

# Manufacturing Growth and the Lives of Bangladeshi Women

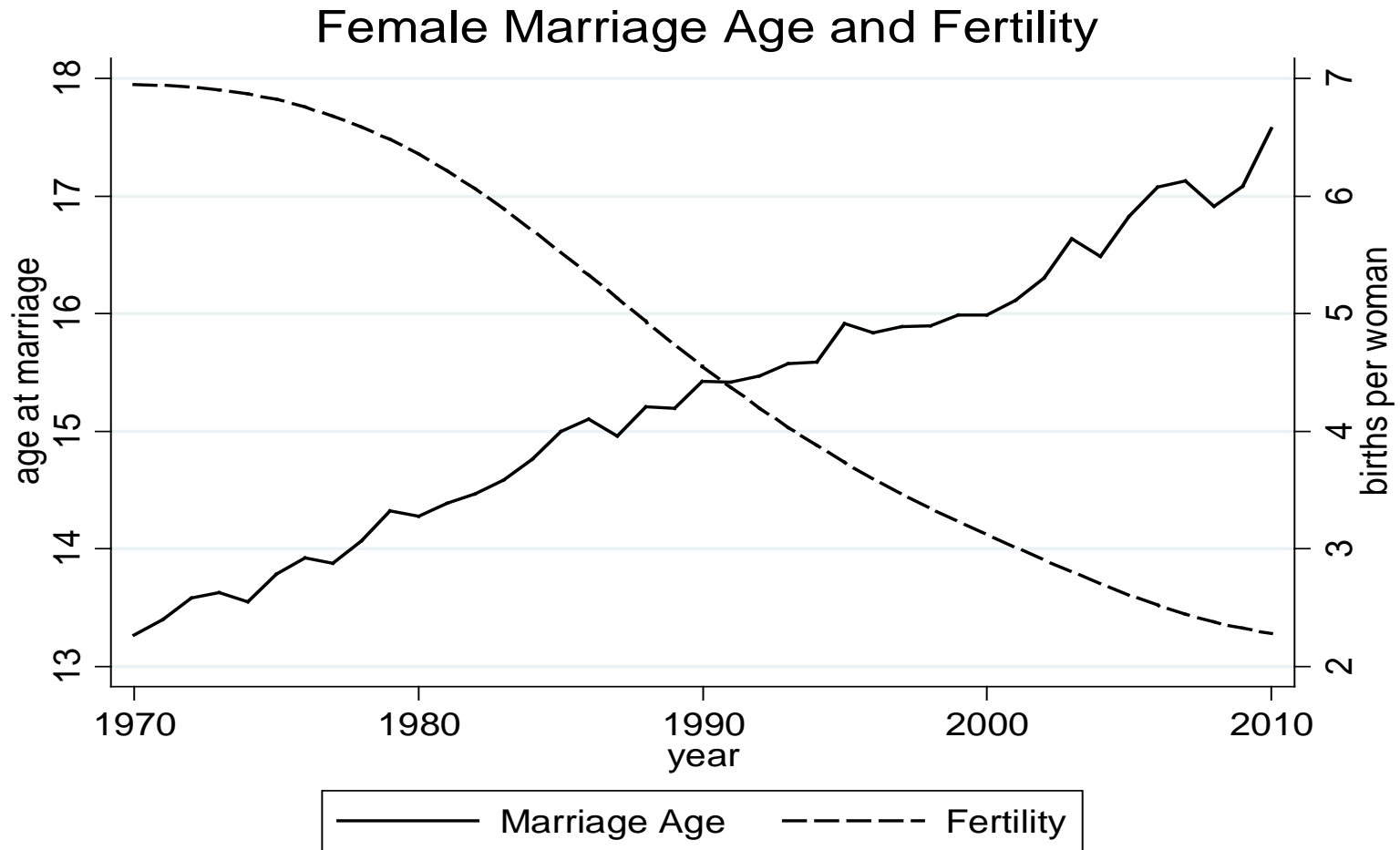
Rachel Heath

University of Washington, Seattle

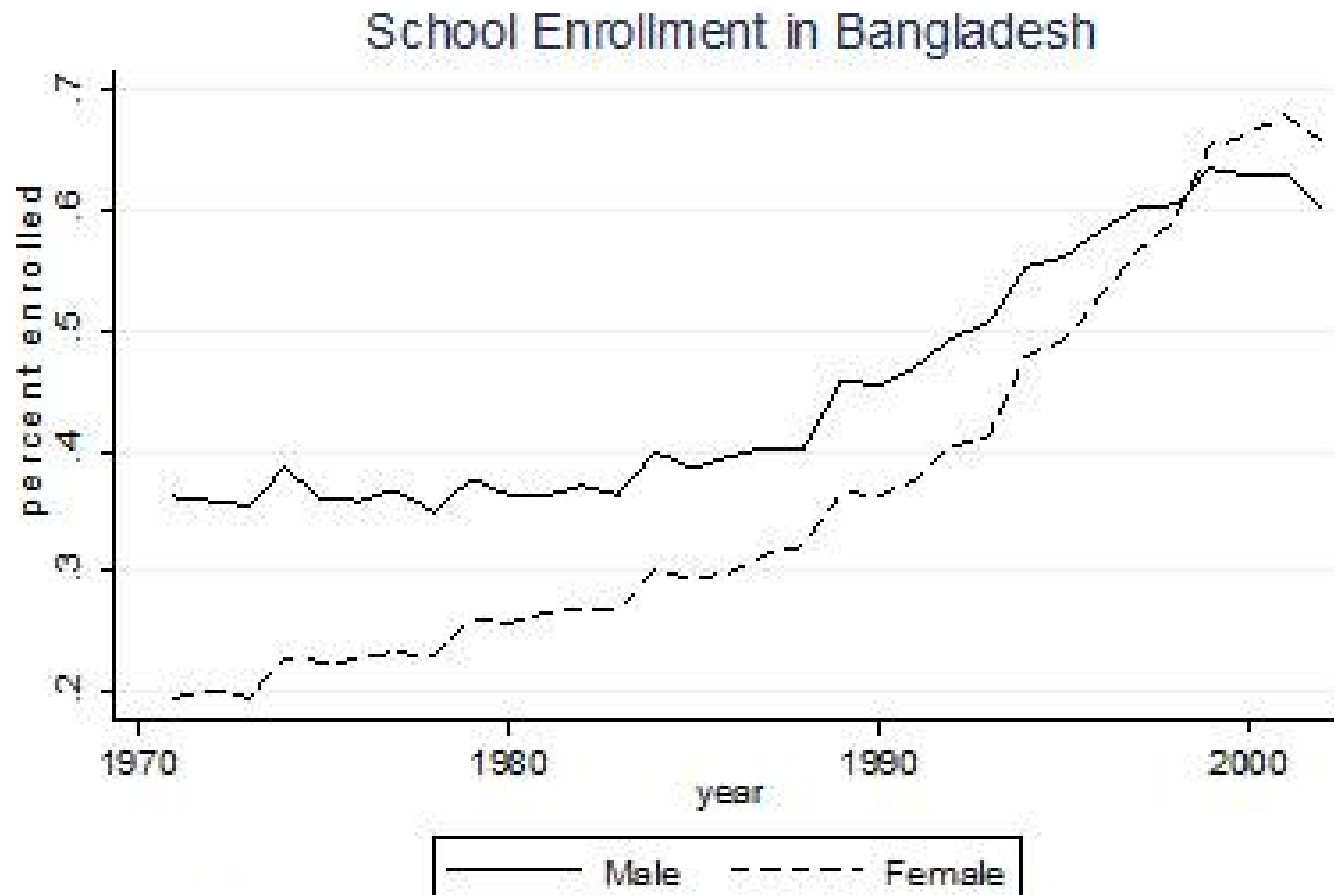
Ahmed Mushfiq Mobarak

Yale University

# Some Exciting News from Bangladesh



# 3<sup>rd</sup> Millennium Development Goal: Gender Equity in Enrollments



# Coefficients on a Bangladesh Dummy in Cross-Country Education Regressions

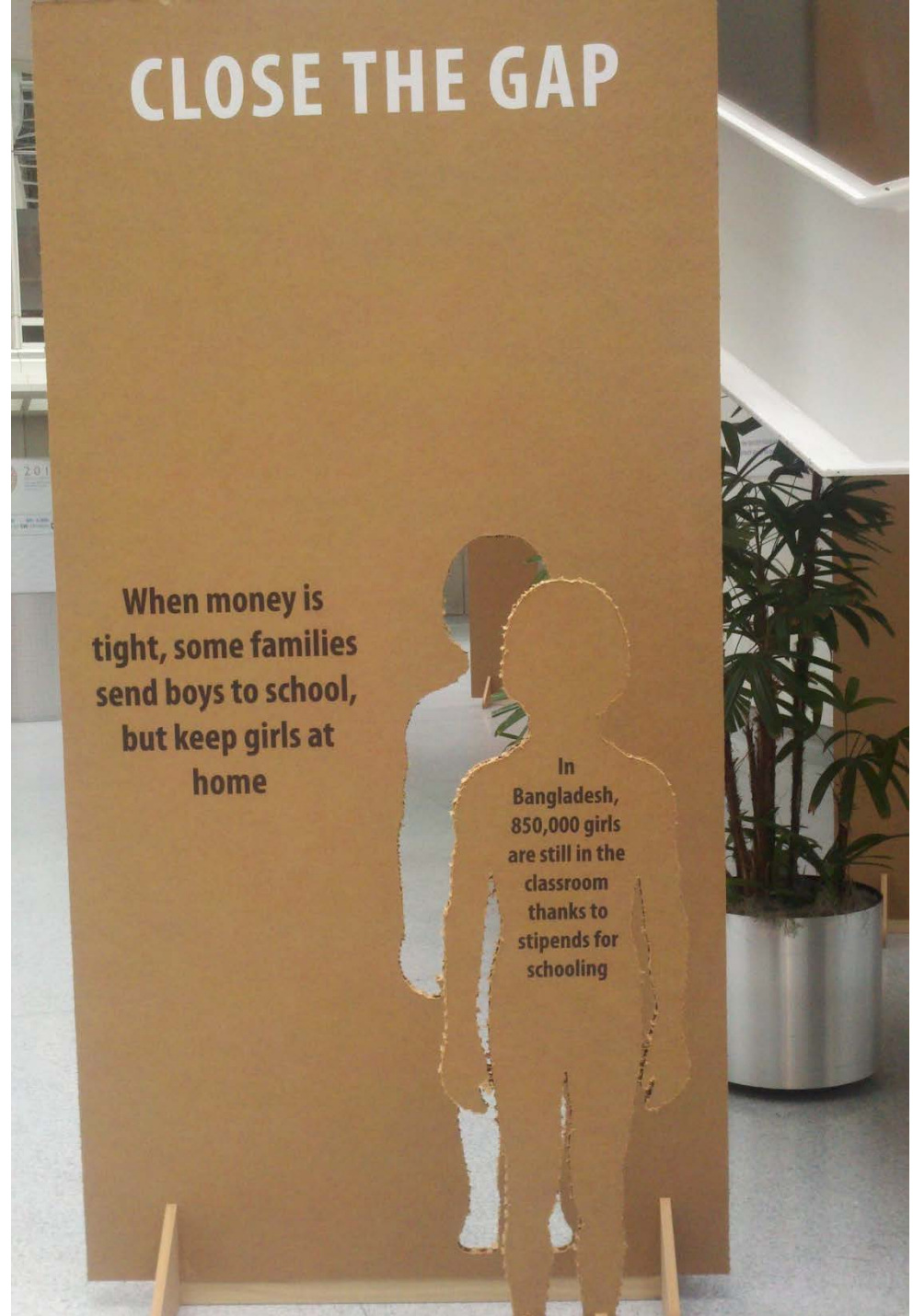
1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010
School enrolment, primary, male (% gross)							
20.76*** (4.08)	6.88 (5.06)	-10.56** (4.77)	-8.53* (4.32)			-1.88 (2.66)	-7.02** (2.82)
School enrolment, primary, female (% gross)							
1.94 (4.51)	-6.63 (5.10)	-14.78*** (5.36)	-9.62** (4.85)			14.34*** (3.10)	7.63** (3.22)
School enrolment, secondary, male (% gross)							
12.80*** (1.89)	3.59 (2.62)	2.28 (2.26)	-0.77 (2.68)		8.30*** (2.66)	4.73* (2.41)	-3.39 (2.34)
School enrolment, secondary, female (% gross)							
3.09* (1.76)	-5.35** (2.51)	-4.60** (2.30)	-5.12* (2.66)		13.80*** (2.92)	14.84*** (2.57)	6.12** (2.35)
School enrolment, tertiary, male (% gross)							
2.60*** (0.58)	2.18*** (0.73)	3.66*** (0.75)	3.51*** (0.52)		-0.67 (1.16)	-0.70 (1.25)	-1.25 (1.54)
School enrolment, tertiary, female (% gross)							
0.16 (0.40)	0.24 (0.52)	0.69 (0.59)	0.72 (0.55)		-2.08* (1.21)	-2.87** (1.38)	-4.76** (2.10)

