Impact of an Affirmative Action Program in Employment on Child Mortality in India

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1 Background

1.1 'Caste'

- Hierarchal classification by birth, of population into 4 groups
  - General, OBC, SC, ST
- Caste discrimination is illegal and punishable by law
- Caste *still* determines ones' socioeconomic status (Deshpande, 2001)
- Severe concentration of poverty and CM in lower castes

1.2 'Affirmative action' program to help lowest castes

- Reservation of seats in public sector employment
  - 1950: quotas for SC (15%) and ST (7.2%)
  - 1993: 27% reservation for Other Backward Classes (OBCs)
    - excludes the so called 'creamy layer'

and the nations' response? Nationwide rallies and protests!!!

1.3 So why the caste controversy?

Pros:

- High concentration of socioeconomic backwardness amongst OBC's
- High incidence of CM amongst OBC's
- Previously deprived and therefore deserving

Cons:

- Use of criteria besides merit compromises quality
- Past reservations found to not improve job related attributes
- Other criteria like religion or gender could be more suitable
- Regional disparities and controversies in caste classification

1.4 The questions that arises then...

- Does the current 'affirmative action' program increase equality?
  - Does this increased equality ⇒equal opportunity to survive to 5 years of age?
- Who exactly is benefitting from this policy?
- How relevant is a public sector concentrated affirmative action policy today?
- How effective is the policy in presence of economic growth on caste inequality?
  - In which areas should the policy operate in face of changing macroeconomic environment? (E.g. health, nutritional support to children of 'lower castes', insurance).

1.5 Why worry about child mortality in India as an outcome?

Motivation:

- India sufferes from high child mortality rate (CMR) of 12.1%
- 18% of the world population lives in India
- High rates of infant mortality often result in high fertility rates

2 Data

2.1 Individual data (National Family and Health Survey III, 2005-2006):

- Representative sample of 65000 ever married women aged 15-49
- Used to create retrospective panel of entire birth history of every woman
  - Includes education, income, occupation, birth intervals, family planning, regions etc.

2.2 Macro-economic Indicator:

- Time series of NSDP of Indian states
  - We represent the cycle primarily by the cyclical component of log annual real per capita NSDP
  - So we need a decomposition into trend and cycle
    - we use the Hodrick-Prescott filter (smoothing 500)

2.3 Exogenous Policy Change Information:

- Consolidated using official Government of India publications

3 Outline of the Empirical Analysis

- Study impact of the affirmative action policy on Child mortality (first births only)
- Study impact of the affirmative action policy on Fertility

4 Methodology

4.1 Univariate duration model with Weibull duration dependence for child mortality

Hazard of child mortality given by:

$$\theta_{cm}(t|x(t)) = \lambda_{cm}(t) \cdot e^{x(t)'\beta}$$

where,

$x(t)$: - time constant and time varying explanatory variables

$\lambda_{cm}(t)$: - Weibull duration dependence

- Specification: $\lambda_{cm}(t) = \alpha(x(t)) \cdot t^{\alpha(x(t))-1}$

  where $\alpha(x(t)) = e^{(\gamma_0 + \gamma_1 I_A)}$

Estimated using MLE.

4.2 Poisson count data model for fertility

Probability mass function for the number of children is given by:

$$\Pr(N = n) = \frac{e^{-\mu T} \cdot (\mu T)^n}{n!}$$

where,

T : 8 years (1985 - 1992 and 1995 - 2002)

μ Fertility rate given by $\exp(x'(t)\beta)$

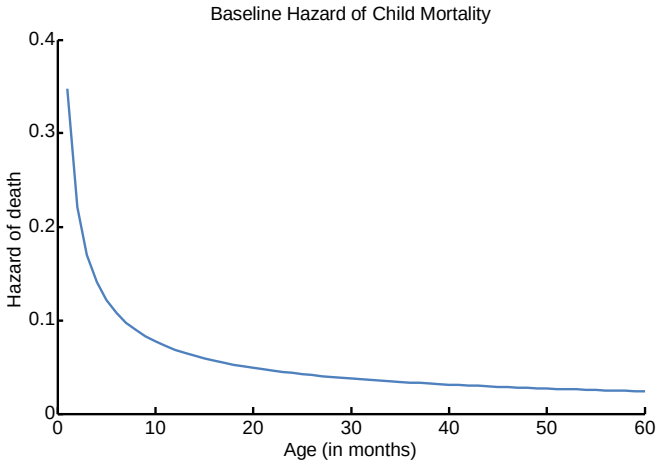
n : Number of children born in T

5 Results

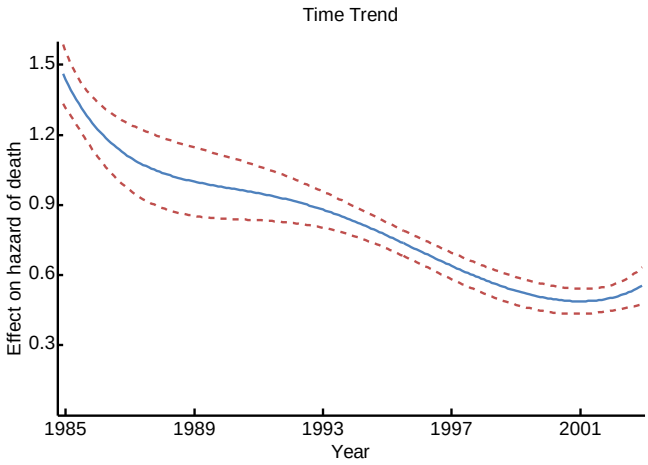
5.1 For Child Mortality Rates

For child mortality amongst first born...

