

Intergenerational Persistence in Latent Socioeconomic Status: Evidence from Taiwan

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Introduction

- “...practically all the advantages or disadvantages of ancestors tend to disappear in only three generations: ‘from shirtsleeves to shirtsleeves in three generations.’ Parents in such ‘open’ societies have little effect on the earnings of grandchildren and later descendants.”

— Gary S. Becker and Nigel Tomes (1986, p. S28)

Introduction

- “This law of mobility implies that on average, the status of the descendants will move toward the mean for the society generation by generation. When the persistence rate, b , is as high as 0.8, this is a slow process, taking many hundreds of years for families who are initially far above or below the mean.”

— Gregory Clark (2014, p. 212)

Introduction

- The degree to which socioeconomic status is passed on from parents to their offspring has long interested researchers and policymakers.
- This interest has stemmed largely from a belief that intergenerationally transmitted differences in socioeconomic status violate **equal opportunity** norms.

Introduction

- A large body of economic research aims to describe the degree to which differences in economic outcomes (e.g. earnings inequality) are transmitted from parents to their offspring.
- Studies on intergenerational earnings mobility typically estimate an equation relating the offspring's earnings to parental (usually the father's) earnings.

Introduction

- One of the most notable results is that the estimated intergenerational persistence in earnings
 - falls in the range of 0.4 to 0.6 for the U.S.
 - Solon, 1999; Mazumder, 2005; Lee and Solon, 2009; Black and Devereux, 2011
 - but is lower, at 0.1 to 0.3, for Nordic countries.
 - Black and Devereux, 2011

Introduction

- The Son Also Rises by Clark (2014)
 - proposes a *simple law of mobility*, suggesting that persistence in social status is approximately 0.75 over time and across a range of societies.
 - argues that social mobility is much lower than traditionally estimated because traditional estimates of intergenerational persistence are obtained using one partial measure (e.g. earnings) of latent status.

Introduction

- ‘Families turn out to have a general social competence or ability that underlies partial measures of status such as income, education, and occupation. These partial measures are linked to this underlying, not directly observed, social competence only with substantial random components. The randomness with which underlying status produces particular observed aspects of status creates the illusion of rapid social mobility using conventional measures. ’(Clark, 2014, p.8)

Introduction

- **Clark and Cummins (2015)**
 - illustrate the diverging estimates by presenting both traditional and surname estimates of intergenerational persistence in England.

Introduction

- **Clark and Cummins (2015)**
 - To reconcile the discrepancy, they propose (but do not directly test) that,
 - lacking surname data, traditional estimates of persistence would increase if the information from several partial measures – such as parental earnings, education, and occupation – were aggregated for an individual.

Introduction

- **Vosters (forthcoming), Vosters and Nybom (forthcoming)**
 - test the hypothesised attenuation bias empirically
 - use Lubotsky and Wittenberg's (2006) method to combine information from several partial measures:
 - Earnings
 - Education
 - Occupation

Introduction

- **Vosters (forthcoming), Vosters and Nybom (forthcoming)**

– Data :

- PSID, U.S. (Vosters, forthcoming)
- Administrative data, Sweden (Vosters and Nybom ,forthcoming)

– Findings:

- The evidence does not support the hypothesised substantial attenuation bias in previous estimates.

Introduction

- **The estimated intergenerational persistence in Taiwan**
 - Based on the Björklund and Jäntti two-sample approach
 - Mixed results: (for the son–father association)
 - Kan, Li, and Wang (2015): 0.18
 - Sun and Ueda (2015): 0.25 to 0.3
 - Chu and Lin (2016): 0.4 to 0.5
 - None of these studies tested the hypothesised attenuation bias.

This paper

- Look for new evidence of the asserted downward bias using the empirical strategies used in Vosters (forthcoming) and Vosters and Nybom (forthcoming)

Preview of results

- The intergenerational persistence estimates rise nontrivially as more partial measures of underlying status are added.
 - The traditional OLS estimate of persistence: 0.350
 - The LW estimates of persistence: 0.509 to 0.546

Preview of results

- My findings therefore support Clark's hypothesis that prior estimates obtained using a single noisy measure of fathers' latent status contain attenuation bias.
- The estimated persistence rate in Taiwan falls in the range (0.4–0.6) of traditional estimates for the U.S., a society exhibiting higher persistence than that of Nordic countries.

