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INEQUALITY OF OPPORTUNITY IN INDIA

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The paper associates inequality of opportunities with outcome differences that can be accounted by pre-determined circumstances which lie beyond the control of an individual, such as parental education, parental occupation, caste, religion and place of birth. The overall opportunity share estimates (parametric) of total consumption expenditure inequality due to a set of circumstances comprising of caste, religion, geographical region, parental education and parental occupation vary from 16% to 25% in urban India. The corresponding figures for rural areas stand at 20% and 23%. The analysis further reveals that, parental education is the major contributor to the opportunity share of consumption expenditure inequality in urban India, but caste and geographical region also play an equally important role when rural India is considered.

JEL Codes: D31, D63, J62

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1. Introduction

Should an individual's achievement depend only upon his/her choices and efforts or predetermined circumstances beyond his/her control? This is an age old debate which has occupied the minds of thinkers, philosophers and policy makers alike. The debate became prominent in the late 1960s and early 1970s, when a number of studies reported that the returns to efforts made by individuals of different family background were different. Three important studies which highlighted this conclusion were Hanoch (1967), Weiss (1970) and Bowles (1972). Hanoch (1967) found that in United States, the internal rate of return to increased schooling (except for graduate studies) was considerably lower for African Americans than for whites. Extending Hanoch's work, Weiss (1970) estimated earnings functions for African Americans workers having 12 or fewer years of schooling. He found no statistically significant monetary return to additional schooling except for workers in the 35-44 year age group. He also found that the effect of education on earnings was less for African Americans than for whites and that lower average achievement for African Americans does not account for the difference in the mean earnings between African Americans and whites. Bowles (1972) discovered that returns to own schooling are very much overestimated if family background is not taken into account properly. These studies initiated a new agenda where researchers began to estimate the role of family background in the overall achievement of an individual, either in terms of earnings or cognitive ability.

As Indian society is characterized by different caste groups, religions, regions and languages, similar questions can be asked for Indian society as well. Are Indians of different backgrounds provided with the same kind of opportunities? Is there any kind of discrimination among Indians based on their caste, religion, region or sex? Previous studies reveal that, Indian society suffers from substantial inequalities based upon caste and ethnicity in education, employment and income (Desai and Kulkarni, 2008; Deshpande, 2001; Gaiha *et al.*, 2007; Gang *et al.*, 2007; Kijima, 2006). If these inequalities are arising due to differences in level of efforts made (henceforth referred as inequality of efforts) by individuals of different backgrounds then they are morally acceptable but if they are due to circumstances beyond the control of an individual (henceforth referred as inequality of opportunity) such as parental education, parental occupation, caste, religion, region of birth and sex, then they may be deemed unacceptable and call for compensation to those who have suffered due to inferior circumstances.

The ideas of inequality due to efforts and inequality due to circumstances (inequality of opportunity) have been developed by a number of scholars.¹ It is important to discuss Roemer (1993, 1998 and 2006) because the formalization of the concept of unequal opportunities, suggesting that one should separate the determinants of a person's advantage (i.e., desirable outcomes, such as income or cognitive ability) into circumstances and efforts was offered by him. The concept is motivated by two principles: the first one, also known as the principle of compensation, states that differences in individual achievements which can be unambiguously attributed to differences in factors beyond the individual responsibility are inequitable and have to be compensated by society. In India, an individual's circumstances such as caste, religion, parental education and parental occupation are outside the control of the individual, for which he or she should not be held responsible. Inequalities due to differences in circumstances often reflect social exclusion arising from weaknesses of the existing systems of property and civil rights, and thus should be addressed through public policy interventions (Ali and Zhuang, 2007). On the other hand, the second principle, commonly known as the principle of responsibility, advocates that differences in achievements which can be attributed to factors within the personal responsibility (inequalities due to individual efforts) are equitable and need not be compensated.

In the case of India, an enquiry into inequality of opportunity becomes relevant because historically the Indian society has been severely divided into different caste (or religion and other social group) structures with several groups enjoying privileges more than other groups only because of their superior social status (Deshpande, 2001; Dreze and Sen, 1995, Dubey *et al.*, 2006, Gaiha *et al.*, 2007; Gang *et al.*, 2007; Government of India, 2006, Kijima, 2006; Shah *et al.*, 2006; Sharma, 1999). Given this historical divide and the associated consequences, it becomes important from an academic as well as policy point of view to estimate the extent of inequality due to different circumstances of people in India. It will help in going to the roots of prevailing earnings inequality, evaluating the age old government programs aimed at bringing equality in society and developing policies for bridging gaps between different sections of society.

This study therefore estimates inequality of opportunity in consumption expenditure for different age based cohorts in India. The estimation has been carried out separately for urban and rural areas using parametric approach proposed in earlier studies. The study finds compelling evidence of substantial inequality of opportunity in both urban and rural areas. Since the study uses approaches which have been

¹ See Rawls (1971), Sen (1979), Dworkin (1981), Arneson (1989), Cohen (1989), Roemer (1993, 1998), Dirk (1993) and Fleurbaey (1995, 2008) for theoretical background and a formal discussion. Dirk (1993) in addition to contributing to the theoretical debate has also provided an application based on stochastic correspondences between income of parents and children's outcomes. Further the author has formulated a model of intergenerational transmission based on optimal behaviour by altruistically inspired parents.

developed by authors of earlier studies on the subject, it will be important to discuss the existing studies. This will help in comparing the different approaches proposed in earlier literature and bringing out the importance of our study in light of them. With this background, the next section reviews some important applications of the inequality of opportunity principle in different country settings. It is followed by a formal description of the framework and the data used, which in turn is followed by the main findings of the study. The paper finally concludes with a discussion on the findings.

