The Effects of Universal Primary Education on Attendance: Evidence from Burkina Faso

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7 juin 2016

Motivations

- Most countries in Sub-Saharan Africa implemented Universal Primary Education programs in early 2000s
  - Large school construction + fees abolition
  - Still no evidence on the effects of these programs on school attendance
- Theoretical predictions are ambiguous :
  - Large school construction + fees abolition $\rightarrow$ higher supply of education at lower price
  - Fall in quality $\rightarrow$ less incentive for schooling
- Related literature :
  - Duflo (2001) in Indonesia : positive effect of school construction on educational attainement
  - Deninger (2003) in Uganda : positive effect of fees abolition on attendance
  - Harounan et al. (2013) in Burkina-Faso : positive effects of a specific school construction targeted at girls

This paper :

- The effects of Burkina-Faso's UPE program (**PDDEB**) on attendance
  - Causal identification strategy : difference in trend between exposed and non-exposed birth cohorts
  - Heterogenous effects with respect to age, gender, region of residence and grades
- Findings :
  - Higher attendance in first grade of primary school
  - Larger effects for younger children, girls, and children living in deprived areas
  - Significant dropout from the third grade, particularly for girls

Scope of PDDEB

- Two phases :
  - Phase 1 : 2002 - 2006, our focus
  - Phase 2 : 2006 - 2010
- Nation-wide, but more intense in some initially deprived "PP areas"
- Large school construction + free school supplies + fees abolition + awareness raising campaigns

Components of PDDEB1

- Large school construction (50%) + free school supplies

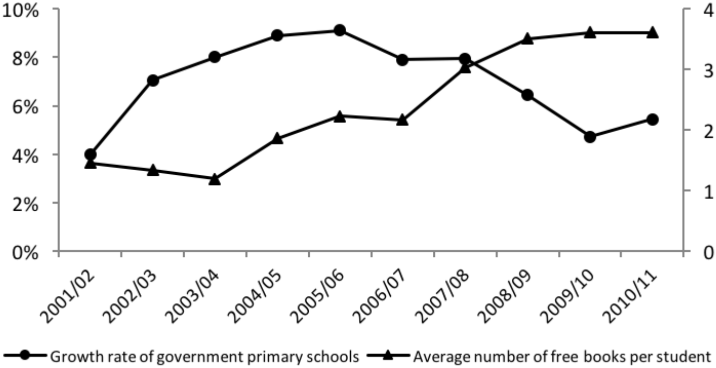

Figure: School construction and Books distribution

Components of PDDEB1

- Fees abolition was not effective : no legal enforcement before 2007.

		Variation wrt the previous year		
	Av. 1997	2002	2004	2006
High schooling cost	0.512	0.072***	0.104***	-0.047***
No School/Too Far	0.451	-0.129***	-0.060***	0.018*

Significant at 1%(***), 5%(**) and 10%(*).

Table: Reasons for not attending school

Dataset

- Five repeated cross-sectional household surveys covering the academic years 1993-1994, 1997-1998, 2002-2003, 2004-2005 and 2006-2007.
- Information on school attendance
  - Current and previous years attendance of a given grade
  - + The highest grade completed for all individuals that ever attended school
  - $\rightarrow$ Outcome variable : having attended grade g as of a given year
- Additional information on year of birth, gender and place of residence
- + administrative database on the effectiveness of the program

Identification Strategy : Treated and Control Groups

- Two groups of birth cohorts : exposed (treated) vs. non-exposed (control)
- Non-exposed : cohorts that are more than 14 years old in 2002, i.e. born before 1988.

