

ECON 326: Economics of Developing Countries

TA Session 3

Vaidehi Parameswaran (Northwestern Econ)

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Today's Agenda

Evidence on Cash Transfer Programs

- ▶ Effects on Child Health: [Gertler \(2004\)](#)
- ▶ Conditional Cash Transfers vs Unconditional Cash Transfers
- ▶ Effects on Education: [Baird, McIntosh & Ozler \(2011\)](#)

Gertler (2004)

Do Conditional Cash Transfers Improve Child Health?

Evidence from PROGRESA's Control Randomized

Experiment

- ▶ Paper evaluates the impact of a large-scale RCT in Mexico
- ▶ Conditional Cash Transfer (CCT) Program called PROGRESA in Mexico
- ▶ Preview of result: CCTs improve child health significantly
- ▶ Suggestive that CCTs are effective and can be used to achieve equality of opportunity

- ▶ A CCT program in Mexico established in 1997 to address needs of extreme poverty
- ▶ Who is eligible? Poor households in underserved communities
- ▶ What are the conditions?
 - ▷ Children of age 0-23 get immunised and visit nutrition monitoring clinics every two months
 - ▷ Children of age 24-60 months visit nutrition monitoring clinics every four months
 - ▷ Pregnant and lactating mothers visit clinics to receive care
 - ▷ Other family members visit clinics for physical check-ups
 - ▷ All adult family members participate in regular meetings to discuss health and nutrition
- ▶ If conditions are met, household receives cash transfer every two months
- ▶ Sizeable cash transfer - roughly 20-30% of household income

- ▶ So what does the program incentivise? Using these health clinics
- ▶ Who is eligible? Poor households in underserved communities
- ▶ Over first three years, extended benefits to 2.6 million families in 50,000 villages
- ▶ which is 40% of all rural families and 10% of all families in Mexico
- ▶ Budgetary and logistical constraints led the government to roll out program over a period of time
- ▶ So the government randomly selected 320 villages to receive the program in 1998 and 185 villages to receive the program in 2000
- ▶ Led to clear treatment and control groups
- ▶ (without some usual ethical concerns)

Empirical Strategy

- ▶ Estimating equation: $Y_i = \theta + \rho Z_i + u_i$
- ▶ Z_i denoted treatment status
 - ▷ $Z_i = 1$ if village i received PROGRESA in 1998 (Treatment group)
 - ▷ $Z_i = 0$ if village i received PROGRESA in 2000 (Control group)
- ▶ Reduced-form equation to estimate the effect of being randomly assigned to treatment group
- ▶ This captures an Intent To Treat (ITT) effect. Why?
- ▶ The sample is restricted to eligible households only
 - ▷ Exclude non-poor households in the experimental villages, about 22%
- ▶ 2 rounds of data collection
 - ▷ Baseline in early 1998. What's this data used for?
 - ▷ Endline in 2000

- ▶ Very high compliance rate - 93%
- ▶ Who are the compliers here?
- ▶ Who are the non-compliers here?
- ▶ Local Average Treatment Effect (LATE) is given by $\frac{ITT}{\text{Compliance Rate}}$
- ▶ So LATE and ITT are very similar in this case
- ▶ Let's focus on ρ

Balance Test

- ▶ Ideally want health outcomes and other household characteristics to be balanced across treatment and control groups. Why?
- ▶ If not, there could be something systematically different between the two groups that could be driving the results
- ▶ In practice, it is normal to have slight differences in means
 - ▷ Because people are different in real life
 - ▷ Look at the p-values of the difference in means
 - ▷ Tells use the likelihood of observing differences as large as the ones we observe by chance

TABLE 1—PRE-INTERVENTION DESCRIPTIVE STATISTICS
FOR THE MORBIDITY SAMPLE OF CHILDREN
AGE 0–35 MONTHS AT BASELINE

Variable	Treatment	Control	<i>p</i> value for difference
Child was ill in last 4 weeks (=1)	0.330	0.323	0.771
Age	1.625	1.612	0.914
Male (=1)	0.511	0.491	0.091
Father's years of education	3.803	3.840	0.980
Mother's years of education	3.495	3.829	0.062
Father speaks Spanish (=1)	0.942	0.929	0.276
Mother speaks Spanish (=1)	0.935	0.917	0.443
Own house (=1)	0.923	0.917	0.465
House has electricity (=1)	0.644	0.711	0.091
Hectares of land owned	0.809	0.791	0.553
Male daily wage rate (pesos)	30.483	31.219	0.370
Female daily wage rate (pesos)	27.258	27.844	0.493
Sample size:	4,519	3,306	

Notes: This table reports descriptive statistics for the sample of children age 0–35 months at baseline before the intervention. The *p* values in the third column are for the test of the hypothesis that the means of the treatment and control groups are equal and are adjusted for inter-cluster correlation at the village level.