2. Existing Literature on Empirical Applications of Inequality of Opportunity

There are a few studies which have estimated inequality of opportunity in different country settings. Checchi and Peragine (2010) use nonparametric approach to decompose the total inequality in income in Southern and Northern Italy into inequality of opportunity and inequality of efforts.² The method being non parametric, does not use any functional form and uses two alternative approaches to measure inequality of opportunity. In the first approach, the population is divided into groups based on circumstances of individuals (“types”) with individuals in each group having same set of circumstances. The overall inequality in income is then decomposed into between-group and within-group components with between-group component being taken as inequality of opportunity (“types” or ex ante approach). Since the ex ante approach focuses on inequality between “types” and is neutral with respect to inequality within types, it is an expression of a reward focused approach to equality of opportunity (Checchi *et al.*, 2010, p. 6; Fleurbaey, 2008, chapter 9). In the second approach, the population is divided into groups based on the level of efforts made by the individuals with individuals in each group having exercised same level of effort, and then the within-group inequality resulting from the decomposition of overall inequality (into between-group and within-group) is taken as inequality of opportunity (“tranche” or ex post approach).

Bourguignon *et al.* (2007) use parametric approach to obtain inequality of opportunity in earnings in urban Brazil. The approach is to compare the inequality in actual distribution of earnings in the sample with the inequality in distribution of counterfactual earnings for the same sample, the counterfactual earnings being generated under the counterfactual of same set of circumstances for the whole sample. For generating the counterfactual distribution, earnings is assumed to be a linear function of circumstances, effort and other factors (or luck), it is then estimated and the estimates are used to generate the counterfactual earnings for the whole sample simply by replacing individual circumstance values with the sample average of each circumstance variable (the procedure is explained in detail subsequently). The

² The working paper version (IZA discussion paper no. 1874) was first published in 2005 and is one of the earliest empirical works on inequality of opportunity. Interested readers may also refer to Peragine (2004).

difference in inequality in actual earnings distribution and the inequality in counterfactual earnings distribution is then taken as inequality of opportunity.

Ferreira and Gignoux (2008) have used both parametric as well as non parametric approaches to estimate inequality of opportunity in earnings as well as consumption expenditure in six Latin American countries. Checchi *et al.* (2010) have again used both the approaches to estimate inequality of opportunity in earnings in 25 European countries. Since existing literature has used parametric as well as non parametric approaches, it must be noted that both parametric and non parametric approaches have pros and cons. The non parametric models avoid the arbitrary choice of a specific functional form on the relationship between outcome (earnings or consumption expenditure), circumstances and effort but suffer from data insufficiency problems once number of circumstance variables increase, and fail to capture the partial effects of individual circumstances on outcomes. Whereas, parametric models can handle large number of circumstance variables, allow studying partial effects of individual circumstances on outcomes (other things constant) and also make it feasible to decompose the overall inequality of opportunity into the components due to direct effect of circumstances on outcomes (direct component) and effect of circumstances on outcomes through influence on efforts (indirect component). At best they should be seen as complementary (Checchi *et al.* 2010; Ferreira and Gignoux 2008).

There are few other studies which have used approaches different than the above mentioned ones. One of them is Lefranc *et al.* (2008) which has used stochastic dominance rankings to compare the distribution of opportunities across a set of nine OECD countries.³ The use of this approach is limited as it fails to provide a quantification of how far the different groups (groups based on circumstances) are from one another. Therefore its ranking of inequality of opportunity across countries is limited to a binary classification into equal or unequal. The approach also fails to capture the contribution of individual circumstance variables in overall inequality of opportunity which is very important for readers and policy makers alike as far as India with its complex social divide is concerned.

Another study worth noting is Fleurbaey and Schokkaert (2009). The study analyses unfair inequalities (similar to inequality of opportunity) in health and health care using the concepts of direct unfairness and fairness gap. Direct unfairness is linked to the variations in medical expenditures and health in the hypothetical distribution in which all legitimate sources of variation are kept constant. Whereas, fairness gap is associated with the differences between the actual distribution and the hypothetical distribution in which all illegitimate sources of variation have been removed. In fact, the

³ An earlier version (2006) of this paper is an ECINEQ discussion paper, number 2006-54.

concept of fairness gap is very similar to the inequality of opportunity (parametric approach) as proposed by Bourguignon *et al.* (2007) and Ferreira and Gignoux (2008) who have associated inequality of opportunity with the differences between the actual distribution and the hypothetical (counterfactual) distribution in which all illegitimate sources of variation have been removed (that is effect of circumstances have been removed). Moreover, the approach used by Fleurbaey and Schokkaert (2009) to construct hypothetical distribution is very similar to that used by Bourguignon *et al.* (2007) and Ferreira and Gignoux (2008) for constructing counterfactual distributions.

The third study which needs special mention is Barros *et al.* (2009) whose main focus is on estimation of inequality of opportunity in access to basic services (for example education) among children of different Latin American and Caribbean countries. The study uses inequality of opportunity and human opportunity indices which themselves are based on the concept of dissimilarity index and are useful mainly in the case of categorical outcomes (small number of categories, for example dichotomous outcomes). In addition, it also provides non parametric and parametric estimates of inequality of opportunity in economic outcomes and educational attainment for a number of Latin American countries.⁴

It can be noted that none of the above studies is based on India. However, one study (Singh, 2010) needs to be mentioned. The study has used non parametric approach proposed by Checchi and Peragine (2010) and estimates inequality of opportunity in wage earnings due to father's education for males in urban Indian. The sample used in the study was very selective and restrictive as it included only urban males who were on regular wages and were not involved in any other income generating process. The sample size was little more than 9,000, whereas this study is based on a sample size of more than 18,000 (32,000) males in urban (rural) areas. Also, the present study uses parametric approach for estimating inequality of opportunity in one of the most common indicator of household welfare namely, consumption expenditure. The estimation has been carried out separately for different age based cohorts in urban and rural areas. Moreover, the parametric approach used is not limited to father's education alone as the proxy for circumstances but includes father's occupation, caste, religion and geographical region as other circumstance variables. Further, in addition to estimates of overall inequality of opportunity, the study also provides the estimates of inequality of opportunity due to individual circumstances.

