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Revisiting Between-group Inequality Measurement

An Application to the Dynamics of Caste Inequality in Two Indian villages

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Abstract

Standard approaches to decomposing how much group differences contribute to inequality rarely show significant between-group inequality, and are of limited use in comparing populations with different numbers of groups. This study applies an adaptation to the standard approach that remedies these problems to longitudinal household data from two Indian villages—Palanpur in the north, and Sugao in the west. The authors find that in Palanpur the largest scheduled caste group failed to share in the gradual rise in village prosperity. This would not have emerged from standard decomposition analysis. However, in Sugao the alternative procedure did not yield any additional insights because income gains applied relatively evenly across castes.

This paper—a product of the Poverty and Inequality Team, Development Research Group—is part of a larger effort in the department to study inequality if opportunity and economic development. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The author may be contacted at planjouw@worldbank.org.

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Revisiting between-group inequality measurement: An Application to the dynamics of caste inequality in two Indian villages

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1. Introduction

Few things reveal the salience of ethnic diversity as much as the level of inequality between ethnic groups. When group-based differences remain stable over long periods of time they have been influentially described as "durable inequalities" (Tilley 1998). Such "inequality traps" (World Bank 2005, Rao 2006) are believed to be highly correlated with the unequal distribution of power and are consequently considered an important cause of ethnic conflict and immobility. Not surprisingly, there is a large literature devoted to measuring the extent to which inequality is influenced by group differences.

The standard method used to 'decompose' overall income inequality into its constituent parts is by employing measures that can separate inequality into the sum attributable to differences in mean outcomes *across* population sub-groups, and that attributable to differences *within* those sub-groups.[i] Such decompositions have been widely used to understand economic inequality and guide the design of policy. While most of the applications of these methods have been to study income inequality – the measures can also be readily applied to other measurable outcomes such as years of education, political power, or nutritional status.

The empirical application of inequality decomposition has tended to find little evidence of significant between-group differences. For example, in a classic reference, Anand (1983) showed that inequality between ethnic-groups in Malaysia accounted for only 15% of total inequality in the early 1970s. This led to his recommendation that government strategy should focus on the sources of inequality *within* ethnic groups rather than on between-group differences.

At the aggregate level in India, decomposition analysis has also found a relatively small contribution of between-group differences to overall inequality when groups are

defined in terms of broad social group membership (Scheduled Tribe, Scheduled Caste, and Other). Mutatkar (2005) finds a between-group contribution of less than 5% in three rounds of National Sample Survey data during the 1980s and 1990s (corresponding to 1983, 1993/4 and 1999/0). These findings hold irrespective of whether one looks at rural or urban areas. Deshpande (2000) finds an even lower contribution between these three social groups within the state of Kerala, using data from 1993/4 round of the NSS[ii].

Part of the reason for this is that the inherent properties of standard inequality decomposition measures tend to be structured so as to understate between-group inequality. A recent paper by Elbers, Lanjouw, Mistiaen and Özler (2008) – hereafter referred to as ELMO (2008) - points out that the standard procedure for decomposing inequality into a between- and a within-group component fails to capture a particular feature of group differences that might be highly relevant to an assessment of their importance. We outline the mathematics of this below, but the intuition behind ELMO is quite simple: standard decomposition procedures assess the extent to which group divisions contribute to inequality by giving everyone within a group the average income of the group and then asking how much of overall inequality can be attributed to the inequality accounted for by the inequality in these group-average income levels. By comparing group-average income inequality against total inequality, the procedure in effect compares observed group differences against the extreme benchmark where each individual in the data is treated as a separate group. As a result, between-group inequality is always rather low, in comparison with the benchmark. In addition, standard measures have the mathematical property that between-group inequality will increase (or more precisely - never decrease) with a greater number of groups. This makes it very difficult to make comparisons across populations which have different numbers of groups within them. For instance, standard measures would likely report a rise in between-racial group inequality in the US when comparing census data from before 2000 to

census data from 2000 simply because the latter census allows an open-ended race definition resulting in a greater number of racial groups.

There is clearly something unsatisfactory about this. ELMO proposes a relatively minor adaptation of the conventional procedure to produce an alternative statistic that overcomes some of these issues. Suppose that a given population is divided into two groups. ELMO compares the extent of between-group group inequality against a new benchmark, namely the extent to which these two groups are completely "separate" from each other in income terms; i.e., whether the richest person of the poorer group is poorer than the poorest person in the richer group. The standard decomposition procedure is entirely silent on this question. Yet, from the perspective of assessing the importance of group differences, the ELMO index is arguably quite relevant. If two population groups divide the income distribution into two entirely non-overlapping partitions, but there exists a high level of inequality within each of the two groups, overall between-group inequality - conventionally calculated – would be relatively low. Yet a fairly strong statement about the contribution of groups to inequality would remain unstated; namely, that the two groups "stand apart" in income terms – they are somehow economically "excluded" from one another. Elbers et al (2008) illustrate this point with reference to South Africa. They show that when inequality is decomposed by racial group defined in terms of a "white/non-white" classification, the conventional decomposition suggests that only about 27% of inequality is attributable to between-group differences. Their alternative statistic, on the other hand, shows that two groups are 80% of the way towards a completely partitioned South African income distribution.

ELMO is assessing the extent to which inequality is derived from group-based differences by comparing it against the benchmark of what the maximum amount of group-based inequality could be given the size and composition of the actual groups in the

population. It is therefore "standardizing" the extent of group-based inequality, allowing for realistic comparisons to be made across populations with different group divisions. A corollary of this approach is that between-group inequality in the ELMO measure does not necessarily increase with an increase in the number of groups. This is helpful for another analytic reason. Instrumentalist and constructivist approaches to ethnicity require a flexible approach to group categorization (Varshney 2007). There may be a variety of ways in which, in principle, a society can be categorized into different groups. It is not always obvious, to the analyst, which particular categorization captures the 'salient' group differences. Conventional inequality decomposition techniques would inevitably point the analyst towards more groups. The ELMO measure, on the other hand, prompts the researcher to compare a much wider range of categorizations.. For example, in the Indian case castes can be categorized either by using official categories of "Scheduled Caste," "Scheduled Tribe", "Backward Caste" and "Forward Caste", or by locally defined *jati* categories. As we will see in this in this paper, these different systems of categorization can produce very different measures of the extent of group-based inequality, and it is not necessarily the case that the most disaggregated categorization – based on *jati* – is unambiguously most relevant..

In this paper we compare the ELMO statistic with standard inequality decomposition measures to study dynamics of caste-inequality in two Indian villages over several decades. Caste-based inequality is considered notoriously durable and has been the subject of a lot of work across the social sciences (e.g. Dumont 1966, Deshpande 2000). The data examined in this paper offer a unique insight into the question for two reasons: first - they provide a long-term view of the evolution of caste inequality, and – second - they are based on repeated censuses of the villages and are thus not subject to the usual biases caused by sampling error which can be quite high for inequality measurement. The data are from detailed census surveys of the village of Palanpur in Moradabad district in Uttar Pradesh state in northern

India – surveyed over four periods from the 1950s to the 1980s, and the village of Sugao in Satara district in Maharashtra state in western India surveyed over three periods from the 1940s to the 1970s. Both villages have been the subject of close qualitative and quantitative examination over several decades (Bliss and Stern 1982, Dandekar 1986, Lanjouw and Stern, 1998).

Our analysis in Palanpur shows that examining caste differences on the basis of the conventional inequality decomposition yields a relatively modest "contribution" of caste differences to overall inequality. This is at odds with what is actually known about the way caste has figured in the evolution of Palanpur's economy and society – knowledge based on first-hand observation as well as detailed data covering all households in the village in four annual rounds of intensive data collection between the late 1950s and early 1980s. Palanpur is a poor, agricultural village which has been relatively untouched by globalizing forces and is therefore imbedded within inter-linked systems of political, economic and social power. These differences are revealed to be quite acute when caste differences are explored on the basis of the ELMO (2008) adaptation. The statistical analysis based on ELMO lines up much more clearly with what the more detailed, field-based analysis has suggested – that caste based inequality is large and durable. A further finding from this study is that a crude breakdown of the village population into a "Scheduled Caste/Non-Scheduled Caste" partition may not do so well in capturing the importance of certain key group differences in a given setting. We also document that while caste based inequality in Palanpur is significant, preliminary analysis based on other criteria for group differentiation – education of household head, and household landownership – fail to reveal sizeable between group differences, whether based on the ELMO statistic or the standard between group decomposition.

