CAN AFFIRMATIVE ACTION AFFECT THE TARGETED POPULATION?

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Affirmative Action

- Affirmative actions are practised throughout the world to support historically marginalized communities.
  - For Blacks and/or Hispanics in U.S. in college admissions, extra credit points
  - Norway. In all public limited companies boards, either gender should be represented by 40%.
- How effective are the affirmative actions?

Literature Survey

- Coate and Loury (1993, AER) discusses a situation (taste based discrimination) where aggressive imposition of affirmative action hurts educational investment of minorities.
- Lundberg and Startz (1983, AER) shows efficiency of affirmative action in all scenarios with statistical discrimination.

Literature Survey...cont'd

- Efficiency of affirmative action in theoretical models: Moro and Norman (2003), Chan and Eyster (2003), Rotthoff (2008).
- A list of empirically relevant papers is done in Holzer and Neumark (2000, JEL).
- Sanders (2004) presents a case where affirmative action reduces number of black lawyers in U.S.

India: Socio-Economic Dynamics

- In the time of Independence, some "depressed classes" were declared as Scheduled Castes (SC) and Scheduled Tribes (ST) for backwardness.
- On the basis of proportion in population, SCs and STs have been awarded 15% and 7½% reservation in educational institutes and public sector jobs since independence.

Other Backward Classes

- The Mandal Commission was established in 1979 by with a mandate to "identify the socially or educationally backward.“
- It identified Other Backward Classes (OBC) and proposed 27% reservation for them in educational institutions and public sector jobs.
- The recommendations were implemented in two steps (1993 and 2008).

Muslims as Disadvantaged

- The backwardness of Muslims is conjectured for educational deficiency. (Bhaumik and Chakrabarty, 2009)
- Some groups among Muslims are included in SC or OBC.
- The Govt. of India appointed Sachar committee to enquire into the state of backwardness in the Muslim communities.

Educational attainment of communities in India

	ST	SC	Muslims	OBC	General Caste
Secondary	3.2	3.9	4.3	5.8	9.7
Higher Secondary	1.4	1.6	1.5	2.5	4.3
Graduate	0.7	0.8	0.8	1.4	3.0

Compiled from NSS report (2001).

All numbers are in percentage terms.

Implementation of Reservation

Year	Employment
1974	**7.8%**
1998	**18.7%**

Employment of SCs and STs in Class 1 and Class 2 Posts.
Source: Mendelsohn and Vicziany (1998)

Puzzle?

- Reservation was intended to give incentive to economically weak classes.
- Reservation is implemented to considerable extent for almost 60 years.
- There is large discrepancy regarding education between target groups of reservation and the general population.

Investment in human capital

- We investigate whether there is any difference in educational spending between targeted populations in the system of reservation and the general population.

Economic Environment

- Two sectors:
  - Formal with a wage rate of unity
  - Informal with a wage rate of zero
- The probability, p_α, of a job in the formal sector depends on education, **z.**
- Education is costly: c(z) > 0 and c() is a convex function.

Probability

- $P_{\alpha}(z) = 0$ if $z < \bar{z}$

  $= 1 - exp(-\alpha z)$
- Before a threshold level of education, there is *no* job in the formal sector.
- α is a parameter denoting institutional regulation and affirmative action.
- For the same level of education, a person from the backward population has a higher probability of a job (Affirmative action).
  - $\alpha_{backword} > \alpha$