Source: Asadullah et al 2012

# What are the underlying causes of gains in girls' schooling?

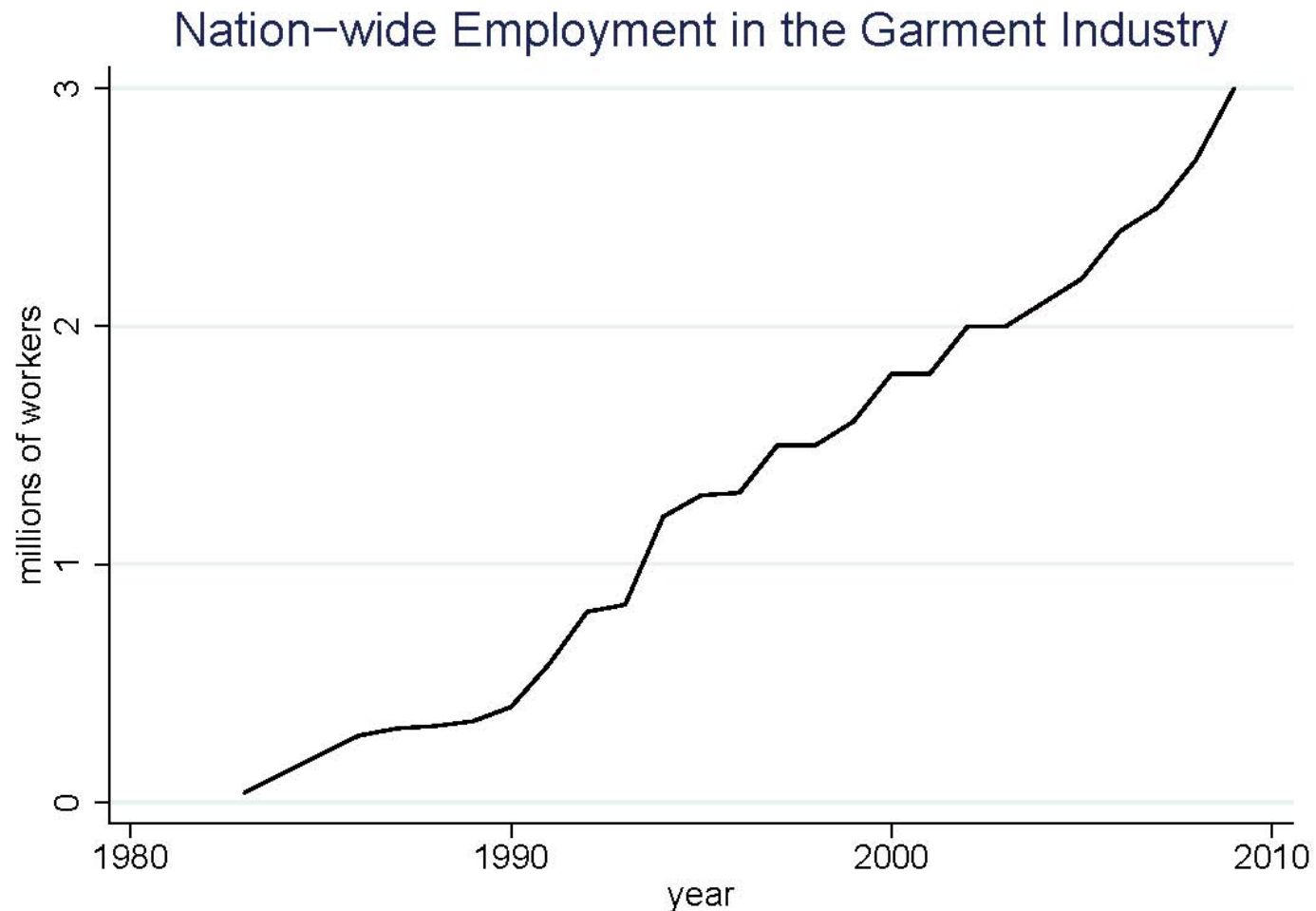
- World Bank and Government of Bangladesh have claimed credit on behalf of the “Girls’ School Stipend program”
  - A monthly stipend of 25 to 60 taka given to girls enrolled in secondary school since 1994, provided that they
    - Maintain an attendance rate of 75 percent
    - Achieve 45 percent marks on term and annual exams
    - Remain unmarried
- World Bank reports:
  - “*Stipends Triple Girls Access to School*”
  - “*There is no systematic evaluation that shows the causal effect of the program on increased enrolment of girls in schools, yet nothing else can explain the exponential increase in gender parity.*”

**From the World Bank MC  
Building Lobby, April 17, 2012**



# Is there a demand-side to the story?

(Changes in market conditions that determine the returns to investing in education)



# The RMG Sector

- The Ready-made garment industry did not exist in 1980, but now constitutes
  - 79 percent of Bangladesh's export earnings
  - 14 percent of GDP
- Average yearly labor force growth of 17.3 percent, 1983 to 2010
- Now employs ~4 million workers
- Represents a larger labor market innovation for women
  - 15% of women aged 16-30 nationwide works in sector
  - (35% in the garment proximate villages in our sample)
- Factory jobs reward cognitive skills, ability to follow directions, coordination (assembly line work), read English signs, and do basic math
- Factories administer reading and arithmetic tests