Analysis of inequality in the village of Sugao in Satara district, Maharashtra, in contrast, finds that the ELMO decomposition yields relatively little additional insight into the

evolution of living standards in that village between the early 1940s and the late 1970s (Dandekar, 1986). This village, unlike Palanpur, was already closely integrated with the broader Indian economy even in the 1940s, and there is little evidence that a particular set of households in the village, defined in terms of caste or other social characteristics, has come to "stand apart" from the rest of the village over time. In this setting, the ELMO decomposition points in the same direction as the conventional inequality decomposition in suggesting that income inequality in Sugao is largely driven by individual-specific characteristics that are only weakly associated with caste or social-group characteristics.

Thus, this paper makes both a methodological and a substantive contribution to the literature on ethnic diversity. It illustrates the relevance of re-visiting standard methods of measuring group-based inequality and demonstrates that the ELMO statistic is better able to capture persistent inequalities where they are salient than standard measures, but is no different from standard measures when group-based inequality is not salient. The paper further illustrates this point in the important case of caste inequality in India by comparing repeated censuses of village-wide survey data, measured over several decades, in two Indian villages located in very different parts of the country.

2. The Mathematics of Group-Based Inequality Decompositions[iii]

In the standard approach to decomposing inequality by population subgroup, decomposable inequality measures can be written as follows:[iv]

$$I = I_w(\Pi) + I_B(\Pi)$$

where $I_w(\Pi)$ is a weighted average of inequality within population sub-groups, while $I_B(\Pi)$ stands for between-group inequality and can be interpreted as the amount of inequality that would be found in the population if everyone were given the average income of their group.

The most commonly decomposed measures in this literature come from the General Entropy class. These take the following form:

$$GE = \frac{1}{c(c-1)} \sum_i f_i \left[\left(\frac{y_i}{\mu} \right)^c - 1 \right] \qquad \text{for c} \neq 0, 1$$

$$= \sum_i f_i \log\left(\frac{\mu}{y_i} \right) \qquad \text{for c=0}$$

$$= \sum_i f_i \left(\frac{y_i}{\mu} \right) \log\left(\frac{y_i}{\mu} \right) \qquad \text{for c=1}$$

where f_i is the population share of household *i*, yi is per capita consumption of household *i,* μ is average per capita consumption, and *c* is a parameter that is to be selected by the user.[v] This class of inequality measures can be neatly decomposed into a between- and within-group component as follows (Bourguignon, 1979; Mookherjee and Shorrocks, 1982):

$$GE = \frac{1}{c(c-1)} \left[\sum_j g_j \left(\frac{\mu_j}{\mu} \right)^c - 1 \right] + \sum_j GE_j g_j \left(\frac{\mu_j}{\mu} \right)^c \qquad \text{for c} \neq 0, 1$$

$$= \left[\sum_j g_j \log\left(\frac{\mu}{\mu_j} \right) \right] + \sum_j GE_j g_j \qquad \text{for c=0}$$

$$= \left[\sum_j g_j \left(\frac{\mu_j}{\mu} \right) \log\left(\frac{\mu_j}{\mu} \right) \right] + \sum_j GE_j g_j \left(\frac{\mu_j}{\mu} \right) \qquad \text{for c=1}$$

where *j* refers to the sub-group, g_j refers to the population share of sub-group *j* and GE_j refers to inequality in sub-group *j*. The between-group, $I_B(\Pi)$, component of inequality is captured by the first term: the level of inequality if everyone within each sub-group *j* had consumption level μ_j. The second term gives within-group inequality $I_w(\Pi)$.

Given a particular breakdown of the population into groups and an inequality measure *I*, between-group inequality can be summarized as follows:

$$R_B(\Pi) = \frac{I_B(\Pi)}{I}.$$

$R_B(\Pi)$ represents the share of inequality explained by between-group differences. For any characteristics x and y, $R_B(\Pi_{x\,\&\,y}) \geq R_B(\Pi_x)$ and $R_B(\Pi_{x\,\&\,y}) \geq R_B(\Pi_y)$.[vi] This means that moving from any group breakdown to a finer breakdown, the share of between-group inequality cannot decrease.

As mentioned in the Introduction it is rarely the case that between-group inequality calculated in this way, accounts for a large proportion of total inequality. In fact, this is not surprising because between-group inequality would equal total inequality under only two unlikely scenarios: (i) if each household itself constituted a group, or (ii) if there were fewer groups than households, but somehow all the households within each of these groups happened to have identical per capita incomes. It is difficult to imagine a realistic setting in which either of these scenarios would occur: for virtually any empirically relevant income distribution and a limited number of groups (much smaller than the number of individuals in the population), the share of maximum between-group inequality that can be attained is strictly below unity.

The Elbers et al (2008) adaptation

ELMO (2008) point out a further limitation of the standard inequality decomposition, namely, that it fails to reflect the extent to which groups lined up along the income axis can be viewed as separate from one another - whether they partition the income distribution into non-overlapping intervals. ELMO (2008) propose evaluating observed between-group inequality for a certain population group-breakdown against an alternative benchmark of maximum between-group inequality that can be attained when the number and relative sizes

of groups for that partition are unchanged and given the actual, observed, distribution of per capita income.

The ELMO index, which we will denote below as the *partitioning index*, is defined as:

$$\hat{R}_B(\Pi) = \frac{I_B(\Pi)}{Max\{I_B \mid \Pi(j(n), J)\}} = R_B(\Pi)\frac{I}{Max\{I_B \mid \Pi(j(n), J)\}},$$

where the denominator is the maximum between-group inequality that could be obtained by reassigning individuals across the J sub-groups in partition Π of size $j(n)$.

Since between-group inequality can never exceed total inequality, it follows that $\hat{R}_B(\Pi)$ cannot be smaller than $R_B(\Pi)$. However, unlike the traditional between-group inequality measure, $\hat{R}_B(\Pi)$, does not necessarily increase when a finer partitioning is obtained from the original one. (ELMO, 2007). To calculate $\hat{R}_B(\Pi)$, $I_B(\Pi)$ can be calculated in the usual way. Maximum between-group inequality is slightly more difficult to compute. A key property of maximum between-group inequality is that sub-group incomes should occupy non-overlapping intervals. This is a necessary condition for between-group inequality to be at its maximum: if $\{y\}$ is an income distribution for which inequality between sub-groups g and h is maximized, then either *all* incomes in g are higher than *all* incomes in h, or *vice versa* (See Shorrocks and Wan, 2004, section 3).

In the case of J sub-groups in a particular partition, the following approach can be followed: take a particular permutation of sub-groups $\{g_{(1)},\ldots, g_{(J)}\}$, allocate the lowest incomes to $g_{(1)}$, then to $g_{(2)}$, etc., and calculate the corresponding between-group inequality. Repeat this for all possible $J!$ permutations of sub-groups.[vii] The highest resulting between-group inequality is the maximum sought.[viii]

Thus, to restate the procedure, suppose there are two groups, A and B. under consideration. First, to calculate the numerator in $\hat{R}_B(\Pi)$, one calculates the standard between-group inequality term, $I_B(\Pi)$. Then, second, the household survey data are sorted by income. Starting from the bottom of the income distribution, all incomes are allocated to a group the size of group A, and the remainder are allocated to a second group the size of group B. Between-group inequality is calculated. The exercise is repeated, but now with the first group equal to the size of group B and the second group equal to the size of group A. The largest of the two between-group inequality components is the maximum, and this is then taken as the denominator in the expression for $\hat{R}_B(\Pi)$. If instead of two groups there had been 3, a total of six (3!) between-group calculations would have been necessary to determine which is the maximum.

3. The Story of Caste and Inequality in Palanpur

Palanpur is a village in Moradabad District of west Uttar Pradesh in north India. The village has been the subject of study since 1957-8, when it was first surveyed by the Agricultural Economics Research Centre (AERC) of the University of Delhi.[ix] The AERC resurveyed the village in 1962-3. In 1974-5 Christopher Bliss and Nicholas Stern selected Palanpur as a village in which to study the functioning of rural markets and the behavior of farmers. They spent just under a year residing in the village and collecting quantitative data, based on a set of questionnaires they designed and fielded, as well as qualitative information emerging out of informal discussion and observation. Bliss and Stern published a book based on their investigations (Bliss and Stern, 1982), which has a primary focus on the 1974-5 survey year.[x]

A fourth resurvey of Palanpur took place in 1983-4 when Jean Drèze and Naresh Sharma, in close consultation with Bliss and Stern, lived in the village for fifteen months, once again collecting data for the entire village population.[xi] The most recent re-survey of the village, once again by Drèze and Sharma, was conducted in 1993. This survey was carried out over a shorter period and is consequently somewhat less comprehensive. [xii] A considerable body of research has emerged from the Palanpur research program. A volume edited by Lanjouw and Stern (1998) brings together a set of these studies and attempts to distill the main findings. This volume touches on most of the themes discussed in the earlier book by Bliss and Stern (1982), but includes a more explicit focus on outcomes and processes of change over the entire period from 1957-8 to 1993. The general story, presented below, of economic development in Palanpur and its social consequences, has been adapted from the more detailed and complete discussion that can be found in Lanjouw and Stern (1998).