⁴ There are few other papers which have quantified in different contexts the costs and effects of implementing equal opportunity policy as proposed by Roemer (1998). Taking race and parental education as determinants of opportunities in the United States, Betts and Roemer (1999) enquired about what reallocation of educational expenditures would equalize opportunities across individuals in the US. In another study, Page and Roemer (2001) examined the extent to which the fiscal system could be seen as an opportunity equalizing device in the United States.

The study uses ex ante approach and is based on the framework proposed by Ferreira and Gignoux (2008). The analysis is also similar to that of Bourguignon *et al.* (2007). The primary reason for using ex ante approach is that by construction it is focused on the inequality between social types (see Checchi *et al.* 2010, p. 13). The focus on inequality between social types is important given the historical division of Indian society into different caste and religious groups with some caste and religious groups enjoying better opportunities than the others just because of their social inheritance. Estimating inequality of opportunity in India in this way not only helps in understanding the genesis of income inequalities but also helps in prioritizing a redistributive policy. The next section provides the basic outline of the framework and the details of the data used in the paper.

3. Analytical Framework and Data⁵

The framework starts with the categorization of various factors affecting “outcomes” (also referred as “advantages”) into “circumstance” and “effort” variables as defined by Roemer (1998). Following Ferreira and Gignoux (2008) a model of outcome of the general form is defined below:⁶

$$y = f(C, E, u) \tag{1}$$

where y denotes the outcome of interest (in our case, consumption expenditure), C denotes a vector of circumstance variables, E denotes a vector of effort variables and u stands for pure luck or other random factors. Since, effort may depend on circumstances itself, (1) can be rewritten as:

$$y = f[C, E(C, v), u] \tag{2}$$

Going by Roemer’s concept of equality of opportunity which requires that $F(y/C) = F(y)$, the following three conditions are implied (Ferreira and Gignoux, 2008, p.6):

- (i) $\frac{\partial f(C, E, u)}{\partial C} = 0, \forall C$, that is, no circumstance variable should have a direct causal impact on y ;
- (ii) $G(E/C) = G(E), \forall E, \forall C$, each effort variable should be distributed independently from all circumstances.

⁵ The present study uses Ferreira and Gignoux (2008) framework for estimation. The notations have been retained for coherence and comparison. *I do not take any credit for the development of the framework as well as the associated assumptions and provide only the basic outline of the framework as a ready reference for the readers.* For greater details, readers may refer to the above study.

⁶ Ferreira and Gignoux (2008) themselves have followed Bourguignon *et al.* (2007) for the parametric decomposition.

(iii) $H(u/C) = H(u)$, i.e. random factors and luck are also independent from circumstances. This condition holds by assumption. F , G and H denote cumulative distributions.

To measure inequality of opportunity is therefore to measure the extent to which $F(y/C) \neq F(y)$ (Ferreira and Gignoux, 2008, p.6). Given this background, the salient features of the approach follow.

3.1 Parametric Approach⁷

Following Ferreira and Gignoux (2008), consider a counterfactual distribution $\{\tilde{y}_i\}$, corresponding to $F(y/C)$ as the distribution that arises from replacing y_i with $\tilde{y}_i = f[\bar{C}, E(\bar{C}, v_i), u_i]$ in (2), where \bar{C} stands for vector of sample mean circumstances. To generate this counterfactual distribution a specific model of (2) needs to be estimated. Keeping in line with Bourguignon *et al.* (2007) and Ferreira and Gignoux (2008), a log-linear (linear specification) of the form as mentioned below can be specified:

$$\ln y = C\alpha + E\beta + u \quad (3)$$

$$E = BC + v \quad (4)$$

The reduced form of the structural model (3) – (4) is $\ln y = C(\alpha + \beta B) + v\beta + u$, which can be estimated by OLS as follows (Ferreira and Gignoux, 2008, p. 11):

$$\ln y = C\varphi + \varepsilon \quad (5)$$

Under these functional form assumptions, the counterfactual distribution is obtained by:

$$\tilde{y}_i = \exp [\bar{C}\hat{\varphi} + \hat{\varepsilon}_i] \quad (6)$$

The overall opportunity share of outcome (earnings or consumption expenditure) inequality can now be given as:

$$\theta_l = \frac{I[\{y_i\}] - I[\{\tilde{y}_i\}]}{I[\{y_i\}]} \quad (7)$$

It is nothing but difference between the inequality in actual distribution of outcome and the inequality in counterfactual distribution of outcome as a proportion of the inequality in actual distribution of outcome.