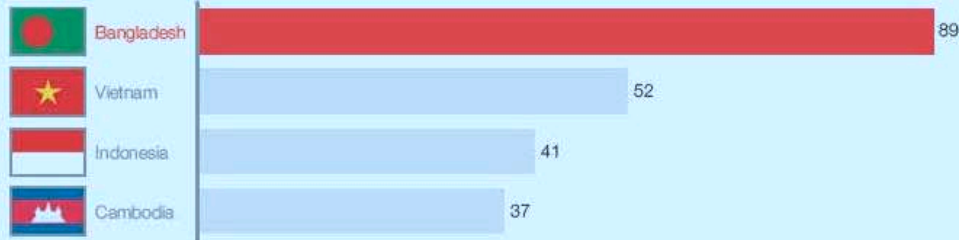




For most CPOs, Bangladesh will be the No. 1 sourcing hot spot over the next 5 years

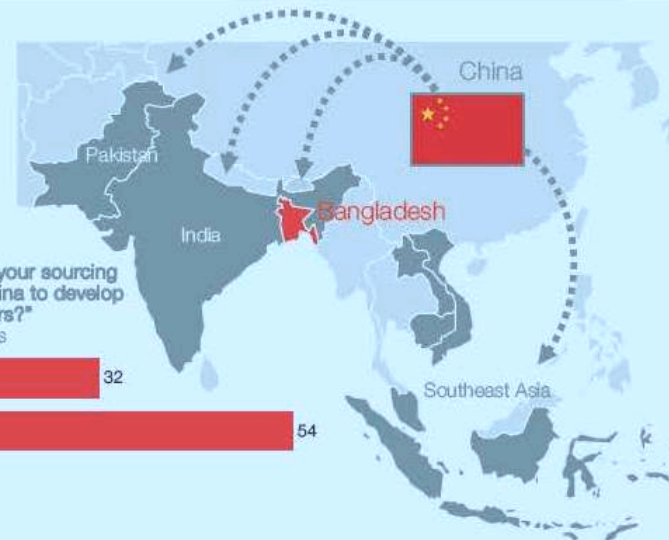
"What are your top 3 sourcing country hot spots within the next 5 years?"

Percent of respondents



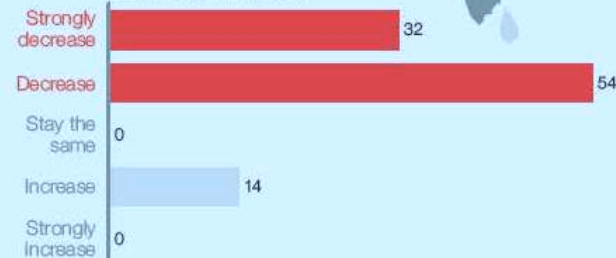
SOURCE: McKinsey CPO survey, September - November 2011

CPOs plan to shift a large share of their sourcing value away from China to other countries over the next 5 years



"How do you expect your sourcing share (value) from China to develop during the next 5 years?"

Percent of respondents



SOURCE: McKinsey CPO survey, September - November 2011

# Mechanisms

- The presence of garment factories increase returns to education, and parents respond by keeping daughters in school
  - Sewing and stitching require fine motor skills. Women have an absolute (and comparative) advantage
  - In our sample, women employed in RMG earn 13.7% more than women of same education and experience employed elsewhere
  - Within RMG, wages are 3.67% greater for an extra year of education
  - Factory proximity matters for job access since parents prefer to keep daughters at home.
- Income effect: mother now has access to a factory job
  - We have data on parents' work status
- Factory opening induces school drop-out
  - We will differentiate enrollment effects by age

# Mechanisms

- Girls may delay marriage and childbirth either due to:
  - the extra educational investments at younger ages, or
  - factory work at older ages
- Access to jobs raises the opportunity cost of getting married and raising children
- Early marriage and childbirth associated with a range of adverse development outcomes for women and children (e.g. Jensen and Thornton 2003)

# The Survey

- Survey of 1400 households in Dhaka and Gazipur
- 44 villages within commuting distance of garment factories, and 16 not.
- Rural households in relatively close proximity to Dhaka, not workers in dormitories
- Retrospective schooling and work histories of all offspring of household head (plus migration and marriage/child-bearing histories)