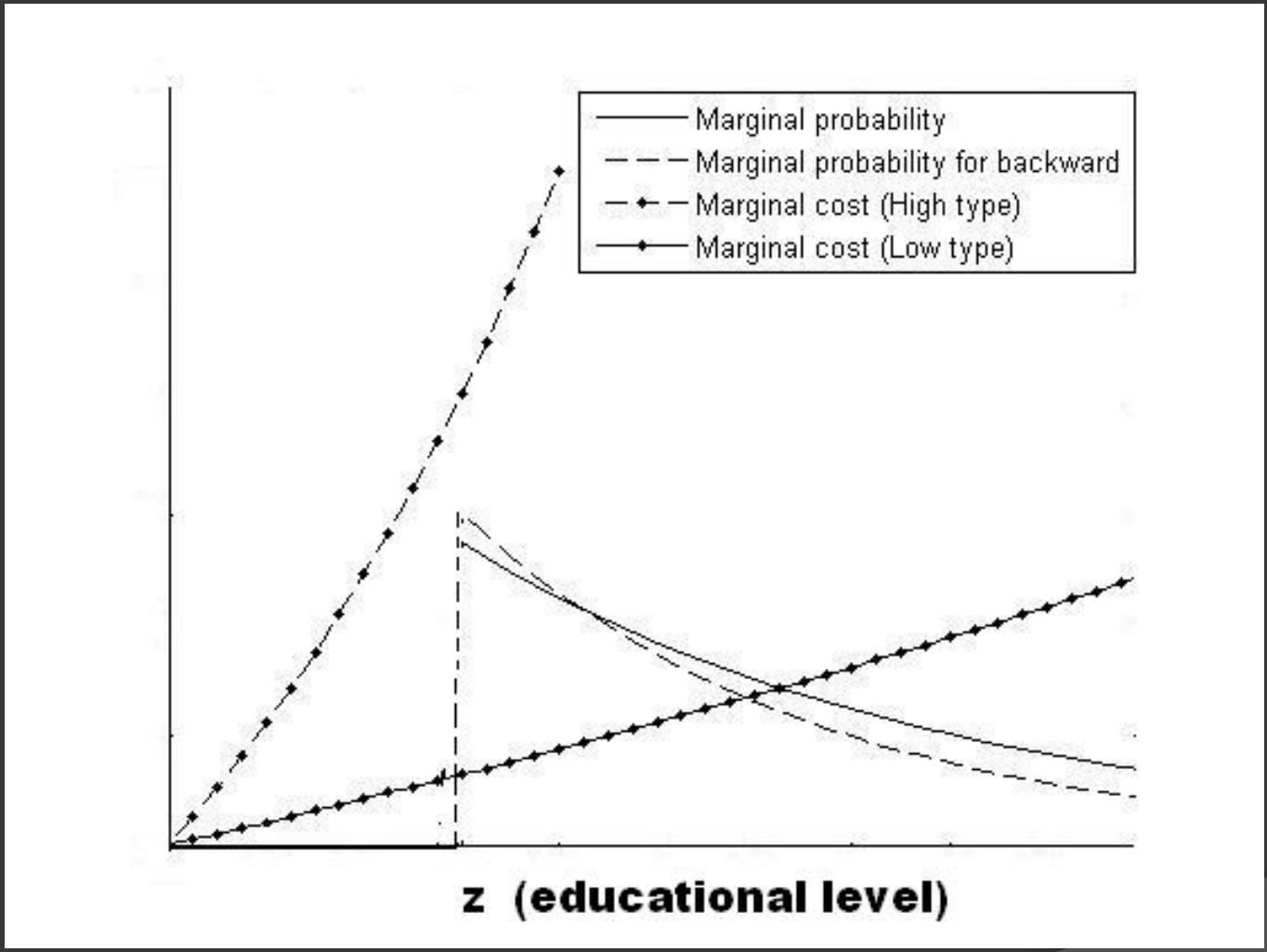
Optimal Education

- An (risk-neutral) agent chooses z to maximize

$$p(z) \cdot 1 + (1 - p(z)) \cdot 0 - c(z)$$

  - Educational attainment (z) is given by
    - $p'(z) = \alpha \cdot \exp(-\alpha \cdot z) = c'(z)$
    - Marginal Probability = Marginal Cost
- There are two kinds of agents: High cost and low cost type with $c'_H > c'_L$.
  - A high cost agent has higher marginal cost of attaining education at all levels compared to her low cost type counterpart

Equilibrium



Assumption: Optimal level of education for low cost type is sufficiently high and high cost type receives minimum education.

Theoretical deduction

- If a low cost agent has “enough” level of education, the system of reservation would promote less education for him.
- For a high cost agent, there is no change.
- This could explain the discrepancy between SCs and Muslims regarding educational investment.
- If a low cost agent does not have “enough” level of education, the system of reservation would promote more education for him. (Case for STs)

Prediction

- Backward class with reservation system may end up having less education (a vicious cycle).
- Backward class without reservation system will not have that effect.
- An increase in positive discrimination increases the probability of getting a formal sector job for the backward community members.

