Determinants of Access to Higher Education: Evidence from Jharkhand, India

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Abstract

This paper examines the access to higher education across socio-religious groups in the state of Jharkhand in India. It also examines the factors affecting access to higher education and the role of students' social background in explaining the inequality in participation in higher education. The analysis is based on cross tabulation, logistic regression and Fairlie decomposition method. The analysis shows that tribals, Muslims and Scheduled Castes are the worst performing groups in the state. The most prominent factor behind the vulnerable condition of tribals is their high concentration in rural areas as there is a remarkable gap in their performance between rural and urban areas. A large part of the gap between the privileged and the underprivileged groups could not be explained by endowment factors, namely, household size, education of the head of household and income background. The results suggest that incentives created due to family background leads to different outcomes among different socio-religious groups.

INTRODUCTION

The conventional understanding on higher education in literature of economics is from the vantage point of the human capital theory. The human capital theory draws a parallel between the investment in human capital and physical capital. This theory was primarily developed by Schultz (1961), Becker (1964), Denison

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(1962) and Mincer (1974). This theory using cost benefit analysis argues that the expenditure on higher education is considered investment in human capital which increases productivity and provides returns in terms of improved earnings (Schultz, 1961; Becker, 1964). The endogenous growth theory propounded by Lucas (1988), Romer (1989, 1990) and Mankiw et al. (1992) showed a positive correlation between human capital and economic growth. That is, human capital has a statistically significant positive impact on economic growth (Vinod and Kaushik, 2007). In addition, higher levels of educational attainment are associated with lower income inequalities, and national expenditure (per student) (Keller, 2010).

The relation between education and growth is non-linear. Study shows higher estimated returns in developing countries than in developed countries (Duflo, 2001). Krueger and Lindahl (2001) found a positive association between education and employment in countries with the lowest educational level. In fact, they found an inverted U-shaped relation based on their cross-country study. Nelson and Phelps (1966) also stated education enhanced ability to receive, decode, and understand information. Krueger and Kumar (2004) explain the difference in growth between Europe and the United States (US) due to difference in educational policy. The calibration based on their models finds that difference in education policies play an important role in the growth difference between European countries and the US. They argue that general education helps workers in migrating to higher-productivity sectors, thereby, increasing the growth rate.

The impact of education on quality of life happens prominently through the labour market. The higher education improves the chances of getting employment and higher earnings. The workers with a relatively lower level of education are found to be highly concentrated in vulnerable employment (Sparreboom and Staneva, 2014). It also contributes in terms of improving job security (Ortiz, 2010).

Thus, the equal opportunity in access to higher education is crucial for ensuring equality in terms of economic outcomes. This study focuses broadly on the unequal access to higher education among socio-religious groups in the state of Jharkhand. The specific objectives are as follows:

a) to study the access to higher education of different socio-religious groups with a focus on the tribal population of the state,

b) to examine the factors determining the access to higher education in the state,

c) to examine the extent to which socio-religious background determines the access to higher education in the state.

The study contributes to the existing literature by using data from national sample survey on social consumption, education for the period 2017–18. The study is based on logistic model to determine the access to higher education. The Fairlie decomposition method is used to analyse the role of identity in determining access to higher education. The analysis shows that tribals and Muslims are the worst performing groups in the state. The Scheduled Castes also lag behind the privileged groups. The low performance of the underprivileged groups in education can't be fully attributed to the income inequality as an equal improvement in income does not lead to an equal improvement in participation in higher education across socio-religious groups. The group affiliation affects the participation of underprivileged groups despite improving economic conditions. The findings suggest that incentives created due to family background leads to different outcomes among different socio-religious groups. The result is more concerning due to the fact that tribals are lagging behind other socio-religious groups despite their high concentration in the state. The most prominent factor behind this is their very high concentration in rural areas as there is a remarkable gap in their performance between rural and urban areas.

1 LITERATURE REVIEW

There is a scarcity of research from the aspect of economics as to how students' background affects the access to higher education. The ethnic background affects the economic outcomes in several ways. Studies have showed that low investment on a particular ethnic identity due to the poor public policy results

in poor economic condition of certain ethnic groups (Miguel and Gugerty 2005; Alesina, Baqir and Easterly 1999). The conceptualisation of discrimination from the viewpoint of economics provided theoretical ground for analysing the role of identity in the domain of economics (Becker, 1957). The presence of discrimination, active or passive, might also be a reason for the unequal economic outcomes. There are evidences that discrimination against a particular ethnic group reduces the chance of their vertical mobility irrespective of the effort by the underprivileged groups (Churchill, Ocloo and Robertson, 2017). The methodology for the estimation of discrimination was developed by Oaxaca (1973) and Blinder (1973). Fairlee (1999) has extended this method to the non-linear variables.