The estimation of the partial effects of one (or a subset) of the circumstance variables, controlling for the others can be obtained by constructing alternative counterfactual distributions as follows:

⁷ The approach follows Ferreira and Gignoux (2008) and the notations are retained to maintain coherence. Since their approach itself derives from Bourguignon *et al.* (2007), the approach also follows Bourguignon *et al.* (2007).

$$\tilde{y}_i^J = \exp [\bar{C}^J \hat{\varphi}^J + C_i^{J \neq J} \hat{\varphi}^{J \neq J} + \varepsilon_i] \quad (8)$$

Therefore the circumstance J-specific opportunity inequality share can be given by:

$$\theta_l^J = \frac{I[\{y_i\}] - I[\{\tilde{y}_i^J\}]}{I[\{y_i\}]} \quad (9)$$

The analysis has been conducted separately for urban and rural areas. It has been done because the sources of income and expenditure are very different in these areas. Also, the nature of job market and business environment in urban areas differs from that in rural areas. If urban and rural areas are combined, then the results will show a picture which averages the extent of opportunity inequality in the two regions and will fail to capture the contrast between the regions.

The samples in urban and rural areas are divided into different age based cohorts: 21 years (yrs) to 30yrs, 31yrs to 40yrs, 41yrs to 50yrs and 51yrs to 65yrs, respectively.⁸ This allows, not only to measure the role of inequality of opportunities in shaping the inequality of outcomes (consumption) at a point in time, but also to study how this role may vary across cohorts (Bourguignon *et al.*, 2007). Then for each cohort of the two areas, the analysis has been performed separately. The analysis uses Mean Log Deviation (also known as GE (0); hence forth referred as MLD) as the inequality measure because it is the only measure which satisfies six axioms or properties which comprise of the four standard axioms of (i) anonymity or symmetry; (ii) population replication or replication invariance; (iii) mean independence or scale invariance; (iv) Pigou - Dalton principle of transfers and the additional axioms of (v) additive subgroup decomposability and (vi) path independence.⁹

The next subsection describes the dataset, samples used and the details of the circumstance as well as effort variables.

3.2. Data

The data for the present study has been taken from India Human Development Survey (IHDS), 2004-05, conducted by National Council of Applied Economic Research (NCAER), New Delhi, India, in collaboration with the University of Maryland. This is a micro unit recorded, nationally representative survey based on a stratified, multistage sampling procedure. It covers 26,734 households (143,374

⁸ This study treats cohorts as age homogenous by definition and that is why age (beyond the division of sample into cohorts based on it) and imputed experience do not appear in the analysis. This practice has been used in earlier studies on inequality of opportunity (see Bourguignon *et al.*, 2007, p. 601).

⁹ Refer to Ferreira and Gignoux (2008), Bourguignon (1979), Shorrocks (1980), Foster and Shneyerov (2000), and Shorrocks and Wan (2005) for a detailed discussion on these properties.

individuals) and 14,820 households (72,380 individuals) in rural and urban areas respectively. The survey contains information on a person's family background and other demographic details like sex, religion, parental education and parental occupation. Besides, the survey also reports consumption expenditure and actual earnings from different sources for households and individuals.

The study is restricted to males in the age group of 21 yrs to 65 yrs in both urban and rural areas. It would have been desirable to include the females also in the analysis and examine the effect of gender on outcomes but given the fact that the information on key circumstance variable of father's education (and father's occupation) is missing for most of the females in the age group 21 yrs to 65 yrs, it became impossible to include them. In the urban sample, father's education (and father's occupation) was available only for approximately 10% females in the age group 21 yrs to 65 yrs. The same figure for rural sample stands at 6%. The main reason for unavailability of father's education (and father's occupation) for majority of the females is that majority of the females in the above mentioned age group in both urban and rural samples are either wives of the household heads (or household heads themselves) or daughter-in-laws of household heads, groups for which the information on father's education (and occupation) is not captured in the survey.

The dependent variable for the analysis is logarithm of consumption expenditure which has been measured as household per capita consumption expenditure. The circumstance variables include father's education, father's occupation, caste, religion and geographical region of residence.¹⁰ Father's education has been taken as a continuous variable and measured as the number of years of schooling completed by the father. For urban areas, father's occupation has been categorized into three categories: (i) higher status which includes scientists, engineers, architects, physicians, surgeons, accountants, mathematicians, statisticians, economists, social scientists, teachers, journalists, creative and performing artists, elected and legislative officials, administrative officials (government and local bodies), managers and related; (ii) medium status which includes people in clerical jobs, village officials, transport and communication supervisors and sales professionals like shopkeepers, commercial travelers, insurance, real state, securities and business services, money lenders and related; and (iii) lower status which includes farmers, fishermen, agricultural laborers, farm and forestry workers, hunters and related workers, waiters, bartenders and related workers, maids and other housekeeping service workers, sweepers, cleaners and

¹⁰ The ideal variable for capturing effect of region would have been region of birth but in the absence of this information, geographical region of residence has been taken as a proxy for region of birth. Since, the geographical regions of residence are very big regions comprising of multiple states, we assume that the migration between regions is low. When it comes to father's education and father's occupational status, one would like to investigate the extent of correlation between them, the study checked for the possible correlation which came out to be low. The correlation was less than 0.45 for urban cohorts and less than 0.35 for rural cohorts.

related workers, service workers, other laborers involved in production, transport equipment and construction and related. Higher occupation status has been taken as the reference category.¹¹ For rural areas, “higher” and “medium” occupational categories were combined into one category, “high” and therefore the “lower” category has been renamed as “low”. This was done because in rural areas the majority (more than 85%) of population was falling under “lower” status category and there was a dearth of population in “higher” and “medium” categories.

