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Who Participates in Higher Education in India?

Rethinking the Role of Affirmative Action

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Abstract

This paper explores how an individual's participation in higher education (HE) is dependent on his religious affiliations, socio-economic status and demographic characteristics. It argues that an appropriate measure of 'deficits' in participation should inform the nature and scope of affirmative action. The study emphasises the relevance, both for analytical examination and in policy formulation, of distinguishing between stock and flow measures of participation and of recognizing the differences (or imbalances) in the eligibility for HE across groups. On isolating the effect of socio-religious affiliation from other factors that may influence participation in HE, what emerges is a suggestion that the deficits faced by some marginalized groups are not substantial enough to justify reservation for these groups just on the basis of low participation.

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1. Introduction

Reservation for different social groups at the central and the state levels has been the typical response to India's long standing policy objective of promoting access to higher education amongst its 'marginalized' people. With the implementation of reservation for Other Backward Castes (OBCs) in the centrally aided higher education institutions since 2006¹, the debate on reservation has picked up again. Among other things, the policy of reservation in higher education (HE) is based on the premise that participation of persons from the reserved category has been uniformly low and reservation would result in a significant rise in participation. The discussion on issues relating to the measurement of HE participation and the 'deficits' in different groups has been inadequate. It is argued here that an appropriate measure of 'deficits' should inform the nature and scope of affirmative action. Such an effort may also make the policy initiative more acceptable across various population segments. An empirical analysis of the National Sample Survey Organization's (NSSO) 61st Round data on India suggests that, if we use more appropriate measures, the results would show that the deficits were not significant enough to argue in favour of affirmative action for these groups.

The rest of the paper is divided into four sections. Section 2 briefly reviews the recent literature in the area of affirmative action. Issues relating to measuring participation in higher education are discussed in Section 3. This section also defines some socio-religious and economic categories through which participation can be potentially compared. The participation estimates of different socio-religious groups are analyzed in Section 4. This section discusses the results of some econometric analyses of the role of different socio-religious affiliations in determining participation in higher education. Section 5 concludes.

2. Recent Literature on Affirmative Action in India – Identifying Issues

The studies on affirmative action in India primarily focus on the reservation policy for the SC/ST, mandated by the Constitution from its inception. Since OBC reservation is comparatively a new issue, few studies have concentrated solely on OBCs.

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Defining Socio-economic and Religious Categories

Partly because reservation policy had primarily focused in SC/ST candidates till 1990, separate estimates for these categories were available from government sources. All other castes were put in the 'others' category. But inclusion of OBCs for affirmative action since 1999, has resulted in the availability of some data separately for this category as well. Hence the category of 'others' now includes all upper castes as well as some lower castes close to SCs, as also other lower castes which are not recognized as either SC, ST or OBC. Deshpande (2006) argues that this kind of categorization is not appropriate for analyzing the differences between the upper and lower classes in the pursuit of equitable development and prosperity.

More recently, some studies have tried to combine caste and community categories to analyze its implications for affirmative action. The Sachar Committee Report on the conditions of Muslims in India (Government of India, 2006) defined socio-religious categories (SRCs) that distinguished between Hindus (upper castes, SC/ST and other backward classes), Muslims (general and OBCs) and other minorities. These SRCs were further classified into economic groups (poor and non-poor). The analysis of data for these categories showed that educational and employment conditions varied across these groups.

Role of Socio-religious Background and the Confounding Effects

Deshpande (2001) developed a Caste Development Index (CDI) using the 1992-93 National Family and Health Survey Data. While the study recommends the inclusion of caste as an indicator of the stratification of the Indian population, it shows that there are regional variations in the status of SC/ST in terms of CDI. The study finds that, on reconstructing the index after the implementation of reservation system in the early 1990s, the same pattern of differences in castes between SC/ST and others persists even as late as in 1998-99. Some recent analyses of SRCs have shown that the differences in participation and achievements narrow down when economic conditions are *taken into account* (Government of India, 2006). These results are consistent with the argument that the 'creamy layer' in each of the marginalized groups tend to shore up the lion's share of the benefits flowing from reservation policies.

Eligibility for Higher Education

Sundaram (2006), using the 55th round of NSSO data, shows that if we consider only that section of the eligible population which is eligible for higher education (i.e., those who have passed higher secondary or equivalent examination), then the educational achievements do not vary much with their poverty levels among SC/ST/OBCs in urban or rural areas. That means once the SC/ST/OBC groups cross the secondary education level, their decision to go for higher education is not significantly affected by their economic conditions anymore. But poverty does make a significant difference for eligible students in the general category. This implies that reservation may be helping in improving the level of enrollment, irrespective of economic status, once the threshold level of school education is crossed. However, one issue that is not clear from his estimates is: will the differences across SRCs remain significant once differences in eligibility, economic status, regional background etc. are also taken into account?

Inability of certain marginalized segments to achieve HE eligibility may be due to the unequal access to school education. Banerjee and Somanathan (2007) analyses the census data between 1971-1991 and finds that unequal access to primary schools has been a major factor in creating disparities among different caste groups. They mapped the availability of

public goods against the parliamentary constituency areas and found that the areas of SC/ST concentration had much less access to primary or secondary schools in 1971 as compared to other areas.