At the beginning of the last survey (in mid-1993), Palanpur had a population of 1,133 persons, divided into 193 households (Table 1). Hindus represented 87.5 percent of the village population, and Muslims the remaining 12.5 percent. Hindus were divided into six main castes (ranging from 14 to 48 households in size), and three minor castes of three households or less (Table 2). The shares of Hindus and Muslims in the total population, and the relative sizes of the main castes, remained fairly stable throughout the survey period.

[Table 1 about here]

[Table 2 about here]

At the time of the last survey for which detailed income data were available, 1983/4, the economy of Palanpur was essentially one of small farmers. The proportion of landless households was relatively small by Indian standards and there were no clearly outstanding

large farmers. The bulk of economic activity was in agriculture, although a non-negligible share of village income also came from wage employment outside the village. The economy was by and large a market economy with few restrictions on production and exchange. However, the village's economy did differ from standard textbook models of market economies due to factors such as incomplete markets, imperfect information, transactions costs, and extra-economic coercion.

The evolution of economic well-being

Table 3 presents income levels for the survey years from 1957-8 to 1983-4. Based on these figures it appears that real per-capita incomes in Palanpur grew between 1957-8 and 1984-5, but not rapidly.[xiii] As in most parts of India during this period, economic growth was sluggish. Even so, per-capita income growth in Palanpur was widely acknowledged by villagers themselves to have resulted in an expansion of purchasing power and wealth.

Alongside the growth in average per-capita income there was some decline in absolute poverty (Table 3). The proportion of the village population below a poverty line of Rs 140 per capita per year in 1960-1 prices (corresponding roughly to the line proposed by Dandekar and Rath, 1971, for rural India as a whole) declined from 47% in 1957-8 to 34% in 1983-4. This comparison is possibly somewhat conservative, given that the harvest in 1983-4 was exceptionally poor. Comparing the average of 1957-8 and 1962-3 head count indices with the average of 1974-5 and 1983-4 (each average covering a good and a poor agricultural year, and the former pair of years also representing the pre-"Green Revolution" period and the latter pair the post-"Green Revolution" period) suggests that the latter is less than half as high as the former. The broad qualitative conclusion of slowly declining poverty is also confirmed on the basis of more sophisticated measures of poverty (such as the poverty gap and squared poverty gap measures).

[Table 3 about here]

In the presence of rising average income, it is possible for absolute poverty to decline without there being any change in the distribution of income. Table 3 indicates that inequality fluctuated, but did not follow an obviously monotonic course over the 1957-84 period. The Gini coefficient of per capita incomes rose between 1957-8 and 1962-3, fell between 1962-3 and 1974-5, and rose again between 1974-5 and 1983-4. The most pronounced change occurred between 1962-3 and 1974-5, when for example the Gini coefficient declined from 0.39 to 0.25. Once again, however, if one were to take the two former years as a pair, and the latter two as a pair, there seems to have been a slight decline in income inequality.[xiv]

Caste

In Palanpur, caste exercised not only an important social function but also influenced economic behavior and outcomes. In Palanpur there were three main castes in the village accounting for about two-thirds of the population: Thakurs, Muraos and Jatabs (see Table 2). Relations between these three castes evolved in significant ways between 1957-8 and 1983-4.

Highest in the village social hierarchy were the Thakurs, who traditionally had the largest landholdings in the village which, because of an aversion to manual labor, they usually leased out or cultivated with hired labor. Declining land endowments and rising real wages gradually compelled most of them to take up cultivation. Thakurs were also keen to take advantage of new employment opportunities outside the village. Politically, the Thakurs remained the most powerful caste in Palanpur in 1983/4, but they had become less and less the unquestioned leaders of the village. Muraos, whose rising prosperity inspired much respect in the village, started challenging their supremacy (see below).

The Muraos were the only caste in Palanpur whose traditional occupation was cultivation. In 1957-8 their per-capita land endowments were roughly the same as those of the Thakurs, but over the survey period they accumulated land, and ended up with the best land endowments in the village. Good land, hard work, sustained thrift and excellent farming skills enabled the Muraos to take advantage of technological change in agriculture. They were so successful in this regard that they tended to eschew involvement in non-agricultural activities. The economic status of Muraos improved considerably over the survey period, and this carried over into some rise in their social status as well.

An examination of evolving caste relations based on scrutiny of the Muraos and Thakurs would suggest considerable caste dynamism in Palanpur, with the Muraos gradually coming to rival the Thakurs at the top of the village hierarchy. At the bottom end of the hierarchy, however, the situation of the Jatabs appeared frozen in place. The Jatabs were socially and economically the most deprived caste in Palanpur. They owned little land, lived in a cluster of shabby mud dwellings, and earned most of their income from casual labor and subsistence farming. Illiteracy among Jatabs had been near universal throughout the survey period, and few Jatabs succeeded in obtaining regular employment outside the village at any stage.[xv] There was little sign of growth in per-capita income for the Jatabs. So, in relative terms, their incomes declined sharply over the survey period: in the first two survey years the average per-capita income of Jatab households was about 70% of the village average. By the later pair of survey years the corresponding proportion had declined to barely 50%. In terms of access to land the Jatabs also experienced little advancement. Even though Jatabs were as involved in cultivation as the Muraos and Muslims, unlike those two groups they did not succeed in increasing their land endowments. In fact, between 1983/84 and 1993 Jatabs lost 10 percent of their land, mainly due to one household selling most of its land to repay mounting debts.

Although in some symbolic respects the disadvantaged position of the Jatabs did become less obvious over time (for example, Jatabs gradually became able to sit on string cots alongside other castes, and were eventually allowed to draw water from the same wells) their weak position remained clear. Jatabs continued to endure many forms of discrimination, not only on the part of fellow villagers but also from government officials. They had, for example, been a prime target of extortion by urban-based managers of the local credit cooperative (see chapter 9, by Drèze, Lanjouw and Sharma, in Lanjouw and Stern, 1998).

"Social development" in the dimension of caste relations in Palanpur was thus a mixed process. On the one hand there was clear evidence of the erosion of the dominant position of the Thakurs in the village hierarchy. The Thakurs were increasingly being challenged by the Muraos – a caste whose ability to take advantage of the opportunities offered by agricultural change had been remarkable. Yet, from the point of view of the poorest caste in Palanpur, their relative position improved hardly at all. Few of the major changes and events which had taken place in Palanpur over the survey period appeared to exercise any positive impact on the relative position of Jatabs in the village society.

We shall see below that standard inequality decomposition analysis does not capture well this portrayal of different caste fortunes during the study period. The ELMO (2008) adaptation, on the other hand, produces a statistic which captures at least some elements of the story briefly presented above.

4. Inequality in Palanpur and Group Differences

We consider in this section the contrasting performance of the conventional between-group inequality contribution and the partitioning index derived from the ELMO (2008)

adaptation, in capturing the story of inequality in Palanpur as was briefly summarized in Section 3.. Tables 4-7 present calculations of these statistics for the four respective survey years that included a comprehensive income aggregate (1957-8, 1962-63, 1974-75, 1983-4).

We experiment with a variety of different breakdowns of the village population into social groups. Even though we have a good deal of knowledge of Palanpur society and its caste breakdown, we want to allow for different ways of combining and separating different castes into groups – in an effort to assess which breakdown seems particularly pertinent to the story of income inequality. In the first instance, we keep all castes apart and treat each of them as a separate group.[xvi] We then combine certain castes into groups in ways that might make sense given what we know about Palanpur. Given that Thakurs, Muraos and Jatabs represent the three largest castes, and that Muslims represent an additional 12% or so of the village population, our next breakdown divides the village into five groups: Thakur, Murao, Jatab, Muslim and all Others. Our next group breakdown combines with Muslims with the Other category, leaving just 4 groups in the population. We then consider a three group breakdown comprising the Majority, Jatabs, and Muslims. We then explore a number of 2-group breakdowns of the village population: Majority versus Jatabs and Muslims; Majority (including Muslims) versus Jatabs; Majority versus Scheduled Castes (Jatabs and Passis); Majority versus Thakurs; and Majority versus Muraos. For each of these group breakdowns we calculate, in turn, the conventional between group inequality contribution and the partitioning index. We produce these calculations separately for each of the four survey years. The inequality measure that we decompose is the General Entropy measure with parameter value 0, also known as the Theil L measure or the mean log deviation.