TABLE 2—ESTIMATED LOG ODDS ESTIMATES
OF THE IMPACT OF PROGRESA
ON CHILDREN'S PROBABILITY OF ILLNESS

Variable	Newborns	Child age 0–35 months at baseline	
		Model 1	Model 2
PROGRESA eligible = 1	0.747 (0.013)	0.777 (0.000)	
PROGRESA eligible for 2 months = 1			0.940 (0.240)
PROGRESA eligible for 8 months = 1			0.749 (0.000)
PROGRESA eligible for 14 months = 1			0.836 (0.005)
PROGRESA eligible for 20 months = 1			0.605 (0.000)

Notes: The first two columns report the estimated log odds from coefficients on dummy variables indicating whether the child was in a treatment village and eligible for PROGRESA. The p value for the hypothesis test that the estimated log odds is equal to 1 is reported in parentheses. The third column reports the results for the length of time that the child could have been on PROGRESA. The coefficients for all three models are estimated from a random-effects logit model, which allows for inter-cluster correlation at the village level and controls for the socio-

TABLE 3—ESTIMATED IMPACT OF PROGRESA
ON CHILDREN'S OBJECTIVE HEALTH MEASURES

Statistic	Height	Stunted	Anemia
Estimated program impact	0.959 (0.004)	0.914 (0.495)	0.745 (0.012)
Treatment group mean	80.725	0.396	0.410
Control group mean	79.742	0.410	0.483
Sample size:	1,552	1,552	2,010

Notes: The first row in this table reports the estimated coefficient on a dummy variable indicating whether the child was in a treatment village for height from a linear regression with village random effects, and the estimated log odds from a coefficient on a dummy variable indicating whether the child was in a treatment village for stunting and anemia from a random-effects logistic regression. The p value for the test that the coefficients are different from zero in the first two columns and different from 1 in the third column are reported in parentheses.

- Increase in children's height
- Control group more likely to be stunted and more likely to be anaemic

Open Questions

- ▶ Long-term impacts?
- ▶ Was it the **conditional** or the **cash** part of the CCT that matters?
 - ▷ What would be the effect of a UCT?

CCTs vs UCTs

Conditional Cash Transfers - Pros and Cons

► Pros

- ▷ Incentivises certain behaviours that can potentially correct market failures
- ▷ Can be used to target specific outcomes
- ▷ Politically palatable

► Cons

- ▷ Can be paternalistic
- ▷ Can be expensive to monitor compliance

Why UCTs might be better

- ▶ Easier to implement
- ▶ Theoretical default - people are rational

Baird, McIntosh & Ozler (2011)

Cash or Condition? Evidence from a Cash Transfer
Experiment

- ▶ Paper compares the effects of a UCT and a CCT in Malawi in 2007-2009
- ▶ Interested in effects on education as opposed to health (as in Gertler 2004)
- ▶ Provided cash transfers to households with school-age girls (ages 13 - 22)
 - ▷ This group was at risk of dropping out
 - ▷ Objective was to keep them in school
- ▶ CCT arm was conditional on school attendance - payment made if attendance $> 80\%$
- ▶ UCT arm was unconditional - payment made regardless of attendance

- ▶ Unit of randomisation - Enumeration Area (EA)
- ▶ 176 EAs selected from different strata - urban, rural, far rural
- ▶ Randomly divided into equal size groups of treatment and control
- ▶ 88 treatment EAs further divided
 - ▷ 46 EAs for the CCT arm
 - ▷ 27 EAs for the UCT arm
 - ▷ 15 EAs received no cash treatment
- ▶ In each EA, a percentage of baseline school girls was randomly selected to participate
- ▶ Cash transfer made to both the girls and the parent - amount varied by EA

- ▶ Baseline data in 2007 - 2008 before participation was sought
- ▶ Follow up surveys in 2008 - 2009 and in 2010
- ▶ Use household surveys, school surveys, school ledgers, interviews, test score data

Balance Test

TABLE II
BASELINE MEANS AND BALANCE

	Mean (s.d.)			
	(1)	(2)	(3)	
	Control group	Conditional group	Unconditional group	p-value (Conditional-Unconditional)
Panel A: Household-level variables				
Household size	6.432 (2.257)	6.384 (2.146)	6.662 (2.075)	.202
Asset index	0.581 (2.562)	0.984 (2.740)	1.221 (2.447)	.623
Female-headed household	0.343 (0.475)	0.252** (0.434)	0.245** (0.431)	.899
Mobile phone access	0.616 (0.487)	0.583 (0.494)	0.605 (0.490)	.799
Household transfer amount	N/A	6.991 (2.319)	6.829 (2.101)	.822