# Identification

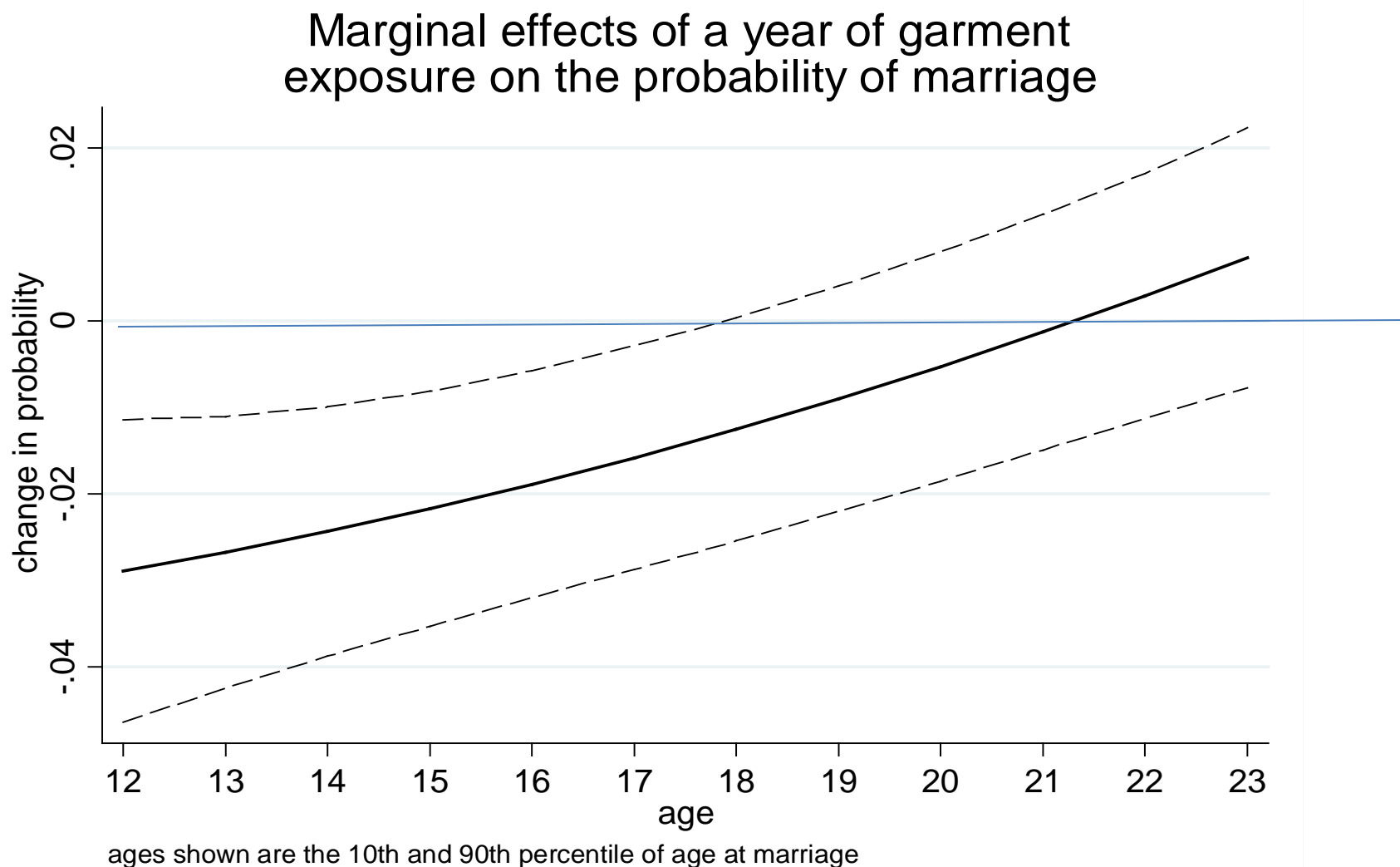
- Triple difference:
  - by a village's proximity to garment factories;
  - over time as more factories open; and
  - by gender as the factories represent new opportunities for girls more so than for boys
- To avoid household or person level selection, we use proximity rather than job choices
- Compare girls living within commuting distance of factories to:
  - Girls in the same district, but further away
  - Girls in earlier years (before factory opened)
  - Boys in the same village, or same household

# Marriage and Child-bearing

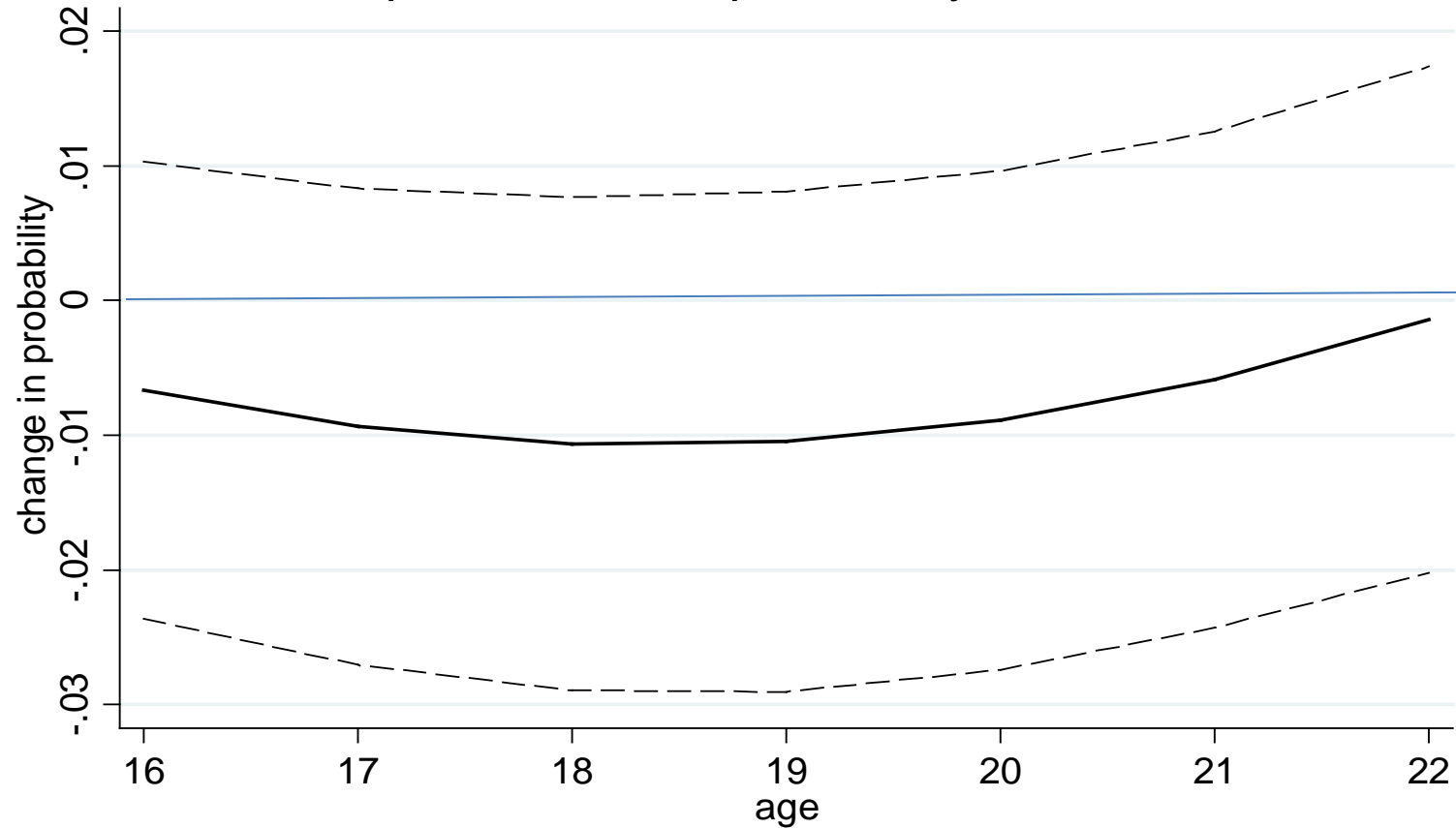
- Girls living in garment-proximate villages where factories have operated for 6.4 years (sample average exposure) have a **0.3 percentage point** lower probability of getting married by that year relative to control group
  - Represents a **28% drop** in the hazard of marriage
- They are also **0.23 percentage points** less likely to have given birth by that year
  - Represents a **29% drop** in the hazard of child-birth
- No significant effect on boys



