

Impact of Female Labor Force Participation on Child Outcomes: Evidence from a Employment Guarantee Program

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Research Question

Effect of mother's employment on the child's educational outcomes.

- Focus on the participation of women in an employment guarantee program in India (policy employed mothers) versus women employed in the regular labor market (independently employed women).
- Utilize the natural experiment of introduction of an employment guarantee program.

Motivation

- 2 main channels through which employment guarantee schemes influence schooling decisions of children of household¹:
 - direct impact via the **income effect**, i.e. an increase in income would lead to more expenditure on the education of the children
 - indirect **substitution effect**, where increased employment would lead to an increased burden on children's time to either work on farms or in the household.
- Multiple studies focused on impact of MGNREGA on targeted households with conflicting results: Afridi et al (2012); Li and Sekhri (2013); Das and Singh (2014); Mani et al. (2014).

What I do

- Collect data using the survey data from India Human Development Survey I and II and the pre and post program introduction to analyse the impact of labor participation of mothers on children's education.
- I use multivariate analysis and propensity score matching and I add information about mother's work status during the pre program period, which accounts for endogeneity associated with willingness to participate in labor force.

Definitions

- **District:** It is an administrative division of an Indian state or territory. There are 713 districts in India
- **Gram Panchayat:** It is an old system of local government still followed in India. Panchayati Raj Act (73rd Amendment) in 1992 which involved 1) 3 tier Panchayati Raj for states with population over 2 million, 2) elections every 5 years, 3) reservations for backward classes and women. Local government bodies

Background: MGNREGA

- Largest employment guarantee scheme in the world and was introduced by Government of India in 2005
- Guarantees "right to work" to every rural household at a minimum wage
- 100 days of guaranteed employment per household at minimum wage
- Reservation of one-third work-days for women
- Provides child-care for all children below 6 years of age at job sites
- Work provided within 5 kms of where the household resides

Background: MGNREGA

- Household applies for job card, which identifies households as beneficiaries.
- Household member applies for job (to the Gram Panchayat), supposed to receive work within 15 days or are entitled to unemployment benefits.
- Focus of projects undertaken under the Act is improvement of local infrastructure
- Wage to material ratio is 60:40 and no machinery allowed
- Minimum wage rate set by the Central Government of India
- State government takes care of the unemployment allowance in case jobs are not available
- Generated 2.68 billion person days of employment in 2018-19

1. First and second round of Indian Human Development Survey (IHDS) conducted in 2004-05 and 2011-12
2. Nationally representative, multi-topic survey of 41,554 households in 1503 villages and 971 urban neighbourhoods across India
3. Approximately 83% of households from IHDS-I were re-interviewed
4. Survey divided into modules: 1) interview with household head, 2) tests administered to children 8-11, 3) Interview with ever married women aged 15-49, 4) Assessment of village infrastructure, 5) Facilities of one public and one private school in the area

Data: Child Specific Characteristics

1. Children aged 8-11 completed short reading, writing and arithmetic tests (which is my main variable of interest)
 - Test conducted in 13 languages
 - **Reading Test:** could not read at all-0 points. 1 point for letters; 2 points if they could read a word. Reading a paragraph 3 points and a story 4 points.
 - **Math Test:** could not identify numbers 0 points, 1 point identifying numbers; 2 points for subtraction and 3 points for division
 - **Writing Test:** 1 point if they could write a paragraph with 2 or less mistakes, and 0 points otherwise.
2. Hours spent at school every week- a self reported variable is also included.

Data: Parent and Household Specific Characteristics

1. Data about whether mother is policy-employed or independently employed, if mother worked during first survey (2005).
2. Education of the mother and father
3. Household income and assets owned
4. Demographic and economic characteristics of household

Sample limited to married women in rural areas where data from both surveys is available.

Final sample of 2427 children with corresponding information about the mother and household from both surveys.

