Do Conditional Cash Transfers for Schooling Generate Lasting Benefits?
A Five-Year Followup of PROGRESA/Oportunidades

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Motivation

- Conditional cash transfer (CCT) programs link public transfers to human capital investment in hopes of alleviating current poverty and reducing its intergenerational transmission.

- PROGRESA/Oportunidades began operating in small rural communities in 1997.

- It expanded to urban areas and now covers five million families, or about one quarter of all families in Mexico.

- Well over 30 countries now have as part of their social policy CCT programs, most of which include substantial schooling conditionalities.

Motivation

- Little is known about the longer-term impacts of CCTs on schooling attainment or other outcomes, despite the rapid spread of these programs.

- Evaluations are limited for the most part to assessing the impact of a fairly short exposure to a new program (that is, for a year or two) on outcomes over short periods.

- An important policy issue is whether program impacts change over time.

- Higher subsidy may be required to induce girls to obtain as much schooling as boys.

Motivation

- While the income effect tends to increase the time spent in leisure, the net effects on time spent at school and working would be respectively positive and negative if the substitution effect dominates.

- Assuming diminishing marginal returns to schooling, lead us to expect that over the short run, the program is likely to decrease working but over the longer run, the program might increase working.

- If the program encourages children with lower scholarly ability to stay in school, we might observe an increase in school-going along with a decrease in the rates of grade progression for such children.

Main Question and How to Answer It

- Do Effects Change Over Time?

1. Impact on Schooling

2. Impact on Working

3. Probability of Working in Agriculture

- This paper evaluates longer-run impacts on schooling and work of the best-known CCT program, Mexico's PROGRESA/Oportunidades

- Investigate two types of longer-run impacts for the well-known and influential Mexican PROGRESA/Oportunidades CCT program.

Main Question and How to Answer It

		Time Since Program Initiation	
		(1) Short-Run	(2) Longer-Run
Exposure differential	(1) Short differential	A: Short-run impact of short differential exposure	B: Longer-run impact of short differential exposure
	(2) Longer differential	N/A	C: Longer-run impact of longer differential exposure

Main Question and How to Answer It

Quadrant B:

- Experimental impacts based on an initial short (18-month) differential in exposure using difference-in-difference (DID)

- Estimates that permit assessing whether initial program impacts from short exposure differentials are robust or fade over time

Main Question and How to Answer It

Quadrant C:

- Difference- in-difference matching (DIDM) impacts based on a longer differential in exposure that provide insight into longer-run program impacts of longer differential in exposure

- In comparison with the estimates of Type 1, into whether there are increasing or diminishing returns to the duration of program exposure.

Main Question and How to Answer It

- 320 communities to a treatment group and 186 to a control group

- In 2000, approximately one and a half years after the start of the experiment, the control group communities also began to receive benefits.

- In 2003, analyze impacts on schooling attainment and labor force participation of youth five and a half years after the experimental treatment group first began receiving benefits.

- 2003: New group of households in 152 communities that had never received benefits of Oportunidades

Main Question and How to Answer It

- Analysis focuses on youth who were 9–15-years-old in 1997 and who were 15–21-years-old in 2003.

- In 1997, when the program began, this group was at or near the age of the transition from primary to secondary school and in 2003, many of these youth had entered the labor market.

- A critical juncture in rural Mexico at which many children drop out of school.

Results

- The results show positive impacts on schooling, reductions in work for younger youth (consistent with postponing labor force entry), increases in work for older girls, and shifts from agricultural to nonagricultural employment. The evidence suggests schooling effects are robust with time.

PROGRESA/Oportunidades Impacts on Schooling and Work after Five and a Half Years of an Initial 18-Month Differential Program Exposure

Longer-run impact of short differential exposure

- Evaluate whether the *short differential exposure* to treatment between the two groups had longer-run impacts on schooling and work.

- Estimate impacts of differential exposure from a linear regression of the difference in the outcome variable before and after the program

Controls:

-parental age, parental schooling attainment, indigenous status, and household characteristics including number of rooms, electricity, type of floor, and water/sewage system

- To account for possible attrition biases, we employ a weighting method that is equivalent to a matching on observables approach.