When we focus on the conventional between-group contribution to inequality (column 3 in Table 4-7) two observations stand out. First, the contribution to overall inequality of

differences between groups is low – irrespective of the way in which we sub-divide the population into groups and irrespective of survey year. In only one instance, corresponding to the 1974/5 survey year and the population breakdown of 8 groups, does the between-group contribution rise above 30%. Even in this case well over two-thirds of all inequality can be attributed to differences between individuals within their caste groups, as opposed to being attributed to differences in average income between groups. Second, when the population is broken down into fewer groups – in an effort to isolate the trajectories of the three main caste groupings in Palanpur as summarized in section 2, the between group component is generally substantially lower still. It is interesting to note that when, for example, the village population is broken down into Scheduled Castes versus all others, the conventional between-group contribution is as low as 0.7% in 1957-8 and only as high as 6.4% in 1974-5.

As was noted in the introduction, the conventional between-group decomposition analysis does not appear to attribute a significant role to caste differences in "accounting" for overall inequality, or to the evolution of inequality over time. The general picture for Palanpur looks rather similar to what was observed for India as a whole in studies of inequality at the national level.

Column 4 in Tables 4-7 presents the partitioning index proposed by ELMO (2008). In many instances this between group "contribution" looks quite similar to the conventional statistic. For example, in 1957-8 conventional between group inequality accounted for 23% of total inequality in the case of 8 village caste groupings. In this year the ELMO partitioning statistic suggests that dividing the population into these 8 groups takes one only some 24% of the way towards neatly partitioning the income distribution into 8 non-overlapping groups of the same size as these castes. There is little additional insight into inequality offered by this statistic in this case.

Indeed, it turns out that for all of the population groupings considered in the first two rounds of data collected (1957-8 and 1962-3) there is no dramatic difference between the conventional between-group contributions and the ELMO partitioning statistic. In particular, although in some cases the ELMO statistic is much higher in proportionate terms to the conventional between-group contribution, it remains low in absolute terms and there is no clear insight offered by this statistic.[xvii]

However, when one turns to the two latter survey years – 1974-5 and 1983-4 – the two statistics start to provide quite a different impression of how group differences matter in inequality. For 1974/5, the conventional between-group contribution remains fairly low (below 20% in all cases of less than 4 groups and only as high as 31% in the case of 8 groups), but the ELMO partitioning index is now considerably greater. In particular, when the village is divided into two groups comprising Jatabs and Muslims on the one hand and all other castes on the other, one is nearly 40% of the way of having divided the income distribution into two non-overlapping partitions of the same size as these two population groups.

The ELMO partitioning index becomes even more clearly differentiated from the conventional between-group statistic in the 1983/84 survey year, when the population groups are defined in terms of Jatabs versus all others. In this case the statistic suggests that one is nearly 50% of the way to a non-overlapping partitioning of the income distribution. A three-way breakdown of the population into Jatabs, Muslims, and all others also yields an Elbers et al statistic that is quite high – nearly 40% - even though the conventional between group contribution is only 26%.

[Tables 4-7 about here]

The above findings are summarized in graphical form in Figures 1 and 2. Figure 1 shows that with the conventional inequality decomposition the between-group contribution is low in absolute terms, but is always highest for the 8-way breakdown of the village population into caste groupings. Figure 2 provides the contrasting results for the ELMO partitioning index, illustrating that in the case of the Jatab versus all-Other breakdown of the population, in the latter two survey years' calculations, the village income distribution comes nearly halfway to a complete partitioning of the income distribution.

[Figure 1 about here]

[Figure 2 about here]

Thus, the ELMO statistic appears to be capturing well the extent to which the Jatabs as a group have been "left behind" or are "socially excluded" from the overall growth process in Palanpur – as was described in Section 2. The conventional inequality decomposition approach suggests that social groupings (at least as defined here) are not particularly pertinent to an evaluation of the evolution of inequality in the village. But this index fails to capture the extent to which a particular group in the village - the Jatabs - has fallen behind during the overall growth process in Palanpur. Interestingly, the focus here has also revealed that in Palanpur it is not so much the group of Scheduled Caste households that have fallen behind, but rather one relatively disadvantaged group within the broader set of Scheduled Caste households in the village whose fortunes have clearly failed to improve. This latter observation indicates that, at least in the Palanpur setting, a focus on Scheduled Caste households as the "socially excluded" group would fail to capture what is happening. In Palanpur, the Scheduled Castes comprise both Jatab and Passi households, and this represents

a rather heterogeneous population group which cannot be easily discerned to have been "left behind" in income terms during the 1957/8-1983/4 survey period.

To what extent are the findings pointed to in Palanpur part of a broader pattern of social exclusion reflected, for example, also in education levels, or landholdings? If households in Palanpur were classified into groups based on education levels of the household head, would we uncover similar evidence of a partitioned income distribution as was found, for example, between Jatabs and the rest of the population? Investigations along such lines are common in the literature on inequality decomposition, and can help point to underlying causes of group differences. If, say, all Jatabs in Palanpur were illiterate in 1983/4 while the rest of the village enjoyed at least some education, then a breakdown of the village population into "illiterates" versus "the rest" would yield a similar ELMO statistic as was found for a caste-wise breakdown between Jatabs versus the rest. This might then point to education disparities as a possible explanation for the differences observed between these two caste-groupings. Land holdings, could provide an alternative basis for defining groups – capturing a key wealth dimension.

In the event, in Palanpur in 1983/4, a variety of different ways of defining groups in terms of levels of education of household head, and of household landholdings, fail to reveal a similar degree of partitioning as was observed for Jatabs versus the rest of the population (or Jatabs and Muslims together, versus the rest). In terms of education, the greatest degree of partitioning is observed when the population is broken up between those households with household head with 12 or more years of education versus everyone else. But the ELMO statistic here takes a value of 10.3% only – far lower than the nearly 50% observed for a breakdown between Jatabs and the rest.[xviii] For groups defined in terms of landholding, the highest value of the ELMO statistic occurs when the population is broken down into the four

groups comprising the landless, marginal landholders (less than 5 bighas), smallholders (between 5 and 15 bighas) and "large" landholders (more than 15 bighas).[xix] In this case, however, the ELMO statistic barely reaches 5%. This kind of analysis based on alternative group definitions can be refined further, but the initial impression is that caste is proxying a dimension of disadvantage that is distinct from education or asset levels (although probably not entirely unrelated). Indeed, the detailed fieldwork underpinning the Palanpur study does point to factors such as networks of contacts as important determinants of economic opportunity, and these networks are often linked to caste but not necessarily human capital or wealth (Lanjouw and Stern, 1998).

5. Sugao: A Contrasting Western Indian Example

Economic development in the village of "Sugao," in Satara district Maharashtra, has not followed the same pattern as Palanpur (Dandekar, 1986). Sugao is located about 240 kms South-east of Mumbai, and 42 km from Satara town. Since the turn of 20th century, men from Sugao have provided a steady stream of labor for the textile mills of Mumbai and mill work was in this period a significant source of income for Sugao households. (With the decline of the mill industry in Mumbai in the 1980s and 90s it is unclear to what extent this is still the case). Professor VM Dandekar and his team at the Gokhale Institute of Politics and Economics in Pune conducted a socio-economic census of Sugao in 1942 which was repeated in 1958. Hemalata Dandekar, then a PhD student at UCLA, conducted another census of the village in 1977. There are thus over three decades of data on the village over, roughly, the same span as the Palanpur study.

Sugao's population in that period expanded by 60 percent, from 1621 individuals in 1942 to 2578 individuals in 1977. The majority of people in Sugao are Marathas – who are

small peasants and migrant workers. The Marathas, in turn, are divided into two sub-castes – Jadhavs and Yadavs who do not inter-marry. They are the dominant caste(s) in the village. Other major groups include the Dhangars, who are sheep and goat herders, and Dalits – the vast majority of whom are Mahars. There are also various smaller populations of artisan groups who can roughly be categorized as "high-caste" artisans – e.g. goldsmiths and blacksmiths, and "low-caste" – e.g. cobblers and basket-weavers. Table 8 provides some basic descriptive statistics for the village in 1977.

[Table 8 about here]

The incidence of migration steadily increased over these three decades from 16.7 % of the population in 1942 to 28.5% in 1977 with the proportion of total wage earners who were migrants rising from 37% to 48% over the period. However, the likelihood of migration was, more or less, equally distributed among the various castes. The proportion of migrants who were Marathas increased from 57% in 1942 to 64% in 1977, while the Dalits constituted 20% of migrants in 1942, decreasing to 14% in 1977. Of the non-migrant village population, about 54% were Marathas throughout the survey period, while the non-migrant Dalit population decreased from 11% in 1942 to 9% in 1977. Overall, Dalits appear to have participated no less than Marathas in the migration process. However, migration is Sugao is usually "circular" in that men tend to migrate during their working years and retire in the village.

