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CASTE DISCRIMINATION IN THE DISTRIBUTION OF CONSUMPTION EXPENDITURE IN INDIA: THEORY AND EVIDENCE

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1. MOTIVATION

While a great deal of work has been done by economists on the measurement of inequality and poverty, rather less appears to have been done with respect to a related phenomenon - that of 'discrimination'. Much of the work in this area - with specific reference to segregation - has been undertaken by sociologists (see, for example, the seminal contributions of Duncan and Duncan (1955a, 1995b).

In this paper we discuss a number of real-valued indices of discrimination, measured - for specificity - along the dimension of income. At this juncture it might be as well to issue a caveat to the effect that the term 'discrimination' carries with it connotations of intentionality which it may be hard to infer from a consideration of outcomes. Those who feel uncomfortable with the use of the term 'discrimination' may simply wish to replace it with the more neutral term 'relative disadvantage'. Now that this qualification is in place, we shall continue to employ the term 'discrimination' without further outbreaks of defensiveness.

In this paper we also seek a concrete application of our measurement - related concerns. This we do by estimating the extent of discrimination that obtains, in rural India, with respect to the distribution of consumption expenditure between the scheduled castes and tribes on the one hand, and the rest of the population, on the other[1]. It must be emphasized that our

2.2 Some Real-Valued Indices of Discrimination

In what follows, we present a set of five discrimination indices $D^k (k=1,\ldots,5)$ which, we believe, are intuitively fairly immediately plausible. The first of these indices is given by :

$$D^1(s^g) = 1-\mu^{s^g}/\mu,$$

where μ^{s^g} is the mean income of the reference group s^g. D^1 simply measures the proportionate deviation of the mean income of the reference group from the overall mean income. If μ^{s^g} is less than μ, $D^1(s^g)$ is positive, and we have a case of 'discrimination against' the reference group; and the other way around if μ^{s^g} is greater than μ. D^1 is a very elementary index, and hardly requires any further explication. By taking the median and the mode, rather than the mean, as the relevant measure of central tendency, we can generate the following two simple variants of D^1:

$$D^2(s^g) = 1-m^{s^g}/ m; \qquad \ldots (2.3)$$

and

$$D^3(s^g) = 1-M^{s^g} / M. \qquad \ldots (2.4)$$

If $F^{s^g}(x_i)$ is the cumulative proportion of the reference-group population with incomes not exceeding x_i, and $F(x_i)$ is the cumulative proportion of the entire population with incomes not exceeding x_i, then it is easy to verify that D^1 is given by:

$$D^1(s^g) = \frac{1}{\mu} \sum_{i \in T} [F^{s^g}(x_i) - F(x_i)] (x_{i+1} - x_i), \qquad \ldots (2.5)$$

where we adopt the convention that $x_{n+1} = 0$[2]. In obvious notation, and employing the continuous analogue of the discrete distribution we have thus far used, we obtain the following from (2.5):

$$D^1(s^g) = \frac{1}{\mu}\int_{\underline{x}}^{\bar{x}} (F^{s^g}(x) - F(x))dx, \qquad \ldots (2.6)$$

where $[\underline{x},\bar{x}]$ is the support of $F(x)$. The index D^1 can be visualized as being proportional to the area enclosed between two cumulative density functions, as represented by the dotted area in Figures 1(a) and 1(b). (We have, for specificity, assumed the cumulative density functions to have the particular shapes that have been depicted in the figures).

From Figure 1, we obtain a lead for yet another discrimination index, namely, the <u>maximum</u> distance between the two cumulative density functions. More precisely, define a distinguished member of T, i^*, as:

$$i^* = \underset{i \in T}{\operatorname{argmax}} \, |(F^{s^g}(x_i) - F(x_i)|.$$

Next, define the discrimination index D^4 simply as:

$$D^4(s^g) = F^{s^g}(x_i*) - F(x_i*). \qquad \ldots (2.11)$$

For the continuous distribution, we would have:

$$D^4(s^g) = F^{s^g}(x^*) - F(x^*), \qquad \ldots (2.12)$$

where $x^* = \underset{x \in [\underline{x},\bar{x}]}{\operatorname{argmax}} \, |F^{s^g}(x^*) - F(x^*)|$.

It is immediate that D^4 lies between -1 and $+1$ (all negative values signifying discrimination in favour of, and all positive values signifying discrimination against, the reference group). Notice from Figures 1(a) and 1(b) that the maximum distance between the two cumulative density functions, D^4, is the distance between the two points on the functions at which the slopes are equalized. At any point on the cumulative density function F(.), the slope (assuming differentiability) is simply the value of the density function f(.). Therefore, the value of D^4 can be