Linkages in Affirmative Action in Education and Employment Spaces

Desai and Kulkarni (2008) compare educational achievements of upper caste Hindus and other upper castes with that of Dalits, Adivasis, and Muslims during 1983 and 2000. Although the primary school enrollment at all income levels are higher for Hindu and other upper castes over this period, the study shows that there is a narrowing trend in the gap between Hindus and other marginalized groups at the higher income levels. It implies that affirmative action in employment may have contributed to higher primary school enrollment over the years (that is, more people participating in school education in anticipation of getting jobs through reservation). At the same time, improvement in economic condition has increased the effectiveness of the programme. That is, households with better economic conditions benefited more from the job reservation as it resulted in higher school enrollment.

What is the combined impact of affirmative action in education and employment? Xaxa (2000) in his study of the quota system in the admission to the University of Delhi finds that even after implementation of the quota system in higher education and in government and semi-government jobs for SC/ST/OBC, the quotas remain largely unfulfilled in several places. Kirpal and Gupta (1999), in a study on reserved seat students entering the B Tech programme in five major and oldest Indian Institute of Technologies (IITs) between the year 1981 and 1992, found that the average graduation rates among the SC and ST students were lower than those of general students getting admission in those institutes. The performance of the reserved students in the IIT examinations was lower too.

Chakravarthy and Somanathan (2008) compare the job market achievements of the SC/ST and general candidates among Indian Institute of Management (IIM) graduates. They find no significant difference between the two categories' wages once the academic performance (Grade Point Average or GPA) is taken in to account when fixing the wages. However, when academic performance is not taken into account (or controlled for) the average wages of SC/ST candidates tend to be lower than those of the general candidates. On an average, the GPA of SC/ST candidates were also found to be less than those of the general candidates. This implies that the weaker background of the SC/ST students admitted through the reservation policy, adversely affect their job market achievements because of lower GPA. Hence, even if the SC/ST candidates are given the opportunity to study at higher education institutions, their weak educational background should be taken care of before they reach job market. This is consistent with the argument that the preferentially selected students would also need to be given significant human and financial support if the reservation policy is to fully serve the purpose of eliminating the differences (Weisskopf, 2004)².

At a more general level, however, post HE job market achievements can be affected by other factors. Deshpande and Newman (2007), in their comparisons of the Dalit and non-Dalit students in turning the educational achievements into job market outcomes found that the latter exploited their social networks well to benefit from such opportunities, whereas the former were not privileged with such a social capital. Apart from this, the Dalits' neither had the necessary financial strength nor were they able to access inexpensive loans. All this also deprives the poor students from utilizing reservation based admission options (Deshpande and Newman 2007: 4135).

While the survey of studies provided above is by no means complete, it brings out some interesting insights. These include:

- ♦ An appropriate definition of socio-economic-religious categories is required for analysis and for affirmative action;
- ♦ While analyzing the impact of socio-religious affiliation on participation, one needs to take in to consideration a variety of regional and other factors;
- ♦ A sharper focus on eligibility (crossing the threshold of school education) for HE may be critical for any efficacious policy action and;
- ♦ The linkages between affirmative action for employment and education needs to be explored to better understand the impact of such policy instruments.

This paper tries to deal with the first three of these issues to provide some additional insights.

3. Participation in Higher Education: Issues Relating to Measurement and Classification

We argue in this section that, when analyzing participation in HE across different socio-economic groups, due importance needs to be given to the measures used for participation, as also the ability to empirically distinguish between analytically meaningful socio-economic categories.

Measuring Participation in Higher Education

The first issue that needs to be resolved while defining a measure is whether we should focus on *attainment* or *enrollment*. While the former captures the segment that has *completed* graduate and higher level of education, the latter focuses on the segment that is *currently studying* for graduation or higher courses. In addition, while attainment is a *stock* measure and carries the 'burden of history', enrollment is a *flow* measure that captures the current situation and provides indications for the future³.

Given this background, three measures can be defined for any population segment:

1. The share of graduates and higher degree holders in the population group above 20 years of age. This characterizes an *All Generations' Stock (henceforth, AGS) measure* of participation in higher education, a higher share signifying higher participation. Alternatively, one can compare a group's share in the 20 years and above population with its share in the number of graduates. Broadly, if the population share is higher than the share in graduates, the group suffers from a 'deficit' in participation.
2. Share of graduates and higher educated in the age group of 22 – 35 years⁴ provides the *Current Generation Stock (henceforth, CGS) measure*. As in the case of the first measure, difference in population share and graduates' share measures the 'deficit'.
3. Share of currently studying persons at the level of graduation and above in the age group of 17 – 29 years⁵ provides a *Current Generation Flow (henceforth, CGF) measure* of participation in higher education. This measure can also be converted into a 'deficit' measure as in the case of the above two measures.

Another method of measuring deficit using any of the above methods is to consider the eligibility aspect. Here, the first requirement for enrollment in an under-graduate course would be to complete higher secondary education. Thus, instead of focusing on the entire population in the relevant age group, measures of participation can also focus on that segment that has crossed the threshold of higher secondary education. Accordingly, the three measures described above can be estimated for only the eligible and not for the entire population in the relevant age group. A sharper focus on the eligible population brings the links between secondary and tertiary education explicitly into the analytical discussion.