Longer-run impact of short differential exposure

Differential exposure to Oportunidades: Schooling and work outcomes for households receiving benefits in 1998 versus 2000

| | Preprogram 97 | | After program 03 | | P > \|Z\|, \|T\| | Dif in Dif | P > \|Z\|, \|T\| |
| | | | | | Preprogram dif. | | |
	Treat98	Treat00	Treat98	Treat00	T98 vs. T00		
Grades of schooling attainment							
Boys 9–15 in 1997	4.514	4.513	7.740	7.520	0.967	0.219	0.000
Girls 9–15 in 1997	4.580	4.610	7.680	7.510	0.568	0.200	0.000
Employment							
Boys 9–15 in 1997	0.179	0.164	0.631	0.654	0.040	−0.039	0.001
Girls 9–15 in 1997	0.078	0.054	0.270	0.259	0.000	−0.013	0.226

Source: Author's calculations with 1997 ENCASEH and 2003 ENCEL data.

Longer-run impact of short differential exposure

Impact of Differential Exposure to Oportunidades on Schooling Grades and LFP Difference-in-difference Estimates: Adolescents 9–15 in 1997, T1998 vs. T2000

	Schooling		Work	
	Coefficient Standard error	2003 level, percent impact	Coefficient Standard error	2003 level, percent impact
Girls	0.201	7.52, 2.7%	−0.013	0.26, −5%
By age in 1997	[0.047]***		[0.013]	
9–10	0.075	7.43, 1%	−0.008	0.14, −5.6%
	[0.076]		[0.019]	
11–12	0.181	7.75, 2.3%	−0.01	0.34, −2.9%
	[0.091]**		[0.024]	
13–15	0.32	7.44, 4.3%	−0.02	0.40, −5%
By completed 1997 schooling	[0.077]***		[0.025]	
< = 3	0.057	6.03, 0.9%	−0.01	0.18, −5.5%
	[0.083]		[0.020]	
4	0.18	7.76, 2.3%	−0.016	0.24, −6.8%
	[0.106]*		[0.031]	
5	0.529	7.75, 6.8%	−0.032	0.25, −12.7%
	[0.113]***		[0.033]	
6	0.304	7.37, 4.1%	−0.006	0.34, −1.8%
	[0.097]***		[0.034]	
7 +	0.117	9.68, 1.2%	0.005	0.35, 1.4%
	[0.121]		[0.044]	

Notes: Estimates based on weighted DID regression estimates. Controls for parental age, schooling, indigenous status, and housing characteristics (see text). * Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

Longer-run impact of short differential exposure

Impact of Differential Exposure to Oportunidades on Schooling Grades and LFP
Difference-in-difference Estimates: Adolescents 9–15 in 1997, T1998 vs. T2000

	Schooling		Work	
	Coefficient Standard error	2003 level, percent impact	Coefficient Standard error	2003 level, percent impact
Boys	0.18	7.54, 2.4%	−0.027	0.65, −4.1%
By age in 1997	[0.045]***		[0.015]*	
9–10	0.197	7.38, 2.7%	−0.015	0.40, −3.8%
	[0.075]***		[0.024]	
11–12	0.241	7.68, 3.1%	−0.007	0.67, −1%
	[0.088]***		[0.026]	
13–15	0.139	7.56, 1.8%	−0.046	0.83, −5.5%
By completed 1997 schooling	[0.074]*		[0.025]*	
< =3	0.137	5.97, 2.3%	−0.013	0.53, −2.5%
	[0.074]*		[0.023]	
4	0.196	7.63, 2.6%	0.01	0.61, 1.6%
	[0.102]*		[0.034]	
5	0.347	7.89, 4.4%	−0.041	0.70, −5.9%
	[0.111]***		[0.037]	
6	0.204	7.67, 2.7%	0.011	0.79, 1.4%
	[0.103]**		[0.036]	
7 +	0.047	9.62, 0.5%	−0.136	0.85, −15.9%
	[0.111]		[0.041]***	

Notes: Estimates based on weighted DID regression estimates. Controls for parental age, schooling, in-digenous status, and housing characteristics (see text). * Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

Longer-run impact of short differential exposure

Impacts on Schooling

 - Youth with 18 months greater exposure to the program accumulated significantly more schooling and this differential persisted for the longer-term five and a half year period

- The largest effects are observed for those who had completed five grades of schooling by 1997

- An *F* test rejects equality of coefficients at conventional significance levels for each set of subgroups for both males and females, suggesting different impacts of PROGRESA/Oportunidades on schooling by age and preprogram schooling grades completed.

Longer-run impact of short differential exposure

Impacts on Working

- The theoretical effect of PROGRESA/Oportunidades on the probability of working is ambiguous. Over the short run, the program decreases working, but over the longer run, the program might increase working.

- The DID estimate of the impact of the one and a half year differential exposure to the program on working five and a half years later shows that greater exposure significantly decreases the proportion working by 4.1 percent for boys with no significant effects for girls.