Caste has been categorized into three categories; “general”, “other backward Castes” (OBC) and “scheduled castes and scheduled tribes” (SC/ST) with “general” as the reference category. Religion has also been grouped into three categories; “hindus” (who form the majority of population in India), “muslims” and “others” with “hindu” as the reference category.¹²

India is comprised of 29 states and 7 Union Territories. The different states of India are at different levels of socio-economic development; most of the eastern and central states of India are economically and demographically lagging the other states (Bhat and Zavier, 1999; Bose, 1991). So, any meaningful analysis should take into account the consequence of vast regional diversity present in India. To take care of the effect of geographical region on the outcome measures, the analysis also includes geographical region of residence as one of the circumstance variables. Geographical region has been categorized into six categories namely North, Central, East, North-east, West, and South. Northern region comprises of states of Jammu & Kashmir, Himachal Pradesh, Delhi, Uttaranchal, Punjab, Haryana and Rajasthan. The states of Uttar Pradesh, Madhya Pradesh and Chattisgarh come under the central region. The Eastern region comprises of states of Bihar, Jharkhand, West Bengal and Orissa. The North-eastern region includes the seven north-eastern sister states namely Assam, Arunachal Pradesh, Meghalaya, Manipur, Tripura, Nagaland and Sikkim. The Western region includes states of Maharashtra, Goa and Gujarat. Finally, the Southern region comprises of states of Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Pondicherry. Northern region has been taken as the reference category.

¹¹ The occupational categories are collapsed version of occupation codes which are based on the Government of India’s national classification of occupations – 1968.

¹² For greater details on implications of caste (and religion) and social inequalities in welfare and other demographic indicators in India based on caste and religion please refer to Desai and Kulkarni (2008), Deshpande (2001), Gaiha *et al.* (2007), Gang *et al.* (2007), Kijima (2006) and Govt. of India (2006). There has been substantial evidence of individuals belonging to lower caste categories (SC/ST and OBC) facing discrimination and severe disadvantages when it comes to access to public services, public goods and other facilities resulting in lower attainments (education, earnings etc.). There is also evidence of “muslims” falling behind “hindus” when it comes to access of above mentioned facilities.

4. Results

The descriptive statistics of the main variables are presented in Table 1. It can be seen that the mean years of completed schooling of fathers decreases as one moves from younger to older cohorts in urban as well as rural areas. Also, the figures are higher for urban cohorts compared to their rural counterparts. Another stylized observation which can be noted from the table is that fathers of a majority of individuals fall in lower occupational category.

To obtain the overall opportunity share of earnings (and consumption expenditure) inequality, the reduced form equation (5) has been estimated. Table 2 reports the results of the reduced form regression for urban areas. As expected, belonging to “OBC” or “SC/ST” categories has significant negative correlation with consumption expenditure of individuals in all the cohorts (reference being “general”). Similarly religion also plays an important role where being in “muslim” category is associated with significant lower consumption expenditure than “hindus”. This relationship is true for all the cohorts.

Father’s education always has a significant positive association with consumption expenditure. The same is true for father’s occupational status also. Individuals whose fathers are in “medium” or “lower” occupational status categories have significantly lower consumption expenditure compared to those who have their fathers in “higher” occupational category. The above two observations are true for all the cohorts. The trends are similar when rural areas are considered (Table 3).

Using the estimates of the coefficients from the reduced form equation (5), reported in Table 2 (urban) and Table 3 (rural), counterfactual distributions corresponding to equation (6) have been obtained for urban and rural areas. This helps to decompose consumption expenditure inequality for each cohort in urban and rural samples into a component due to unequal circumstances (inequality of opportunity) and a residual component due to all factors other than observed circumstances which may be “efforts”, random elements or any other unaccounted factor. Table 4 presents the MLD coefficients for factual and counterfactual consumption expenditure distributions for all the cohorts in urban and rural areas. It also reports the corresponding overall opportunity share in total observed inequality.

In urban areas (Table 4A), the overall opportunity share in total observed consumption expenditure inequality ranges from 25% to 16% across youngest to oldest cohorts, the simple average across cohorts being 21%. In rural areas (Table 4B), the overall opportunity share in total observed consumption expenditure inequality ranges from 23% to 20% across different cohorts, the simple average across cohorts being 22%.

Table 5 assesses the influence of individual circumstance variables on consumption expenditure inequality by urban and rural cohorts. It presents the MLD coefficients for factual consumption expenditure and counterfactual consumption expenditure, obtained by equalizing each individual circumstance variable in turn, while controlling for all others (using equation (8)). Each circumstance variable's contribution as a proportion of total observed inequality has also been reported.

It can be noted that in urban areas (Table 5, Panel A), it is the father's education which has the maximum effect on an individual's consumption expenditure (column 10). The opportunity share in total observed earnings inequality due to father's education varies from 18% to 10% across youngest to oldest cohort. The second largest influence on consumption expenditure results from caste (column 4) which constitutes 4-5% in total consumption expenditure inequality. In case of rural areas (Table 5, Panel B) the estimates of opportunity shares in total observed consumption expenditure inequality due to father's education is not as dominating as in the case of urban India. It can be observed that barring the exception of first cohort the effect of caste is higher than that of father's education. But, the highest opportunity share in every cohort is contributed by geographical region of residence (column 8).

The overall opportunity share of consumption expenditure inequality is comparable across urban and rural areas. The opportunity share estimates of total observed consumption expenditure inequality due to father's education as the circumstance variable in rural areas which was nearly half of the estimated share in urban areas is more than compensated by increased role of other circumstance variables (caste and geographical region) in rural areas. Further discussion on the above findings has been provided in the next section which is also the concluding section of the paper.

5. Discussion and Conclusion

Based on framework proposed by Ferreira and Gignoux (2008), this paper has estimated overall opportunity share of total observed consumption expenditure inequality for India. In addition, it has also estimated the individual effects of five circumstance variables (namely father's education, father's occupation, caste, religion and geographical region) on the consumption expenditure inequality among individuals. This helps in identifying the comparative role of each circumstance variable vis a vis other ones and can lead to more targeted policy interventions. Since the approach used has been derived from earlier studies it will be worthwhile to compare the findings of this paper with the earlier ones whose approaches have been used.

