How Does Parental Out-migration Affect Left-behind Childrens Schooling Outcomes?

Xiaoman Luo, Department of Agricultural and Resource Economics, UC Davis

Background & Motivation

Background

- Why children are left behind in rural China?
  - High living cost and high education cost due to *Hukou* restrictions
  - Parents are too busy to take care of children
- 61 million children left behind, accounting for 37.7% of children in rural China, and 21.9% of children in China (NBS, 2010)

How to define school-aged left-behind children?

- 6-15 years old with at least one parent moving from rural to urban areas, stay in rural areas, and do not live with parents
- In this paper, I use a stricter definition: left behind children whose parents migrate away for more than 3 months in the past year

Research Question

- Does parental out-migration have significant influence on left-behind childrens schooling outcomes?
- If yes, what are the effects through different mechanisms of influence? (Parental absence; Study time; Monetary investment)

Summary

- Significant negative impact of parental migration on left-behind children's education.
- The negative impact of migration is not really driven by reduced study time. It is partly driven by parental absence. It is primarily driven by reduced investment in left-behind children.
- The reduction in investment in mainly due to reduction in nutrition.
- Subgroup analysis calls for attention to significant underinvestment in education for left-behind girls.
- Confirm that the mediation analysis via structural equation models (SEM) could further understand the mechanism of influence.

Theoretical Model

Model: A Toy Model (General Form in the Paper)

- (Part I) Child utility maximization:

$$\begin{aligned} \max_{s} \quad & u_1^k(s, c_1^k) + \beta_k u_2^k(c_2), \\ s.t. \quad & c_1^k = \gamma(d) W_p(d), \\ & c_2 = g(h), \\ & h = f(d, s, c_1^k, h_0). \end{aligned}$$

- (Part II) Parents' utility maximization:

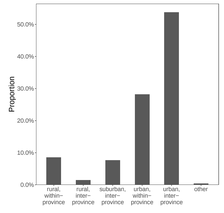
$$\begin{aligned} \max_{d} \quad & u_1^p(c_1^p) + \beta_p u_2^p(c_2), \\ s.t. \quad & c_1^p = \gamma_p W_p(d), \\ & c_2 = g(h), \\ & h = f(d, s, c_1^k, h_0). \end{aligned}$$

Derivation of Equilibrium (Including Other Covariates X)

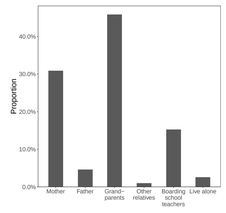
$$\begin{aligned} h &= f(d, s, c_1^k; X) \\ c_1^k &= \gamma(d) W_p(d; X) \\ s &= s^*(d; X) \\ d &= d^{**}(X) \end{aligned}$$

Data

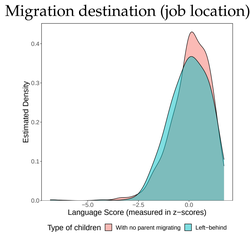
- RUMiC Survey: 08 & 09 data released by the Institute of Labor Economics (IZA)
  - Sample size: 1971 children in 1593 households
  - Origin: 68 cities from 9 Provinces
  - Destination: 137 cities in 29 Provinces
- Descriptive Statistics:



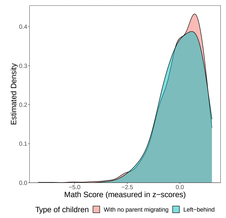
Migration destination (job location)



De facto custodian



Language score



Math score

Empirical Framework

Regression Model

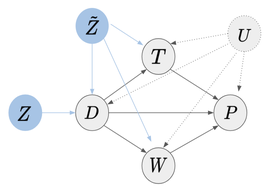
- Structural form:

$$\begin{aligned} Eq1 &: P \sim \gamma_D D + \gamma_T T + \gamma_W W + X \\ Eq2 &: T \sim b_T D + X \\ Eq3 &: W \sim b_W D + X \\ Eq4 &: D \sim Probit(X) \end{aligned}$$

- Structural form studies its direct and indirect effect.
- Total effect decomposed into three channels:

$$\delta = \underbrace{\gamma_D}_{\text{Through parent absence}} + \underbrace{\gamma_T b_T}_{\text{Through study time}} + \underbrace{\gamma_W b_W}_{\text{Through investment}}$$

- Instrumental variables:
  - Strong: Bartik
  - Weaker: Extreme weather shocks, birth order



