

Cost-effective Analysis of Demand- and Supply-side Education Interventions: The Case of PROGRESA in Mexico

By David P. Coady and Susan W. Parker (2004)

Presentation by Mohammadreza Farajpour

Introduction

- ▶ Question
 - ▶ Most cost-effective way of improving access to education for poor households in developing countries
- ▶ Data
 - ▶ PROGRESA
 - ▶ School-level data, SEP

Identification

$$S_{it} = \sum_{t=0}^3 \alpha_{0t} + \alpha_1 T_i + \alpha_2 T_i R_2 + \alpha_3 T_i R_3 + \sum_{j=1}^J \beta_j X_{jit} + \varepsilon_{it}$$

- ▶ Control variables:
 - ▶ child's age
 - ▶ Mother and father education levels
 - ▶ Marginality level of the community
 - ▶ Community agricultural wage
 - ▶ Distance to the nearest municipal center

Table 1. Program Impact on Enrollment in Secondary School for Boys and Girls

	Boys			Girls		
	Initial 1997	Nov. 1998	Nov. 1999	Initial	Nov. 1998	Nov. 1999
Secondary enrollment	0.653			0.528		
<i>Without supply side</i>						
Program dummy		0.079 (3.12)	0.053 (1.83)		0.117 (4.45)	0.120 (3.70)
<i>With supply side</i>						
Program dummy		0.085 (3.70)	0.057 (1.95)		0.126 (4.75)	0.132 (3.98)
Distance to school (km)		-0.079 (6.68)			-0.114 (7.83)	
Distance squared		0.004 (3.73)			0.007 (3.35)	
School is tele-secondary		-0.098 (1.70)			-0.138 (2.74)	
Teachers with HS degree (%)		0.30 (0.40)			0.176 (2.53)	
Students failing (%)		-0.020 (0.11)			-0.243 (1.38)	
Child/teacher ratio		-0.002 (1.71)			-0.0007 (0.63)	

Note: These estimates are generated by double-difference regression analysis of individual-level data. *t*-statistics are in brackets.

Effectiveness

Table 2. Impact of Education Grants on Extra Years of Secondary Education for Boys and Girls

<i>Grade</i>	<i>Boys' conditional enrollment</i>				<i>Girls' conditional enrollment</i>			
	<i>Before</i>	<i>Impact</i>	<i>After</i>	<i>Extra years</i>	<i>Before</i>	<i>Impact</i>	<i>After</i>	<i>Extra years</i>
7	0.345	0.094	0.440	94.5	0.265	0.198	0.463	198.3
8	0.903	0.000	0.903	85.3	0.895	0.000	0.895	177.5
9	0.866	0.000	0.866	73.8	0.879	0.000	0.879	156.1
Totals				253.8				531.9

Effectiveness

Table 3. Effect of Decreasing Distance on Enrollment (allocated to transition year)

Grade	Enrollment			Extra years of education		
	Before	Impact 1998	Impact 1999	1997-98	1998-99	1997-99
<i>Girls</i>						
7	0.265	0.006	0.004	6.46	3.76	10.22
8	0.895	0.000	0.000	5.78	3.36	9.14
9	0.879	0.000	0.000	5.08	2.96	8.04
Totals				17.33	10.07	27.40
<i>Boys</i>						
7	0.345	0.004	0.004	3.70	4.41	8.10
8	0.903	0.000	0.000	6.83	3.39	9.22
9	0.866	0.000	0.000	5.01	2.91	7.92
Totals				14.53	10.71	25.24

Cost-effectiveness

Table 4. Cost of Extra Years of Education through Secondary Grants

	<i>Boys</i>	<i>Girls</i>	<i>Average</i>
Total enrollment	1,181	1,243	1,212
Total impact	254	532	393
Grants	3,184,059	3,671,964	3,428,012
Cost per year	12,557	6,904	9,730

Cost-effectiveness

Table 5. Cost-effectiveness Ratios for School Building

	<i>r = 0%</i>			<i>r = 5%</i>		
	<i>20 years</i>	<i>30 years</i>	<i>40 years</i>	<i>20 years</i>	<i>30 years</i>	<i>40 years</i>
Girls 1997–98	118,575	108,560	103,552	136,749	127,620	123,550
Girls 1998–99	327,174	302,905	290,771	371,211	349,090	339,228
Girls 1997–99	195,268	180,013	172,385	222,951	209,046	202,846
Boys 1997–98	141,357	129,417	123,447	163,023	152,140	147,287
Boys 1998–99	307,758	284,930	273,515	349,181	328,374	319,097
Boys 1997–99	211,952	195,393	187,113	242,000	226,907	220,177
Avg. 1997–98	129,966	118,989	113,500	149,886	139,880	135,419
Avg. 1998–99	317,466	293,917	282,143	360,196	338,732	329,162
Avg. 1997–99	203,610	187,703	179,749	232,476	217,976	211,511