Testbed: India

- Null Hypotheses:

  - Affirmative action ("Reservation") will eliminate any systematic bias in investment in human capital between the general population and targeted population under the purview of affirmative action.

Private Tuition as the "official" system of education

- Education is essentially a public good. It is hard to measure the spending for this service.
- The public education system in West Bengal is arguably ineffective and private tuition has replaced it as the official system of education.

Public Education in West Bengal

- There were 50,522 primary and junior basic school. (2005-06)
- Total enrolment in primary schools (grades four and below) : 10,489 thousands
- Total number of teachers at the primary stage: 153,220.
- One School = Three teachers
- 69 students per teacher

Statistical Handbook: West Bengal 2005-2006 (combined), published by the Bureau of Applied Economics and Statistics, Government of West Bengal, July 2007.

Private Tuition as Institution

- It is almost impossible for anybody to receive lessons in the government schools.
- Private tuition is the universally practiced system of education.
- The average proportion of money spent for tuition is highest for West Bengal in the country excluding Dadra and Nagar Haveli.

Importance of Private Tuition

State	Annual Total Expenditure on Education (Rs.)	Expenditure on Private Tuition (Rs.)	Proportion of spending on Education
West Bengal (Rural)	648	261	40.3%
West Bengal	1056	472	44.7%
India	882	117	13.3%

"Attending an Educational Institution in India:
Its Level, Nature and Cost",
NSS Fifty-second Round
July 1995 - June 1996

Strategy of this Paper

- The amount spent on private tuition is a private choice and reflects of the demand of the household for offspring's education.
- We investigate controlling for other factors if there is any discrepancy in the tuition expenditure of various populations.

Data Description

- A random sample of rural households of West Bengal (excluding Kolkata and Durjeeling) – described in Bardhan et al. (2009).
  - 89 Villages
  - 2397 Households
  - Years: 2003-05
  - Number of households per village:
    - Mean: 26.9
    - Minimum: 2
    - Maximum: 149

Comparison with NSS

	NSS (1995-96)	Our Sample (2003-05)
Average Annual Educational Expenditure (Rupees)	**648**	**3041.20**
Average Tuition Expenditure (Rupees)	**261**	**1670.91**
Proportion Spent on Tuition	**40.3%**	**54.9%**

Summary of the Data I

Variable	Mean	Standard Deviation	Minimum	Maximum	No. of Obs.
Age (Heads)	49.242	14.407	3	104	2397
Age (All)	28.451	19.557	0	104	12492
Years of Education (Heads)	4.783	4.447	0	17	2397
Maximum Years of Education	8.214	4.242	0	17	2397
Male dummy (All)	0.516	0.500	0	1	12497
ST Dummy (Heads)	0.035	0.184	0	1	2397
ST Dummy (All)	0.036	0.187	0	1	12497

Summary of the Data II

Variable	Mean	Standard Deviation	Minimum	Maximum	No. of Obs.
SC Dummy (Heads)	0.319	0.466	0	1	2397
SC Dummy (All)	0.036	0.187	0	1	12497
Muslim Dummy (Heads)	0.201	0.401	0	1	2397
Muslim Dummy (All)	0.214	0.410	0	1	12497
Landholding	1.307	2.509	0	21.333	2397
Annual Income	36604.39	73873.04	0	2599000	2397

Population wise Description I

	Scheduled Caste	Scheduled Tribe	Muslim	Others
Mean Age of the Heads (in years)	48.31 (14.19)	49.71 (15.23)	45.76 (13.79)	51.47 (14.43)
Mean Education of the Head	3.57 (3.79)	3.11 (4.20)	3.82 (4.35)	6.21 (4.52)
Mean Highest Education	7.18 (3.99)	6.29 (4.24)	7.06 (4.20)	9.62 (4.01)
Number of observations	*765*	*84*	*483*	*1072*

Standard Deviations are in the parenthesis

Population wise Description II

	Scheduled Caste	Scheduled Tribe	Muslim	Others
Mean annual family income (Rs.)	27883.47 (34077.77)	26234.12 (35264.97)	30785.45 (34378.55)	46232.86 (102869.50)
Mean annual educational expenditure (Rs.)	2019.48 (3619.28)	2523.75 (6920.53)	2769.83 (6550.91)	3916.07 (10560.93)
Mean annual tuition expenditure (Rs.)	1115.23 (2049.27)	1708.69 (5760.04)	1444.93 (3347.67)	2157.26 (5378.89)
Number of observations	*765*	*84*	*483*	*1072*