When this study's estimates of overall opportunity share of total consumption expenditure inequality are compared to the corresponding estimates for a set of Latin American countries (Ferreira

and Gignoux, 2008), it is revealed that inequality of opportunity in consumption expenditure in India is lower than the aforesaid set of Latin American countries. Ferreira and Gignoux (2008) have measured inequality of opportunity for Colombia, Peru, Panama, Ecuador, Guatemala and Brazil and their estimate of overall opportunity share of total consumption expenditure (per capita household) inequality ranges from 24% for Columbia to 50% for Guatemala. Whereas for India, the overall opportunity share of total consumption expenditure (per capita household) inequality varies from 21% (simple average across cohorts, the range being 16% to 25%) for urban India to 22% (simple average across cohorts, the range being 20% to 23%) for rural India.¹³

While the results of this study are interesting, they should be interpreted with some caution. That is, not to consider the variation of inequality of opportunity estimates across cohorts as variation over time. This is because, in the words of Bourguignon *et al.* (2007), “they are measured at the same point in time, and it is impossible to disentangle period, age and cohort effects (Bourguignon *et al.*, 2007, p.613)”.

Also, the estimates presented in this paper should be considered as the lower bound estimates of inequality of opportunity. This is so because, though the analysis uses multiple circumstance variables, there might be possibility of existence of other circumstance variables which are not observed. Adding another independent circumstance variable to the right-hand side of the regression equation (for generating the counterfactual distribution of the outcome variable) must reduce the variance of the residual and increase the variance of observed circumstances therefore increasing the inequality of opportunity share (Barros *et al.*, 2009, p. 127; Also refer to Bourguignon *et al.*, 2007; Checchi, Peragine and Serlenga, 2010; Ferreira and Gignoux, 2008; Shorrocks and Wan, 2005). Another reason why the inequality of opportunity estimates are lower-bound is that the partitioning of population into categories within each circumstance variable is rather coarse. Like adding other circumstance variables, further subdivision of these categories within each circumstance might also increase (but could not reduce) the share of inequality attributed to opportunities (Ferreira and Gignoux, 2008, p. 13).

Even with the above cautions, the results are important because they give a clear picture about the extent to which circumstances (especially family background) affects the earning ability of an individual. Whether it is urban India or rural India, a substantial part (nearly 20%) of total consumption inequality is accounted by unequal circumstances. If one of the main findings of this study, that is the influence of parental education on an individual’s earnings is considered in conjunction with similar findings from

¹³ Barros *et al.* (2009) have also estimated overall opportunity share of total observed earnings (and consumption expenditure) inequality for seven Latin American Countries of which six are included in Ferreira and Gignoux (2008). The additional country is Mexico. Their results are similar to that of Ferreira and Gignoux (2008) and therefore have not been compared with the findings of this paper.

Bourguignon *et al.* (2007) and Ferreira and Gignoux (2008) who have also found major role of parental education in explaining the difference in earnings of individuals, then it is high time for the government to increase the support for improving the educational levels of general masses. Special focus should be on to attract children of uneducated parents to attend schools which are at par with the best schools in the country and to ensure that they complete their schooling.

The importance of caste as a factor contributing to the difference between consumption expenditures (income) of individuals is in line with many past studies (Desai and Kulkarni, 2008; Deshpande, 2001; Gaiha *et al.*, 2007; Gang *et al.*, 2007; Kijima, 2006). These studies have found that a substantial portion of difference between the achievements (educational attainment or earnings) can be explained by the difference in caste backgrounds of the individuals. The findings of the present study along with the above mentioned ones become important if seen in the light of affirmative action by central and state governments (in terms of reserving positions in educational institutions and governmental jobs) for individuals belonging to lower caste categories. The study offers some support for this affirmative action.

In the words of Checchi and Peragine (2010), “the main suggestion of an equal opportunity philosophy is that social and economic inequalities due to factors beyond the individual responsibility are inequitable and to be compensated by society; whereas inequalities due to personal responsibility are equitable and not to be compensated. Therefore, according to the opportunity egalitarian conception, to judge a country’s status as an egalitarian society, one has to distinguish, in a given distribution of outcomes, the inequalities due to personal responsibility as opposed to the inequalities due to non responsible factors or opportunities (p. 448)”. In this paper, the inequality of opportunity for India has been estimated which is a diversion from the conventional ways where the authors try to estimate the earnings inequality for different sections and regions of the country. Though their results are useful, by using them one cannot actually go to the roots of the earnings inequality. By trying to understand the components of earnings (consumption expenditure) inequality, focused policies in terms of type (and extent) of redistribution and other welfare measures required to reduce the disparities in earnings in the society can be suggested. The present study also goes one step ahead of the studies (Duraismy, 2002; Kingdon and Theopold, 2006) which have estimated returns to schooling for people of different family backgrounds for India. These studies showed evidence that the returns to schooling for some sections of the society have been more than for other sections. The present study in a sense explores the possible reason behind this observation. If returns to schooling depend not only on an individual’s education but also his family background, then it is obvious that the returns to education for individuals belonging to different family backgrounds will be different.