Path diagram representation

$$\begin{aligned} \text{Eq. 1} &: P \sim D + T + W \\ \text{Eq. 2} &: T \sim D + \tilde{Z} \\ \text{Eq. 3} &: W \sim D + \tilde{Z} \\ \text{Eq. 4} &: D \sim Z + \tilde{Z} \end{aligned}$$

Algebraic representation

- Another source of endogeneity: nonrandom missing
  - Children with missing values in study hour or education spending are more negatively affected than children with non-missing values
  - Simply omitting observations with missing values as STATA usually does will underestimate the negative effect of parental migration
  - Heckman model for imputation

Results (All Samples)

- Effect of Parental Migration on Child Schooling Outcomes:

	(1) Language	(2) Math
Direct Effect		
Parental Accompany	-0.524**	-0.453**
	(0.002)	(0.006)
Indirect Effect		
Study time	0.003	0.002
	(0.096)	(0.406)
Investment in children	-0.894***	-0.874***
	(0.000)	(0.001)

Sepecification Tests	*(1) Study time*	*(2) Investment*	*(3) Language*	*(4) Math*
Underidentification test				
(Anderson canon. corr. LM statistic)	29.868***	29.868***	29.859***	29.859***
	(0.000)	(0.000)	(0.000)	(0.000)
Overidentification test (Sargan statistic)	2.752	0.607	0.360	0.306
	(0.097)	(0.436)	(0.835)	(0.858)
Endogeneity test	2.366	10.199***	26.587***	30.409***
	(0.124)	(0.001)	(0.000)	(0.000)
Obs.		1971		

- Decomposition of Indirect Effects of Migration:

	(1) Mediator	(2) Language	(3) Math
Through Study Time			
Migration (b_T)	-0.294		
	(0.083)		
Study time (γ_T)		-0.012	-0.006
		(0.096)	(0.406)
Through Investment			
Migration (b_W)	-2.375***		
	(0.000)		
Investment (γ_W)		0.376***	0.368***
		(0.000)	(0.001)

Results (Subgroups by Gender)

- Effect of Parental Migration on Child Schooling Outcomes:

	Girl		Boy	
	(1) Language	(2) Math	(3) Language	(4) Math
Direct Effect				
Parental Accompany	-0.413*	-0.424*	-0.351**	-0.207
	(0.015)	(0.030)	(0.008)	(0.074)
Indirect Effect				
Study time	0.002	0.003	-0.006	0.000
	(0.602)	(0.474)	(0.340)	(0.974)
Investment in children	-1.393*	-1.621*	-0.124**	-0.115**
	(0.010)	(0.010)	(0.008)	(0.003)

Sepecification Tests	*(1) Study time*	*(2) Investment*	*(3) Language*	*(4) Math*
Girl				
Underidentification test				
(Anderson canon. corr. LM statistic)	5.904	5.904	13.599**	13.599**
	(0.052)	(0.052)	(0.004)	(0.004)
Overidentification test (Sargan statistic)	0.903	1.938	1.486	2.573
	(0.342)	(0.164)	(0.476)	(0.276)
Endogeneity test	0.800	9.201**	9.436*	15.019**
	(0.371)	(0.002)	(0.024)	(0.002)
Obs.		887		
Boy				
Underidentification test				
(Anderson canon. corr. LM statistic)	28.100***	28.100***	20.772***	20.772***
	(0.000)	(0.000)	(0.000)	(0.000)
Overidentification test (Sargan statistic)	2.622	0.001	1.794	2.798
	(0.105)	(0.981)	(0.408)	(0.247)
Endogeneity test	1.156	1.696	18.078***	12.723**
	(0.282)	(0.193)	(0.000)	(0.005)
Obs.		1084		

- Decomposition of Indirect Effects of Migration:

	Girl			Boy		
	(1) Mediator	(2) Language	(3) Math	(4) Mediator	(5) Language	(6) Math
Through Study Time						
Migration (b_T)	-0.524*			0.400		
	(0.022)			(0.340)		
Study time (γ_T)		-0.004	-0.006		-0.016	0.000
		(0.602)	(0.474)		(0.096)	(0.974)
Through Investment						
Migration (b_W)	-3.514*			-0.967***		
	(0.010)			(0.001)		
Investment (γ_W)		0.397**	0.461**		0.128**	0.119**
		(0.008)	(0.008)		(0.008)	(0.003)

p-values in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$