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Rethinking the Role of Affirmative Action

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Abstract

This paper explores how socio-economic, especially socio-religious affiliations, and demographic characteristics of individuals influence participation in higher education (HE). It argues that appropriate measures of 'deficits' in participation should inform the nature and scope of affirmative action. The analytical and policy relevance of distinguishing between stock and flow measures, the differences in eligibility for HE across groups are emphasized. After controlling for relevant factors, the 'hierarchy of participation in higher education' that emerges from detailed analysis suggests that deficits for some marginalized groups are not high enough to justify reservation for these groups on the basis of low participation.

Keywords: India, Asia, Education, Affirmative Action, Reservation, Caste.

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Introduction

Access to higher education has been a long standing policy concern in India. Reservation for different social groups at the central and the state levels has been a typical policy response. With the implementation of reservation for Other Backward Castes (OBCs) in the centrally aided higher education institutions effectively from the year 2006¹, the debate on reservation has picked up again. Among other things, the policy of reservation in higher education is based on the premise that participation of persons from the reserved category is uniformly low and reservation would result in significantly higher participation. The discussion on issues relating to the measurement of participation in higher education and the ‘deficits’ experienced by different groups has, however, 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, deficits for some groups that benefit currently from reservation policies may be inadequate to justify the affirmative action for these groups.

The rest of the paper is divided into four sections. Section 2 briefly reviews 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 for which participation can be potentially compared. Estimates of participation for different socio-religious groups are analyzed in Section 4. This section reports results of some econometric analyses on the role of different socio-religious affiliations in determining participation in higher education. Section 5 concludes.

1. 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 of India from its inception. Since OBC reservation is comparatively a new issue, few studies have concentrated solely on OBCs.

Defining Socio-economic and Religious Categories

Partly due to the fact that reservation policy being primarily focused in SC/ST candidates till 1990, government level data on caste in India was available only for SC/ST. all other castes were put in the category of ‘others.’ But as a consequence of considering affirmative action for the OBC category, the latter has also been added from the year 1990 onwards. Hence the category of ‘others’ now includes all upper castes as well as some lower castes close to SCs, and other lower castes which are not recognized as either SC, ST or OBC. Deshpande (2006) argues that this kind of categorization is inappropriate to analyze the differences between the upper classes and the classes at the bottom of the society in terms of development and prosperity.

More recently, studies have tried to combine caste and community categories to analyze the 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, other backward classes and SC/ST), 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

A Caste Development Index (CDI) has been developed by Deshpande (2001), using the National Family and Health Survey Data of 1992-93. While the study recommends inclusion of caste as indicator of stratification of Indian population, it shows that there is regional variation in the status of SC/ST in terms of CDI. The study finds that the same pattern of difference in castes between SC/ST and others persists even in the years 1998-99, when she constructs the index again after the implementation of reservation system of early 1990s. Some recent analyses of SRCs have shown that differences in participation and achievements decline when economic conditions are controlled for (Government of India, 2006). These results are consistent with the argument that ‘creamy layer’ within each marginalized group may garner larger parts 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 the eligible population for higher education, that is, those who have passed higher secondary or equivalent examination, then the educational achievements do not vary much with their poverty status 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 for the general category people the poverty status does make a significant difference among the eligible or qualified people in joining higher education, implying that reservation may be helping in better enrollment irrespective of economic status once the threshold level of school education is crossed. It is not entirely clear from his estimates if differences across SRCs remain significant once eligibility, economic status, regional background etc. are controlled for.

Inability of certain marginalized segments of the population to become eligible for higher education may be due to the unequal access to school education. Banerjee and Somanathan (2007) analyses the census data between 1971-1991 and finds that 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 find that the areas concentrated with SC/ST population 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 different levels among Hindus along with that of other upper castes, Dalit, Adivasis, and Muslims between the years of 1983 to 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 declining trend in the gap between Hindus and other groups at the higher income levels. It implies that while affirmative action in employment seems to have contributed to higher primary school enrollment over the years (more people participating in school education in anticipation of getting jobs through reservation), but improvement in economic

condition increased the effectiveness of the program. That is, households with better economic conditions benefited more from the job reservation as it helped improve enrollment in schools.