For an adequate understanding of 'higher education deficits' in different groups, we not only need to define participation appropriately, but also define socio-economic categories that make sense in the context of current policy debates.

Defining Socio-economic Groups

Given the history of affirmative action in India and current debates on the issue, it is imperative that we define categories that capture caste, religion and economic status. Based on the availability of data from the NSSO, seven socio-religious and two economic categories have been defined. Socio-Religious Categories (SRCs) are Hindu Scheduled Castes (H-SC), Hindu Scheduled Tribes (H-ST), Hindu Other Backward Classes (H-OBC), Hindu Upper Castes (H-UC), Muslim Other Backward Classes (M-OBC)⁶, Muslim General (M-G), and Other Minorities from any religion other than Hindu and Muslims (OM)⁷.

The two economic categories defined by Monthly Per Capita Expenditure (MPCE) of the household are: 'Poor' households having MPCE below the Poverty Line (PL) and 'Non-poor' households having MPCE more than or equal to PL. Poverty lines are taken from the calculations of the Planning Commission of India using the same round of NSS data, separately for urban and rural areas⁸. Given the ongoing discussion on the 'creamy layer' issue, it would be interesting to look at HE participation within combinations of SRCs and economic categories. Unfortunately, the small sizes of the samples in all the sub-groups of different economic categories do not permit such detailed comparisons.

4. Participation in Higher education: Some Estimates⁹

We first discuss estimates of participation by SRCs. This is followed by an analysis through economic categories, the combination of SRCs and economic classifications.

Participation in Higher Education by Socio-religious Groups

Table 1 provides the estimates of participation for each socio-religious group defined above. Overall, participation in higher education is alarmingly low across all socio-religious categories. A clear indication of the substantial number of students who quit studies after the higher secondary education is the wide gap between the population based and eligibility based measures of participation in the relevant age groups¹⁰.

As expected, the participation rates are lower than the average for the marginalized groups (SC, ST, OBC and Muslims) in all measures of full sample. But for the eligible population, a flow measure of some marginalized groups show higher participation than average -- more than Hindu UC and Other minorities. In other words, an eligible candidate, be he a marginalised or a non-marginalised student, has today an equal chance of going to college and, in some cases, the chances are even better for marginalized students. This may be indicative of the fact that being qualified probably has a stronger

impact on the marginalized groups to go in for higher education. However, there has in the recent years been a visible improvement in participation among all groups when one compares all generation stocks with current generation stock measures, suggesting a trend towards convergence across all groups.

Socio - Religious Categories	Table 1: Share of Population in the Relevant Age Group Participating in Higher Education for Each Socio Religious Category					
	AGS (20+ years)	CGS (22 - 35)	CGF (17 - 29)	AGS: Eligible (20+ years)	CGS: Eligible (22-35 years)	CGF: Eligible (17-29 years)
H - SC	2.44	3.69	3.52	39.73	43.57	32.17
H - ST	1.66	2.36	3.47	37.69	40.58	41.74
H - OBC	4.41	6.43	4.95	42.13	44.99	28.61
H - UC	15.57	19.77	11.48	57.08	59.23	31.91
M - OBC	2.50	3.31	3.84	37.94	41.35	35.18
M - G	4.09	5.04	4.03	49.10	51.40	35.26
OM	9.07	11.91	7.96	46.44	46.57	27.69
Total	6.70	8.76	6.07	49.60	51.50	31.16

Notes: 1. AGS - Share of graduates and higher degree holders in the population group above 20 years of age. 2. CGS - Share of graduates and higher educated in the age group of 22 - 35 years. 3. CGF - Share of currently studying persons at the level of graduation and above in the age group of 17 - 29 years.

Table 2 brings out the 'deficits' across SRCs more sharply. There are deficits in all measures for all SRCs, except upper caste Hindus and Other minorities. The differences in participation in HE across SRCs are much higher when we compare the measures based on total population. They are lower in eligible population based measures. This again substantiates the fact that once the hurdle of eligibility is crossed, the difference among SRCs in further education declines steadily. Deficits in participation are less for all SRCs in the flow measure of population than that of any stock measures.

Table 2: Deficits in Participation in Higher Education by SRCs									
Socio-religious group	Share in 20+ age group			Share in 22 -35 age group			Share in 17 -29 age group		
	Among Total	Among Grad	Among Eligible	Among Total	Among Grad	Among Eligible	Among Total	Among Studying	Among Eligible
H-SC	17.3	06.3	07.9	17.8	07.5	08.9	18.0	10.4	09.9
H-ST	06.9	01.7	02.2	07.2	01.9	02.5	07.1	04.0	02.9
H-OBC	34.9	23.0	27.0	34.8	25.6	29.3	34.5	28.2	30.1
H-UC	23.9	55.4	48.1	22.9	51.7	44.9	22.1	41.8	41.6
M-OBC	04.4	01.7	02.2	04.6	01.7	02.1	05.0	03.2	02.8
M-G	06.8	04.1	04.2	07.2	04.1	04.1	07.8	05.2	04.6
OM	05.8	07.8	08.4	05.5	07.5	08.2	05.5	07.2	08.0
Total	100	100	100	100	100	100	100	100	100

Participation in Higher Education by Economic Categories

The scarcity of samples for all the poor categories frustrates our attempt to present aggregate estimates of the three participation measures for the SRCs poor and non-poor categories. Hence, Table 3 presents the estimates of the non-poor categories and only the sample sizes for the poor categories. As expected, for all SRCs put together, participation

rates are generally higher among the non-poor, irrespective of the measure one uses. But before concluding anything further from this, we should remember the extremely small sample size of poor in all three cases.

