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 one’s 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’

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 macro-economic 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 suffers 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: \[ \lambda_{cm}(t) = \alpha(x(t)) \cdot t^{\delta} \cdot e^{(\gamma_0 + \gamma_1 I_A)} \]

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,
\[ \mu \] 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. \( \exp(\sum_{i=0}^{4} \eta_i U_i(t)) \))
The effect of the affirmative action policy:

Reference category: (GEN, rural, before)
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- 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:
- Fertility adjustment: OBC ↓ and SC/ST ↑
  * Wealth effect for targeted caste? But then CM?
  * For lower castes: Shorter birth intervals \( \Rightarrow \) ↑ CM?
  * larger substitutability amongst lower castes in employment or education?
  * Time trends may be caste specific?
  * ...
  - Reallocation of resources away from GEN \( \Rightarrow \downarrow \) fertility? \( \uparrow \) 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