Data

- The Panel Study of Family Dynamics (PSFD)
- Son–father pairs
 - Sons:
 - at least 30 years old & at least one positive earnings observation
 - Fathers:
 - 60 or younger & at least 5 positive earnings observations

Data

- Measures of status:
 - Earnings
 - Obtained from RR2002~RR2014
 - 5-year averages of log real annual earnings for fathers
 - Education (years of schooling)
 - Occupation (7 one-digit categories)

Summary statistics

Variables	Mean	Std. Dev.
<i>Sons (N=196)</i>		
Year of birth	1980	1.74
Average log annual earnings, age 30-37	13.05	0.62
Log average annual earnings, age 30-37	13.07	0.61
Average annual earnings, age 30-37	584,883	538,854
Years of schooling	14.49	2.40
<i>Educational attainment</i>		
Less than high school	0.04	0.19
High school	0.30	0.46
Some college	0.16	0.37
4-year college / graduate school	0.51	0.50

Variables	Mean	Std. Dev.
<i>Fathers (N=155)</i>		
Year of birth	1953	2.70
Age when offspring born	28	2.86
Average log annual earnings, age 41-60	13.06	0.73
Log average annual earnings, age 41-60	13.15	0.71
Average annual earnings, age 41-60	715,937	1,211,773
Years of schooling	10.48	3.73
<i>Educational attainment</i>		
Less than high school	0.44	0.50
High school	0.34	0.47
Some college	0.11	0.31
4-year college / graduate school	0.12	0.32
<i>Occupation category</i>		
[1] Professional, technical, manager/businessmen	0.21	0.41
[2] Clerical work	0.09	0.29
[3] Sales and services	0.15	0.36
[4] Farmer, foreman, manufacturing	0.07	0.26
[5] Craftman	0.17	0.37
[6] Operatives, labourers	0.28	0.45
[7] Undefined/not currently employed/missing	0.03	0.16

Empirical methodology

- The typical approach used in the **descriptive** literature on intergenerational earnings mobility begins with the estimation of a basic equation:

$$y_{it+1} = \beta y_{it} + \varepsilon_{it+1} \quad (1)$$

y_{it+1} = offspring's log (lifetime) earnings of family i

y_{it} = fathers' log (lifetime) earnings of family i

β = the intergenerational elasticity (IGE) measuring immobility or persistence

$1 - \beta$ = measuring intergenerational mobility

Empirical methodology

- To more clearly illustrate the empirical strategy used by Vosters and colleagues, I present Clark's hypothesis in a more formal latent variables framework.
- The intergenerational equation (1) is now represented by the following equation:

$$y_{it+1} = \beta x_{it}^* + v_{it+1} \quad (2)$$

y_{it+1} = offspring's log (lifetime) earnings of family i

x_{it}^* = fathers' unobserved latent status

β = the measure of intergenerational persistence in latent status

Empirical methodology

- Clark and colleagues argue that imperfect measures of status such as earnings, education, or occupation are linked to the unobserved latent factor with nontrivial random components.
- The relationship between a single *noisy* measure such as earnings and the unobserved latent factor can be written as

$$y_{jit} = \rho_j x_{it}^* + u_{jit} \quad (3)$$

j indexes the proxy measure, i family, t generation, and u_{jit} measurement error

Empirical methodology

- As shown in Vosters (forthcoming) and Vosters and Nybom (forthcoming), the LW estimator can be written as

$$\beta_{LW} = \rho_1 \phi_1 + \rho_2 \phi_2 + \cdots + \rho_J \phi_J \quad (4)$$

$$y_{it+1} = \phi_1 y_{1it} + \phi_2 y_{2it} + \cdots + \phi_J y_{Jit} + \eta_{it+1} \quad (5)$$

$$\rho_j = \frac{\text{COV}(y_{it+1}, y_{jit})}{\text{COV}(y_{it+1}, y_{1it})} \quad (6)$$

