

Teenage Childbearing and Educational Subsidies, Evidence from Colombia

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Outline

Aims of the paper

- Evaluate the effect of recent educational conditional cash transfers on teenage childbearing, in Bogotá.
 - City government has made large efforts on education policies (CCT, tuition fees, *gratuidad*).
 - Large incidence of teenage childbearing. Heterogeneity by *localidades*

The main idea

- The main mechanism behind our study assumes that the event of becoming a mother by adolescent girls is not entirely a result of lack of family planning methods knowledge or availability and that
- In many cases becoming a mother at teenage may be a conscious decision.
 - Adolescent girls would see the possibility of becoming a mother as one of several alternative lifetime investment projects.
 - In our framework the alternative projects differ on the degree and timing of different decisions related to having a family and human capital investments.

Main Result

- Two CCT: Familias en acción (FAM) and Subsidio Educativo (SED)
- Differences in assignment criteria (FAM-Sisben 1 and SED-Sisben 2) and school performance conditions
- Familias en acción also has a component of nutrition (CCT to households with children – 7 years old)
- The SED-CCT reduces childbearing incidence from 6.2% to 2.4%
- The FAM-CCT has no effect.

Explanation

- SED- The performance condition provides girls incentives to reduce childbearing
- Familias en acción, net effect of two countervailing effects
 - Incentive effect (nutrition component) that increases likelihood of TC
 - Income effect (CCT, performance prize) that decreases likelihood of TC

Review of Literature

- Descriptive studies
 - Flórez and Soto (2007 and 2008). Latin America countries
 - Flórez (2005) and Barrera and Jaramillo (2004). Colombia
 - High levels of teenage pregnancy rate
 - Rates are not decreasing (some cases increasing)
 - Negative effects on human capital accumulation of mothers and welfare of children (mixed evidence)
- Studies on the causal effect of policies interventions.
 - Girma and Paton (2006) Access of emergency birth controls, England
 - Wolfe, Wilson and Haveman (2001). Costs and benefits, US
 - Black, Devereux, Salvanes (2008) Compulsory schooling, US, Norway
 - Duflo et. al. (2006). School Uniforms, Kenya
 - Baird et.al. (2009). Educational CCT, Malawi

Methodology issues

- Education policies were already on place. Non-experimental approach.
- Information about teenage childbearing incidence was scarce.
 - Administrative records were impossible to link with data on education.
 - Solution: building a data base to link education policies and teenage childbearing.
- We ran a survey covering around 300 schools in Bogota, with girls between 14 to 19 years old.

Methodology design

- In February and March 2010 we ran a survey on 300 schools in Bogotá
- The instruments collected information on 4 dimensions
 - Socioeconomic and family background (information of older sister and brother about childbearing, age and education).
 - Incidence of education policies (subsidies and CCT).
 - Childbearing and pregnancy incidence.
 - Knowledge and use of family different planning methods.
- Stratified random sampling, representative by *localidades*
- We collected information on 273 schools, with 21.287 interviewed girls.

Education policies in Bogotá

- CCT -SED: Local government, covering 45.000, Started in 2006.
- CCT -FAM: National government, covering 120.000 children, Started in 2008.
- Non-experimental design
- Diff-in-Diff methodology based on Duflo (2001)
- Identification strategy uses the school level differences in the implementation of policies
- We are able to compare two CCT policies that differ mainly in one aspect:
 - CCT-SED asks by attendance and minimum performance.

Empirical Strategy

- Two different treatments: T_1 , T_2 .
- Two cohorts, C_i : interviewed girls and their older sister (who went to the same school).
 - Older cohort: sisters between 19-32 years old that did not drop out from schools (in school between 1997-2005). Less likely to be affected by the policies.
 - Old cohort - Before policy.
 - Young cohort -After policy.
- We control by school and household unobservables that do not vary across time.
- Households that have not migrated and their socioeconomic conditions have not changed dramatically over time.

Empirical Strategy (cont.)