TABLE II
(CONTINUED)

	Mean (s.d.)			
	(1)	(2)	(3)	
	Control group	Conditional group	Unconditional group	p-value (Conditional-Unconditional)
Panel B: Individual-level variables				
Age	15.252 (1.903)	14.962* (1.827)	15.424 (1.923)	.007***
Highest grade attended	7.478 (1.634)	7.246 (1.598)	7.896** (1.604)	.004***
Mother alive	0.842 (0.365)	0.802 (0.399)	0.836 (0.371)	.360
Father alive	0.705 (0.456)	0.714 (0.453)	0.759 (0.428)	.288
Never had sex	0.797 (0.402)	0.797 (0.403)	0.775 (0.419)	.582
Ever pregnant	0.023 (0.149)	0.030 (0.171)	0.031 (0.173)	.973
Individual transfer amount	N/A	3.090 (1.431)	3.033 (1.451)	.606
Number of observations	1356	470	261	

Notes: Mean differences statistically different than 0 at 99% (***), 95% (**), and 90% (*) confidence. Asterisks on the coefficients in columns (2) and (3) indicate significantly different than the control group, while in column (4) asterisks indicate a significant difference between the conditional and unconditional treatment arms. Standard errors are clustered at the EA level to account for the design effect. Means are weighted to make them representative of the target population in the study EAs. The number of unique observations vary slightly across variables due to missing observations, with the total sample size ranging between 3059 and 3064.

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Results: Schooling Outcomes

Student-reported school enrollment imply that UCTs are better ...

TABLE III
PROGRAM IMPACT ON SCHOOL ENROLLMENT

Panel A: Program impacts on *self-reported* school enrollment

	Dependent variable: =1 if enrolled in school during the relevant term							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Year 1: 2008			Year 2: 2009			Year 3: 2010	
	Term 1	Term 2	Term 3	Term 1	Term 2	Term 3	Total terms (6 terms)	Term 1, post- program
Conditional treatment	0.007 (0.011)	0.019* (0.011)	0.041** (0.017)	0.049*** (0.017)	0.056*** (0.018)	0.061*** (0.019)	0.233*** (0.070)	0.005 (0.025)
Unconditional treatment	0.034*** (0.010)	0.051*** (0.011)	0.054*** (0.018)	0.072*** (0.021)	0.095*** (0.022)	0.101*** (0.021)	0.406*** (0.079)	0.074*** (0.026)
Mean in the control group	0.558	0.834	0.900	0.833	0.800	0.759	5.191	0.841
Number of observations	2,087	2,087	2,086	2,087	2,087	2,087	2,086	2,086
Prob > F(Conditional = Unconditional)	0.006	0.012	0.460	0.299	0.102	0.098	0.038	0.028

Results: Schooling Outcomes

Teacher-reported school enrollment imply that CCTs are better ...

Panel B: Program impacts on teacher-reported school enrollment								
Conditional treatment	0.043*** (0.015)	0.044*** (0.016)	0.061*** (0.018)	0.094** (0.041)	0.132*** (0.035)	0.113*** (0.039)	0.535*** (0.129)	0.058* (0.033)
Unconditional treatment	0.020 (0.015)	0.038** (0.017)	0.018 (0.023)	0.027 (0.038)	0.069 (0.037)	0.033 (0.039)	0.231* (0.136)	0.001 (0.036)
Mean in the control group	0.906	0.881	0.852	0.764	0.733	0.704	4.793	0.596
Number of observations	2,023	2,023	2,023	852	852	852	852	847
Prob > F(Conditional = Unconditional)	0.173	0.732	0.067	0.076	0.014	0.020	0.011	0.108

Notes: The dependent variable in Panel A is whether the core respondent reported being enrolled in school for the relevant year/term. The dependent variable in Panel B is whether the teacher reported the core respondent being enrolled in school for the relevant year/term. Post-program refers to Term 1, 2010, the first term after the program ended. Total terms refers to the total number of terms enrolled during the program. Columns (4)-(8) in Panel B are restricted to the subsample of core respondents sampled for the Round 5 school survey who are also both part of the panel data set and part of the school survey panel. Regressions are OLS models with robust standard errors clustered at the EA level. All regressions are weighted to make them representative of the target population in the study EAs. Baseline values of the following variables are included as controls in the regression analyses: age dummies, sex dummies, household asset index, highest grade attended, and an indicator for never had sex. Parameter estimates statistically different than 0 at 99% (***), 95% (**), and 90% (*) confidence.

So it seems to depend on who you ask. But the authors believe that teacher-reported data is less likely to be biased.