Standard Deviations are in the parenthesis

Population wise Description III

	Scheduled Caste	Scheduled Tribe	Muslim	Others
School Enrollment (7-12 Yrs.)	0.89	0.86	0.90	0.94
School Enrollment for Males (7-12 Yrs.)	*0.91*	*0.86*	*0.88*	*0.95*
School Enrollment (13-18 Yrs.)	0.54	0.45	0.47	0.69
School Enrollment for Males (13-18 Yrs.)	*0.57*	*0.41*	*0.43*	*0.70*
School Enrollment (19-22 Yrs.)	0.13	0.19	0.14	0.26
School Enrollment for Males (19-22 Yrs.)	*0.16*	*0.21*	*0.16*	*0.28*

Population wise Description IV

	Scheduled Caste	Scheduled Tribe	Muslim	Others
Mean distance to the primary school	0.05 (0.16)	0.02 (0.11)	0.04 (0.17)	0.02 (0.13)
Mean distance to the secondary school	1.09 (1.51)	1.50 (1.86)	1.24 (1.60)	0.70 (1.18)
Mean distance to the college	10.88 (10.26)	10.46 (8.89)	12.28 (7.79)	8.95 (8.09)
Number of observations	*765*	*84*	*483*	*1072*

Standard Deviations are in the parenthesis

Baseline Regression

	No Village Effect	Fixed Effects	Random Effects
Family income	0.019***	0.019***	0.019***
Family income squared	4.20e-9***	-4.27e-9***	-4.29e-9***
Age of the head	37.063	48.087	36.732
Age square of the head	-0.362	-0.472	-0.357
Landholding	62.189*	114.029***	58.293*
Head's years of education	80.692***	68.884***	79.887***
Scheduled Tribe dummy	220.124	185.456	156.293
Scheduled Caste dummy	-342.391**	-319.149*	-357.962**
Muslim dummy	-229.547	2.637	-241.990
Distance to secondary school	-111.577**	-	-
Distance to college	14.454*	-	-

Dependent Variable: Annual Expenditure on Tuition. Standard errors are in the parenthesis. *** significant at 1%; ** significant at 5%; significant at 10%

Baseline Regression… cont'd

	No Village Effect	Fixed Effects	Random Effects
Number of School Going children: Aged 0-6	279.207	283.699	282.797
Number of School Going children: Aged 7-12	418.983***	419.665***	424.090***
Number of School Going persons: Aged 13-18	1407.019***	1398.871***	1414.426***
Number of School Going persons: Aged 19-22	4234.057***	4362.201***	4270.555***
R Squared	0.317	0.314	0.316
Number of observations	2397	2397	2397

Dependent Variable: Annual Expenditure on Tuition. Standard errors are in the parenthesis. *** significant at 1%; ** significant at 5%; significant at 10%

Robustness Exercises

- The years of education of the highest educated in a household (both Male and Female) replacing head's years of education.
- Average tuition expense per children as dependent variable

Robustness Exercises II

- Expansion of dependent variable to
  - Fourth degree polynomial of income'
  - Second degree polynomial of landholding
  - Second degree polynomial of number of school-going children in age groups 7-12, 13-18, and 19-22.
  - Number of school-going male children in age groups 7-12, 13-18, and 19-22.
  - Profession dummies

Testbed: Urban West Bengal

- Data from 5 urban agglomerations in West Bengal – Durgapur, Howrah, Kolkata, Malda, and Siliguri.
- Number of Households: 1000
- Potentially, the effect of traditional occupation is much less prominent in Cities.