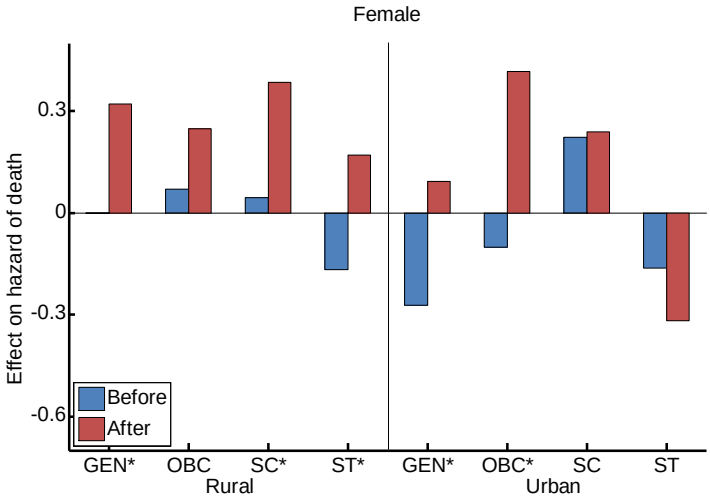
- Hazard of child mortality ↓ as
  - mother's age ↑, mother's education ↑, wealth ↑
- Significantly higher child mortality hazard for multiple births
- Significant religious differences
  - Lower CMR for Muslims and Christians
- Large regional differences (state dummies)
- Gender matters
- Other controls: health care provider, macro economic conditions, other interactions
- Baseline hazard of CM consistently ↓ over first 5 years (In line with Weibull specification)



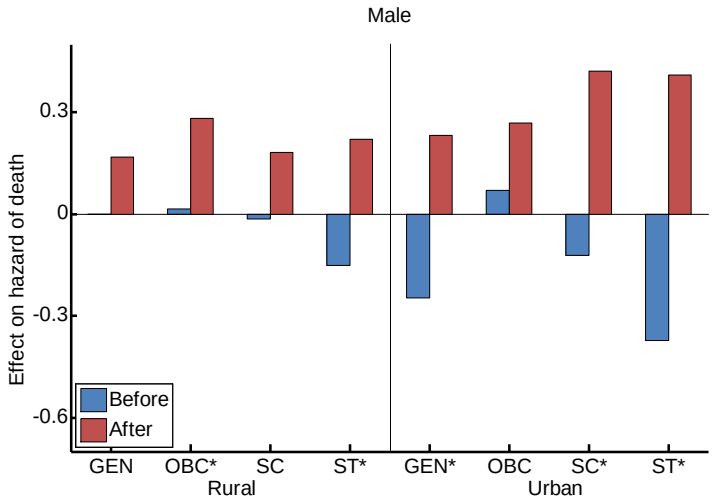
- Downward time trend of CM over 1985-2002 (Chebyshev polynomials of second kind, i.e. $exp(\sum_{i=0}^{4} \eta_i^{cm} U_i(t))$



- The effect of the affirmative action policy:



Reference category: (GEN, rural, before)



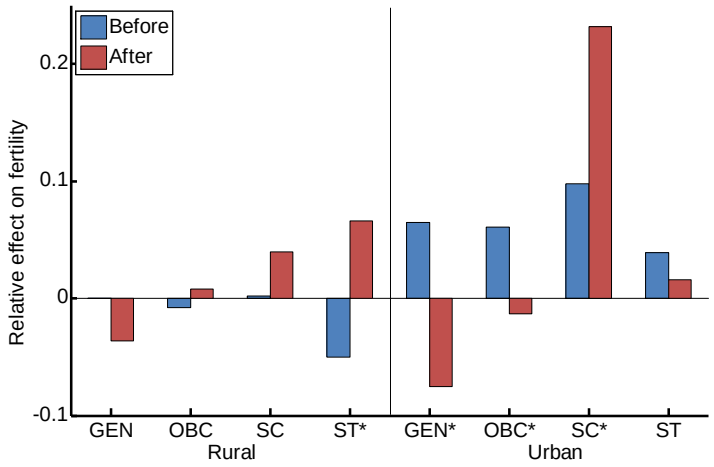
Reference category: (GEN, rural, before)

- – Policy seems to have large adverse effects on CM!
  - – Large spillover effects for other castes as well
    - ∗ Redistribution of resources away from other castes?
    - ∗ Fertility responses to policy?

May be different mechanisms for different groups?

5.2 For fertility

- Fertility ↓ as
  - – mother's education ↑, wealth ↑
- Significant religious differences
  - – High fertility amongst Muslims
- Large regional differences (state dummies again)
- Other controls: health care provider, macro economic conditions, other interactions
- The effect of the affirmative action policy on fertility:



Reference category: (GEN, rural, before)

- – Fertility adjustment: OBC ↓ and SC/ST ↑
  - ∗ Wealth effect for targeted caste? But then CM?
  - ∗ For lower castes: Shorter birth intervals ⇆ ↑ CM?
  - ∗ larger substitutability amongst lower castes in employment or education?
  - ∗ Time trends may be caste specific?
  - ∗ ...
- – Reallocation of resources away from GEN ⇒↓ fertility? ↑ CM?

6 Further work

- Modelling of policy discontinuity vis-a-vis other changes in society around this date
- Interaction effects
- Random-effects model that simultaneously explains birth intervals, child mortality, and effects of policy change
- Underlying mechanisms
- Functional form specifications

7 Conclusions

- For child mortality

  - Significant adverse impact on all
    - Interactions with fertility?

- For fertility
  - Significant fertility responses with spillover effects
    - Substitutability in employment could be crucial?

- Policy implications
  - Labour market based affirmative action has significant demographics consequences
  - Large spillovers require careful consideration of equilibrium effects

- Scope for relevant future work