

The Millennium Development Goals and Education: Accountability and Substitution in Global Assessment

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Research Question

How do attempts to promote international accountability for public goods provision (i.e., the Millennium Development Goals) alter the portfolio of public goods (i.e., education) provided by governments?

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- How do these effects vary depending on domestic accountability?

Hypotheses

International assessment has two effects on public goods provision:

- ① Increase provision of measured public goods
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- non-democracies
- opaque informational environment

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Part of a larger collaboration on 'global assessment power' (Kelley & Simmons, 2015)

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We're interested in complicating this picture by examining provision of portfolio of public goods

Global Assessment Framework

Assessment alters gov't incentives over provision of public goods:

- **Informational Effect:** Reporting on gov't achievement of intr'n'l standard informs public of performance – increases incentive to perform well
- **Material Incentives:** Intr'n'l bodies or other gov'ts link material benefits to achievement of assessment standards
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Same Substantive Effect: Boosts the power of gov't incentives to meet standards assessed by intn'l boides

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We should see substitution of gov't resources away from related, but unassessed, public goods due to intn'l assessment

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 - ▶ greater leeway to alter menu of public goods – minor sacrifice of material rents

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Particularly focus on goal of universal primary education

- single indicator: primary enrollment rates
- closely related, but unassessed public good: secondary school enrollment

Empirical Claims

- 1 The promulgation of the MDGs should boost primary enrollment rates.
- 2 The promulgation of the MDGs should reduce secondary enrollment rates (relative to primary).

Data Sources

Enrollment Rates UNESCO Institute of Statistics

Gov't Transparency HRV

Democracy DD

Economic Controls PWT version 6.3

Impute obs. for countries with more than 10 years of data (Amelia II)

114 countries, 1980-2010

Analysis 1: Do the MDGs Increase Primary Enrollment?

Varying intercepts hierarchical model:

$$\begin{aligned}\Delta P_{i,t} = & \alpha_i + \beta_1 \text{Transparency}_{i,t} + \beta_2 \text{Democracy}_{i,t} \\ & + I(t \geq 2000)[\gamma_1 + \gamma_2 \text{Transparency}_{i,t} + \gamma_3 \text{Democracy}_{i,t}] \\ & + \beta_3 \Delta rGDP_{i,t} + \tau_t + \epsilon_{i,t}\end{aligned}$$

where

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Hypotheses:

- $\gamma_1 > 0$
- $\gamma_2, \gamma_3 < 0$

Analysis 1: Results

Table: *The relationship between the Millennium Declaration to the primary school enrollment rate.*

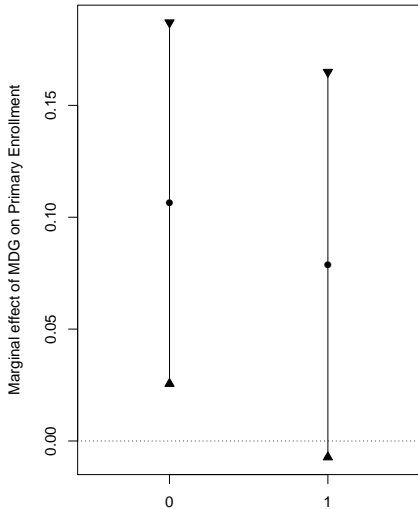
	<i>Dependent variable:</i>				
	Δ Primary Enrollment				
	(1)	(2)	(3)	(4)	(5)
MDG	0.047 (0.038)	0.060 (0.039)	0.095** (0.041)	0.097** (0.040)	0.106*** (0.041)
MDG:Dem			-0.062*** (0.023)		-0.027 (0.027)
MDG:Trans				-0.018*** (0.005)	-0.015** (0.006)
Observations	3,533	3,533	3,533	3,533	3,533
Lagged DV	Yes	Yes	Yes	Yes	Yes
Country RE	Yes	Yes	Yes	Yes	Yes
Year RE	Yes	Yes	Yes	Yes	Yes
Cubic Country Trends	Yes	Yes	Yes	Yes	Yes

Notes: Multi-level model analysis allowing for random effects by country and year. Lagged primary enrollment rate and cubic country-specific time trends not shown. Standard errors presented in parentheses.

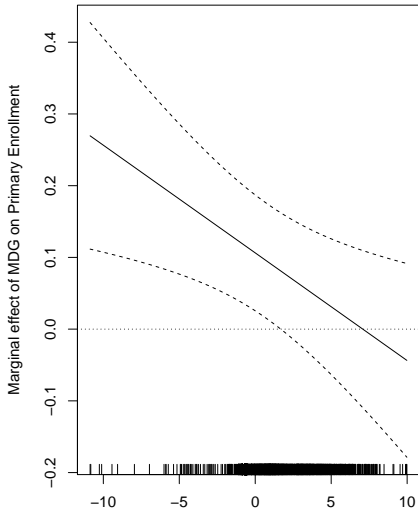
* $p < 0.10$, ** $p < 0.05$; *** $p < 0.01$.