There are some studies on examining the role of group identity in determining the access to higher education in Indian context (Khan, 2022; Tilak and Choudhary, 2019; Khan, 2017; Thorat and Khan, 2017; Borooah, 2017). However, the analysis at the sub-national level is pertinent for India due to a wide diversity of the population across different states. This study extends the attempts to identifying the inequality in access to higher education and factors causing it at the sub-national level (Khan, 2023). Furthermore, the analysis at all India level does not capture the state specific factors. There is a wide variation in the performance of different states. For example, the GER, defined as the percentage of population in 18–23 years attending higher education is 40% or above in Kerala, Himachal Pradesh, Tamil Nadu, Uttarakhand and below the national average in Odisha, Assam, Bihar, Gujarat, and Madhya Pradesh (Khan 2023).

2 EDUCATION SYSTEM IN INDIA

The education system in India may be broadly divided into two parts: school education and higher education. The school system in India comprises of lower primary covering first five standards, upper primary divided into two standards, high school based on three and higher secondary comprising the next two standards. At the national level there are two streams of school education, namely, Central Board of Secondary Education (CBSE) and Indian Certificate of Secondary Education (ICSE). Each state has its own school body called the State Council for Educational Research and Training (SCERT). The SCERT generally follows the guidelines provided by the National Council for Educational Research and Training (NCERT) but they also have certain degree of freedom in the implementation of educational strategies. There is a large number of private self-financed schools catering to the urban middle class families. Private sponsored schools are another category of schools started by a private agency and receive grant-in-aid by the government.

The higher education in India begins after the 10 + 2 stage. The education sector in India comes under the concurrent list i.e. education policies and programmes are suggested at the national level by the central government but the state governments have freedom in implementing them. The higher education system comprises various type of institutions like universities, colleges, institutes of national importance, polytechnics etc. Universities are broadly central universities, state universities, and deemed to be universities. The central universities are formed by government of India, by an act of parliament. The state universities are formed by the state government through state legislature. The deemed to be universities means the accreditation granted to higher education institutions due to their high standard of working in a specific area. In addition, there is a large number of private universities managed by private organisation formed through state legislature.

Colleges generally offer undergraduate courses of three years. These are affiliated or constituent body of universities. The degree awarding authority is given to the universities. Bachelor's degree is awarded in Arts, Science, Commerce, etc. However, the undergraduate courses in professional subjects like Engineering, Medicine, Dentistry and Pharmacy are of four to five and a half years. Postgraduate courses are of two years ending with a Master's degree. The certificate or diploma courses are offered in disciplines like Engineering, Agricultural Sciences and Computer Technology.

India has a federal set-up comprising of twenty-eight states and eight union territories. The education is placed in concurrent list extending the responsibility to both the centre and state. The higher education in India is regulated by University Grant Commission (UGC), All India Council for Technical Education (AICTE) and Council of Architecture (COA).

3 DATA AND METHODOLOGY

This paper examines participation in higher education in the state of Jharkhand in India. The analysis is based on the 75th round National Sample Survey data on Social Consumption, Education for the year 2017–18 (NSS, hereafter). Participation in higher education is measured in terms of enrolment at the age between 17 and 35 years. This is to note that the National Sample Survey data on Social Consumption, Education provides information on attendance up to 35 years. In order to avoid the problem of sample size, all samples in the age group of 17 to 35 are considered in the econometric analysis.

The survey covered whole of the Indian Union *except* the villages in Andaman and Nicobar Islands which are difficult to access. The data is collected in four sub-rounds with equal number of sample villages/ blocks (FSUs) allotted for survey in each sub-round to ensure uniform spread of sample FSUs over the entire survey period. A stratified multi-stage design has been adopted for the 75th round survey. The first stage units (FSU) are the census villages (Panchayat wards for Kerala) in the rural sector and urban frame survey (UFS) blocks in the urban sector. The ultimate stage units (USU) are households in both the sectors. In the case of large FSUs, two hamlet-groups (hgs)/sub-blocks (sbs) from each rural/urban FSU has been selected in the intermediate stage of sampling.

Along with the basic socio-economic information, the NSS focussed on the participation and expenditure on education. The survey covers information on current attendance, basic course structure and expenditure on education. The survey provides both individual and household level information. It includes questions on enrolment, attendance, courses, institutions, expenditure, dropouts, etc. This study used the information on enrolment. The sample distribution for the enrolment in higher education is shown in Table 1.

Table 1 Sample size in higher education, Jharkhand

	ST	SC	HOBC	HHC	Muslim	Total
Male	58	31	154	84	52	380
Female	25	21	83	44	26	203
Rural	41	32	99	34	28	234
Urban	42	20	138	94	50	349
Quintile 1: 0–20%	25	18	43	9	17	112
Quintile 2: 20–40%	14	8	53	13	12	100
Quintile 3: 40–60%	12	9	56	21	18	116
Quintile 4: 60–80%	14	12	33	26	15	102
Quintile 5: 80–100%	18	5	52	59	16	153
Self employed	39	21	135	53	31	280
Regular/salaried employees	12	12	64	51	27	168
Casual labour	14	9	15	2	17	57
Others	18	10	23	22	3	78
Total	83	52	237	128	78	583

Source: Author's calculation based on 75th round National Sample Survey data on Social Consumption: Education, 2017–18