- Effects do not significantly differ by age groups or by preprogram schooling level.

Longer-run impact of short differential exposure

Do Effects Change Over Time?

- Impact estimates for the year 2000 are based on comparing the treatment group which had two and a half years versus the control group at nearly a year of benefits. That is, we test whether impact estimates based on 2000 followup data are different from those based on the 2003 data used in this paper

- Estimates show significantly higher estimated impacts for 2003 than 2000, the large majority of the 18 reported estimates do not reject the null hypothesis of equality. The results suggest that PROGRESA/Oportunidades impacts on schooling do not diminish over time.

Longer-run impact of short differential exposure

Do Oportunidades impacts change overtime? Experimental evidence comparing household treated in 1998 with households treated in 2000 (T1998 vs. T2000)

	Year of impact coefficient		F test, Prob > F
	2003	2000	
Girls			
All girls 9–15 in 1997	0.201	0.201	0.32
By age in 1997			
9–10	0.075	0.057	0.63
11–12	0.181	0.234	0.43
13–15	0.32	0.313	0.21
By completed 1997 schooling grades			
< =3	0.057	0.053	0.93
4	0.18	0.253	0.69
5	0.529	0.384	0.09*
6	0.304	0.28	0.19
7 +	0.117	0.21	0.33
Boys			
All boys 9–15 in 1997	0.18	0.118	0.32
By age in 1997			
9–10	0.197	0.123	0.52
11–12	0.241	0.094	0.39
13–15	0.139	0.135	0.95
By completed 1997 schooling grades			
< =3	0.137	0.264	0.24
4	0.196	0.061	0.04**
5	0.347	0.075	0.02**
6	0.204	0.095	0.57
7 +	0.047	0.256	0.35

Notes: Estimates based on weighted DID regression estimates described in text. Controls for parental age, schooling, indigenous status, and housing characteristics (see text). * Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Longer-Run PROGRESA/Oportunidades Impacts after Five and a Half Years of Differential Exposure

Longer-run impact of longer differential exposure

- We compare the original treatment groups (T1998 and T2000) with the new comparison group (C2003) that was drawn from rural areas that had not yet been incorporated into the program in 2003.

- Because the C2003 group was not selected randomly, we use matching methods to take into account differences in observed characteristics between the T2000 and C2003 samples and between the T1998 and C2003 samples.

- DIDM is analogous to the standard DID regression estimator, but does not impose functional form restrictions in estimating the condi- tional expectation of the outcome variable and reweights the observations according to the weighting functions implied by the matching estimators.

Longer-run impact of longer differential exposure

Impact on Schooling

- The findings confirm significantly larger impacts on schooling with a longer time of exposure to the program than for those with shorter time of exposure.
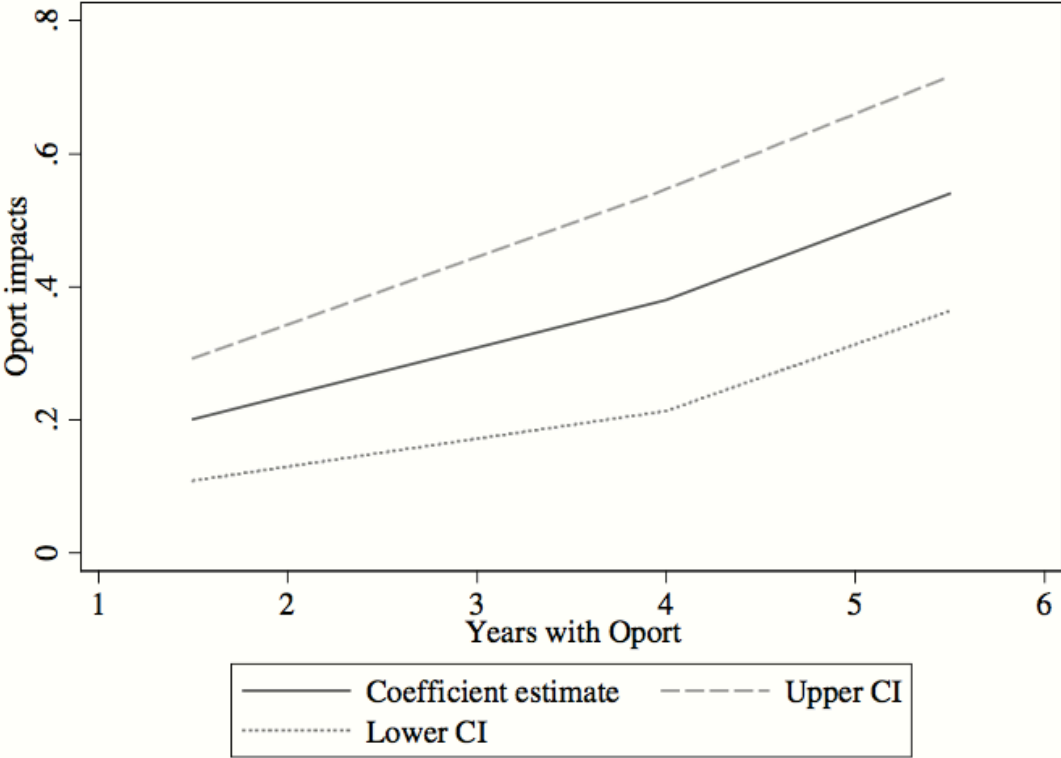
Longer-run impact of longer differential exposure