- Treatment dummy variable at school level: high treatment and low treatment schools.

$$T_{tj} = \mathbb{1}(\text{prop}_{tj} > E_j[\text{prop}_{tj}]),$$

- The following equation:

$$\begin{aligned} Y_{ij} = & \alpha_0 + \alpha_1 T_{1j} + \alpha_2 T_{2j} + \alpha_3 C_i + & (1) \\ & \theta_1 T_{1j} C_i + \theta_2 T_{2j} C_i + \\ & \beta_1 T_{1j} T_{2j} + \gamma_1 T_{1j} T_{2j} C_i + \\ & X_{ij} \eta + Z_j \vartheta + \varepsilon_{ij} \end{aligned}$$

Descriptive Statistics

Descriptive Statistics						
	Total n=24885			Sample n=2402		
	Interviewed girls	Sisters	Diff ¹	Interviewed girls	Sisters	Diff ¹
Childbearing	0.03	0.03	0.00 **	0.02	0.05	-0.03 ***
Age	15.41	19.23	-3.82 ***	15.49	21.82	-6.33 ***
Standard of living	23.16	22.55	0.61 ***	22.97	22.90	0.07
HH Size	5.26	5.72	-0.46 ***	5.57	5.66	-0.09
Children	3.24	3.70	-0.46 ***	3.60	3.72	-0.12 *
Rooms	4.10	4.22	-0.12 ***	4.30	4.31	-0.01
PRIV	0.12	0.10	0.02 ***	0.10	0.10	0.00
Students-teacher	27.02	30.71	-3.69 ***	27.03	30.55	-3.52 ***
Sch-quality	325.49	325.01	0.48	329.90	330.18	-0.28
Private	0.24	0.22	0.02 ***	0.25	0.25	0.00
Distance	2110.54	2135.72	-25.18	1978.68	1981.26	-2.58
Person theft	1.42	0.77	0.65 ***	1.46	0.82	0.64 ***
Motorcycle theft	0.13	0.15	-0.02 ***	0.13	0.17	-0.04 ***

The treatments

Outcome: Childbearing

	Familias en acción			Subsidio Educativo		
	Control	Treated	Diff	Control	Treated	Diff
Sisters	0.053	0.050	-0.003	0.035	0.074	0.039
Interviewed	0.019	0.035	0.016	0.023	0.024	0,001
Diff	-0.034	-0.015	<i>0.019</i>	-0.012	-0.050	<i>-0.038</i>

No controls

Outcome: childbearing		
VARIABLES	(1)	(2)
Cohort	-0.0120 (0.00847)	-0.0343*** (0.00984)
SED	0.0389*** (0.0149)	
Cohort x SED	-0.0382** (0.0174)	
FAM		-0.00281 (0.0150)
Cohort x FAM		0.0194 (0.0182)
Observations	2,402	2,402
R-squared	0.011	0.006

Standard errors clustered by school
***p<0.001 **p<0.05 *p<0.1

General Results

Outcome: childbearing					
VARIABLES	(1)	(2)	(3)	(4)	(5)
Cohort	-0.0152 (0.00933)	0.0832*** (0.0151)	0.0843*** (0.0152)	0.0792*** (0.0149)	0.0654*** (0.0160)
Cohort x FAM	0.0124 (0.0214)	0.00938 (0.0211)	0.00916 (0.0210)	0.00650 (0.0213)	0.0126 (0.0225)
Cohort x SED	-0.0492** (0.0222)	-0.0517** (0.0219)	-0.0522** (0.0218)	-0.0502** (0.0215)	-0.0483** (0.0211)
Individual controls	No	Yes	Yes	Yes	Yes
Family controls	No	No	Yes	Yes	Yes
School controls	No	No	No	Yes	Yes
Localidad	No	No	No	No	Yes
Observations	2,402	2,402	2,402	2,402	2,402
R-squared	0.012	0.042	0.047	0.054	0.061
Standard errors clustered by school					
***p<0.001 **p<0.05 *p<0.1					

Continuous Treatments

Outcome: childbearing					
VARIABLES	(1)	(2)	(3)	(4)	(5)
Cohort	-0.0220** (0.0108)	0.0779*** (0.0161)	0.0796*** (0.0162)	0.0714*** (0.0161)	0.0543*** (0.0179)
Cohort x FAM	-0.0954 (0.0937)	-0.115 (0.102)	-0.115 (0.102)	-0.124 (0.101)	-0.106 (0.101)
Cohort x SED	-0.208 (0.137)	-0.247* (0.135)	-0.250* (0.135)	-0.224* (0.130)	-0.218* (0.124)
Individual controls	No	Yes	Yes	Yes	Yes
Family controls	No	No	Yes	Yes	Yes
School controls	No	No	No	Yes	Yes
Localidad	No	No	No	No	Yes
Observations	2,402	2,402	2,402	2,402	2,402
R-squared	0.014	0.044	0.047	0.052	0.059
Standard errors clustered by school					
***p<0.001 **p<0.05 *p<0.1					