3.1 Variables

The study analyses the access of different social groups to higher education in the state of Jharkhand in India. The access is measured in terms of enrolment in higher education. The enrolment in higher education includes graduate, post graduate and higher level of education. The NSS has asked the details of education of interviewee from 5 to 35 years of age. The questions pertain to both their level of education and current enrolment. The details of enrolment and course, expenditure of those currently attending are asked. The questions are asked about the particulars of those currently not attending any educational institution. The questions about reasons for drop out and details about the last enrolment are also covered in the data. This paper is based on the analysis of current enrolment in higher education. All those enrolled in graduate and above including diploma education are considered to be part of higher education and this variable is considered as dependent variable. This is a dummy variable assuming the value 1 if someone is enrolled in higher education and 0 otherwise. In order to compare the performance of different groups the Gross Enrolment Ratio (GER) is calculated. It is defined as the ratio of persons enrolled in higher education institutions to the population in the in the age group from 18 to 23 years.

In the econometric analysis for logistic regression and decomposition method, the enrolment in higher education is the dependent variable. Urban location, household size, head's education and state region are used as independent variables in the model. The state is divided into two parts, namely, region one and region two. This is different from rural-urban disaggregation because the former controls the location based on economic development while the latter controls geographical location. Out of total twenty-four districts, eleven districts are clubbed into region one while the remaining thirteen districts are included into region two. The forest cover is slightly higher in the first region while the forest cover is far lower than the state average in many districts in the second region. Household size is the only continuous variable in the model. All other variables are binary covering yes/no answers. For head's education, those households with head's education below higher secondary education are considered as a reference group for low level of head's education while households with higher secondary and higher level of head's education are treated with higher level of head's education.

India is a diverse society and so is the state of Jharkhand. It is one of the states highly dominated by tribals, namely, Scheduled Tribes (ST). They constitute 26 per cent of the total state population. These are recognised as one of the backward groups based on their geographical isolation. The Scheduled Castes (SC) are another constitutionally recognised underprivileged group based on their historical disadvantages. The other backward classes (OBC) are considered underprivileged group based on the group of socio-economic indicators. The population not belonging to SC, ST and OBC are considered higher castes. The Higher Castes among the majority Hindus are the most privileged group in terms of socio-economic background and are named by Hindu Higher Castes (HHC) in the analysis. The OBC among Hindus are the next better off group and are denoted by HOBC. Muslims are the largest and most backward religious minority. The other religious minorities comprise of Christians, Sikhs, Buddhists, Jains and Zoroastrians. The sample size for the minority group is very low in the NSS data. So, these are combined together and named as Other Religious Minorities (ORM). Hence, the total of six socio-religious groups have been identified for the analysis, namely, Scheduled Tribes (ST), Scheduled Castes (SC), Hindu Other Backward Classes (HOBC), Hindu High Castes (HHC), Muslims and ORMs. The results obtained for ORM may suffer from the limitation of low sample size and hence are not shown in the analysis. Thus, the results for only five socio-religious groups, namely, Scheduled Tribes (ST), Scheduled Castes (SC), Hindu Other Backward Classes (HOBC), Hindu High Castes (HHC), Muslims and ORMs are shown in the analysis. The NSS provides information on monthly per capita consumption expenditure (MPCE), which may be used as a proxy of income.

3.2 Logit Model

The logit model is used to examine the factors determining access to higher education in the state of Jharkhand. The following derivation shows that the linear model may be applied to binary dependent variables with some modifications (Gujarati and Porter, 2009). The model may be presented as follows. Consider the following regression model:

$$Y_i = \beta_1 + \beta_2 X_i + U_i \text{ ,} \tag{1}$$

where X_i are independent variables and $Y_i = 1$ if the person is enrolled in higher education and 0 if he/she is not enrolled. Here, U_i is error term. Note that the error term is not normally distributed if the dependent variable is binary. In fact, the error term also undertakes dichotomous values. Thus, logistic transformation is needed for estimation in this case.

Model (1) looks like a typical linear regression model but because the regressand is binary, or dichotomous, it is called a linear probability model (LPM). This is because the conditional expectation of Y_i given X_i i.e. E ($Y_i \mid X_i$) can be interpreted as the conditional probability that the event will occur given X_i, that is, Pr ($Y_i = 1 \mid X_i$).

Thus, in this case, E ($Y_i \mid X_i$) gives the probability of an individual being enrolled in higher education given X_i. The justification of the name LPM for models can be seen as follows. In order to obtain unbiased estimators, we assume $E(U_i) = 0$:

$$\text{E } (Y_i \mid X_i) = \beta_1 + \beta_2 X_i \text{ .} \tag{2}$$

If P_i is the probability that $Y_i = 1$ (that is, the event occurs), and $(1 - P_i)$ is the probability that $Y_i = 0$ (that is, that the event does not occur). Then, by the definition of mathematical expectation, we obtain:

$$\text{E}(Y_i) = 0(1 - P_i) + 1 (P_i) = P_i \text{ .} \tag{3}$$

Comparing (2) with (3), we can equate:

$$\text{E } (Y_i \mid X_i) = \beta_1 + \beta_2 X_i = P_i \text{ ,} \tag{4}$$

that is, the conditional expectation of the model (1) can be interpreted as the conditional probability of Y_i. In general, the expectation of a Bernoulli random variable is the probability that the random variable equals 1. If there are n independent trials, each with a probability P_i of success and probability $(1 - P_i)$ of failure, and X_i of these trials represent the number of successes, then X_i is said to follow the binomial distribution. The mean of the binomial distribution is nP and its variance is $nP(1 - P)$. The term success is defined in the context of the problem. Since the probability P_i must lie between 0 and 1, we have the restriction:

$$0 \leq \text{E}(Y_i \mid X_i) \leq 1, \tag{5}$$

that is, the conditional expectation (or conditional probability) must lie between 0 and 1.

Thus, Ordinary Least Square (OLS) can be extended to binary dependent variable regression models. However, there are several problems in applying LPM to estimate the occurrence of a binary variable. The notable problem is that Y_i may step outside the 0–1 range and $P_i = \text{E } (Y_i = 1 \mid X_i)$ increases linearly with X_i, that is, the marginal or incremental effect of X_i remains constant throughout is unrealistic. In reality, P_i *may be* nonlinearly related to X_i.

Thus, the most suitable model is the one having two features:
(1) As X_i increases, $P_i = E (Y_i = 1 \mid X_i)$ increases but never steps outside the 0–1 interval,
(2) the relationship between P_i and X_i is nonlinear.

These two properties are satisfied by the sigmoid, or S-shaped curve. The Logistic CDF satisfies these characteristics. This model may be depicted as follows. The LPM explaining enrolment in higher education is:

$$P_i = E\,(Y_i = 1 \mid X_i) = \beta_1 + \beta_2 X_i \,, \tag{6}$$

where X_i is the series of independent variables and $Y_i = 1$ means the individual is enrolled in higher education. But now consider the following representation of enrolment:

$$P_i = E\,(Y_i = 1 \mid X_i) = \frac{1}{1 + e^{-(\beta_1 + \beta_2 X_i)}} \,. \tag{7}$$

Formula (6) may be written as:

$$P_i = E\,(Y_i = 1 \mid X_i) = \frac{1}{1 + e^{-Z_i}} = \frac{e^{Z_i}}{1 + e^{Z_i}} \,, \tag{8}$$

here $Z_i = \beta_1 + \beta_2 X_i$.

Formula (7) represents the (cumulative) logistic distribution function. As Z_i ranges from $-\infty$ to $+\infty$, P_i ranges between 0 and 1 and that P_i is non-linearly related to Z_i (i.e. X_i). Hence, it satisfies the two requirements discussed earlier. The challenge with this model is that P_i is non-linear not only in X_i but also in the β's as shown in Formula (6). Thus, OLS procedure cannot be used to estimate the parameters. However, Formula (6) can be linearized as follows.

If P_i, the probability of enrolment is given by Formula (3), then $(1 - P_i)$, the probability of not enrolled is:

$$1 - P_i = \frac{1}{1 + e^{Z_i}} \,. \tag{9}$$

Therefore,

$$\frac{P_i}{1 - P_i} = \frac{1 + e^{Z_i}}{1 + e^{-Z_i}} = e^{Z_i} \,, \tag{10}$$

here, $\dfrac{P_i}{1 - P_i}$ is ratio of the probability that an individual is enrolled to the probability that he is not enrolled. This is called odd ratio. By taking the natural log of Formula (9), we obtain:

$$L_i = ln\,\left(\frac{P_i}{1 - P_i}\right) = Z_i = \beta_1 + \beta_2 X_i \,, \tag{11}$$

here L, the log of the odds ratio is linear in both X_i and the parameters. L is called the logit. This is called logit model. We will apply this model shown in Formula (11) in our estimation.

The NSS data on social consumption, education has conducted survey of the persons in the age group 3 to 35 years. The survey covers information of those attending, not attending and never attended. The survey is based on questions on the status of enrolment, expenditure on education and drop out. The determinants of the model are the income background of the household as measured by the monthly per capita consumption expenditure (mpce). The mpce is converted into log function for the convenience of interpretation. It is a continuous variable in the model. The location is denoted by the binary variable rural versus urban. The improvement in chance of enrolment in urban areas against rural is estimated to examine the impact of location. The household size is a continuous

variable showing the impact of higher household size on the chance of enrolment in higher education. Head's education is also taken as an explanatory variable. The two categories of head's education are identified, namely, below higher secondary level and higher secondary and above. The NSS data has divided the state of Jharkhand into two regions, namely, region one and region two. The region two underperforms compared to the region one. In order to capture the advantage of region one over region two, the latter is used as a reference group. Finally, the Hindu High Caste who are the most privileged group in India are used as a reference group to examine the relative position of ST, SC, HOBC and Muslims.