Estimated Impacts of PROGRESA/Oportunidades on Grades of Schooling Local linear longitudinal DID matching † T1998 vs. C2003 and T2000 vs. C2003

	C2003 Grades of schooling	T1998 versus C2003		T2000 versus C2003	
		Impact, standard error	Percent change	Impact, standard error	Percent change
Girls					
15–16	6.92	0.69 (0.16)***	10.0	0.57 (0.17)***	8.2
17–18	7.54	0.75 (0.18)***	10.0	0.55 (0.18)***	7.3
19–21	7.19	0.03 (0.18)	0.4	−0.43 (0.18)**	−6
Boys					
15–16	6.85	1 (0.15)***	14.6	0.88 (0.16)***	12.8
17–18	7.2	0.93 (0.21)***	13.0	0.70 (0.21)***	9.7
19–21	7.08	0.55 (0.18)***	7.8	0.40 (0.14)***	5.6

Notes: DIDM estimator, imposing common support (trimming = 2 percent). Bootstrapped standard errors (parentheses) with 500 replications. Bandwidth = 0.8.
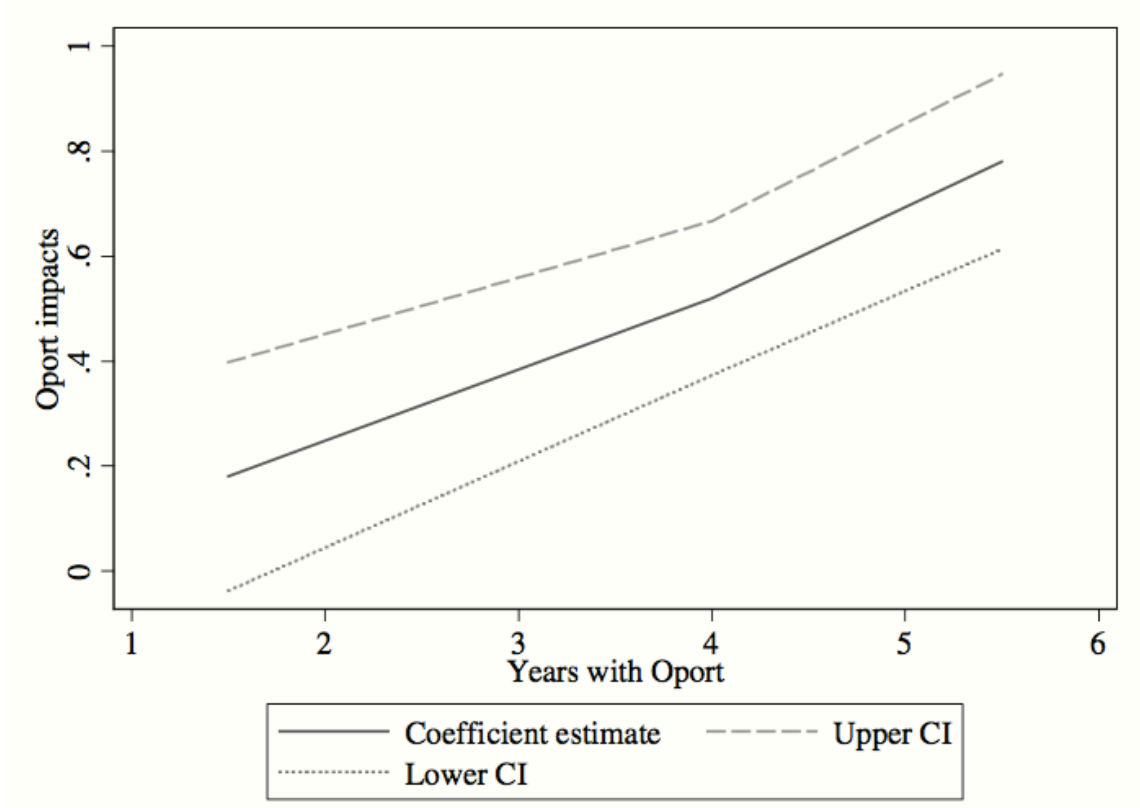
Longer-run impact of longer differential exposure