SRC	20+ Age Group % Graduates Observations in SRC		22-35 Age Group % Graduates Observations in SRC		17-29 Age Group % Currently Studying Observations in SRC	
	Poor (1)	Non -poor (2)	Poor (3)	Non -poor (4)	Poor (5)	Non -poor (6)
H-SC (%)		2.5		3.7		3.5
No of Obs	146	1,173	27	20,207	35	19,529
H-ST (%)		1.7		2.4		3.5
No of Obs	56	21,182	10	9170	16	8,534
H-OBC (%)		4.4		6.4	0.3	5.0
No of Obs	271	1,08,461	40	44,146	51	41,874
H-UC (%)		15.6		19.7		11.5
No of Obs	135	84,061	50	32,476	61	30,494
M -OBC (%)		2.5		3.3		3.9
No of Obs	41	16,165	15	6,776	16	7,091
M -G (%)		4.1		5.0		4.0
No of Obs	52	25,248	11	10,746	14	11,146
OM (%)		9.1		11.9		8.0
No of Obs	41	40,748	10	16,329	26	16,497
Percentage	3.0	6.7	12.6	8.8	2.7	6.1
Total Obs	742	3,44,101	163	139,944	219	135,256

Use of Private Institutions of Higher Education

In the context of privatization of higher education in recent years, the relevant question is: to what extent does the aspirants' choice of private educational institution depend on the socio-economic group to which he belongs? Table 4 provides some estimates. On average, about 45 percent of the persons studying for higher education go to private institutions (aided + unaided). Hindu-ST students, followed by Hindu-SC, Hindu-UC and Hindu-OBCs (in that order) rely the most on government institutions (including local municipal bodies). Muslims and Other minorities rely more on private institutions. While the private/non-private distinction may not be very difficult to recognize, it is not entirely clear if the respondents in the NSS surveys are able to distinguish clearly between aided and unaided private institutions. Given the possibility of reporting problems, (with the respondent not able to clearly distinguish between aided and unaided institutions) it needs to be noted that the use of private unaided institutions is very low among Hindu-STs and quite high among Muslim-OBCs.

SRC	Govt	Local body	Private aided	Private unaided	Not known	Total %	Total Obs
H-SC	58.5	1.3	26.0	11.3	2.8	100	823
H-ST	64.8	6.5	24.0	4.7	0.0	100	301
H-OBC	50.4	1.3	28.3	16.9	3.1	100	2,562
H-UC	54.4	1.3	27.6	15.7	1.0	100	3,446
M -OBC	35.7	0.0	31.5	30.5	2.2	100	322
M -G	49.3	1.1	31.8	16.6	1.2	100	584
OM	33.4	1.7	38.4	24.3	2.2	100	1,168
All	51.8	1.5	28.5	16.2	1.9	100	9,215

Role of Socio Religious Affiliation in Participation

A large variety of factors influence participation in higher education. We have so far looked at only the socio-religious background and some economic factors. It is important to ascertain if socio-religious background continues to be an important determinant of

participation in higher education after controlling for location (state, rural/urban), household expenditures, gender and so forth. A preliminary analysis undertaken by the Sachar Committee suggests that, once the effects of location and economic factors are taken care of, the role of socio-religious factors declines dramatically.

In order to explore this further we analyze two separate models to understand how the chances of a person's participation in higher education depends on various socio-religious affiliations after taking into account the effect of two sets of factors -- individual (age and gender), household (per capita expenditure)¹¹. Locational differences are dealt with by the use of state dummies, along with separate estimations for rural and urban areas.

The two models allow us to compare the stock and flow measurements of participation as discussed earlier. The *flow* model is for those currently in the 17-29 age group. It shows how the chances of their enrollment in higher education depend on various socio-religious affiliations, when other possible determinants are also taken into account. In the same vein, the *stock* model is for those in the 22-35 age group and estimates if affiliation with specific SRCs could increase or decrease their chances of completing graduate or higher courses. Keeping in mind their inherent differences, we have estimated the models separately for rural and urban populations. We have also run separate regressions of the stock and flow models in rural and urban areas for the subset of persons who are eligible to enter HE.

Table 5 provides the estimates of the *flow* model for all the four specifications of rural-urban sectors with both the full sample and the eligible sample. The results confirm many relationships that make intuitive sense. All else being equal, the probability of current enrollment in higher education increases significantly with per capita expenditure of households, and, in general, men have a higher chance of HE enrollment than women and the difference is greater when we consider only the eligible population.