Summary of the Urban Sample I

Variable	Mean	Standard Deviation	Minimum	Maximum	No. of Obs.
Age (Heads)	46.02	13.09	13	92	1000
Age (All)	30.35	18.80	0	115	4547
Years of Education (Heads)	7.03	5.56	0	18	1000
Maximum Years of Education	9.65	4.82	0	18	1000
Male dummy (All)	0.530	0.499	0	1	4547
ST Dummy (Heads)	0.003	0.055	0	1	1000
ST Dummy (All)	0.003	0.055	0	1	4547

Summary of the Urban Sample II

Variable	Mean	Standard Deviation	Minimum	Maximum	No. of Obs.
SC Dummy (Heads)	0.286	0.452	0	1	1000
SC Dummy (All)	0.307	0.461	0	1	4547
Muslim Dummy (Heads)	0.069	0.254	0	1	1000
Muslim Dummy (All)	0. 075	0. 263	0	1	4547
Annual Income (in Rupees)	99385.6	180841.6	0	3648000	1000

Urban Population wise Description I

	Scheduled Caste	Muslim	General Caste
Mean Age of the Heads (in years)	42.89 (13.85)	45.09 (11.82)	47.53 (12.66)
Mean Education of the Head	3.49 (4.16)	3.88 (4.68)	8.93 (5.28)
Mean Highest Education	6.98 (4.00)	6.13 (5.02)	11.20 (4.43)
Number of observations	*286*	*69*	*643*

Standard Deviations are in the parenthesis

Urban Population wise Description II

	Scheduled Caste	Muslim	General Caste
Mean annual family income (Rs.)	57931.65 (218908.94)	53910.14 (88381.82)	122770.37 (165080.28)
Mean annual educational expenditure (Rs.)	3063.84 (5649.13)	3019.88 ((7131.74)	7534.70 (37649.44)
Mean annual tuition expenditure (Rs.)	1517.11 (2317.09)	1740.87 (5052.46)	2594.39 (6175.64)
Number of observations	*286*	*69*	*643*

Standard Deviations are in the parenthesis

Urban Population wise Description III

	Scheduled Caste	Muslim	Others
School Enrollment (7-12 Yrs.)	0.83	0.58	0.95
School Enrollment for Males (7-12 Yrs.)	*0.83*	*0.56*	*0.96*
School Enrollment (13-18 Yrs.)	0.41	0.35	0.64
School Enrollment for Males (13-18 Yrs.)	*0.39*	*0.31*	*0.64*
School Enrollment (19-22 Yrs.)	0.10	0.14	0.32
School Enrollment for Males (19-22 Yrs.)	*0.13*	*0.00*	*0.35*

Baseline Regression :Urban Data

	No City Effect	Fixed Effects	Random Effects
income	0.020***	0.020***	0 .020***
income squared	-4.12e-08**	-4.33e-08***	-4.12e-08**
Income cubed	2.74e-14**	2.99e-14**	2.74e-14**
Income raised to fourth	-4.80e-21*	-5.31e-21**	-4.80e-21*
Age of the head	9.663	8.350	9.663
Age square of the head	-0.355	-0.278	-0.355
Max years of education	17.348	41.194	17.348
Scheduled Tribe dummy	-1256.745	-1444.213	-1256.745
Scheduled Caste dummy	-729.538**	-790.799**	-729.538**
Muslim dummy	-241.338	-286.144	-241.338

Dependent Variable: Annual Expenditure on Tuition. Standard errors are in the parenthesis. *** significant at 1%; ** significant at 5%; significant at 10%

Basic Regression (Urban)... cont'd

	No City Effect	Fixed Effects	Random Effects
Number of School Going children: Aged 0-6	-314.012	-262.300	-314.012
Number of School Going children: Aged 7-12	1112.918***	1149.540***	1112.918***
Number of School Going persons: Aged 13-18	3633.512***	3636.648***	3633.512***
Number of School Going persons: Aged 19-22	2198.813***	2136.944***	2198.813***
R Squared	0.263	0.262	0.3263
Number of observations	1000	1000	1000

Dependent Variable: Annual Expenditure on Tuition. Standard errors are in the parenthesis. *** significant at 1%; ** significant at 5%; significant at 10%

Summary Findings

- The educational spending is *significantly lower* for the Scheduled Caste communities, when we control for all available factors. (Dataset West Bengal – Urban and Rural)
- Other disadvantaged communities like Scheduled Tribes and Muslims do not display any such preference.

Conclusion

- Affirmative Action in the form of reservation in jobs *may not be effective.*
- As policy measure, we can think of some ways to incorporate educational subsidies for backward classes.