Robustness Checks (1)

Outcome: childbearing				
VARIABLES	(1)	(2)	(3)	(4)
	Benchmark	Without 19	Without 19 and 20	Without 19, 20 and 21
Cohort	0.0654*** (0.0160)	0.0599*** (0.0192)	0.0287 (0.0270)	-0.0276 (0.0338)
Cohort x FAM	0.0126 (0.0225)	0.0131 (0.0270)	0.0139 (0.0339)	0.0115 (0.0427)
Cohort x SED	-0.0483** (0.0211)	-0.0586** (0.0262)	-0.0747** (0.0327)	-0.0912** (0.0408)
Observations	2,402	2,115	1,866	1,699
R-squared	0.061	0.060	0.063	0.073

Standard errors clustered by school
*** $p < 0.001$ ** $p < 0.05$ * $p < 0.1$
All controls included in all regressions

Robustness Checks (2)

Outcome: childbearing					
VARIABLES	(1)	(2)	(3)	(4)	(5)
	Benchmark	Without 32	Without 31 and 32	Without 30, 31 and 32	Without 14, 30, 31 and 32
Cohort	0.0654*** (0.0160)	0.0759*** (0.0164)	0.0832*** (0.0172)	0.0802*** (0.0175)	0.0790*** (0.0184)
Cohort x FAM	0.0126 (0.0225)	0.0101 (0.0218)	0.00793 (0.0224)	0.00394 (0.0229)	0.00849 (0.0258)
Cohort x SED	-0.0483** (0.0211)	-0.0505** (0.0212)	-0.0496** (0.0213)	-0.0553*** (0.0213)	-0.0553** (0.0223)
Observations	2,402	2,394	2,387	2,370	2,125
R-squared	0.061	0.065	0.068	0.063	0.061

Standard errors clustered by school

***p<0.001 **p<0.05 *p<0.1

All controls included in all regressions

Robustness Checks (3)

Outcome: childbearing						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Benchmark	Placebo ¹	No program	Bootstrapping	With Dropout	Last Grade
Cohort	0.0654*** (0.0160)	-0.0583* (0.0299)	0.0675*** (0.0185)	0.0654*** (0.0144)	0.0783*** (0.0166)	0.0538*** (0.0204)
Cohort x FAM	0.0126 (0.0225)	0.00609 (0.0400)		0.0126 (0.0179)	-0.00494 (0.0204)	0.00213 (0.0371)
Cohort x SED	-0.0483** (0.0211)	-0.0237 (0.0403)	-0.0464** (0.0210)	-0.0483*** (0.0183)	-0.0407** (0.0202)	-0.0376 (0.0315)
Observations	2,402	1,516	1,680	2,402	2,912	1,145
R-squared	0.061	0.067	0.077	0.061	0.056	0.083

Standard errors clustered by school

*** $p < 0.001$ ** $p < 0.05$ * $p < 0.1$

¹ Placebo cohort

All controls included in all regressions

Different Thresholds

Outcome: childbearing					
VARIABLES	(1)	(2)	(3)	(4)	(5)
	Benchmark	P30th	P40th	P50th	P60th
Cohort	0.0654*** (0.0160)	0.0699*** (0.0181)	0.0670*** (0.0162)	0.0653*** (0.0159)	0.0552*** (0.0150)
Cohort x FAM	0.0126 (0.0225)	-0.00118 (0.0312)	0.0255 (0.0252)	0.0146 (0.0233)	0.0173 (0.0218)
Cohort x SED	-0.0483** (0.0211)	-0.0367** (0.0156)	-0.0342** (0.0148)	-0.0417** (0.0179)	-0.0313* (0.0166)
Observations	2,402	2,402	2,402	2,402	2,402
R-squared	0.061	0.060	0.060	0.060	0.059

Standard errors clustered by school

***p<0.001 **p<0.05 *p<0.1

All controls included in all regressions

Final Remarks

- Not all CCT programs reduce teenage childbearing
- Disentangle effects of components of FA on teenage childbearing
- Use the additional information to understand other potential determinants of teenage childbearing. Increases the knowledge about the problem.
- We have information of sexual risk behaviour, which can be combined with other type of information and administrative records.
- We also interviewed boys. Mix boys' data with the existing girls' data. Peer group effects.

Thank you!