Model 1: Flow	Specification 1: All		Specification 2: Eligible	
	Marginal effects (dF/dx)		Marginal effects (dF/dx)	
Variables	Urban	Rural	Urban	Rural
Age	-0.02 (0.00)	-0.00 (0.00)	-0.08 (0.00)	-0.07 (0.00)
Hindu-ST (dummy)	0.06 (0.00)	0.01 (0.02)	0.04 (0.45)	0.12 (0.01)
Hindu-OBC (dummy)	0.01 (0.12)	0.00 (0.56)	-0.03 (0.33)	-0.04 (0.06)
Hindu-UC (dummy)	0.05 (0.00)	0.01 (0.00)	-0.01 (0.83)	-0.06 (0.01)
Muslim OBC	-0.02 (0.07)	-0.01 (0.03)	-0.03 (0.46)	0.05 (0.12)
Muslim - general (dummy)	-0.01 (0.25)	-0.00 (0.79)	-0.05 (0.12)	0.06 (0.25)
Other minorities (dummy)	0.03 (0.01)	0.00 (0.39)	-0.02 (0.59)	-0.00 (0.89)
Gender dummy (male =1)	0.01 (0.00)	0.01 (0.00)	0.06 (0.00)	0.06 (0.00)
Log MPCE	0.10 (0.00)	0.04 (0.00)	0.12 (0.00)	0.11 (0.00)
Household size	-0.02 (0.00)	-0.01 (0.00)	-0.03 (0.00)	-0.02 (0.00)
Observed probability	0.12	0.04	0.34	0.28
Predicted probability	0.07	0.02	0.27	0.22
Number of obs	48,419	86,965	15,613	14,361
Wald chi2(39)	1955.62	1720.97	1396.98	1161.17
Prob > chi2	0	0	0	0
Pseudo R2	0.21	0.15	0.27	0.21
Log pseudolikelihood	-13773.86	-11903.1	-7278.15	-6739.85

- Notes: 1. Estimates of state dummies are not reported here.
 2. The base dummy for SRC estimates is Hindu-SC.
 3. P-Values in parentheses. P-value < 0.5 implies significant at 5% level.

Marginal effects reported in Table 5 indicate how the chances of HE participation differ for different socio-religious groups vis-à-vis the Hindu-SCs. For the full (eligible for HE as well as others) sample, Hindu ST and Hindu UC in both urban and rural areas have significantly better chances. The enrollment chances of Other minorities in the full sample model is 3 percent higher than those of the Hindu SCs in urban areas. In rural areas, the difference is not statistically significant. Similarly, in rural areas, the full sample shows that the Muslim OBCs' participation chances are one percent lower than those of Hindu SCs. For the urban population, as compared to Hindu SCs, the participation chances of the Muslim OBCs are somewhat lower and those of Hindu-OBCs somewhat higher, but the differences are statistically insignificant.

More interesting results emerge once we look at the estimates for the eligible population in specification 2 of the same model. There is no significant difference in the participation prospects of the urban persons for any of the SRCs and the SCs. For rural people too, the story looks same except for 12 percent higher chances for Hindu STs and a 6 percent lower probability for the Hindu UC over Hindu SC. Finally, none of the Muslim groups in any specification seem to have higher chances of enrollment as compared to Hindu SC, which supports the Sachar Committee report on the conditions of Muslim community.

Table 6: Probability of Completing Under Graduate Degree - Probit Estimates

Variables	Model 1: Stock		Specification 1: All Marginal effects (dF/dx)		Specification 2: Eligible Marginal effects (dF/dx)	
	Urban	Rural	Urban	Rural	Urban	Rural
Age	-0.00 (0.00)	0.00 (0.40)	-0.01 (0.00)	-0.01 (0.00)		
Hindu-ST (dummy)	0.01 (0.18)	-0.00 (0.02)	-0.03 (0.41)	-0.02 (0.41)		
Hindu-OBC (dummy)	0.02 (0.00)	0.00 (0.67)	0.03 (0.13)	0.02 (0.12)		
Hindu-UC (dummy)	0.04 (0.00)	0.00 (0.00)	0.07 (0.00)	0.01 (0.30)		
Muslim OBC	-0.01 (0.02)	-0.00 (0.00)	-0.04 (0.34)	-0.06 (0.01)		
Muslim - general (dummy)	0.00 (0.30)	-0.00 (0.00)	0.02 (0.46)	-0.02 (0.38)		
Other minorities (dummy)	0.04 (0.00)	0.00 (0.72)	0.06 (0.00)	-0.03 (0.18)		
Gender dummy (male =1)	0.01 (0.00)	0.01 (0.00)	-0.02 (0.02)	0.02 (0.01)		
Log MPCE	0.05 (0.00)	0.01 (0.00)	0.05 (0.00)	0.07 (0.00)		
Household size	-0.01 (0.00)	-0.00 (0.00)	-0.00 (0.73)	0.00 (0.68)		
Observed probability	0.05	0.01	0.26	0.20		
Predicted probability	0.04	0.01	0.23	0.19		
Number of obs	203218	395631	35496	27770		
Wald chi2(39)	2514.02	3403.19	2026.84	747.99		
Prob > chi2	0	0	0	0		
Pseudo R2	0.10	0.12	0.10	0.04		
Log pseudolikelihood	-36361.90	-18904.85	-18451.1	-13436.3		

- Notes: 1. Estimates of state dummies are not reported here.
 2. The base dummy for SRC estimates is Hindu-SC.
 3. P-Values in parentheses. P-value < 0.5 implies significant at 5% level.