Sugao's distribution of land has historically been more equal relative to Palanpur. While the two Maratha *jatis* own 70 percent of the land, Dhangars and the Dalit groups have also historically owned land. The various artisan groups were paid for their services with the

use of village land, which they were entitled to own after tenancy reform. Education is also, relatively speaking, more equitably distributed. The first primary school was established in Sugao in 1887 and primary education was made compulsory in the rural areas of Satara district in 1946. Mahar's have been enrolled in village schools since 1892.

However, overall income inequality throughout the study period is markedly higher in Sugao than was observed in Palanpur (Tables 9-11). While in Palanpur inequality, as represented in the General Entropy 0 measure was below 0.2 in three of the survey years and only as high as 0.289 in 1962/3, it was above 0.4 in all three survey years in Sugao. As in Palanpur, there is a slight suggestion of inequality declining over time (from about 0.43 in 1942 and 1958 to 0.407 by 1977), but even in the final year for which Sugao income data are available, overall inequality was very high relative to Palanpur.[xx] Part of the reason for this is that non-farm sources of income is Sugao are higher than in Palanpur – primarily from migrant remittances, but also from village industries and shops.

[Tables 9-11 about here]

When we examine decomposition results for Sugao we find that both the conventional as well as the ELMO decompositions indicate that group differences are not particularly salient to an understanding of overall inequality in the village. The conventional between-group inequality contribution is generally well below 10% (in contrast to Palanpur where in several instances it is above 25%), and even the ELMO statistic is only above 15% in one instance. As argued by Elbers et al (2008) comparing the conventional between-group contribution in Sugao against that in Palanpur is potentially misleading, because of the different number and composition of population groups in these two villages. However, the

ELMO statistic can be more readily compared across settings (because in each village the size and number of population groups is controlled for) and so the finding of a much lower salience for group differences in Sugao based on this statistic is fairly robust. A further broad finding from Tables 9-11 is that if anything, group differences in Sugao are becoming *less* important over time – in contrast to Palanpur where the reverse was observed.

Considering the results for Sugao for each year in turn, a few additional observations can be noted. In 1942, the most important breakdown of the village population in terms of both the conventional and the ELMO decomposition corresponds to a caste-based grouping. In the case of the conventional decomposition, the unsurprising finding is that the highest between-group contribution obtains when the village is divided up into the largest number of groups (Table 9). In the case of the ELMO decomposition, the closest one comes to a partitioning of the village population along the income distribution is when the village is divided into 4 groups (Maratha versus Dalits versus Muslims versus the rest of the village). By 1958 and even more so by 1977, caste differences seem to become less pertinent, and there is some suggestion that occupational characteristics are becoming more salient. In 1958 the largest ELMO statistic obtains when the village is divided into two groups comprising scheduled caste agricultural labor households (as opposed to all scheduled caste households) on the one hand versus the rest of the population. In 1977, the highest ELMO statistic obtains when the population is divided into three groups, distinguishing agricultural labor and traditional occupation households from white collar service employed households from the rest. In this last year however, as already noted, all decomposition results are particularly low, relative not just to Palanpur but also to the earlier survey years. Group differences in Sugao (at least based on the characteristics presented in Tables 9-11) appear to be of only minor importance.

Do the findings of low group differences in Sugao apply also when groups are defined in terms of criteria other than social group or occupation? Unlike Palanpur, we do not have the data at hand for Sugao that would allow us to assess whether groups defined in terms education (of household head, or of other family members) tend to "stand apart" to a greater extent than was observed for groups defined in terms of caste. However, we are able to re-define groups in terms of landownership status (distinguishing also between irrigated and unirrigated land). Experimenting with a variety of different ways in which to categorize households in terms of landownership status, we find that neither the classic between-group contribution, nor the ELMO statistic, ever take on a significant value. The highest value for the ELMO statistic occurs when the population in 1977 is divided into two groups: those with less than 5 bighas of land (just under one acre) versus the rest. In this case the ELMO statistic takes on a value of 0.04 – on par with, but certainly not higher than, the low values obtained for the ELMO statistic when the Sugao population is broken down into a variety of different caste and occupational groups. Nor is there any evidence of a change over time in terms of the salience of this type of group definition. As was found for Palanpur, dividing households into groups based on landownership does not appear to yield any new insights into our understanding of the "structure" of inequality in Sugao.

6. Conclusion

This paper has demonstrated that standard inequality decomposition analysis does not always appear to capture well the particular story of group differences and the evolution of inequality at the village level in India. In particular, in the small north Indian village of Palanpur, such a decomposition analysis provides a misleading picture of the importance of caste differences. The paper has suggested that one difficulty with the standard approach is

that it fails to reflect the possibility that a particular population group may exhibit considerable within-group inequality but at the same time represent an entirely distinct partition of the overall income distribution. If such a non-overlapping partitioning of the income distribution occurs this would seem to constitute evidence of some kind of social exclusion occurring. And yet conventional decomposition techniques are not designed to capture this.

A recent paper by Elbers, et al (2008) proposes a simple adaptation to the standard inequality decomposition calculation. This yields a new statistic which has been designated here as a *partitioning index* and which sets out to capture exactly to what extent a given breakdown of the population into groups results in a partitioning of the income distribution into non-overlapping intervals. One important advantage that this approach for the study of ethnicity over previous inequality decomposition methods is that it allows for valid comparisons to be made even if group categorizations differ. This makes it useful to compare the level of between-group inequality across different populations, and also makes it much more amenable to analyses that are informed by instrumentalist and constructivist approaches to ethnicity.

The paper demonstrates that when this index is calculated for Palanpur there is evidence that during the 26-year period covered by the first four surveys of the village, one group of village households – the Jatabs – has failed to share in the overall steady, albeit slow, rise in prosperity experienced by the bulk of the population. This statistical evidence matches rather well the findings from the much more in-depth analysis of economic and social development in Palanpur that was reported in Bliss and Stern (1982) and Lanjouw and Stern (1998), and that was based on detailed fieldwork in the village. The fact that a simple statistical analysis, based only on income data and an indicator of social group membership,

can resonate with findings from such an intensive village study, would appear to give support to the notion that its application in other settings might also offer insights that are not being captured by the standard inequality decomposition approach. Furthermore these differences do not seem to be driven by characteristics other than caste such as education and land.

When the analysis is repeated in the Western Indian village of Sugao, Maharashtra, however, it is found that the ELMO statistic does not provide any obvious additional insight into the level and evolution of income inequality in this village. In this village, unlike Palanpur, the basic story of income generation appears to be largely driven by access to outside employment (in Mumbai) and remittance income, and in Sugao there does not appear to have been a particular caste or social group that has been systematically excluded from such income sources.

The differences between Palanpur and Sugao are reflective of larger differences in the caste-dynamics of North and South India. Palanpur is in a state – Uttar Pradesh - where land reform has largely been ineffective; where the "politics of identity", in the period under consideration, dominated the "politics of development" (Varshney 2000). The deeply entrenched inequalities that we observe have resulted in an uphill battle for lower castes and lower caste emancipation has, consequently been more about voice and respect than economic well-being. Sugao, on the other hand, is in the state of Maharashtra where land reform has worked relatively well, and where the economic vitality of the city of Bombay (now Mumbai) resulted in the migration-driven empowerment of people from all castes, a process that continues to this day (Rosenzweig and Munshi, 2006). Sugao, as a village of migrants, has benefited from such processes for a long time and has consequently not experienced sticky caste-based inequality traps in the same way that Palanpur has.

The ELMO statistic, thus, may offer additional insight into the role of group differences in understanding overall inequality, but whether or not it does so is clearly an empirical question. An objective of this paper has been to demonstrate, first, that undertaking such an extended decomposition analysis is conceptually and practically straightforward and, second, that doing so at the micro-level, such as a village, may offer a deeper understanding of the factors and processes governing participation in the economic development process in India.

References

Anand, S. (1983). *Inequality and Poverty in Malaysia* , Oxford, Oxford University Press.

Ansari, N. (1964) 'Palanpur: A Study of its Economic Resources and Economic Activities', Continuous Village Survey No. 41, Agricultural Economics Research Centre, Universityof Delhi.

Bliss, C. and Stern, N. (1982) Palanpur: the Economy of an Indian Village (Oxford and New Delhi: Oxford Univeristy Press).

Bourguignon, Francois. 1979. "Decomposable Income Inequality Measures." *Econometrica* 47(4):901-920.

Cowell, Frank. 1980 "On the Stucture of Additive Inequality Measures." *Review of Economic Studies* 47(3):521-531.