Results: Attendance

Among those who stay in school, school records favour CCTs over UCTs

TABLE V
PROGRAM IMPACTS ON ATTENDANCE FROM SCHOOL LEDGERS

	Dependent variable: Fraction of days respondent attended school				
	(1)	(2)	(3)	(4)	(5)
	Term 1, 2009	Term 2, 2009	Term 3, 2009	Overall 2009	Term 1, 2010
Conditional treatment	0.139*** (0.045)	0.014 (0.033)	0.169** (0.085)	0.080** (0.035)	0.092** (0.041)
Unconditional treatment	0.063 (0.056)	0.038 (0.033)	0.118 (0.102)	0.058 (0.037)	-0.038 (0.053)
Mean in the control group	0.778	0.849	0.688	0.810	0.801
Number of observations	284	285	192	319	211
Prob > F(Conditional = Unconditional)	0.129	0.334	0.358	0.436	0.010

Notes. Regressions are OLS models with robust standard errors clustered at the EA level. All regressions are weighted to make them representative of the target population in the study EAs. The variable "Overall 2009" is defined for all core respondents who have ledger information for any of the three terms and is constructed by dividing the number of days present by the number of days in session for all terms in which there is information. Baseline values of the following variables are included as controls in the regression analyses: age dummies, strata dummies, household asset index, highest grade attended, and an indicator for never had sex. Parameter estimates statistically different than 0 at 99% (***), 95% (**), and 90% (*) confidence.

Results: Test Scores

Test scores are also higher in the CCT group

TABLE VI
PROGRAM IMPACTS ON TEST SCORES

	Dependent variable			
	(1)	(2)	(3)	(4)
	English test score (standardized)	TIMMS math score (standardized)	Non-TIMMS math score (standardized)	Cognitive test score (standardized)
Conditional treatment	0.140*** (0.054)	0.120* (0.067)	0.086 (0.057)	0.174*** (0.048)
Unconditional treatment	-0.030 (0.084)	0.006 (0.098)	0.063 (0.087)	0.136 (0.119)
Number of observations	2,057	2,057	2,057	2,057
Prob > F(Conditional= Unconditional)	0.069	0.276	0.797	0.756

Notes. The cognitive test score is based on Raven's Colored Progressive Matrices. Math and English reading comprehension tests were developed based on the Malawian school curricula. Five questions (four from the Fourth Grade test and one from the eighth Grade test) from Trends in Mathematics and Science Study (TIMMS) 2007, which is a cycle of internationally comparative assessments in mathematics and science carried out at the fourth and eighth grades every 4 years, were added to the Math test. All test scores have been standardized to have a mean of 0 and a standard deviation of 1 in the control group. Regressions are OLS models using Round 3 data with robust standard errors clustered at the EA level. All regressions are weighted to make the results representative of the target population in the study EAs. Baseline values of the following variables are included as controls in the regression analyses: age dummies, strata dummies, household asset index, highest grade attended, an indicator for never had sex, and whether the respondent participated in the pilot phase of the development of the testing instruments. Parameter estimates statistically different than 0 at 99% (***), 95% (**), and 90% (*) confidence.

Results: Long-term Outcomes

TABLE VII
PROGRAM IMPACTS ON MARRIAGE AND PREGNANCY

	Dependent variable			
	(1)	(2)	(3)	(4)
	=1 if ever married		=1 if ever pregnant	
	Round 2	Round 3	Round 2	Round 3
Conditional treatment	0.007 (0.012)	−0.012 (0.024)	0.013 (0.014)	0.029 (0.027)
Unconditional treatment	−0.026** (0.012)	−0.079*** (0.022)	−0.009 (0.017)	−0.067*** (0.024)
Mean in the control group	0.043	0.180	0.089	0.247
Number of observations	2,087	2,084	2,086	2,087
Prob > F(Conditional = Unconditional)	0.024	0.025	0.265	0.003

- ▶ Marriage rates unchanged in CCT group but significantly lower in UCT group
- ▶ How to reconcile that CCT boosted schooling outcomes but only UCT reduced marriage rates?
 - ▷ Two channels for schooling to affect marriage
 - ▷ Through the CCT arm, dropouts averted
 - ▷ Through the UCT arm, girls dropped out but income effect delayed marriage
 - ▷ The second group is larger than the first group in this study

Conclusion: No Clear Winner

- ▶ CCTs increased enrollment and regular attendance for those in school more than the UCT
- ▶ UCTs substantially lowered teenage pregnancy and marriage rates
- ▶ CCTs more cost-effective at improving schooling outcomes - they use different payment amounts to learn this
- ▶ So which program to choose may depend on the level of compliance
- ▶ Ultimately, some of these individuals need income support and are vulnerable
- ▶ “while CCT programs may be more effective than UCTs in obtaining the desired behaviour change, they can also undermine the social protection dimension of cash transfer programs”

See you next time!