0.015)			(0.015)	(0.017)
Grandparents		0.079***		0.050*	0.050*
		(0.024)		(0.020)	(0.021)
Great grandparents			0.051*		0.021
			(0.023)		(0.021)
R^2	0.141	0.029	0.023	0.150	0.172
Obs.	2014	1996	1668	1996	1657
Panel B: Older than 18					
Parents	0.218***			0.208***	0.210***
	(0.021)			(0.022)	(0.025)
Grandparents		0.119***		0.072*	0.073
		(0.032)		(0.032)	(0.037)
Great grandparents			0.064		0.021
			(0.047)		(0.043)
R^2	0.080	0.045	0.040	0.084	0.086
Obs.	2643	2603	2133	2596	2098

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Back

By age, log

	(1)	(2)	(3)	(4)	(5)
Panel A: Age 18 and younger					
Parents	0.473***			0.442***	0.492***
	(0.048)			(0.051)	(0.091)
Grandparents		0.246***		0.074	0.151
		(0.049)		(0.043)	(0.105)
Great grandparents			0.172*		−0.011
			(0.070)		(0.056)
R^2	0.183	0.064	0.054	0.179	0.208
Obs.	1393	1438	604	1240	501
Panel B: Older than 18					
Parents	0.404***			0.390***	0.409***
	(0.055)			(0.071)	(0.104)
Grandparents		0.161***		0.067	0.299**
		(0.038)		(0.038)	(0.092)
Great grandparents			0.131*		−0.050
			(0.064)		(0.078)
R^2	0.212	0.152	0.123	0.212	0.210
Obs.	1168	1145	383	994	327

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Back

Non-linearities: Spline regressions

	2nd generation	3rd generation		4th generation		
Quartile	(1) Parents	(2) Parents	(3) Grand-parents	(4) Parents	(5) Grand-parents	(6) Great grandparents
1st	−0.534*	0.110	−0.472*	0.216*	−0.067	−0.300
	(0.244)	(0.139)	(0.207)	(0.094)	(0.135)	(0.171)
2nd	0.770***	0.235*	0.229	0.266**	0.173	0.256*
	(0.227)	(0.107)	(0.174)	(0.082)	(0.100)	(0.129)
3rd	−0.161	0.331**	−0.036	0.476***	0.108	−0.174
	(0.216)	(0.100)	(0.175)	(0.085)	(0.096)	(0.147)
4th	0.611**	1.077***	0.526**	0.564***	0.776***	0.440*
	(0.189)	(0.120)	(0.185)	(0.132)	(0.149)	(0.195)
R^2	0.082	0.163	0.033	0.145	0.055	0.012
Obs.	1147	2579	2128	4657	4599	3801

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Back

Wealth regressions, censored at zero

	2nd generation	3rd generation		
	(1)	(2)	(3)	(4)
Panel A				
Parents	0.305***	0.402***		0.400***
	(0.033)	(0.021)		(0.024)
Grandparents			0.176***	0.044
			(0.032)	(0.029)
R^2	0.078	0.158	0.033	0.173
Panel B: Capitalized wealth for 1st generation				
Parents	0.321***			0.405***
	(0.039)			(0.024)
Grandparents			0.184***	0.029
			(0.040)	(0.036)
R^2	0.062	0.000	0.027	0.172
Obs.	1147	2579	2128	2100

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Back

Wealth regressions, corrected real estate value

	2nd generation	3rd generation	
	(1)	(2)	(3)
Panel A			
Parents	0.265***	0.385***	0.386***
	(0.033)	(0.021)	(0.024)
Grandparents			0.034
			(0.029)
R^2	0.065	0.143	0.156
Panel B: Capitalized wealth for 1st generation			
Parents	0.291***		0.387***
	(0.040)		(0.024)
Grandparents			0.034
			(0.037)
R^2	0.055	0.000	0.155
Obs.	1147	2579	2100

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Back

Wealth regressions, single year

Dependent variable is 2nd generation wealth

	1985		1988		1991	
	(1)	(2)	(3)	(4)	(5)	(6)
Parents	0.219***		0.258***		0.271***	
	(0.033)		(0.034)		(0.034)	
Parents, returns		0.261***		0.299***		0.315***
		(0.041)		(0.040)		(0.041)
R^2	0.048	0.046	0.059	0.054	0.067	0.062
Obs.	1147	1147	1123	1123	1076	1076

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Back

Wealth at younger ages

Dependent variable: 3rd generation wealth when young			
	(1)	(2)	(3)
Parents	0.251***		0.238***
	(0.022)		(0.026)
Grandparents		0.133***	0.062*
		(0.030)	(0.030)
R^2	0.067	0.017	0.069
Obs.	2655	2184	2159

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Back