Cowell, Frank. 2000. "Measurement of Inequality." In Anthony B. Atkinson and Francois Bourguignon, eds., *Handbook of Income Distribution. Volume 1*. Amsterdam: Elsevier Science, North Holland.

Cowell, F.A. and S.P. Jenkins (1995). 'How Much Inequality Can we Explain? A Methodology and an Application to the United States', *The Economic Journal*, 105(429): 421-430.

Dandekar, H.C. (1986) Men to Bombay Women at Home: Urban Influence on Sugao Village. Deccan Maharashtra, India (1942-1992) Center for South and Southeast Asian Studies, University of Michigan, Ann Arbor, 1986.

Deshpande, A. (2000) 'Does Caste Still Define Disparity? A Look at Inequality in Kerala, India', *The American Economic Review,* Vol 90, No. 2., Papers and Proceedings of the One Hundred Twelfth Annual Meeting of the American Economic Association. (May, 2000),pp 322-325.

Dumont, Louis, *Homo Heirarchicus*, 1966

Elbers, C., Lanjouw, P., Mistiaen, J. and Ozler, B. (2008) 'Re-interpreting Sub-Group Inequality Decompositions', *The Journal of Economic Inequality.*6(3), September 1569-1721.

Gajwani, K., Kanbur, R., and Zhang, X. (2006) 'Patterns of Spatial Convergence and Divergence in India and China', Paper prepared for the Annual Bank Conference on Development Economics (ABCDE),St. Petersburg, January 18-19, 2006.

Lanjouw, P. and Stern, N. (1998) Economic Development in Palanpur Over Five Decades (Oxford and New Delhi: Oxford University Press).

Mutatkar, R. (2005) 'Social Group Disparities and Poverty in India' Indira Gandhi Institute of Development Research, Working Paper Series No. WP-20005-004.

Mookherjee, D. and Shorrocks, A. (1982). 'A Decompositions Analysis of the Trend in UK Income Inequality', *The Economic Journal*, 92(368), 886-902.

Rao, Vijayendra, (2006) "On Inequality Traps and Development Policy," *Development Outreach*, Vol. 8, No. 1, February

Rosenzweig, Mark R and Kaivan Munshi, "Traditional Institutions Meet the Modern World: Caste, Gender, and Schooling Choice in a Globalizing Economy." 2006. *American Economic Review* 96(4):1225-1252, with Mark Rosenzweig.

Shorrocks, Anthony. 1980. "The Class of Additively Decomposable Inequality Measures." *Econometrica* 48(3):613-625.

Shorrocks, A. and Wan, G. 'Spatial Decomposition of Inequality' *Journal of Economic Geography* 5(1) pg 59-81.

Tilley, Charles, *Durable Inequality*, University of California Press, Berkeley, Los Angeles and London, 1998

Varshney, Ashutosh. 2000. 'Is India Becoming More Democratic?', *The Journal of Asian Studies*, 59(1): 3-25.

Varshney, Ashutosh, "Ethnicity and Ethnic Conflict," in *Oxford Handbook of Comparative Politics*, Carles Boix and Susan Stokes (editors), Oxford University Press, 2007

World Bank, *Equity and Development: World Development Report 2006*, World Bank and Oxford University Press, 2005

TABLE 1

PALANPUR, 1993: VILLAGE PROFILE

Location:	13 kilometres north of Chandausi, a small town in Moradabad district
Population:	1,133
Number of households:	193
Proportion of Muslims (%):	12.5
Main Hindu castes[a]:	Thakur, Murao, Dhimar, Gadaria, Passi, Jatab
Literacy rate, age 7+ (%):	
female	9
male	37
Main economic activities:	agriculture, livestock, wage employment outside the village
Total land owned[b]:	2,383 bighas (372 acres)
Proportion of landless households (%):	23
Proportion of land irrigated (%):	96
Main crops:	wheat, rice, sugarcane, bajra, jowar, vegetables, pulses
Main public amenities:	primary school, railway station temples, wells, pond

[a] On the size and other characteristics of different castes, see Table 2 below.

[b] Not including residential plots.

Source: Drèze and Sharma, 1998 (Chapter 1, Lanjouw and Stern, 1998).

TABLE 2: CASTE COMPOSITION OF THE VILLAGE POPULATION, 1993

Caste	**Number of individuals**[a]	**Traditional caste occupation**	**Main current occupations**[b]	**Annual growth rate of population, 1957-93**[c]	**Literacy rate, age 7+** (percentage)		**Land owned per capita**[d] (bighas)	**Percentage of households with at least one regular job**	**Per-capita income, 1983-4** (Rs/year)
					Male	Female			
Thakur	283 (48)	warriors	CT, RJ	2.8 (2.7)	56	19	2.4 (1.9)	21	1,119
Murao	294 (44)	cultivators	CT	2.6 (2.7)	39	2	3.5 (3.5)	14	1,265
Dhimar	82 (14)	water-carriers	CT, RJ	1.1 (1.8)	35	8	0.5 (1.3)	36	1,026
Gadaria	89 (14)	shepherds	CT, RJ	2.1 (2.5)	26	11	1.9 (2.2)	7	1,112
Dhobi[e]	31 (5)	washermen	CT, RJ, CL	4.6 (n/a)	15	0	1.6 (2.0)	0	922
Teli[e]	109 (20)	oil-pressers	CT, RJ, CL	2.3 (2.2)	21	3	1.1 (1.9)	15	784
Passi[f]	62 (15)	mat-makers	CT, RJ	0.3 (1.2)	46	7	1.3 (0.6)	13	1,202
Jatab[f]	133 (24)	leather workers	CT, CL	1.7 (2.0)	12	0	1.3 (1.4)	0	436
Other	50 (9)	Miscellaneous	RJ, SE	1.5 (-1.3)	57	29	0.5 (0.8)	44	1,023
ALL CASTES	1,133 (193)	Miscellaneous	CT, RJ, CL	2.1 (2.3)	33	8	2.1 (2.1)	17	1,025

[a] Number of households in brackets.

[b] CT = cultivation; CL = casual labour; SE = self-employment; RJ = regular job.

[c] In brackets, migration-adjusted population growth rates (see chapter 3 for details).

[d] In brackets, land cultivated per capita (bighas).

[e] Muslims. [f] Scheduled caste.

Note: The arrangement of castes in this table follows Bliss and Stern (1982). The term "regular job" refers to wage employment with monthly salary and some security of employment.
Source: Drèze and Sharma, 1998 (Chapt. 1, Lanjouw and Stern, 1998).

TABLE 3

REAL INCOMES IN PALANPUR, 1957-84

	1957-8	1962-3	1974-5	1983-4
Per-capita income at current prices (Rs/year)	173	149	1,039	1,025
Index of per-capita income at current prices (1957-58=100)	100	86	602	594
Real per-capita income at 1960-1 prices[a]	161	152	275	194
Inequality indices				
Gini coefficient	0.336	0.390	0.253	0.307
Coefficient of variation	0.649	0.871	0.504	0.545
General Entropy (c=0)	0.196	0.289	0.164	0.172
Atkinson index ($\varepsilon = 2$)	0.338	0.485	0.206	0.342
Atkinson index ($\varepsilon = 5$)	0.647	0.821	0.483	0.741
Poverty indices				
Head-count index	0.47	0.54	0.11	0.34
Poverty-gap index	0.18	0.24	0.03	0.12
Squared-poverty-gap index	0.09	0.14	0.02	0.07

[a] Calculated by deflating the nominal per-capita income figures by the Consumer Price Index for Agricultural Labourers for Uttar Pradesh, with 1960-1 as the base.

Note: The inequality and poverty indices appearing in this table are based on treating each individual as one observation, with each individual within a household having the same per-capita income.

Source: Drèze, Lanjouw and Sharma, 1998 (Chapt 2, Lanjouw and Stern, 1998).

Table 4: Social Stratification in 1957/58

Group definition	Overall Inequality GE 0	"Classic" Between-Group Contribution	ELMO Between-Group Contribution
8 groups: all major caste groupings[1]	0.188[2]	0.231[2]	0.239[2]
5 groups: Thakurs, Muraos, Muslims, Jatabs, Others	0.196	0.128	0.138
4 Groups Thakurs, Muraos, Jatabs, Others	0.196	0.124	0.142
3 Groups Majority, Jatabs, Muslims	0.196	0.056	0.084
2 Groups Majority, Jatabs and Muslims	0.196	0.057	0.109
2. Groups Majority, Jatabs	0.196	0.030	0.074
2 Groups Majority, Scheduled Castes	0.196	0.007	0.014
2. Groups Thakurs, Others	0.196	0.006	0.013
2 Groups Muraos Others	0.196	0.086	0.174

[1] In rough order of social status: Thakur, Murao,Dhimar ,Gadaria, Dhobi, Teli, Passi and Jatabs. A small residual group of villagers does not belong to any of the above castes. This "Other" group represents 5.4% of the village population in 1957/58.
[2] Not including the "Other" category of households.