# Does Marriage Postponement Vary by Age?

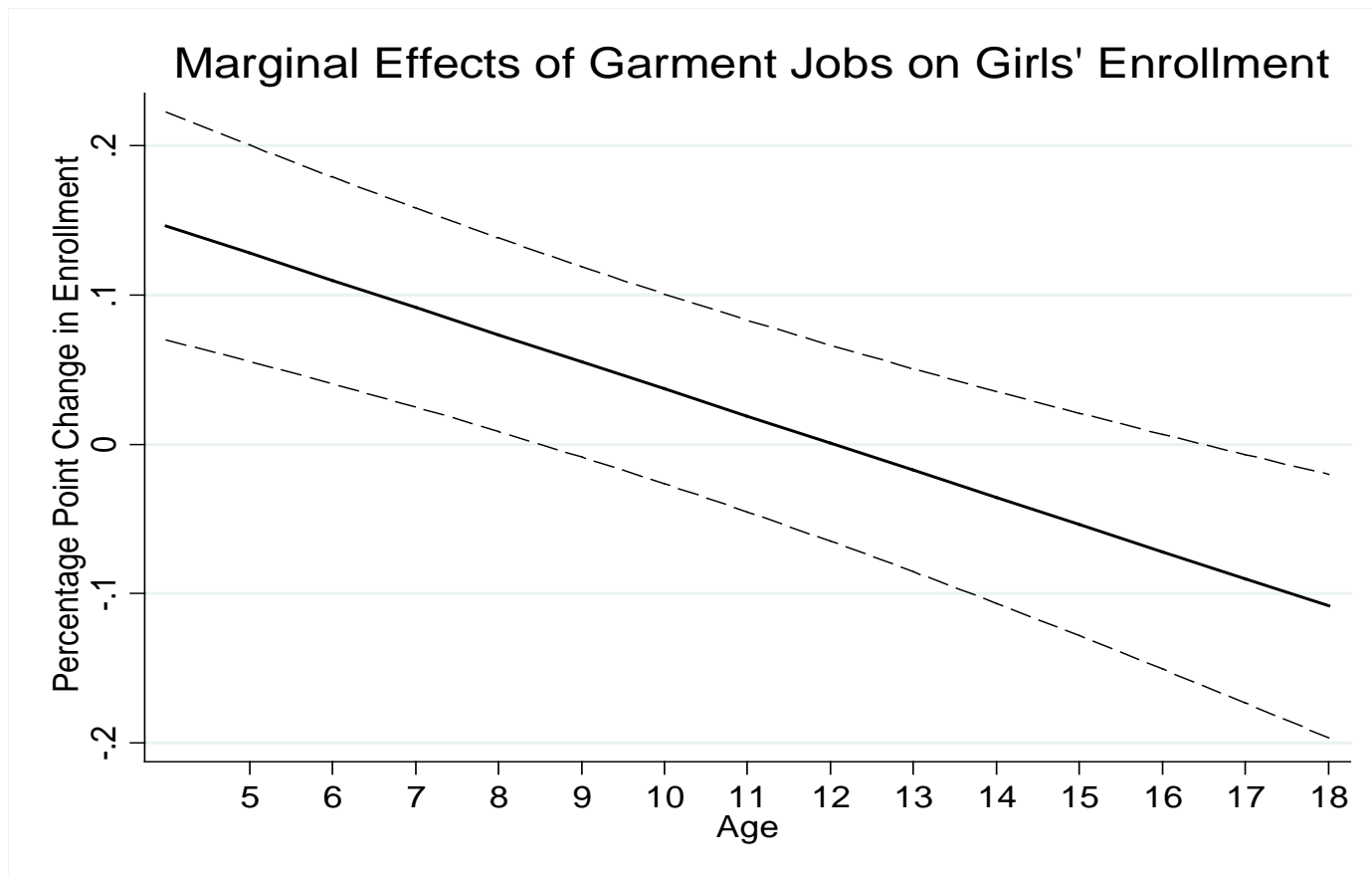


## Marginal effects of a year of garment exposure on the probability of first birth



ages shown are the 10th and 90th percentile of age at first birth

- Each year of exposure to garment factories increases boys' educational attainment by 0.26 years and girls' by 0.48 years.
- The gender gap in education closes by 1.5 years on average due to factory presence