Conventional OLS vs. LW

	[1]	[2]	[3]	[4]
Panel A: OLS estimates				
Fathers' five-year average of log earnings	0.350***	0.229**	0.305***	0.223**
Fathers' years of schooling		0.040**		0.040*
Fathers' occupation				
[1] Professional, technical, manager/businessmen			0.168	0.177
[2] Clerical work			-0.164	-0.112
[3] Sales and services			-0.053	0.022
[4] Farmer, foreman, manufacturing			-0.052	0.084
[5] Craftman			0.121	0.246
[6] Operatives, labourers			-0.117	0.058
Panel C: LW estimates of the IGE				
	0.350***	0.446***	0.434***	0.509**
	N 196	196	196	196

* p<0.05; ** p<0.01; *** p<0.001

OLS by the lengths of averages

	[1]	[2]	[3]	[4]
Panel A: Fathers' earnings: five-year averages				
	(Main results)			
Fathers' average log earnings	0.350 (0.066)	0.229 (0.079)	0.305 (0.077)	0.223 (0.078)
Fathers' years of schooling		0.040 (0.015)		0.040 (0.017)
Fathers' occupation			+	+
Panel B: Fathers' earnings: one-year averages				
Fathers' average log earnings	0.197 (0.057)	0.097 (0.058)	0.135 (0.056)	0.077 (0.055)
Fathers' years of schooling		0.054 (0.014)		0.049 (0.017)
Fathers' occupation			+	+
Panel C: Fathers' earnings: two-year averages				
Fathers' average log earnings	0.261 (0.063)	0.144 (0.071)	0.201 (0.070)	0.126 (0.071)
Fathers' years of schooling		0.048 (0.014)		0.046 (0.017)
Fathers' occupation			+	+

OLS by the lengths of averages

	[1]	[2]	[3]	[4]
Panel A: Fathers' earnings: five-year averages				
(Main results)				
Fathers' average log earnings	0.350 (0.066)	0.229 (0.079)	0.305 (0.077)	0.223 (0.078)
Fathers' years of schooling		0.040 (0.015)		0.040 (0.017)
Fathers' occupation			+	+
Panel D: Fathers' earnings: three-year averages				
Fathers' average log earnings	0.317 (0.068)	0.195 (0.079)	0.267 (0.079)	0.185 (0.081)
Fathers' years of schooling		0.043 (0.015)		0.042 (0.017)
Fathers' occupation			+	+
Panel E: Fathers' earnings: four-year averages				
Fathers' average log earnings	0.346 (0.068)	0.230 (0.080)	0.302 (0.080)	0.222 (0.082)
Fathers' years of schooling		0.040 (0.015)		0.040 (0.017)
Fathers' occupation			+	+
	N	196	196	196
		196	196	196

Robustness of LW estimates

	[1]	[2]	[3]	[4]
Main Results	0.350***	0.446***	0.434***	0.509**
Adjusting the length of fathers' earnings average				
One-year averages	0.197***	0.413**	0.361*	0.493*
Two-year averages	0.261***	0.405**	0.374**	0.473**
Three-year averages	0.317***	0.427***	0.413***	0.493**
Four-year averages	0.346***	0.434***	0.423***	0.492***
Adjusting the education measure				
Indicators for education level	0.350***	0.483***	0.434***	0.546**
Adjusting the occupation measure				
9 Indicators for occupation	0.350***	0.446***	0.440***	0.513**
Adjusting earnings measure				
Fathers' log (average earnings)	0.376***	0.467***	0.455***	0.531***
Sons' and Fathers' log (average earnings)	0.364***	0.457***	0.446***	0.529**

* p<0.05; ** p<0.01; *** p<0.001

Wrap up

- Contrary to the earlier findings, my results indicate that the intergenerational persistence estimates rise towards the hypothesised ‘true’ persistence rate as more partial measures of underlying status are added.

Wrap up

- Provide evidence
 - that the hypothesis that traditional estimates obtained using a single noisy measure of latent status contain attenuation bias and
 - that aggregating the information from several partial measures of latent status reduces the downward bias seen in traditional estimates of persistence.

Thank you!