What is the combined impact of affirmative action in education and employment? Xaxa (2000) in his study of quota system in the admission of the University of Delhi finds that even after implementation of quota system in higher education, government and semi-government jobs for SC/ST/OBC, the quotas remain largely unfulfilled in several places. Kirpal and Gupta (1999) in the study of reserved seat students entering the BTech program in five major and oldest Indian Institute of Technologies (IIT) between the year 1981 and 1992 found that the average graduation rates among the SC and ST students are lower as compared to the general students getting admission in those institutes. The performance of the reserved students in the IIT examinations seemed to be low 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 among their wages once the academic GPA (Grade Point Average) is controlled for. However, without controlling for GPA, the average wages of SC/ST candidates seem to be lower than the average wages of the general candidates. Also on average, GPA of SC/ST candidates was found to be less than GPA of general candidates. This implies that the weaker background of the SC/ST students who get admitted to IIMs due to the reservation policy, adversely affect their job market achievements through relatively lower GPA. Hence, even if the SC/ST candidates are given 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 success of such a policy will also require that the beneficiaries are afforded significant human and financial support after being preferentially selected. Else, the reservation policy may not be able to serve the purpose of eliminating differences (Weisskopf, 2004).²

At a more general level, however, job market achievements of persons who participated in higher education can be affected by factors other than the weak educational background prior to entry into the institution of higher education. 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 use the opportunities far better than their counterparts primarily due to their social networks. Apart from social capital, lower achievement in the job market was also attributed to lack of their sufficient financial strength. In the absence of access to inexpensive loans, lack of financial strength may also deprive poor students of 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 control for 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 in employment and education spaces 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.

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

We argue in this section that while analyzing participation in HE across different socio-economic groups, the measures used for participation and the ability to empirically distinguish between analytically meaningful socio-economic categories is very important.

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. Share of graduates and higher degree holders in the population group above 20 years of age, which 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 terms of 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 share among graduates 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 two measures above.

Another aspect of measuring deficit using any of the above methods is to consider the eligibility. Eligibility requirements for enrollment in an under-graduate course are 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 defined for eligible population. 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 less than 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 participation in higher education within combinations of SRCs and economic categories. Unfortunately, the sample sizes in all the sub-groups of different economic categories do not permit such detailed comparisons.

3. Participation in Higher education: Some Estimates⁹

We first discuss estimates of participation by SRCs. This is followed by an analysis by economic categories and the combination of SRC 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. An indication of high drop out after the higher secondary education can be substantiated by the large difference between the measures of participation based on total population in the relevant age group and those based on only eligible population.¹⁰

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 eligible population, a flow measure of some marginalized groups show higher participation than average, and more than Hindu UC and Other minorities. In other words, the probability of an eligible candidate going to college today is the same or even higher for a marginalized student than for others. This may be indicative of the fact that being qualified probably has a larger impact on the marginalized groups in their decision for enrollment in higher education. However, there is visible improvement in participation among all groups when one compares all generation stocks with current generation stock measures and suggests some convergence across groups in recent years.

Socio-Religious Categories	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; the differences decline when we compare 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.

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

As we try to present aggregate estimates of three measures of participation for the poor and non-poor categories of all SRCs, the low sample size of all the poor categories do not allow a reliable estimation. Hence, Table 3 presents the estimates of non-poor categories only, whereas, the sample size for poor categories are noted in the table for understanding. As expected, within each SRC, participation rates are mostly higher among the non-poor, irrespective of the measure that 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, another question that is useful to ask is whether use of private educational institution differs by socio-economic groups. Table 4 provides some estimates. On average, about 45 percent persons studying for higher education go to private institutions (aided + unaided). The highest reliance on government institutions, including local municipal bodies is for Hindu-ST persons followed by Hindu-SC, Hindu-UC and Hindu-OBCs in that order. Muslims and Other minorities rely more on private institutions. While 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, it is interesting to note 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

4. 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 the role of socio-religious factors declines dramatically once locational and economic factors are controlled for.

In order to explore this further we analyze two separate models to understand how the probability of a person's participation in higher education changes with various socio-religious affiliations after controlling for individual, household and regional characteristics. At the individual level, we control for age and gender, and at the household level we control for per capita household expenditure¹¹. Locational differences are controlled by the use of state dummies, along with separate estimations for rural and urban areas.