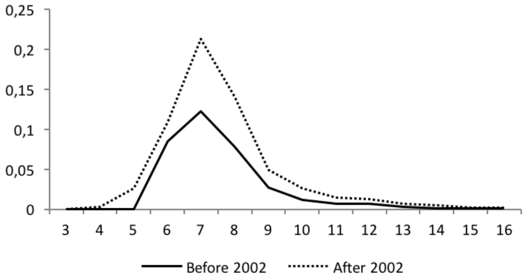

Figure: Share of individuals attending the first grade

Identification Strategy : Illustration

- Two-stage estimation :
  - Fit the trend in school attendance across birth cohorts in the control group with a polynomial
  - Extrapolate on treated cohorts and compare with their rate of school attendance

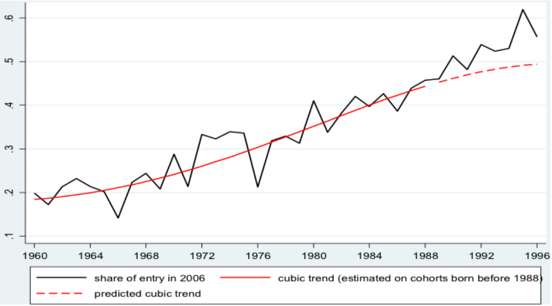

Figure: First grade attendance in 2006

Identification Strategy : Econometric model

- First-stage equation :

$$E_i = \alpha + \sum_{j=1}^{d} \beta_j Y_i^j + \mu_i \tag{1}$$

E_i : dummy variable equals 1 if individual i born in year Y_i has attended the first grade as of a given academic year. d is the order of the polynomial, set to 3 in the main results and 2 in robustness checks. μ_i corresponds to the residuals of the model.

- Second-stage equation :

$$E_i = \hat{\alpha} + \sum_{j=1}^{d} \hat{\beta}_j Y_i^j + \sum_{y=1986}^{2000} \delta_y D_{iy} + \varepsilon_i \tag{2}$$

$\hat{\alpha}$ and $\hat{\beta}_j$ are the estimated coefficients from the first stage regression. D_{iy} is a dummy variable taking 1 if the individual i is born in year y ; and 0 otherwise.

Main Results : Older cohorts

- Significant effect on older cohorts

	2006	2005	2004	2003	2002	2001
Born in 1986	0.933	1.091	1.391	1.399	1.410*	1.410*
	(0.0751)	(0.157)	(0.311)	(0.318)	(0.280)	(0.280)
Born in 1987	1.122	1.318*	1.325	1.333	1.243	1.244
	(0.0904)	(0.190)	(0.296)	(0.303)	(0.247)	(0.247)
Born in 1988	1.175**	1.380**	1.479*	1.469*	1.490**	1.490**
	(0.0947)	(0.199)	(0.330)	(0.334)	(0.296)	(0.296)
Born in 1989	1.164*	1.367**	1.352	1.341	1.473*	1.461*
	(0.0937)	(0.197)	(0.302)	(0.305)	(0.292)	(0.290)
Born in 1990	1.411***	1.640***	1.683**	1.659**	1.311	1.288
	(0.114)	(0.236)	(0.376)	(0.377)	(0.260)	(0.256)
Born in 1991	1.230**	1.438**	1.887***	1.856***	1.438*	1.414*
	(0.0991)	(0.207)	(0.422)	(0.422)	(0.285)	(0.281)
Born in 1992	1.536***	1.791***	1.789***	1.697**	1.270	1.211
	(0.124)	(0.258)	(0.400)	(0.386)	(0.252)	(0.241)
Born in 1993	1.447***	1.652***	1.878***	1.795**	1.461*	1.344
	(0.117)	(0.238)	(0.420)	(0.408)	(0.290)	(0.267)
Born in 1994	1.496***	1.681***	1.684**	1.535*	1.313	0.994
	(0.120)	(0.242)	(0.376)	(0.349)	(0.260)	(0.197)

Main Results in 2006

- Larger effects on younger cohorts ==> kids enter earlier at school
- Larger effects on girls ==> lower gender inequality
- Larger effects in initially deprived areas ==> lower regional inequality