Summary Statistics of Variables Used

Table 1: Summary statistics for working and non-working mothers

Variable	Working		Not Working
	MGNREGA	Independent	
<i>Child Characteristics</i>			
Test Score	4.65 (2.74)	5.03 (2.73)	5.44 (2.66)
Sex (Male =0, Female=1)	.48	.48	.46
Age(Yrs)	9.51 (1.12)	9.50 (1.11)	9.52 (1.11)
Distance to School(Kms)	1.76 (4.55)	1.93 (2.30)	2.10 (2.62)
Hours in School/Week	34.22 (7.80)	33.11 (7.34)	32.37 (7.96)
<i>Mother's Characteristics</i>			
Worked during IHDS-I	0.42	0.26	0.09
Age(Yrs)	34.51 (5.88)	34.48 (5.70)	34.32 (5.46)
Education Completed	2.45 (3.42)	3.88 (4.39)	5.41 (4.51)

Summary Statistics of Variables Used

<i>Father's Characteristics</i>			
Education Completed	4.93 (4.34)	6.47 (4.66)	7.71 (4.76)
Work	.98	.99	.93

<i>Household Characteristics</i>			
Household Size	5.95 (1.91)	6.48 (2.42)	6.77 (2.92)
Assets owned by the HH	11.21 (4.77)	12.87 (5.91)	15.88 (6.14)
# of Children in the HH	2.86 (1.19)	2.99 (1.37)	2.98 (1.48)

Empirical Strategy

$$Y_i = \alpha + \beta_1 NREGA_i + \beta_2 X_i + \gamma_1 Parent_i + \gamma_2 HH_i + \epsilon_i, \quad (1)$$

$NREGA_i$: Indicator for whether the child i's mother is policy-employed or independently-employed.

X_i is a vector of child specific characteristics like age, sex, and distance to school.

Dummies for states and the caste of the family are used.

$Parent_i$ includes the mother's work force participation during time period t-1 (2005), education of parents.

HH_i includes household size, assets owned (in levels), and number of children in the household.

Propensity Score Matching

- PSM to compare across the two groups - policy employed mothers vs independently employed mothers and controlling for the observable differences.
- I use standard discrete choice models- logit and probit.
- Score calculated based on the model:

$$NREGA_i = \alpha + \beta_1 X_i + \gamma_1 Parent_i + \gamma_2 HH_i + \epsilon_i$$

Results: Impact of Mother's Participation in MGNREGA on Child's Schooling Outcomes

Table 2: Determinants of Child Test Score using OLS

	<i>Dependent variable: Test Score</i>				
	(1)	(2)	(3)	(4)	(5)
Mother Working under MGNREGA	-0.42** (0.13)	-0.62*** (0.14)	-0.29* (0.13)	-0.32* (0.13)	-0.17 (0.13)
Child's Sex		-0.33** (0.10)	-0.33*** (0.10)	-0.30** (0.10)	-0.27** (0.10)
Child's Age		0.59*** (0.05)	0.61*** (0.04)	0.60*** (0.04)	0.60*** (0.04)
Distance To School (Kms)		0.34*** (0.06)	0.18** (0.06)	0.20*** (0.06)	0.12* (0.06)
Mother Worked during 2005			0.02 (0.12)	-0.01 (0.12)	0.06 (0.12)
State Dummies	N	Y	Y	Y	Y
Caste Dummies	N	N	Y	Y	Y
Observations	2427	2427	2427	2427	2427
R^2	0.004	0.16	0.26	0.27	0.29

Results based on Propensity Score Matching

Table 4: Treatment Effects based on Test Scores Using Propensity Score Stratification

Methodology	Child Controls	Child, Parent Controls	Child, Parent and HH Controls	Obvs
	(1)	(2)	(3)	(4)
Logit propensity estimation	-0.51 (0.14)	-0.14 (0.17)	-0.17 (0.16)	2427
Logit propensity estimation Keep if prop score 0.01-0.99	—	—	-0.16 (0.16)	2260
Probit based score	-0.51 (0.16)	-0.13 (0.17)	-0.17 (0.13)	2427
Linear probability score	-0.47 (0.14)	-0.18 (0.17)	-0.19 (0.17)	2427
Linear Regression	-0.62 (0.14)	-0.29 (0.13)	-0.32 (0.13)	2427

Main Results

- Test scores of children with policy employed mothers are 6.4% lower
- Female children have 6% lower test scores compared to the male children.
- Female education has a positive impact on the child's educational outcome as posited in previous literature and found here. Female literacy in rural areas is 59%.
- PSM based on logit regression show that children with policy-employed mothers have 10.2% lower test scores.

Conclusion

- Compared policy-employed mothers to independently employed mothers, decision to join labor force impacts educational outcomes of children.
- Found substitution effect to be stronger.
- Reinforces the idea that the negative spillovers of employment opportunities, especially for women need to be factored into the formulation of public programs.

Thank you for listening!

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