# Factory Work

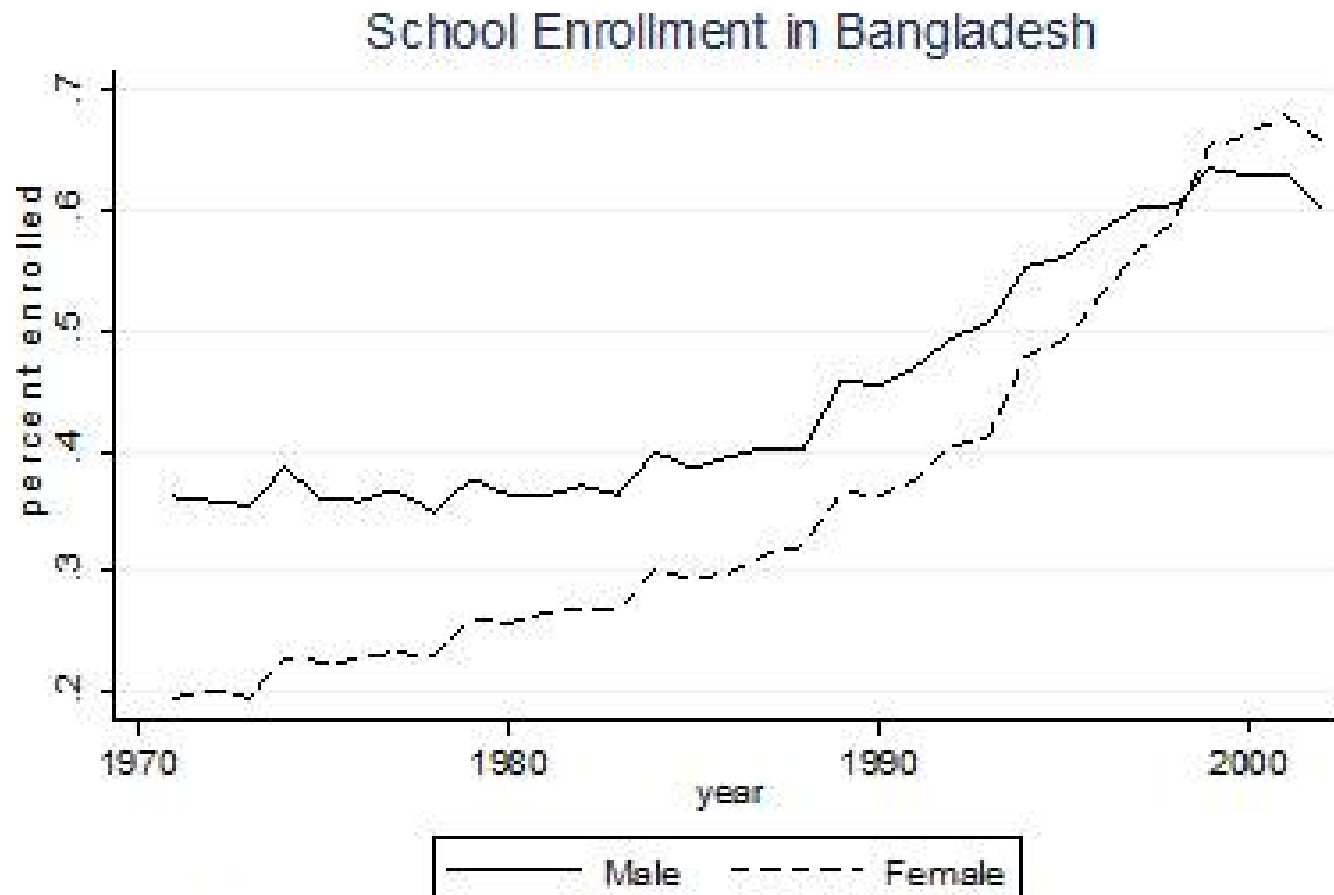
Table 8: Effects of the Garment Industry on Female Labor Force Participation  
(Dependent Variable = 1[Ever Worked])

Garment village	0.154***	0.0650**	0.0455
	[0.0313]	[0.0315]	[0.0392]
Garment village X exposure between ages 10 to 29		0.117**	
		[0.0473]	
Garment village X exposure between ages 30 to 49		-0.0426	
		[0.0751]	
Garment village X exposure between ages 10 to 23			0.127**
			[0.0537]
Garment village X exposure between ages 24 to 39			0.0677
			[0.0587]
Observations	917	917	917
R-squared	0.161	0.164	0.171
Mean dependent variable	0.215	0.215	0.215

# Estimate of the effects of the FSP

- Evaluate the Female Stipend Program using another triple interaction:  $Post1994 \times Female \times In\ school\ 6\ years$ 
  - Compare girls' enrollment to boys' enrollment post 1994.
  - Compare girls of school age when the program started to their sisters who were not of school age.
- Small Effects
- Data suggest that factory expansion was the more likely cause of girls' enrollment gains (and marriage and fertility postponement) in Bangladesh.

# Trend in girls' enrollment pre-dates FSP



# Conclusions

- Extrapolating from our estimates, 14.8 percentage points of the national gain in girls' enrollment could be attributed to garment sector growth
- Education policy in developing countries is closely tied to trade policy or industrial policy
- Enrollments strongly respond to the arrival of jobs
- Manufacturing growth also improves welfare for young women, as they avoid early marriage and childbirth

# Why does this all matter?





# Rana Plaza Disaster

- Recent factory fires and collapses in Bangladesh (e.g. Rana Plaza) captured the world's attention
- Large buyers as well as the U.S. government subsequently made moves to restrict or boycott garment exports from Bangladesh
- Such boycotts have the potential to harm the same workers that the restrictions are designed to protect.
- Imperative to rigorously evaluate the full range of welfare effects of factory jobs, and not only rely on anecdotes from anti-sweatshop activists.