The two models allow us to compare the stock versus flow measurement of participation as discussed earlier. The *flow* model allows us to see how the probability of current enrollment in higher education changes with various socio-religious affiliations, controlling for other possible determinants. This flow model includes people in the age group between 17 to 29 years. The *stock* model allows us to see how the probability of completing graduate or higher degree changes for current generation defined by the people of the age group 22 to 35 years. For all the above models we have done the estimations for rural and urban population separately due to their inherent differences. We

also run separate regressions of the above stock and flow models in rural and urban areas, for the subset of population that is eligible to enter higher education.

Table 5 provides the estimates of the *flow* model for all the four specifications of rural/urban among full sample and among eligible sample. The results confirm many relationships that make intuitive sense. Everything else being the same, the probability of current enrollment in higher education increases significantly with per capita expenditure of households; in general, men have a higher probability of being currently enrolled in higher education than women, and the difference is more when we consider only the eligible population.

Table 5: Probability of Completing Graduate Studies – Probit Estimates				
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 different is the probability of participation in higher education for persons with different socio-religious affiliations vis-à-vis Hindu-SC. For the full (eligible for HE as well as others) sample, Hindu ST and Hindu UC have significantly higher probability of current participation in both urban and rural areas. Other minorities of the full sample model have 3 percent higher probability of current enrollment over the Hindu SC in urban areas only. In rural areas, the difference is not statistically significant. Similarly, for the full sample, Muslim OBCs have 1 percent lower probability of current participation over Hindu SC for the rural population only. For urban population, the probability of participation of Muslim OBC vis-à-vis SCs is somewhat lower and that of Hindu-OBCs slightly higher, but the differences are statistically not very significant.

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 probability of participation among any of the SRCs (vis-à-vis SCs) for the urban people. For rural people too the story looks same except for a 12 percent higher chance for Hindu ST 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 probability of enrollment as compared to Hindu SC, which supports the Sachar Committee report on conditions of Muslim community.

As we explore the full sample of the *stock* model of participation in Table 6, we find that vis-à-vis Hindu SC, most of the SRCs have probability of being graduate different and statistically significant, except for the Hindu ST, Muslim general in urban areas; and for Hindu OBC, Other minorities in the rural areas. Apart from these exceptions, while Hindu UC, Hindu OBC and Other minorities have higher probability of being graduates vis-à-vis Hindu SC, the probability for Muslim general and Muslim OBC are significantly lower.

Just like the flow model, in the stock model too, while we consider the eligible population, the difference in probability of being graduates decreases for most of the SRCs. In urban areas, only the Hindu UC and other minorities have probabilities higher than Hindu SC by 7 and 6 percent respectively. For the rural eligible population the only

statistically significant difference in probability of participation exists between Hindu SC and the Muslim OBC, the latter being lower by about 6 percent.

Model 1: Stock	<i>Specification 1: All</i>		<i>Specification 2: Eligible</i>	
	Marginal effects (dF/dx)		Marginal effects (dF/dx)	
Variables	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.

Overall, the inter-group differences in probability seem to be less among eligible population. Hindu ST seems to be better off among marginalized groups in most specifications and sometimes better off than the Hindu UC. Hindu OBC seems to have a positive sign of probability as compared to the Hindu SC, but the differences do not seem to be significant in most of the specifications. Muslim population has mostly probabilities

that are lower than of Hindu SCs but the differences are not significant in most cases. These results may be partly reflective 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 doing direct comparisons among all SRCs without using the reference point of Hindu SC. It may be more useful to develop a rank order of the probabilities of participation in higher education faced by different SRCs in order to ascertain the relative impact of socio-religious affiliation. 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 reported in 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 affiliation 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 hierarchy of participation in higher education by different SRCs. Table 7 presents the rankings of all urban stock and flow models. Table 8 does the same for rural population¹². Through this summary we get the distribution of SRCs by ranks for each model, which have already been estimated.

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

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

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 find that 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 OBC, ranking always in that order are placed just below Hindu UC and above Muslim groups in all specification of urban population.

