

Intergenerational Mobility of Education — Three Generations Perspective

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Motivation and Literature

- More education leads to lower earnings variability at younger ages (De-laney and Devereux, 2019)
- Analysis shows that the earnings of parents and children are directly related through the intergenerational transmission of human capital (Becker et al., 2018)
- Some researches on IME(intergenerational mobility of education) concentrate on economics growth and across-country comparison by using macro-data (Lee and Lee, 2021)
- Some researchers study IME from mother-perspective (Behrman and Rosenzweig, 2002)
- Güell et al. (2018) gave suggestions for future research directions that multi-generational mobility should be analyzed

Data

- The data used in this paper are from China Family Panel Studies (CFPS) which is a nationally representative, annual longitudinal survey of Chinese communities, families, and individuals launched in 2010 by the Institute of Social Science Survey of Peking University, China. Up to now, five waves survey(2010-2018, once every two years) had been conducted
- In this study, I only use first wave survey which is called CFPS2010

Variables Selection

7 variables and generate a cohort variable by birth year of first child:

- fceduy: year of education of first child
- eduy: year of education of respondents
- sedul: year of education of respondent's spouse
- feduy: year of education of respondent's father
- meduy: year of education of respondent's mother
- fcgender: gender of first child
- fcbirthyear: birth year of first child
- fccohort: cohort of first child by birth year

Summary Statistics

Table1: Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
fceduy	2,327	8.815	4.248	0	22
eduy	2,327	5.934	4.335	0	19
sedul	2,327	2.646	4.004	0	16
feduy	2,327	1.936	3.469	0	22
meduy	2,327	0.387	1.716	0	22
fcgender	2,327	0.664	0.472	0	1
fcbirthyear	2,327	1971	6.321	1949	1980
fccohort	2,327	2.032	0.645	1	3

Table3: Descriptive Statistics

Variable fccohort	fceduy				
	Obs	Mean	Std.Dev.	Min	Max
Cohort1: 1949—1965	447	8.360	4.466	0	19
Cohort2: 1966—1976	1,358	8.585	4.190	0	22
Cohort1: 1977—1980	522	9.805	4.059	0	19

Identification Strategy – OLS

$$\begin{aligned} \text{fceduy}_i &= \alpha_0 + \alpha_1 \text{eduy}_i + \alpha_2 \text{sedul}_i + \alpha_3 \text{feduy}_i \\ &+ \alpha_4 \text{meduy}_i + \alpha_5 \text{fcgender}_i + \alpha_6 \text{fccohort}_i + \varepsilon_i \end{aligned} \quad (1)$$

$$\begin{aligned} \text{fceduy}_{ig} &= \alpha_0 + \alpha_1 \text{eduy}_{ig} + \alpha_2 \text{sedul}_{ig} \\ &+ \alpha_3 \text{feduy}_{ig} + \alpha_4 \text{meduy}_{ig} + \alpha_5 \text{fcgender}_{ig} + \varepsilon_{ig} \end{aligned} \quad (2)$$

where,

- i is respondent's first child
- g is cohort generated by first child birth year
- The first equation controls first child's gender and cohort effect
- The first equation only controls first child's gender

Results – OLS

Table4: OLS Regression Results

	(1)	(2)	(3)	(4)
	OLS total	OLS 2	OLS 3	OLS 4
eduy	0.27*** (0.02)	0.36*** (0.05)	0.25*** (0.03)	0.24*** (0.04)
sedul	0.31*** (0.02)	0.20*** (0.06)	0.35*** (0.03)	0.29*** (0.04)
feduy	0.07*** (0.02)	0.04 (0.07)	0.07** (0.03)	0.07 (0.04)
meduy	0.09** (0.05)	0.23 (0.14)	0.07 (0.06)	0.08 (0.10)
l.fcgender	0.30* (0.16)	0.47 (0.39)	0.35* (0.21)	0.07 (0.33)
_cons	6.00*** (0.22)	5.65*** (0.38)	5.80*** (0.23)	7.05*** (0.36)
r ²	0.27	0.24	0.26	0.27
N	2327	447	1358	522
Cohort Fix Effect	YES			

Standard error statistics in brackets

* p<0.1, ** p<0.05, *** p<0.01

Respondents are limited to father

Results Interpretation – OLS

- Female(Mother and grandmother) tends to have a bigger effect on first child than male(father and grandfather)(but, do not know whether mother has a same effect on other children)
- Boy tends to have higher schooling year(education level) than girl
- Intergenerational mobility of education takes on a increase trend
- Parents generation's effect is bigger than grandparents generation's effect on offspring schooling years

Identification Strategy – IV

- Following Solon Solon (2018), assuming that intergenerational mobility has an AR(1) process:

$$y_{it} = \alpha_0 + \alpha_1 y_{it-1} + \mu_{it} \quad (3)$$

$$y_{it} = \beta_0 + \beta y_{it-1} + \beta_1 y_{it-2} + \varepsilon_{it} \quad (4)$$

- thus, grandfather only can affect grandchild by father mediator, in this assumption, grandfather can be used as instrument variable when estimating father's effect on child:

$$y_{it-1} = \pi_{10} + \pi_{11} y_{it-2} + \lambda_{4t} \quad (\text{First - stage}) \quad (5)$$

$$y_{it} = \pi_{20} + \pi_{21} y_{it-2} + \lambda_{2it} \quad (\text{Reduced - form}) \quad (6)$$

$$\mathbf{y}_{it} = \tau_0 + \tau_1 \mathbf{y}_{\psi-1} + \eta_{it} \quad (7)$$

Results – IV

Table4: Regression Results of Intergenerational Mobility of Education

	(1) OLS AR(1) fceduy	(2) OLS AR(1) eduy	(3) OLS AR(1) fceduy	(4) OLS AR(2) fceduy	(5) IV AR(1) fceduy
eduy	0.36*** (0.02)			0.34*** (0.02)	0.76*** (0.12)
feduy		0.24*** (0.03)	0.19*** (0.03)	0.10*** (0.03)	
_cons	6.27*** (0.14)	5.09*** (0.11)	7.92*** (0.10)	6.17*** (0.14)	4.03*** (0.66)
r2_a	0.15	0.03	0.02	0.16	.
N	1824.00	1824.00	1824.00	1824.00	1824.00

sd statistics in brackets;

* p<0.1, ** p<0.05, *** p<0.01;

Respondents are limited to father;

fceduy: year of education of first child;

eduy: year of education of respondents;

feduy: year of education of respondent's father;

Results Interpretation – IV

- The results by using IV method show that father has a higher effect on child which is consistent to Clark's hypothesis that mobility across generations follows an AR(1) process with a high autoregressive coefficient between 0.7 and 0.8

Conclusion

- Even assumption of AR(1) process is right, ols estimate results may also underestimate the degree of intergenerational mobility, and IV may get a accurate estimate

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Thank you!