Table 5: Social Stratification in 1962/63

Group definition	Overall Inequality GE 0	"Classic" Between-Group Contribution	ELMO Between-Group Contribution
8 groups: all major caste groupings[1]	0.282[2]	0.177[2]	0.189[2]
5 groups: Thakurs, Muraos, Muslims, Jatabs, Others	0.289	0.077	0.098
4 Groups Thakurs, Muraos, Jatabs, Others	0.289	0.058	0.087
3 Groups Majority, Jatabs, Muslims	0.289	0.051	0.075
2 Groups Majority, Jatabs and Muslims	0.289	0.047	0.099
2. Groups Majority, Jatabs	0.289	0.038	0.095
2 Groups Majority, Scheduled Castes	0.289	0.007	0.015
2. Groups Thakurs, Others	0.289	0.006	0.011
2 Groups Muraos Others	0.289	0.037	0.076

[1] In rough order of social status: Thakur, Murao,Dhimar ,Gadaria, Dhobi, Teli, Passi and Jatabs. A small residual group of villagers does not belong to any of the above castes. This "Other" group represents 4.9% of the village population in 1962/3.
[2] Not including the "Other" category of households.

Table 6: Social Stratification in 1974/75

Group definition	Overall Inequality GE 0	"Classic" Between-Group Contribution	ELMO Between-Group Contribution
8 groups: all major caste groupings[1]	0.169[2]	0.313[2]	0.342[2]
5 groups: Thakurs, Muraos, Muslims, Jatabs, Others	0.164	0.289	0.345
4 Groups Thakurs, Muraos, Jatabs, Others	0.164	0.265	0.326
3 Groups Majority, Jatabs, Muslims	0.164	0.193	0.281
2 Groups Majority, Jatabs and Muslims	0.164	0.193	0.389
2. Groups Majority, Jatabs	0.164	0.094	0.224
2 Groups Majority, Scheduled Castes	0.164	0.064	0.132
2. Groups Thakurs, Others	0.164	0.049	0.101
2 Groups Muraos Others	0.164	0.103	0.210

[1] In rough order of social status: Thakur, Murao,Dhimar ,Gadaria, Dhobi, Teli, Passi and Jatabs. A small residual group of villagers does not belong to any of the above castes. This "Other" group represents 3.6% of the village population in 1974/5.
[2] Not including the "Other" category of households.

Table 7: Social Stratification in 1983/84

Group definition	Overall Inequality GE 0	"Classic" Between-Group Contribution	ELMO Between-Group Contribution
8 groups: 8 major caste groupings[1]	0.174[2]	0.287[2]	0.298[2]
5 groups: Thakurs, Muraos, Muslims, Jatabs, Others	0.172	0.265	0.292
4 Groups Thakurs, Muraos, Jatabs, Others	0.172	0.242	0.281
3 Groups Majority, Jatabs, Muslims	0.172	0.257	0.399
2 Groups Majority, Jatabs and Muslims	0.172	0.188	0.323
2. Groups Majority, Jatabs	0.172	0.220	0.498
2 Groups Majority, Scheduled Castes	0.172	0.057	0.103
2. Groups Thakurs, Others	0.172	0.011	0.020
2 Groups Muraos Others	0.172	0.039	0.069

[1] In rough order of social status: Thakur, Murao,Dhimar ,Gadaria, Dhobi, Teli, Passi and Jatabs. A small residual group of villagers does not belong to any of the above castes. This "Other" group represents 4.8% of the village population in 1983/4.
[2] Not including the "Other" category of households.

Table 8 Caste Composition in Sugao Village, 1977

Caste	Number of individuals (no. of hhs)	Traditional caste occupation	Average per capita land owned (ha)	Percentage of households with at least one resident member with an outside job in Sugao	Percentage of households receiving at least some remittance income	Average per-capita income in 1977 (Rs/year)
Maratha: Yadav	815 (137)	Cultivation, migrants	0.86	0	45	2901
Maratha: Jhadav	590 (111)	Cultivation, migrants	1.09	2	42	4063
Muslim	67 (12)	n/a	0.35	33	42	4066
Low artisan caste	108 (21)	Cobblers, basket weaving	0.05	62	14	1448
High artisan caste	151 (31)	Goldsmith, blacksmith	0.28	65	19	2835
Dhangar	191 (45)	Sheep and goat herders	0.40	31	51	3229
Dalit	230 (50)	Leather work	0.28	24	34	2472
Other	426 (83)	n/a	0.75	5	55	4321
TOTAL	2578 (490)		0.71	14	43	3353

Table 9: Partitioning and Social Stratification in Sugao in 1942
Overall Inequality GE0=0.433

Group definition	"Classic" Between-Group Contribution	ELMO Between-Group Contribution
Selected Social Group-Based Categories		
7 groups: Maratha vs Low Artisanal caste vs High Artisanal caste vs Muslim vs Dhangars vs SCST vs rest	0.099	0.108
4 groups: All Marjahadav versus SCST versus Muslim versus rest	0.064	0.123
3 groups: Marjhadav2+muslim versus SCST versus rest	0.061	0.088
3 groups: All Marjhadav versus SCST versus rest	0.059	0.075
2 groups: All Marjhadav verus rest	0.012	0.022
2 groups: SCST versus Rest	0.054	0.106
2 groups : SCST+Dhangar +artisanal castes versus rest	0.069	0.119
Selected Occupational Group-Based Categories		
2 groups: White Collar + other non-traditional occupations versus rest	0.000	0.010
2 groups: Agricultural Labor + traditional occupations versus rest	0.048	0.083
3 groups: Agricultural Labor + traditional occupations versus whitecollar occupation versus rest	0.048	0.078
2 groups: Household with at least one migrant versus rest	0.018	0.032
2 groups: Households with some irrigated land versus rest	0.031	0.053
Selected Combined Social Group and Occupational Group-Based Categories		
2 groups: Agricultural Labor and SCST versus rest	0.005	0.017
2 groups: SCST and landless, agricultural labor or farming household versus rest	0.025	0.065

Table 10: Partitioning and Social Stratification in Sugao in 1958
Overall Inequality GE0=0.431

Group definition	"Classic" Between-Group Contribution	ELMO Between-Group Contribution
Selected Social Group-Based Categories		
7 groups: Maratha vs Low Artisanal caste vs High Artisanal caste vs Muslim vs Dhangars vs SCST vs rest	0.107	0.118
4 groups: All Marjahadav versus SCST versus Muslim versus rest	0.058	0.102
3 groups: Marjhadav2+muslim versus SCST versus rest	0.049	0.072
3 groups: All Marjhadav versus SCST versus rest	0.054	0.074
2 groups: All Marjhadav verus rest	0.033	0.054
2 groups: SCST versus Rest	0.031	0.064
2 groups : SCST+Dhangar +artisanal castes versus rest	0.062	0.099
Selected Occupational Group-Based Categories		
2 groups: White Collar + other non-traditional occupations versus rest	0.012	0.043
2 groups: Agricultural Labor + traditional occupations versus rest	0.059	0.100
3 groups: Agricultural Labor + traditional occupations versus whitecollar occupation versus rest	0.067	0.101
2 groups: Household with at least one migrant versus rest	0.005	0.008
2 groups: Households with some irrigated land versus rest	0.036	0.058
Selected Combined Social Group and Occupational Group-Based Categories		
2 groups: Agricultural Labor and SCST versus rest	0.064	0.162
2 groups: SCST and landless, agricultural labor or farming household versus rest	0.045	0.106

Table 11: Partitioning and Social Stratification in Sugao in 1977
Overall Inequality GE0=0.407

Group definition	"Classic" Between-Group Contribution	ELMO Between-Group Contribution
Selected Social Group-Based Categories		
7 groups: Maratha vs Low Artisanal caste vs High Artisanal caste vs Muslim vs Dhangars vs SCST vs rest	0.040	0.044
4 groups: All Marjahadav versus SCST versus Muslim versus rest	0.024	0.035
3 groups: Marjhadav2+muslim versus SCST versus rest	0.021	0.031
3 groups: All Marjhadav versus SCST versus rest	0.021	0.028
2 groups: All Marjhadav verus rest	0.010	0.016
2 groups: SCST versus Rest	0.014	0.029
2 groups : SCST+Dhangar +artisanal castes versus rest	0.014	0.023
Selected Occupational Group-Based Categories		
2 groups: White Collar + other non-traditional occupations versus rest	0.024	0.060
2 groups: Agricultural Labor + traditional occupations versus rest	0.037	0.062
3 groups: Agricultural Labor + traditional occupations versus whitecollar occupation versus rest	0.055	0.080
2 groups: Household with at least one migrant versus rest	0.000	0.000
2 groups: Households with some irrigated land versus rest	0.031	0.050
Selected Combined Social Group and Occupational Group-Based Categories		
2 groups: Agricultural Labor and SCST versus rest	0.015	0.034
2 groups: SCST and landless, agricultural labor or farming household versus rest	0.013	0.028