As we explore the full sample of the stock participation model in Table 6, we find that for most of the SRC groups, chances of becoming graduates are significantly different (in statistical terms) from those of Hindu SCs, except for the urban Hindu STs, urban Muslim-general rural Hindu OBCs and Other minorities. Apart from these exceptions, while Hindu UC, Hindu OBC and Other minorities have higher chances of completing graduate courses than the Hindu SCs, the chances for Muslim-general and Muslim OBCs are significantly lower.

In the stock model when we consider only the eligible population, the probability differences of becoming graduates narrow down for most of the SRCs. In urban areas, only the Hindu UCs and Other minorities have higher chances than the Hindu SCs -- the Hindu UCs by 7 and Other minorities by 6 percent. For the rural eligible population the only statistically significant difference is between Hindu SCs and the Muslim OBC, the latter being lower by about 6 percent.

Overall, the inter-group differences in probability of becoming graduates seem to be less in the eligible segment. Hindu STs seem to be better off among marginalized groups in most specifications and sometimes better off than the Hindu UCs. Hindu OBC seems to have a higher chance than the Hindu SC, but the differences do not seem to be statistically significant in most of the specifications. The chances of Muslims are lower than those of the Hindu SCs, but the differences are once again statistically insignificant. These results may partly reflect the impact of the affirmative action available for STs and SCs in higher education and jobs.

The marginal effects reported in Table 5 and 6 essentially tell us whether the impact of affiliation with different socio-religious groups is significantly different from that of Hindu SC status. This prevents us from directly comparing all the SRCs without using the reference point of the Hindu SC. It may be more useful to form a rank of SRCs according their participation probabilities in HE, in order to ascertain the relative impact of socio-religious backgrounds. For this purpose, we undertake pair-wise comparisons for different pairs of SRCs.

To generate estimates for such comparisons, we calculate the marginal effects from estimation of different Probit equations by separately using *each* SRC category as the base dummy. In other words, we re-estimate the Probit equations of Tables 5 and 6 as many times as the number of SRCs by changing base dummies in each regression. Through this exercise we are able to compare the impact of socio-religious affiliations vis-à-vis each other. Appendix Table 1 produces one such set of estimates to clarify how the pair wise comparisons are drawn. We do the same exercise for the full sample and eligible sample separately. Appendix Table 2 lists all pairs of SRCs that come out to be statistically different (higher/lower) from each other. The SRCs with statistically significant and positive (negative) marginal effects imply that affiliations to those SRCs increase (decrease) the probability of participation than that of the base SRC.

Based on the differences in marginal effects of SRCs, Table 7 and 8 summarize the ranks of SRCs from each model to help us unravel the SRCs hierarchy of participation in higher education. Table 7 presents the rankings of all urban stock and flow models. Table 8 does the same for the rural population¹². Through this summary we get the distribution of SRCs by ranks for each model, which have already been estimated.

Table 7: Test of Robustness for Rankings of SRCs from *Urban* Models

Stock Full:	Flow Full	Stock Eligible	Flow Eligible
1. H - UC	1. H - UC	1. H - UC	1. H - ST
2. OM	2. H - ST	2. OM	2. H - ST
3. H - OBC	3. OM	3. H - OBC	3. H - UC
4. H - ST	4. H - OBC	4. M - G	4. OM
5. M - G	5. H - SC	5. H - SC	5. H - OBC
6. H - SC	6. M - G	6. H - ST	6. M - OBC
7. M - OBC	7. M - OBC	7. M - OBC	7. M - G

Table 8: Test of Robustness for Rankings of SRCs from *Rural* Models

Stock Full:	Flow Full	Stock Eligible	Flow Eligible
1. H - UC	1. H - ST	1. H - UC	1. H - ST
2. OM	2. H - UC	2. H - SC	2. M - G
3. H - OBC	3. OM	3. H - ST	3. M - OBC
4. H - SC	4. H - OBC	4. M - G	4. H - SC
5. H - ST	5. H - SC	5. H - OBC	5. OM
6. M - G	6. M - G	6. OM	6. H - OBC
7. M - OBC	7. M - OBC	7. M - OBC	7. H - UC

Notes: SRCs are in italics if marginal effects with the adjacent ones are not statistically significant. They are grouped together if they could not get clear ranking. There are three possible cases among all who have been grouped together. One, marginal effects with base dummy being any other SRC in the group, is not statistically significant at 5 percent; but SRCs are ranked by their values only. These are also marked in italics. Two, marginal effects are statistically significant at 5 percent, but values are zero, hence SRCs are ranked by the signs only. Three, marginal effects are statistically significant and non-zero, hence SRCs are ranked by their values¹³.

The rankings in urban areas in Table 7 show Hindu UC ranks at the top and Muslim OBC ranks at the bottom in both the stock and flow models, except for the flow model of eligible sample, where none of the inter-group differences are statistically significant. Other minorities and Hindu OBCs -- ranked always in that order -- are placed just below Hindu UC and above the Muslim groups in all specification of the urban population.