3.3 Decomposition analysis

In order to examine the role of group-identity in determining access to higher education, decomposition method is used. The decomposition analysis is conducted using the Fairlee method (1999). This technique uses a non-linear equation such as the logit or probit model to decompose the binary outcomes into two parts, namely, the explained gap and the unexplained gap. To calculate the decomposition between two groups (say, A for privileged group and B for underprivileged group), define $\overline{Y}^{\,j}$ (where j = A or B) the average probability of the binary outcome for group j and F as the cumulative distribution function from the logistic distribution. Following Fairlie (1999), the decomposition for a non-linear equation, $Y = F(X\hat{\beta})$, can be written as:

$$\overline{Y}^A - \overline{Y}^B = \left[\sum_{i=1}^{N^A} \frac{F(X_i^A\, \hat{\beta}^A)}{N^A} - \sum_{i=1}^{N^B} \frac{F(X_i^B\, \hat{\beta}^A)}{N^B} \right] + \left[\sum_{i=1}^{N^B} \frac{F(X_i^B\, \hat{\beta}^A)}{N^B} - \sum_{i=1}^{N^B} \frac{F(X_i^B\, \hat{\beta}^B)}{N^B} \right], \tag{12}$$

where N^j is the sample size for race $j \cdot \hat{\beta}^B$ and β^A are the coefficients for underprivileged and privileged groups respectively, X_i^B and $\overline{X}^A$ are the endowments for underprivileged and privileged groups, respectively. The first term in brackets of Formula (12) represents the part of the gap attributed to differences in distributions of X_i, and the second term represents the part due to differences in the identity-based processes determining levels of Y_i. The second term also captures the portion of the gap due to group differences in immeasurable or unobserved endowments. An equally valid expression for the decomposition is:

$$\overline{Y}^A - \overline{Y}^B = \left[\sum_{i=1}^{N^A} \frac{F(X_i^A\beta^B)}{N^A} - \sum_{i=1}^{N^B} \frac{F(X_i^B\beta^B)}{N^B} \right] + \left[\sum_{i=1}^{N^A} \frac{F(X_i^A\beta^A)}{N^A} - \sum_{i=1}^{N^A} \frac{F(X_i^A\beta^B)}{N^A} \right], \tag{13}$$

in this case, the underprivileged groups' coefficient estimates, $\hat{\beta}^B$ are used as weights for the first term in the decomposition, and the privileged groups' distributions of the independent variables, $\overline{X}^A$ are used as weights for the second term (Formula 13).

The contribution of each variable to the gap is equal to the change in the average predicted probability of replacing the underprivileged groups' distribution with the privileged groups' distribution of that variable while holding the distributions of the other variables constant. The sum of the contributions from individual variables will be equal to the total contribution from all of the variables evaluated with the full sample. This is to note that the gap explained by the endowment variables is purely economic in nature. Thus, it may be corrected by labelling the endowment among different groups. In this model income background, household size, head's education, urban location and geographical location are endowment variables. The part of the gap not explained by the endowment variables are attributed to the group identity. This is often considered as an indirect measure of discrimination since this part of the gap tells the difference in the average outcome variable among different groups despite having

similar average endowment variable. The decomposition method is used in this paper to estimate the difference in enrolment in higher education between privileged and underprivileged groups (HHC/ST, HHC/SC, HHC/Muslims, HHC/OBC`).

4 RESULT

4.1 Study population

Given that Jharkhand is a tribal dominated state of India with one fourth of the total population belonging to the tribal ethnicity (Census, 2011), it's development would percolate the benefits to the tribal ethnic groups who are one of the most marginalised groups in India. The state is the worst performer in terms of the sustainable development goal (SDG). The performance of the state in terms of quality education (SDG 4) and decent work (SDG 8) is highly disappointing (Hindustan Times, 2021, June 21). The improved access to higher education would enable the state to improve its performance in terms of SDG indicators both directly on the parameter of education as well due to the impacts of education on other indicators related to the SDG. This study directly addresses the question of access to higher education in the state in general and the existing inequality in access to higher education in particular.

Jharkhand is one of the tribal dominated states of India. There are 24 districts, 259 Taluks, 32 394 villages and 229 towns in Jharkhand. As per the Census of India (2011), Jharkhand has 6 254 781 households, population of 32 988 134, of which 16 930 315 are males and 16 057 819 are females representing 51.3 per cent and 48.7 per cent of the population, respectively. The literacy rate of Jharkhand state is 55.56 percent, out of which 64.28 percent males are literate and 46.37 percent females are literate. The total area of Jharkhand is 79 716 sq. km with a population density of 414 per sq. km. Out of total population, 75.95 percent of population lives in urban area and 24.05 percent lives in rural area.

Jharkhand is one of the low performing states in terms of higher education. It houses a significant number of people belonging to the tribal groups. The share of other underprivileged groups, namely, Scheduled Castes (SCs), Muslims and other religious minorities is also high. There are 12.1 percent Scheduled Caste (SC) and 26.2 percent Scheduled Tribe (ST) of total population in Jharkhand. The share of Hindu population is 67.8 percent and Muslims are 14.5 percent while Christians and other religion are 4.3 percent and 12.8 percent, respectively. Nearly 37.5 per cent of the population is below the poverty line as shown by the National Sample Survey data on Consumption Expenditure, 2011–12.

