

# Lectures on Fertility, Education, Growth, and Sustainability

## 2c. Empirical Evidence

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March 2012. Ref: De la Croix and Doepke, REStud, 2009

# Empirical Evidence

Rudimentary empirical evidence of the testable implications of the model.

- The rich prefers private schools
- More inequality → more private education  
higher public school quality
- Fertility depends on public school quality
- Multiple equilibria in non-democracies

Data: Aggregate US State data, US census, PISA international data, OECD macro data, WDI data

## Aggregate US State data

	Gini coef.	Priv. school share
Private school share	0.36 (2.65)	
Public spending per capita	-0.45 (-3.51)	-0.08 (-0.58)
Public spending per student	0.26 (1.84)	0.55 (4.57)
Public instruction spending per student	0.18 (1.23)	0.53 (4.34)
Mean teacher salary in public schools	0.25 (1.77)	0.61 (5.33)
Average number of children	-0.48 (-3.74)	-0.27 (-1.91)

Correlation between inequality and share of private schooling: +

Correlation between inequality and per-capita spending on public education: -

Does more inequality lead to less redistribution?

No, quality of public education positively correlated with inequality

## Households choices - US census

### Ordered Logit: Number of Children on Income and Quality of Public Education

	Measure of quality of public education		
	Total expend. per student	Instruction expend. per student	Mean teacher salary
Log household income	-0.012 (-1.11)	-0.808 (-3.15)	-0.688 (-1.09)
Interac. income $\times$ quality	0.089 (3.15)	0.080 (3.07)	0.063 (1.07)
Total income effect at average quality	-0.012 (-1.11)	-0.013 (-1.27)	-0.013 (-1.13)

## Households choices - US census

### Logit: Choice of Private Schooling on Income and Quality of Public Education

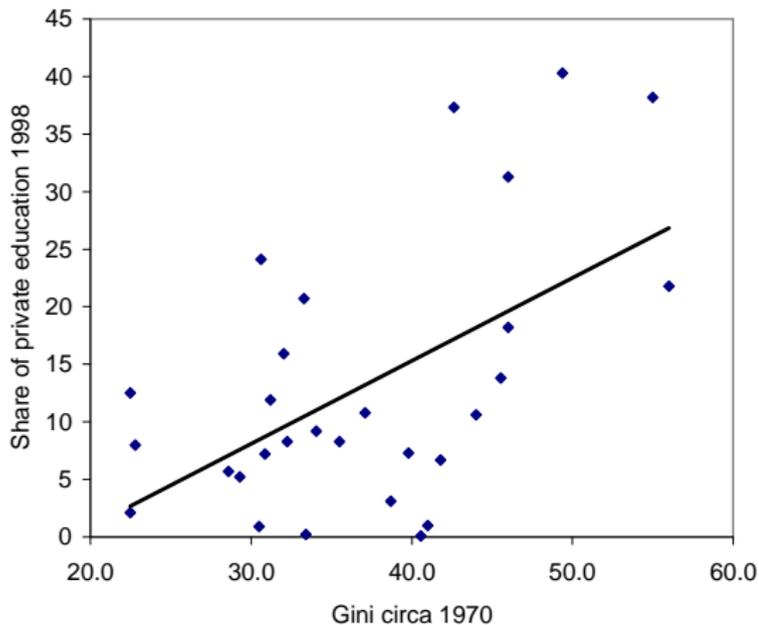
		Measure of quality of public education		
		Total expend. per student	Instruction expend. per student	Mean teacher salary
Log household income	0.542 (18.82)	3.815 (5.59)	3.106 (5.80)	4.838 (2.52)
Interaction income $\times$ quality		-0.367 (-4.83)	-0.304 (-4.84)	-0.402 (-2.22)
Total income effect at average quality	0.542 (18.82)	0.553 (29.34)	0.553 (27.67)	0.550 (22.81)

Effect of income on household choices diminishes as the quality of public schooling goes up

In States with high-quality public schooling ( $\approx$  fully public regime), most parents use public schools *regardless* of income, and fertility varies little across income groups.

## Private funding in a cross-section of countries

Income Inequality (1970)  $\rightarrow$  share of private funding (1998).



correlation:  $\approx 0.5$

## Results using the PISA data

- Negative relation between public subsidization and social class (18 countries over 27).
- Fully public: High subsidization + no difference across social class  
in the Czech Republic, Denmark, Finland, Germany, Iceland, The Netherlands, Norway, and Russia.

Highest segregation: Australia, Austria, Brazil, Mexico, and Spain.

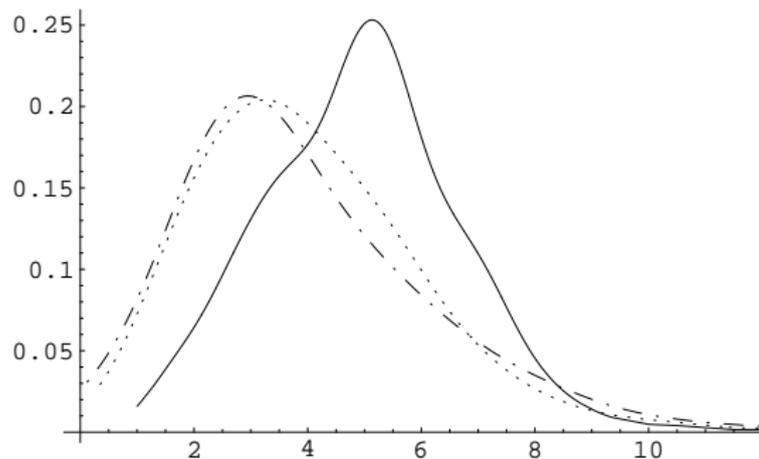
- Fertility of the lowest social group above the fertility of the highest social group (all countries).  
Differential fertility is large in the high segregation countries

## Segregation is associated with low subsidization

	N. of countries	Gini in the 1980s	Share of public funding	Funding diff. betw. poor and rich	Fertility diff. betw. poor and rich
Fully public regime	11	24.7	0.96	0.00	0.36
Segregation regime	18	34.6	0.81	0.14	0.47
Top 5 most segregated	5	44.6	0.69	0.25	0.69
Correlation with Gini			-0.58 (3.65)	0.76 (5.96)	0.53 (3.21)

## Density of Public Education Spending/ GDP

Free, Partially-Free and Non-Free countries (1967-2001). 2500 obs.



Variance across non-free countries higher.

The multiple equilibria result provides an explanation.

## Saudi Arabia and the United Arab Emirates

Oil-rich countries, similar in many respects, low scores on the democracy index → Education systems similar ??.

Saudi Arabia spends 6.15 percent of GDP on public education, while the Emirates only spend 1.87 percent.

Our interpretation: The quality of public education is so low that rich people prefer private schooling for their children, which perpetuates the existing regime of low public spending.

But a high-quality public schooling system could be supported in the Emirates as well.