Girls:

Longer-run impact of longer differential exposure

Boys:

Longer-run impact of longer differential exposure

Impact on Working

- For younger boys—that is, those aged 9–10 prepro- gram in 1997—show a negative and significant impact on the probability of em- ployment, consistent with many boys still attending school at this age (15–16 in 2003).

- For the older age groups, there is no significant impact of the program on working, which may mask negative impacts from some boys continuing to study and positive impacts from those having completed their studies and entering the work force.

Longer-run impact of longer differential exposure

Probability of Working in Agriculture

- Girls have much lower participation in agricultural work than boys.

- For older girls, for whom there was a significant increase in the probability of working, there is no significant increase in the probability of participating in agricultural work, suggestive of increasing nonagricultural work.

-The reductions in agricultural work for boys aged 9–10 preprogram are similar to the percentage reductions in work, implying similar reductions in agricultural as nonagricultural work.

- For older boys, on which there were no overall significant program effects on working, there are significant reductions in agricultural work

Longer-run impact of longer differential exposure

Estimated Impacts of PROGRESA/Oportunidades on Probability of Working and Participation in Agricultural Work Local linear longitudinal DID matching †
T1998 vs. C2003

	C2003 Proportion working	Probability of working		Probability of participating in agricultural work	
		Impact, standard error	Percent change	Impact, standard error	Percent change
Girls					
15–16	0.17	0.01 (0.03)	5.9	−0.004 (0.02)	13.3
17–18	0.28	−0.01 (0.04)	3.6	−0.02 (0.02)	33.3
19–21	0.32	0.064 (0.038)*	20.0	0.01 (0.02)	20.0
Boys					
15–16	0.49	−0.14 (0.04)***	28.6	−0.09 (0.04)***	25.7
17–18	0.70	0.06 (0.04)	8.6	−0.02 (0.04)	4.7
19–21	0.81	−0.02 (0.04)	2.5	−0.09 (0.05)*	20.4

Notes: DIDM estimator, imposing common support (trimming = 2 percent). Bootstrapped standard errors (parentheses) with 500 replications. Bandwidth = 0.8. * Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Benefit-Cost Estimates

Benefit-Cost Estimates

- Here we assume the benefits from the program arise from increases in future earnings only as a result of the increase in schooling attainment from the program.

- Estimate the return to schooling controlling for potential endogeneity

- Focusing on the sample of men, a simple OLS estimate of returns to schooling attainment gives a value of 7.5 percent per year for this age group (16–24), the IV estimate of wage functions increases the value to about 10 percent

Benefit-Cost Estimates

Costs and Benefits of the PROGRESA/Oportunidades Program in U.S. dollars

Impact = 1.0 grades of schooling

| | Initial Earnings | | | Return to schooling | | | | | |
| | | | | 6% | | 8% | | 10% | |
Discount rate	Without program	With program	Costs	Benefits	B/C Ratio	Benefits	B/C Ratio	Benefits	B/C Ratio
3%	1,855	1,966	500	1801	3.60	2,679	5.36	3,557	7.11
5%	1,855	2,003	390	664	1.70	1,082	2.77	1,499	3.84
10%	1,855	2,040	215	27	0.13	233	1.08	438	2.04

Impact = 0.83 grades of schooling

| | Initial Earnings | | | Return to schooling | | | | | |
| | | | | 6% | | 8% | | 10% | |
Discount rate	Without program	With program	Costs	Benefits	B/C Ratio	Benefits	B/C Ratio	Benefits	B/C Ratio
3%	1,855	1,966	500	1,502	3.00	2,231	4.46	2,959	5.92
5%	1,855	2,003	390	556	1.43	903	2.32	1,245	3.19
10%	1,855	2,040	215	28	0.13	198	0.92	363	1.69

Notes: Calculations assume youth take part in the program for six years, beginning at age 10 and finishing at age 16. A return to experience is included $= 0.413E - 0.00048E2$. Exchange rate is 11 Mexican pesos per $1US.

Special Thanks for Your Attendance