4.2 Unequal access to higher education

The most concerning factor with regard to higher education in the state is that the tribals despite comprising high share in total population are the most backward community. Their access to higher education is the lowest among the socio-religious groups. The GER among ST is 7.8 per cent only. The performance of Muslims, 11.4 per cent, is better than ST but they lag behind all other socio-religious groups. It is the highest among HHC at 39.7 per cent followed by 26.9 per cent among HOBC and 18.4 per cent among SC. The GER is 18.7 per cent at the state level. The GER is higher among male than female. Thus, the GER varies remarkably across socio-religious groups. The GER is consistently higher in urban areas than in rural areas among every socio-religious group. The highest improvement from urban location is observed among ST whose GER jumps from 6.1 per cent in rural areas to 40.9 per cent in urban areas. However, GER among HHC is roughly similar in rural and urban areas. The conventional hierarchy by socio-religious groups follows in rural areas but it changes in urban areas. The GER among ST, HOBC and HHC is similar in urban areas and these three groups occupy the top position. However, SC and Muslims continue to be the worst performer. The GER among SC is slightly higher than Muslims (Table 2).

Table 2 GER in higher education, Jharkhand

	Male	Female	Rural	Urban	Total
Scheduled tribes (ST)	9.8	5.9	6.1	40.9	7.8
Scheduled castes (SC)	18.2	18.5	16.2	27.9	18.4
Hindu other backward class (HOBC)	27.5	25.9	20.2	41.6	26.9
Hindu high caste (HHC)	44.4	33.6	38.9	40.7	39.7
Muslims	13.7	9.5	6.4	24.3	11.4
Total	20.9	16.3	13.5	36.7	18.7

Source: Author's calculation based on 75th round National Sample Survey data on Social Consumption: Education, 2017–18

Table 3 shows the GER in higher education by socio-religious groups in different consumption range. The GER increases with the improving income level among every group. It is the lowest among the bottom income group for every socio-religious group and the highest for the top 20 per cent population. The most noteworthy observation is for Muslims whose GER is highest in the top 20 per cent of the population. However, the hierarchy across social groups remains intact. The GER among Muslims remains lowest in the lower 80 per cent population. Further, the GER of SC is higher than OBC in the middle-income group. The poorest 40 per cent among tribals, SC and Muslims are lagging far behind the state average. However, the middle-income groups among ST and SC are relatively better placed, though Muslims continue to lag behind every groups. This might be due to presence of reservation for ST and SC which led to the emergence of the middle class among them thereby improving access to higher education. However, the high GER in the top 20 per cent among Muslims shows intra-community diversity based on the economic background.

Table 3 GER by Socio-religious and income groups (INR)

	0–40	40–80	80–100	Total
Scheduled tribes (ST)	5.9	28.8	42.9	7.8
Scheduled castes (SC)	11.7	40.2	136.7*	18.4
Hindu other backward class (HOBC)	23.9	31.5	46.4	26.9
Hindu high caste (HHC)	31.6	45.6	52.8	39.7
Muslims	9.5	15.7	59.1	11.4
Total	14.1	30.6	52.5	18.7

Note: * Indicates the problem of low sample size. Thus, the estimate is not reliable.
Source: Author's calculation based on 75th round National Sample Survey data on Social Consumption: Education, 2017–18

The pattern is similar also among occupational groups (Table 4). The conventional hierarchy follows for SE and CL with the GER being highest among HHC followed by HOBC, SC, Muslims and ST, respectively. However, this pattern does not hold for the household based on regular employment. In this case, the GER is the highest among HOBC followed by Muslims and HHCs. The GER among ST is the lowest followed by the SC. Worryingly, SC/ST are lagging far behind the state average which is indicative of the fact that a large number of households based on regular employment depend on low quality employment. Further, intra-group inequality is also affirmed from the GER as GER among RS households is far higher than those depending on SE and CL.

Table 4 GER by social groups and occupation groups, Jharkhand, 2017–18

	Self employed (SE)	Regular/salaried employed (RS)	Casual labour (CL)	Total
Scheduled tribes (ST)	8.5	16.6	4.8	7.8
Scheduled castes (SC)	13.9	23.2	9.9*	18.4
Hindu other backward class (HOBC)	20.4	61.2	13.5	26.9
Hindu high caste (HHC)	42.7	41.3	16.7*	39.7
Muslims	12.3	**52.8**	5.9	11.4
Total	16.9	48.8	7.7	18.7

Note: * Implies low sample size. Since the figure confirms the broader pattern, the result may be accepted despite the problem of low sample size.
Source: Author's calculation based on 75th round National Sample Survey data on Social Consumption: Education, 2017–18

4.2.1 What determines participation in higher education?

This section analyses factors affecting participation in higher education as measured by enrolment in higher education. This section is based on two models: the first is a logit model that examines how social, religious and economic background influence higher education enrolment. The decomposition method which is the second model analyses the contribution of social background in creating inequality between privileged and the underprivileged groups. It analyses how variables, namely, gender, urban location, household size and the head's education can explain the gap in access to higher and professional education among different groups.