In the rural areas (Table 8), the full sample of stock gives a ranking with Hindu UC on top and Muslim OBC at the bottom. While the differences in probability of participation

in HE due to affiliation to various SRCs are statistically significant from each other, 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 of rural area. In 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, and 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, still both rank just below Hindu UC and Hindu ST in rural areas too.

Comparing the stock versus flow models of table 7 and 8, it is evident that differences among SRCs seem to wither away over generations in both rural and urban areas, especially in the latter. However, controlling for other effects, unlike in urban areas the differences attributable to affiliation with SRCs were not high to begin with in rural areas and therefore the transition is more dramatic in urban areas. Hindu ST seems to have picked up in enrollment when we look at more current generation of 17 to 29 years old students as compared to the stock of 22 to 35 years old graduates. It ranks at the top having higher probability of current enrollment among eligible population in both rural and urban areas by replacing Hindu UC, and the difference is statistically significant in rural areas, if not in urban areas. The significance of difference of other groups with Hindu OBC reduces in flow models, but ranking do not improve much. Hindu SC too does not show much sign of improvement in enrollment except for rural stock eligible population.

The statistical significance of the differences in the pairs Hindu ST-Hindu UC and Muslim OBC- Muslim general wither away in flow models of both rural and urban areas over the stock model. Moreover, in urban area the statistical significance of pairs Hindu OBC - Other minorities, Hindu OBC - Hindu SC, and Hindu ST - Other minorities disappear too, signifying reduction in inter-group differences in current enrollment of urban marginal groups. In rural areas the statistical significance of pairs Hindu OBC - Muslim general and Hindu SC- Muslim general seem to go away when we look at current enrollment. The most interesting finding is that Muslim groups improve ranking drastically, being just below the Hindu ST in current enrollment of eligible rural

population. It means that one way to improve enrollment of Muslim population in higher education is to help them crossing the threshold.

The inter-group differences seem to get eroded even more when we look at the eligible population of urban areas in table 7. The stock model still provides statistically significant difference between Hindu UC and Hindu OBC, with the former at the top, and Muslim OBC with the rest, but the flow model can not provide a statistically significant difference among any pair of SRCs. 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 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 by policies of reservation in India and the levels of participation in HE. Should it be linked to deficits of respective groups? If yes, what type of deficits one should go by? According to the preliminary statistics, the deficits for Hindu OBC and to some extent Hindu ST are not very high, 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 of 7.2 percent. However, their share increases to 4 percent among 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 controlled for, while inter-SRC differences in many cases decline, interestingly some kind of reversal also takes place as the probability of Hindu ST and Hindu-OBC participation in higher education becomes higher than other marginalized groups in most specifications. The current participation of Hindu ST shows even a brighter story of probability of their participation being significantly higher than *all SRCs* including the Hindu UC. We cannot certainly conclude from here that this is a 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' may be critical for a more nuanced policy of affirmative action, including reservation.

Two, in the discussion on higher education, how should one deal with the issue of eligibility. Deficits for the under-privileged are significantly lower among the eligible population, even after we control for a variety of other factors. Thus, once persons from under privileged groups cross the school threshold, the chances of their going to college are quite high. Clearly, a better understanding of the constraints on school education is critical if participation in higher education is to be enhanced. Therefore, should the higher education policy also focus on ensuring that the threshold is crossed, even when one is thinking about participation in higher education? Arguably, reservation in higher education is an incentive to cross the threshold. Similarly, one can argue that job reservation can enhance the incentives to participate in higher education. Are these adequate? To what extent have these worked? Do we have better options for affirmative action? Do the reservation policies need to be revised frequently along with being more dynamic to reflect the change in participation among eligible underprivileged?

Three, to what extent, socio-religious affiliation be a focus of affirmative action? Since many other factors, other than socio-religious affiliation also influence participation in higher education in a significant manner, an exclusive focus on such affiliation for affirmative action seems inappropriate. The importance of economic background as well as that of location highlights the role of the supply side factors in affecting the participation of various groups in higher education. 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 and other issues. 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 of the above kind might be useful.

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Appendix

Dropped →	H-SC	H-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, OM	M-OBC, M-G, OM	
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			

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).