In the rural areas (Table 8), the full sample of stock ranks Hindu UC at the top and Muslim OBC at the bottom. While the participation probabilities in HE due to affiliations to various SRCs are significantly different from each other in statistical terms, the impact of such affiliation is not high, as all marginal effects are close to zero. This means the inter-group difference is negligible in the stock model for rural areas. In the flow model of full sample, the Hindu ST and Hindu UC ranks at the top two positions in that order, with the difference between them not being statistically significant. The Muslim OBC ranks at the bottom. Another noticeable fact of the flow model is that even if the difference of marginal effects between Other minorities and Hindu OBC is not statistically significant, they both still rank just below Hindu UC and Hindu ST in rural areas too. Comparing the stock and the flow models of table 7 and 8, it is evident that the differences among SRCs seem to wither away over generations, much more so in urban areas. Other things being equal, in

rural areas the differences attributable to SRC affiliations were not high to begin with and therefore the transition has been less dramatic. The enrolment figures of Hindu STs seems to have picked up amongst the more current generation of 17 to 29 years old students as compared to the stock of 22 to 35 years old graduates. Once other factors are accounted for, it ranks at the top in enrollment prospects among the eligible population in both rural and urban areas, having outranked the Hindu UC. The difference is statistically significant in rural areas, if not in urban areas. In flow models, the significance of the difference between other groups with Hindu OBC narrows down, but rankings do not improve much. Hindu SC too does not show much sign of improvement in enrollment except for the rural stock's eligible population.

The statistical significance of the differences in the Hindu ST-Hindu UC and Muslim OBC- Muslim-general pairs wither away in flow models of both rural and urban areas. Moreover, in urban areas the statistical significance of the pairs, Hindu OBC - Other minorities, Hindu OBC - Hindu SC, and Hindu ST - Other minorities disappear too, signifying reduction in inter-group differences in the current enrollment rate of urban marginal groups. In rural areas the statistical significance of the pairs, Hindu OBC - Muslim-general and Hindu SC- Muslim-general seem to vanish when we look at current enrollment figures. The most interesting finding is that Muslim groups have dramatically risen in the rankings (being just below the Hindu ST) in the current enrollment positions of the eligible rural population. It indicates that the one way to increase the enrollment of Muslims in HE is to help them cross the threshold, the schooling stage.

The inter-group differences thin out even more when we look at the eligible population of urban areas in table 7. The stock model still shows up statistically significant differences between Hindu UCs and Hindu OBCs, with the former at the top, and Muslim OBC with the rest. The flow model does not show any statistically significant differences among any of the SRC pairs. Just like urban areas in table 7, taking account of eligibility reduces the inter-group differences in rural areas as well (Table 8), except for the fact that Muslim OBC ranks clearly at the bottom for stock eligible and Hindu ST at the top for flow eligible model.

5. Concluding Remarks

Broadly, three issues emerge from this analysis of the National Sample Survey (2004-05) data. One relates to the linkage between affirmative action as practiced through reservation policies of the nation and the levels of participation in HE. Should it be linked to deficits of respective groups? If so, what type of deficits should one go by? According to preliminary statistics, the deficits for Hindu OBC and, to some extent, Hindu ST have not been high in recent years, particularly when one looks at the currently studying or eligible population (Table 2). The share of Hindu OBC is 25.6 percent among the total graduates in the age group 22-35 years. Their share is even higher (28.2 percent) among the currently studying persons. For Hindu ST, the share of current generation stock of graduates is 1.9 percent, as against their total share of the same age group -- 7.2 percent. However, their share increases to 4 percent among the currently studying population, whereas their share in the total population of the same age group is 7.1 percent.

Moreover, econometric analysis of the data shows that, once other factors are taken in to account, the inter-SRC differences in many cases decline, but some kind of reversal also takes place as the chances of Hindu ST and Hindu-OBC participation in HE improves, as compared to other marginalized groups in most specifications. The current participation of Hindu ST shows even a higher chance of their participation -- significantly higher than

all SRCs, including the Hindu UC. We certainly cannot conclude from the above data that this is the result of the more recent affirmative action in higher education for OBCs, but we can surely argue that a better understanding of this 'hierarchy of deprivation' is necessary for a more nuanced policy of affirmative action, including reservation.

Secondly, how should one deal with the issue of eligibility for HE? Deficits for the underprivileged are significantly lower among the eligible population, even after we take a variety of other factors in to account. Thus, once persons from under privileged groups cross the school threshold, the chances of their going to college are quite high. Clearly, the constraints on school education must first be fully understood and dealt with so as to enhance participation in higher education. Therefore, even while dealing with the issue of participation, should the HE policy also focus on ensuring that the threshold (schooling) is crossed? Arguably, reservation in higher education is an incentive to cross the threshold, just as job reservation is a great incentive to go in for higher education. Are these adequate? To what extent have these worked? Do we have better options for affirmative action? Should we revise the reservation policies more frequently and be more dynamic so as to give a fillip to HE participation among the eligible underprivileged?

Three, to what extent should socio-religious affiliations be a focus of affirmative action? Since many other factors other than socio-religious affiliation also influence participation in higher education in a significant way, an exclusive focus on such affiliation for affirmative action seems inappropriate. The importance of economic background and location highlights the role supply side factors play in HE participation. It may be useful in subsequent analysis to explore the interaction effects between socio-religious affiliation and other explanatory factors.

Recent discussions on higher education in India have raised a variety of very interesting policy related issues, among others. Unfortunately, the empirical underpinnings of this discussion have been rather weak. This is not to argue that issues of higher education can only be resolved through empirical analysis, but to suggest that a better understanding of empirical reality would facilitate a more informed debate on the relevant issues. We suggest that, in this context, a more detailed analysis on the lines of this work might be useful.