	YC	Girls	PP areas
Born in 1995	2.188***	2.731***	3.805***
	(0.176)	(0.276)	(0.704)
Born in 1996	1.728***	2.305***	2.972***
	(0.139)	(0.233)	(0.550)
Born in 1997	1.974***	2.862***	3.926***
	(0.159)	(0.289)	(0.726)
Born in 1998	1.720***	2.608***	3.868***
	(0.138)	(0.263)	(0.715)

Main Results : Higher grades

- Early dropout from the third grade, particularly for girls

	1st grade (G1)		2nd grade (G2)		3rd grade (G3)	
	All	Girls	All	Girls	All	Girls
Born in 1990	1.411***	1.350***	1.680***	1.608***	1.766*	1.934
	(0.114)	(0.136)	(0.149)	(0.200)	(0.570)	(1.043)
Born in 1991	1.230**	1.299***	1.535***	1.565***	1.508	1.707
	(0.0991)	(0.131)	(0.136)	(0.195)	(0.487)	(0.920)
Born in 1992	1.536***	1.718***	2.001***	1.957***	1.780*	1.863
	(0.124)	(0.173)	(0.177)	(0.244)	(0.574)	(1.004)
Born in 1993	1.447***	1.610***	1.904***	1.709***	1.511	1.440
	(0.117)	(0.162)	(0.169)	(0.213)	(0.488)	(0.776)
Born in 1994	1.496***	1.672***	2.052***	1.739***	1.426	1.229
	(0.120)	(0.169)	(0.182)	(0.217)	(0.460)	(0.662)
Born in 1995	2.188***	2.731***	3.106***	2.768***	1.780*	1.563
	(0.176)	(0.276)	(0.275)	(0.345)	(0.575)	(0.843)
Born in 1996	1.728***	2.305***	2.565***	2.110***	1.160	0.918
	(0.139)	(0.233)	(0.227)	(0.263)	(0.374)	(0.495)
Born in 1997	1.974***	2.862***	2.867***	2.433***	0.803	0.630
	(0.159)	(0.289)	(0.254)	(0.303)	(0.259)	(0.339)
Born in 1998	1.720***	2.608***	2.118***	1.642***	0.334***	0.219***
	(0.138)	(0.263)	(0.188)	(0.205)	(0.108)	(0.118)

Robustness Checks

- No effect if rate of entry followed a quadratic trend.

	Primary G1			Secondary G1
	Cubic	Quadratic		Cubic
Born in 1990	1.419***	1.492**	Born in 1982	1.100
	(0.163)	(0.273)		(0.071)
Born in 1991	1.214*	1.243	Born in 1983	1.175**
	(0.139)	(0.227)		(0.076)
Born in 1992	1.482***	1.472**	Born in 1984	0.970
	(0.170)	(0.269)		(0.063)
Born in 1993	1.362***	1.306	Born in 1985	0.961
	(0.156)	(0.239)		(0.062)
Born in 1994	1.370***	1.263	Born in 1986	0.801***
	(0.157)	(0.231)		(0.052)
Born in 1995	1.943***	1.713***	Born in 1987	1.019
	(0.223)	(0.314)		(0.066)
Born in 1996	1.484***	1.245	Born in 1988	1.060
	(0.170)	(0.228)		(0.069)
Born in 1997	1.634***	1.297	Born in 1989	1.019
	(0.188)	(0.237)		(0.066)
Born in 1998	1.368***	1.021	Born in 1990	0.958
	(0.157)	(0.187)		(0.062)

Conclusions and Extensions

- Higher attendance rate in the first grade of primary school : larger effects for younger children, girls, and children living in deprived areas
- ==> reduced delayed enrolment and gender and regional inequalities
- But significant dropout from the third grade, particularly for girls
- Reduced cost of entry into school, but lower quality
- Improvement : using a logistic trend and provide statistical tests for heterogenous effects.
- Extension : Investigate the effects on educational achievements.

THANKS