As a concluding remark it needs to be mentioned that, inequality of opportunity in outcomes of individuals results from a number of factors, such as discrimination (in different forms) including preference for individuals of particular family background over others, social connections of parents and role of family background in formation of aspirations, beliefs and attitudes in individuals during childhood which later influence their earnings (Bourguignon *et al.*, 2007; Checchi and Peragine, 2010; Roemer, 1998). If influence of these factors on earnings of individuals has to be reduced thereby reducing inequality in opportunities in society, then two kinds of policies should be adhered to. First, policies focused on zero discrimination in opportunities should be encouraged and second, policies that reduce the effect of family background on a child's chances of acquiring skills and abilities should also be supported. Since inequality of opportunity forms a substantial part of total earnings inequality in India, a reduction in it (with other factors remaining unchanged) due to above policies may lead to reduction in overall earnings inequality.

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TABLE 1 DESCRIPTIVE STATISTICS

Cohorts →	Urban					Rural				
	First	Second	Third	Fourth	All	First	Second	Third	Fourth	All
Mean consumption expenditure (rupees, monthly)	1199.71	1131.60	1300.98	1493.90	1255.569	753.26	678.87	777.80	857.03	758.66
Mean father's number of years of schooling	6.40	5.17	4.47	4.16	5.23	3.69	2.51	1.69	1.43	2.51
Caste (%)										
Others	41.09	42.70	43.98	47.21	43.27	26.86	27.91	28.42	29.22	27.93
OBC	38.80	37.63	37.66	36.35	37.78	40.82	39.72	39.61	40.59	40.23
SC/ST	20.11	19.67	18.36	16.44	18.95	32.32	32.38	31.97	30.20	31.84
Religion (%)										
Hindu	75.11	77.93	79.14	78.91	77.46	82.38	82.63	82.24	82.92	82.52
Muslim	18.45	15.62	13.40	13.56	15.68	10.11	9.25	9.51	8.81	9.49
Others	6.43	6.45	7.46	7.52	6.86	7.51	8.12	8.25	8.28	7.98
Regions (%)										
North	24.97	23.98	23.45	23.00	24.01	24.36	22.27	22.36	22.57	23.03
East	16.64	17.76	18.44	19.84	17.92	14.80	16.30	16.03	15.54	15.61
North East	4.72	3.86	3.93	4.34	4.24	5.01	5.13	4.87	5.66	5.14
Central	15.30	14.02	13.73	13.68	14.31	22.12	20.87	20.19	20.04	20.97
West	14.54	14.93	14.69	13.65	14.52	12.70	13.75	13.00	12.85	13.07
South	23.82	25.44	25.77	25.49	25.00	21.01	21.69	23.56	23.34	22.18
Father's Occupational Status (%)										
Higher Status	13.44	12.38	10.28	9.89	11.82	12.55	9.03	6.87	6.21	9.17
Medium Status	18.67	19.57	20.13	20.18	19.51					
Lower Status	67.89	68.04	69.60	69.93	68.67	87.45	90.97	93.13	93.79	90.83
Number of Observations	5907	5129	3970	3296	18302	10626	8837	6801	6428	32692

Note: 1. Consumption expenditure is per capita household consumption expenditure.

2. First cohort: 21 – 30 yrs.; Second cohort: 31– 40 yrs.; Third cohort: 41– 50 yrs.; Fourth cohort: 51– 65 yrs.

TABLE 2 REDUCED-FORM OLS REGRESSIONS OF CONSUMPTION EXPENDITURE ON OBSERVED CIRCUMSTANCES BY COHORTS: URBAN

	First	Second	Third	Fourth
Caste (reference: general)				
OBC	-0.192*** (0.018)	-0.185*** (0.019)	-0.194*** (0.022)	-0.210*** (0.027)
SC/ST	-0.240*** (0.022)	-0.251*** (0.023)	-0.313*** (0.027)	-0.325*** (0.035)
Religion (reference: Hindu)				
Muslim	-0.191*** (0.021)	-0.260*** (0.023)	-0.335*** (0.028)	-0.318*** (0.034)
Others	0.061* (0.031)	0.025 (0.033)	0.016 (0.036)	0.018 (0.044)
Region (reference: North)				
East	-0.260*** (0.024)	-0.240*** (0.025)	-0.307*** (0.029)	-0.216*** (0.035)
North East	-0.171*** (0.038)	-0.136*** (0.044)	-0.163*** (0.051)	-0.168*** (0.060)
Central	-0.241*** (0.025)	-0.290*** (0.027)	-0.256*** (0.032)	-0.232*** (0.039)
West	-0.116*** (0.025)	-0.100*** (0.026)	-0.172*** (0.031)	-0.125*** (0.039)
South	-0.032 (0.022)	-0.078*** (0.023)	-0.065*** (0.027)	-0.083** (0.034)
Father's Years of Schooling	0.040*** (0.002)	0.034*** (0.002)	0.039*** (0.002)	0.040*** (0.003)
Father's Occupational Status (reference: higher)				
Medium	-0.063** (0.027)	-0.015 (0.029)	-0.002 (0.036)	-0.118*** (0.045)
Low	-0.149*** (0.024)	-0.105*** (0.027)	-0.078** (0.034)	-0.153*** (0.042)
Constant	6.965*** (0.033)	6.989*** (0.034)	7.130*** (0.041)	7.275 (0.051)
Sample Size	5907	5129	3970	3296
Adj R-squared	0.223	0.204	0.214	0.178

Notes: 1. Dependent variable is log of monthly household per capita consumption expenditure.

2. Figures in parenthesis are standard errors.

3. *** Significant at 1%; **Significant at 5% ; *Significant at 10%.