End Notes

1. Refer to the 93rd Amendment Act of 2005, through which the OBC reservation has been extended to the centrally aided higher education institutions as well. Earlier, the OBC reservation in all government jobs and higher education institutions were recommended in the Mandal Commission report submitted in 1980, which became effective in 1990 through the constitutional amendment.
2. It has been argued elsewhere, such an affirmative action may lead to under-appreciation of the accomplishments of members of beneficiary communities, whose successes may be attributed to policies of positive discrimination rather than to their own individual characteristics. Relatively poor performance of people from the beneficiary groups can also perpetuate the perceptions about the poor quality of these people, an effect just the opposite of what one would like to have of affirmative action. See Weisskopf (2004: chapter 3), for a comprehensive discussion of the arguments for and against policies of positive discrimination.
3. Barro and Lee (2001) also define the stock and flow concepts.
4. Since the average age of study in undergraduate course in India is 18-21 years, we take the lowest age of current generation stock measure as 22 years instead of 20 years. Also, inclusion of people below 22 years would reduce the share of CGS to a large extent as there are comparatively fewer graduates in that age group. But in case of AGS, we want to capture the graduates across all generations and there are some people who complete graduation as early as at 20 years of age, who should not be left out.
5. The question on whether currently studying or not is asked to people below 30 years age.
6. It includes Muslim SC/ST population too, as mandated for the purpose of reservation.
7. It should be noted that the assigned socio-religious affiliation is based on the responses in the surveys conducted by the NSSO. No independent assessment of the validity of these responses was undertaken by the agency. If there are reporting errors in these responses, the estimates would of course be affected.
8. That is, Rs 538.60 for urban areas and Rs 356.30 for rural areas.
9. See Basant (2006) and Sundaram (2007) for some earlier efforts in this direction.
10. The reason of current generation stock measures for most SRCs being higher than flow measures might partly be attributed to the age-sensitivity of the definitions to some extent. It may also be due to the fact that CGS measures includes the stock of educationally backward students needing longer than average time to complete studies, while considering the age group of 22 to 35. But the CGF measure considering only the population of age 17 to 29, might leave out a portion of educationally backwards.
11. Inclusion of per capita household expenditure as an explanatory variable in both stock and flow model may cause endogeneity problems. For stock model, being a higher degree holder increase the scope of higher earnings, causing the household expenditure to increase. For flow model, along with the same logic, current enrolment may also increase household expenditures through educational expenses. However, if we see household expenditure as an indicator of household background, then we may not need to worry about endogeneity.
12. The rankings in first column of table 7 is deduced from the appendix table 1 and so the other columns from corresponding estimations, which are not produced in the paper to keep the length manageable.
13. Example: Say there are three SRCs: A, B, and C. The marginal effects are not statistically significant between A and B, but value of A is higher. Hence A and B have been grouped together in italics, while ranking A as 1 and B as 2. Say, the marginal effect between B and C is not statistically significant. Also, say, the marginal effects between A and C is statistically significant and A has higher value than C. So, we need to put A in a different group than C. Hence the ranking would be as follows: 1. A; 2.B; and 3.C (In italics due to insignificant differences).

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Appendix

Dropped	H-SC	-ST	H-OBC	H-UC	M-OBC	M-G	OM
H-SC		-0.01	-0.01*	-0.03*	0.01*	-0.00	-0.02*
H-ST	0.01		-0.01	-0.02*	0.03*	0.00	-0.02*
H-OBC	0.02*	0.01		-0.02*	0.03*	0.01*	-0.01*
H-UC	0.04*	0.03*	0.02*		0.06*	0.04*	0.01*
M-OBC	-0.01*	-0.02*	-0.02*	-0.03*		-0.01*	-0.03*
M-G	0.00	-0.00	-0.01*	-0.02*	0.02*		-0.02*
OM	0.04*	0.03*	0.02*	-0.01*	0.06*	0.03*	

Note: *Significant at 5%.

In order to keep the tables uncluttered, we do not report estimates of other variables included in the equation as in Tables 5 and 6.

SRC paired with	Stock Full	Flow Full	Stock Eligible	Flow Eligible
Urban Sample				
H-SC	H-OBC, H-UC, M-OBC, OM.	H-ST, H-UC, OM	H-UC, OM	None
H-ST	H-UC, M-OBC, OM.	H-OBC, M-OBC, M-G	H-UC, OM	
H-OBC	H-UC, M-OBC, M-G, OM.	H-UC, M-OBC, M-G	H-UC, OM	
H-UC	M-OBC, M-G, OM.	M-OBC, M-G	M-OBC, M-G	
M-OBC	M-G, OM	OM	OM	
M-G	OM	OM	OM	
Rural Sample				
HSC	H-ST, H-UC, M-OBC, M-G	H-ST, H-UC, M-OBC	M-OBC, H-UC	H-ST, H-UC
HST	H-OBC, H-UC, M-OBC, OM	H-OBC, M-OBC, M-G		H-OBC, H-UC, OM
HOBC	H-UC, M-OBC, M-G	H-UC, M-OBC	H-UC, M-OBC	M-OBC, M-G
HUC	M-OBC, M-G, OM	M-OBC, M-G	M-OBC, OM	M-OBC, M-G
MOBC	M-G, OM	OM		
MG	OM			



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