4.2.2 Participation in higher education

The socio-economic background significantly affects the chances of enrolment in the state. The economic background, ethnic identity and religious background significantly affect the chance of enrolment in higher education in the state (Table 5). The increasing income improves the chance of enrolment in higher education. Further, larger households have a higher chance of enrolment in higher education. The most concerning factor is that the chance of enrolment is far lower among tribals than the HHC despite the state being highly concentrated with the tribal population. The odd ratio for ST is 0.32 which means that their chances of enrolment are 68 per cent lower than the HHC. Muslims continue to be one of the most deprived groups in the state. They have 59 per cent lower chance of enrolment than HHC. It is to note that SC and HOBC also have relatively lower chance of enrolment than HHC by 62 per cent and 23 per cent, respectively. The chances of enrolment improve in households with heads having higher education degree by 46 per cent than the households headed by someone with education up to secondary level. The chance of enrolment is 25 per cent higher in urban areas than in rural areas. This is to note that odd ratios are statistically significant within 5 percent for ST and Muslims. This means that ethnicity and religious background play statistically significant role while caste background is not found to be statistically significant.

In order to further verify the inequality in enrolment in higher education the predicted probability is also estimated. Overall, the chance of enrolment in higher education for the age cohort under consideration is 4.2 per cent. The corresponding probability is 5 per cent in urban areas while it is 4.1 per cent in rural areas. The gap between region 1 and region 2 is notably low. The corresponding probabilities are 4.4 per cent and 4 per cent respectively.

Table 5 Odd ratio of the logistic regression model

Variables	Odd ratio	SE	Z	P>Z
Log MPCE	2.36*	0.496	4.08	0
Urban	1.25	0.375	0.75	0.45
Household size	1.09**	0.048	1.85	0.07
Head's education	1.46	0.349	1.57	0.12
NSS region (ref: region 1)	0.9	0.186	−0.53	0.6
ST (ref: HHC)	0.32*	0.131	−2.78	0.01
SC (ref: HHC)	0.58	0.248	−1.28	0.2
HOBC (ref: HHC)	0.77	0.267	−0.75	0.45
Muslim (ref: HHC)	0.41*	0.174	−2.1	0.04
Constant	0.00010*	0.0001779	−5.4	0
Pseudo R square	0.0687			
Prob>Chi square	0			
Number of observations	3 869			

Note: * Implies significant within 5 percent and ** implies significant withing 10 percent.
Source: Author's calculation based on 75th round National Sample Survey data on Social Consumption: Education, 2017–18

Table 6 Predicted probability of enrolment, Jharkhand

	Predicted probability	Delta method SE	Z	P>|z|
Rural	4.1	0.0046476	8.72	0
Urban	5.0	0.0126731	3.96	0
Education of the head below	3.9	0.0045692	8.54	0
Education of the head	5.6	0.0109085	5.12	0
ST	2.6	0.0055991	4.67	0
SC	4.6	0.0114645	4.00	0
HOBC	6.0	0.0089081	6.74	0
HHC	7.7	0.0240663	3.18	0
Muslim	3.3	0.0085386	3.87	0
Region 1	4.4	0.0056268	7.83	0
Region 2	4.0	0.0062582	6.34	0
Mean	4.2	0.0042678	9.89	0

Source: Author's calculation based on 75th round National Sample Survey data on Social Consumption: Education, 2017–18

4.3 Decomposition analysis

The logistic regression showed the chance of enrolment among different socio-religious groups with reference to HHC. It showed that ST and Muslims are the most underprivileged groups in this regard. The performance of SC and HOBC is also relatively lower. The decomposition analysis in this section divides the explanatory variables into two parts. Table 6 depicts the probability of enrolment by groups in higher education. The probability of enrolment is 7.7 percent among HHC while it is 2.6 percent among ST resulting in a gap of 5.1 per cent point. The probability of enrolment is relatively lower among SC and Muslims and thus the gap with HHC is relatively higher. The probabilities are 4.6 and 3.3 among SC and Muslims respectively. The corresponding probability among HOBC is 6 percent.

This is to note that nearly 54 per cent of the gap among ST and 42 per cent of the gap among SC is not explained by the endowment variables i.e., these are attributed to the social background. Almost the whole gap among Muslims is attributed to their religious identity. Head's education and income benefit them but it is offset by the disadvantages associated with household size, urban location and region.

The economic background is the most effective factor leading to the reduction in the gap in the probability of enrolment in higher education between ST and HHC. Nearly 25 per cent of the gap between them is due to the income inequality between these two groups. Similarly, nearly 14 per cent of the total gap between SC and HHC is attributed to the income inequality between them. Notably, the income gap does not play that prominent role between Muslims and HHC. Nearly 2 per cent of the gap in the probability of enrolment between them is due to income inequality. The reason for it is a high dependence of Muslims on informal sector wherein education does not play any role rather training becomes far more prominent. The reservation in the government sector might be the reason for better explanatory power of income background among ST and SC. Higher probability for getting regular employment provides an incentive for education which results in higher probability of enrolment in higher education.