4. First cohort: 21 – 30 yrs.; Second cohort: 31– 40 yrs.; Third cohort: 41– 50 yrs.; Fourth cohort: 51– 65 yrs.

TABLE 3 REDUCED-FORM OLS REGRESSIONS OF CONSUMPTION EXPENDITURE ON OBSERVED CIRCUMSTANCES BY COHORTS: RURAL

	First	Second	Third	Fourth
Caste (reference: General)				
OBC	-0.132*** (0.014)	-0.160*** (0.015)	-0.170*** (0.018)	-0.197*** (0.019)
SC/ST	-0.302*** (0.015)	-0.362*** (0.016)	-0.361*** (0.020)	-0.408*** (0.021)
Religion (reference: Hindu)				
Muslim	0.003 (0.019)	-0.129*** (0.021)	-0.157*** (0.025)	-0.095*** (0.028)
Others	0.102*** (0.022)	0.036 (0.022)	0.053** (0.027)	0.169*** (0.029)
Geographical regions (reference: North)				
East	-0.463*** (0.018)	-0.494*** (0.019)	-0.517*** (0.023)	-0.526*** (0.025)
North East	-0.226*** (0.028)	-0.175*** (0.029)	-0.266*** (0.036)	-0.232*** (0.037)
Central	-0.531*** (0.016)	-0.574*** (0.018)	-0.545*** (0.022)	-0.543*** (0.024)
West	-0.228*** (0.019)	-0.268*** (0.020)	-0.262*** (0.025)	-0.248*** (0.027)
South	-0.123*** (0.017)	-0.178*** (0.018)	-0.148*** (0.021)	-0.111*** (0.023)
Father's years of schooling	0.034*** (0.001)	0.026*** (0.002)	0.033*** (0.003)	0.043*** (0.003)
Father's occupational status (reference: high)				
Low	-0.103*** (0.018)	-0.100*** (0.021)	-0.080*** (0.030)	-0.135*** (0.033)
Constant	6.746*** (0.023)	6.804*** (0.026)	6.908*** (0.035)	7.000*** (0.038)
Sample Size	10626	8837	6801	6428
Adj R-squared	0.234	0.232	0.213	0.230

Notes: 1. Dependent variable is log of monthly household per capita consumption expenditure.

2. Figures in parenthesis are standard errors.

3. *** Significant at 1%; **Significant at 5% ; *Significant at 10%.

4. First cohort: 21 – 30 yrs.; Second cohort: 31– 40 yrs.; Third cohort: 41– 50 yrs.; Fourth cohort: 51– 65 yrs.

TABLE 4 THE CONTRIBUTION OF UNEQUAL OPPORTUNITIES TO CONSUMPTION EXPENDITURE INEQUALITY, BY COHORTS: MEAN LOG DEVIATION AND RATIOS

(A) URBAN

Cohorts	Total Observed (factual) Inequality (1)	Inequality in Counterfactual (2)	Overall Opportunity Share in Total Observed Inequality $((1)-(2))/(1)$
First (21- 30 yrs.)	0.245	0.185	0.245
Second (31- 40 yrs.)	0.217	0.170	0.218
Third (41- 50 yrs.)	0.236	0.186	0.211
Fourth (51- 65 yrs.)	0.290	0.244	0.160

(B) RURAL

Cohorts	Total Observed (factual) Inequality (1)	Inequality in Counterfactual (2)	Overall Opportunity Share in Total Observed Inequality $((1)-(2))/(1)$
First (21- 30 yrs.)	0.238	0.182	0.232
Second (31- 40 yrs.)	0.215	0.167	0.224
Third (41- 50 yrs.)	0.236	0.190	0.197
Fourth (51- 65 yrs.)	0.269	0.213	0.208

TABLE 5 THE CONTRIBUTION OF INDIVIDUAL CIRCUMSTANCE VARIABLES TO CONSUMPTION EXPENDITURE INEQUALITY, BY COHORTS: MEAN LOG DEVIATION (AND RATIOS)

	Total Observed Inequality (MLD, factual) (1)	Equalizing Caste		Equalizing Religion		Equalizing Region		Equalizing Father's Education		Equalizing Father's Occupation	
		MLD Estimate (CFD) (2)	Share in Total Observed Inequality ((1)-(2))/(1)	MLD Estimate (CFD) (3)	Share in Total Observed Inequality ((1)-(3))/(1)	MLD Estimate (CFD) (4)	Share in Total Observed Inequality ((1)-(4))/(1)	MLD Estimate (CFD) (5)	Share in Total Observed Inequality ((1)-(5))/(1)	MLD Estimate (CFD) (6)	Share in Total Observed Inequality ((1)-(6))/(1)
Panel (A): Urban Cohorts											
First	0.245	0.235	0.043	0.240	0.022	0.240	0.021	0.201	0.180	0.236	0.039
Second	0.217	0.206	0.052	0.211	0.026	0.212	0.024	0.187	0.138	0.210	0.031
Third	0.236	0.223	0.057	0.228	0.036	0.232	0.015	0.207	0.124	0.231	0.019
Fourth	0.290	0.276	0.047	0.284	0.020	0.286	0.012	0.260	0.102	0.284	0.019
Panel (B): Rural Cohorts											
First	0.238	0.224	0.057	0.236	0.005	0.213	0.106	0.216	0.091	0.235	0.013
Second	0.215	0.200	0.074	0.215	0.000	0.189	0.124	0.205	0.047	0.213	0.010
Third	0.236	0.220	0.067	0.235	0.004	0.212	0.102	0.225	0.047	0.235	0.006
Fourth	0.279	0.255	0.087	0.275	0.013	0.248	0.111	0.262	0.061	0.276	0.009

Notes: 1. MLD and CFD stand for mean log deviation and counterfactual distribution respectively.

2. First cohort: 21 – 30 yrs.; Second cohort: 31– 40 yrs.; Third cohort: 41– 50 yrs.; Fourth cohort: 51– 65 yrs.