Analysis 1: Graphical Results

MDG on Primary over Democracy



MDG on Primary over Transparency



Analysis 2: MDGs and Substitution (Part A, Ratio Analysis)

Fixed-effects model:

$$\begin{aligned} \frac{S_{i,t}}{P_{i,t}} &= \alpha_i + \rho \frac{S_{i,t-1}}{P_{i,t-1}} + I(\text{year} \geq 2000)[\gamma_1 \\ &\quad + \gamma_2 \text{Transparency}_{i,t} + \gamma_3 \text{Democracy}_{i,t}] \\ &\quad + \mathbf{X}_{i,t}\beta + \epsilon_{i,t} \end{aligned}$$

Analysis 2, Part A: Ratio Results

Table: *Ratio of Secondary-to-Primary Enrollment*

	<i>Dependent variable:</i>						
	$\Delta \frac{S_{raw}}{P_{raw}}$	$\Delta \frac{S_{adj}}{P_{adj}}$	$\frac{\Delta S_{raw}}{\Delta P_{raw}}$	$\frac{\Delta S_{adj}}{\Delta P_{adj}}$	$\Delta \frac{S_{raw}}{P_{raw}}$	$\Delta \frac{S_{adj}}{P_{adj}}$	$\frac{\Delta S_{raw}}{\Delta P_{raw}}$
	<i>LME</i>	<i>LME</i>	<i>LME</i>	<i>LME</i>	<i>OLS</i>	<i>OLS</i>	<i>OLS</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
MDG	-0.039*** (0.003)	-1.907 (2.794)	-5.282*** (1.263)	-11.020*** (2.428)	-0.028*** (0.003)	-0.156 (3.008)	-2.575* (1.346)
MDG:Trans	0.003*** (0.001)	0.404 (0.967)	0.944** (0.437)	1.825** (0.839)	0.006*** (0.001)	0.988 (1.088)	1.950*** (0.487)
MDG:Dem	0.008* (0.004)	0.890 (4.433)	1.072 (2.001)	2.162 (3.844)	0.011** (0.005)	1.452 (4.861)	1.974 (2.175)
Observations	3,306	3,306	3,306	3,306	3,306	3,306	3,306
R ²	-	-	-	-	0.676	0.296	0.074
Lagged DV	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Analysis 2 Part B: Error Correction Model (ECM)

Estimate:

$$\Delta P_{i,M,t} = \gamma P_{i,M,t-1} + \zeta_{i,M} S_{i,M,t-1} + \delta_{i,M} \Delta S_{i,M,t-1} + \epsilon_{i,M,t}$$

$$\zeta_{i,M} = \omega_{0,i} + \omega_{1,i} M_i + E_i$$

where,

$$\omega_{0,i} \sim \mathcal{N}(\alpha_{0,i}, U_{0,i})$$

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Which can be rewritten as:

$$\Delta P_{i,M,t} = \gamma [P_{i,M,t-1} - \beta_{i,M} S_{i,M,t-1}] + \delta_{i,M} \Delta S_{i,M,t-1} + \epsilon_{i,M,t}$$

Substitution and ECM 'Equilibrium'

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- but can (should) do this in one stage as multilevel model

Analysis 2 Part B: Results

Table: β Substitution Tests

	<i>Dependent variable:</i>			
	$\beta_{i,M}$			
	(1)	(2)	(3)	(4)
MDG	0.164*** (0.040)	0.248*** (0.074)	0.289*** (0.072)	0.285*** (0.076)
MDG×Dem		-0.146* (0.084)		0.008 (0.099)
MDG×Trans			-0.061*** (0.019)	-0.061*** (0.023)

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

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Estimate flexible functional forms: VAR models

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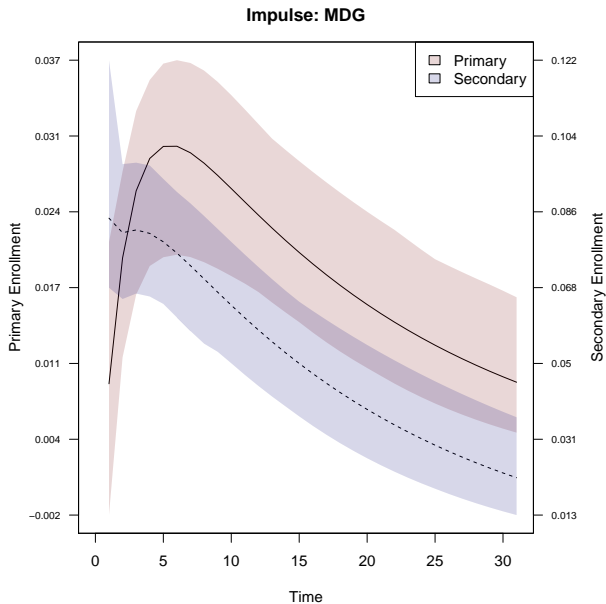
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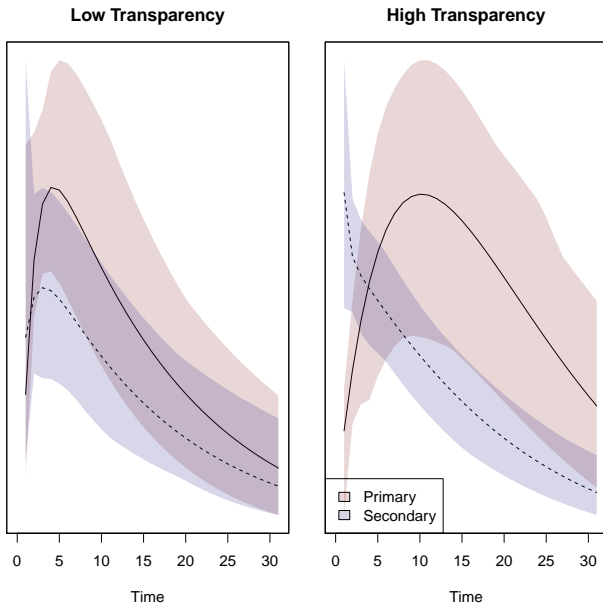
Estimate flexible functional forms: VAR models

- multi-equation system, with both P and S as outcomes
- regress on 4 lags of one another, MDG indicator, institutional covariates

Analysis 2 Part C: Results



Analysis 2 Part C: Results (Heterogeneity)



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Further implication: Settings in which global assessment is most effective are also most prone to second-order substitution effects