Extra slides after this. not for presentation

**END**

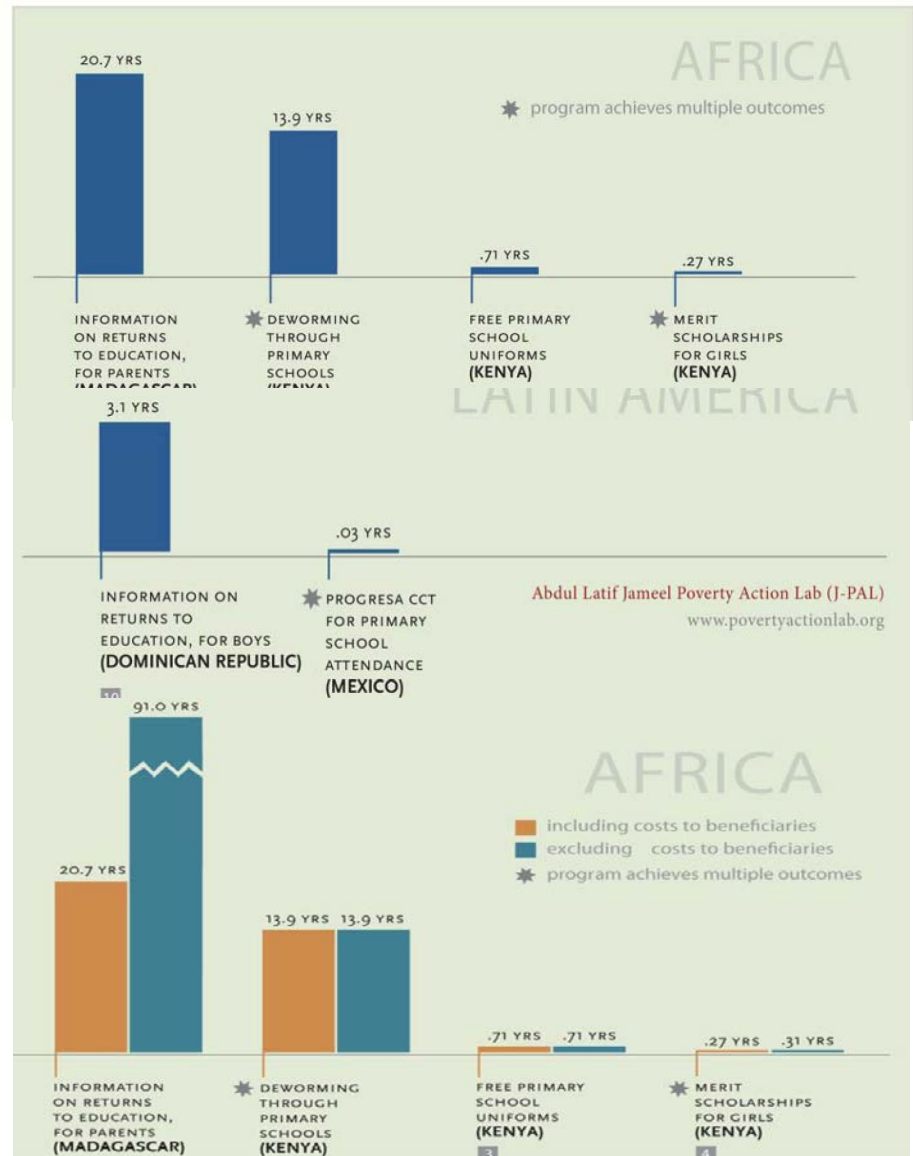
# Comparing Effect Sizes

- Garment factory growth can explain the entirety of the girls' enrollment gains [both absolutely, and relative to boys] in garment proximate areas
  - That growth in enrollment was 27 percentage points (0.22 in 1983 to 0.49 in 2000)
- About 20-25% of the national growth in girls' enrollment
- Progresa (three years of monthly cash grants equivalent to 1/4<sup>th</sup> of average family income):
  - increased enrollment by 3.4-3.6 percentage points in Mexico. 14.8 (6.5) percentage points for older girls (boys)
- Providing free school uniforms increases enrollment by 2-2.5 percentage points (from a base of 82-88%)
- Jensen (2010): revising perceived returns to education upward reduces dropout by 3.9 percentage points (7%)

# Concluding Remarks

- The garment sector in Bangladesh has been an important contributor to human development
- Policy can affect demand-side factors
  - e.g. trade policy (e.g. the African Growth and Opportunities Act)
  - Trade-policy induced industrialization (Badiani 2009)
- The demand-side can be a cost-effective policy lever

COST-EFFECTIVENESS: ADDITIONAL YEARS OF STUDENT PARTICIPATION PER \$100



# Supply-wallahs

- Characteristic of academic and policy focus on supply-side strategies to increase enrolments:
  - MDG #2 places a priority on ensuring that "there are enough teachers and classrooms to meet the demand" (United Nations, 2010)
  - 95% of all Indian children has access to a school within half a mile (PROBE Team, 1999)
  - 2002 No Child Left Behind Act ties financing to school performance,
  - the U.S. Department of Education 'Blueprint for Reform' focuses on teacher quality
  - President Barack Obama 2012 'State of the Union' address: "...every state [should] require that all students stay in high school until they graduate or turn 18"

# Academic Literature

- Mostly supply-side strategies:
  - Burde & Linden (2010) and Duflo (2001) on building schools,
  - Duflo et al. (2008) on decreasing class size and tracking,
  - Duflo et al. (2009) on rewarding teachers for attendance,
  - Glewwe et al. (2009) on providing textbooks,
  - Banerjee et al. (2007) on remedial education programs,
  - Muralidharan & Sundararaman (2011) on teacher incentive pay
  - Glewwe et al. (2004) on flipcharts
  - Rawlings & Rubio (2005) on conditional cash transfers.
- Definitions:
  - “Supply Side” = fixing imperfections in schooling access, inputs and quality (including parents lacking funds to send children to school),
  - “Demand Side” = conditions in the market that determine the returns to investing in education.

# Related Literature

- RCTs changing *perceptions of* the returns to education through informational interventions.
  - Jensen 2010a (DR), Jensen 2010b (India), Nguyen 2008 (Madagascar), Dinkelman and Martinez (Chile)
- Schooling decisions after the returns to specific skills improved in India
  - Farmer comprehension of new agricultural technologies (Foster & Rosenzweig, 1996; Badiani, 2009)
  - English language skills and IT service jobs (Munshi & Rosenzweig, 2006; Oster & Millett, 2010; Shastry, 2011)
- Atkin (2012) for Mexico

# Estimating equation

$$\begin{aligned} \text{Enroll}_{ivft} = & \beta_0 + \delta_f + \lambda_t + \lambda_t \times \text{Female}_{ivft} + \beta_1 \text{Age}_{ivft} \\ & + \beta_2 \text{Female}_{ivft} + \beta_3 \text{Female}_{ivft} \times \text{Age}_{ivft} \\ & + \beta_4 \text{Garment Village}_{ivft} \times \text{Female}_{ivft} \\ & + \gamma_1 \log(\text{Garment Jobs})_t \times \text{Garment Village}_{ivft} \\ & + \gamma_2 \log(\text{Garment Jobs})_t \times \text{Garment Village}_{ivft} \times \text{Female}_{ivft} \\ & + \varepsilon_{ivft} \end{aligned}$$

child  $i$  in family  $f$  living in village  $v$  at year  $t$

- Household (or sibling) fixed effects,
- Year fixed effects interacted with a dummy for female (Flexible gender-specific time trends in enrollment)
- Control for different baseline enrollments for females in garment villages (interaction between a female dummy and an indicator for garment village.)



# Research question

- How much does the enrollment probability of a girl living in a garment-proximate village increase *relative to her brother* with national factory growth, in comparison to that same sibling differential in a control village?
- Investments in infrastructure in garment-proximate villages would be equally likely to affect boys' and girls' enrollment patterns.
- The remaining objects of concern would be investments that are gender-specific.