Notably, household size emerges as the most important factor in reducing the gap in the probability of enrolment in higher education between SC and HHC. It explains nearly 25 per cent of the total gap between these two groups. The household size behaves negatively in the case of Muslims which means that Muslims of smaller households are less likely to get enrolled in higher education. In a backward state like Jharkhand such a role is not unexpected particularly in a scenario wherein a large number of Muslims households are dependent on the informal sector. In such cases the lower size of the household might also result in lower household income as everyone in the household attempts to earn to support the family. Thus, financing of higher education by pooling the resources of other members is highly unlikely in small families.

The educational level of the head is equally important for all the three underprivileged groups. It explains 12 per cent of the gap among SC and ST and 13 per cent of the gap among Muslims. The fact that heads are the primary sponsors of education results in a prominent role of head's educational level among every group.

Table 7 Result of decomposition method, Jharkhand

Jharkhand	ST	SC	Muslims
Log of MPCE	25.3	13.8	1.7
Urban	4.2	12.9	−1.9
Household size	4.3	24.6	−17.0
Head's education HS	11.7	11.6	13.1
Region	0.91	2.5	−11.6
Total explained	46.3	57.7	−15.6
Probability 1	0.065	0.054	0.055
Probability 2	0.024	0.044	0.040
Gap	0.041	0.010	0.015

Source: Author's calculation based on 75th round National Sample Survey data on Social Consumption: Education, 2017–18

The urban location explains nearly 13 per cent of the gap between SC and HHC while the corresponding figure is 4.2 per cent between ST and HHC. The urban location widens the gap between Muslims and HHC. This is to note that SC and ST are highly engaged in regular employment in urban areas which induces their enrolment in higher education while Muslims largely depend on self-employment. Further, being in region 2, in general, reduces the gap for SC and ST but this is not true for Muslims. The gap expands in well off regions for Muslims. This is consistent with the result for urban areas. Thus, the advantage associated with location does not percolate to the Muslim minority.

DISCUSSION AND CONCLUSION

To achieve a competitive economy, the focus should be laid on expansion of higher education which would be instrumental in improving human capital, knowledge and innovation of a country. In this context, improving access of the marginalised section and backward regions would ensure expansion of higher education along with reducing inequality. This study has examined the impact of ethnicity on participation in higher education. The participation of different socio-religious groups in higher education has been analysed. The factors affecting the participation in higher education has also been analysed. Finally, the contribution of ethnic identity to the gap between privileged and underprivileged groups has been estimated by using the decomposition analysis. The result shows that the state performs far lower than the all-India average. The underprivileged socio-religious groups are even at a higher disadvantage. The GER is very low among SC, ST and Muslims. The impact of geographical location is not significant. This indicates a uniform backwardness across the regions. Similarly, being in urban areas improves the probability of participation in higher education but this is not statistically significant. This is to note that the location might not be a significant factor on an average but the rural-urban gap is remarkably higher for tribal population which indicates that the constraints associated with the rural location affect their participation in higher education. The economic backward emerges as one of the most powerful indicators explaining the backwardness. The raising income improves the access to higher education. Similarly, head's educational level also plays a prominent role in improving the access to higher education. The chance of enrolment in higher education is higher in households with head with higher level of education. Interestingly, the chances of enrolment are higher in larger families which might be due to the poor economic condition of the households wherein financing of higher education from household resource is possible only if other earning members support it.

This is to note that merely improvement in the factors associated with economic background would not eradicate inter-group inequality in the state. A notable part of the gap is attributed to the socio-religious identity. Nearly 54 per cent of the gap among ST and 42 per cent of the gap among SC is not explained by the endowment variables i.e., these are attributed to the social background. Almost the whole gap among Muslims is attributed to their religious identity. Head's education and income benefits them but it is offset by the disadvantages associated with household size, urban location and region.

Thus, the analysis shows that ST and Muslims are the worst performing groups in the state. The performance of SC is also notably lower than HOBC and HHC. Even an improvement in income does not lead to an equal improvement in participation. This indicates that ethnicity affects the participation in higher education despite improving economic conditions. The findings suggest that incentives created due to family background leads to different outcomes among different socio-religious groups. The possibility of ethnicity-based discrimination, active or passive, can't be ruled out since the results show that labelling endowments would not eradicate the gap completely. The result is more concerning due to the fact that tribals are lagging behind other socio-religious groups despite their high concentration in the state. The most prominent factor behind this is their very high concentration in rural areas as there is a remarkable gap in their performance between rural and urban areas.

The policy implications of these results are straightforward. If policymakers wish to expand higher education, more attention must be paid to the backward states like Jharkhand and emphasis should be laid on the underprivileged groups. The improvement in economic condition may be one of the approaches towards expansion of higher education. Special attention should be paid on the rural areas and first-generation students to bridge the gap attributed to location and education of the head of household. Furthermore, the socio-religious identity also explains a notable part of the gap which indicates that policy should be sensitive towards group identity to ensure equality of opportunity.

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