Figure 1

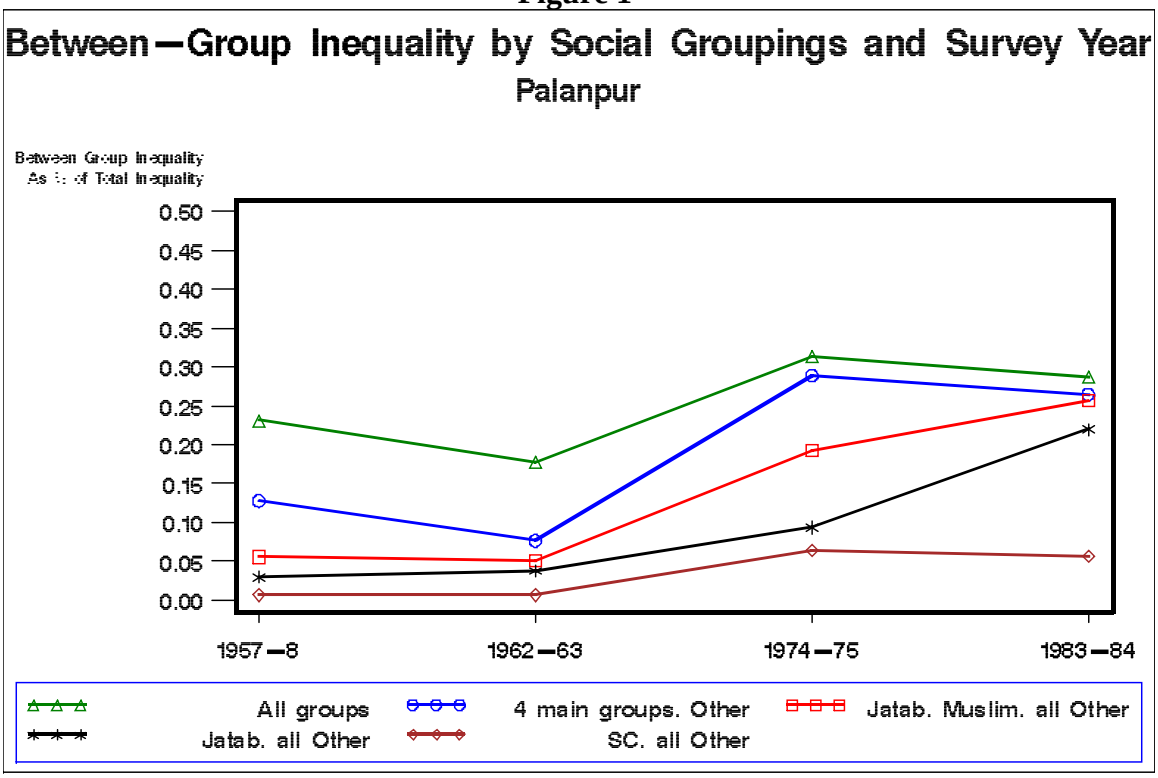
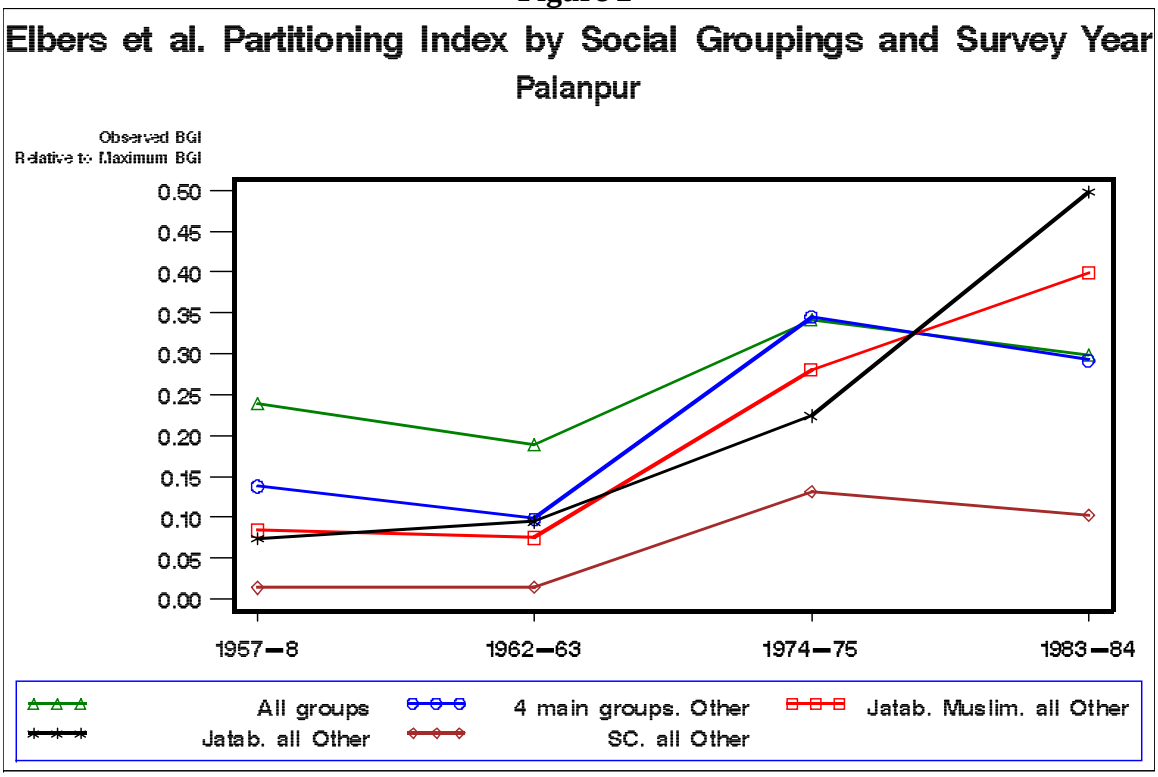


Figure 2



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i See Bourguignon (1979), Shorrocks (1980, 1984) and Cowell (1980). Cowell (2000) provides a recent survey of methods of inequality measurement, including a discussion of the various approaches to sub-group decomposition.

ii Sub-group decompositions for India based on other group definitions, including spatial, also find low between-group contributions. For example, Gajwani, Kanbur and Zhang (2006) find that, at the all-India level, a low between-group contribution is observed when groups are defined in terms of low or high literacy rates, low or high access to irrigation, inland or coastal location or residence, or north-south location of residence. Only when groups are defined in terms of rural versus urban location of residence does the between-group inequality contribution rise above 50% (Gajwani, Kanbur and Zhang, 2006, Table 2). This latter finding is generally thought to be driven, at least in part, to the lack of appropriate sectoral price deflators in India as well as possible non-comparability of the underlying welfare indicator between urban and rural areas. Overall, the findings of a relatively low between-group contribution to inequality are difficult to reconcile with the common perception that group differences are in fact central to an understanding of inequality in India.

iii This section borrows heavily from Elbers et al (2006).

iv We borrow our notation mainly from Cowell and Jenkins (1995).

v Lower values of c are associated with greater sensitivity to inequality amongst the poor, and higher values of c place more weight to inequality among the rich. A c value of 1 yields the well known Theil entropy measure, a value of 0 provides the Theil L or mean log deviation, and a value of 2 is ordinally equivalent to the squared coefficient of variation.

vi See, for example, Cowell and Jenkins (1995)

vii Obviously, this approach requires the number of groups, J, to be relatively small.

viii Elbers et al (2008) discuss an alternative benchmark rather than the maximum described here, in which an additional restriction is introduced. In addition to fixing the number of sub-groups and their relative sizes, the sub-groups are arrayed according to their

observed mean incomes – preserving their "pecking order". The approach is both intuitively appealing and less computationally intensive, involving only a single calculation rather than J! calculations.

ix Ansari (1964) reports on the findings of this village-wide survey.

x Some comparisons with the earlier survey years were reported, but a longitudinal perspective was not given a major emphasis.

xi One of the relatively special features of the Palanpur study is that detailed information is collected from the all households in the village rather than a sample of households.

xii The shorter duration of the 1993 survey prevented collection of the detailed economic information necessary to construct an income measure for 1993 which is comparable to that of the earlier survey years.

xiii Without any correction for fluctuating harvest quality real per capita incomes grew by 1.4%. One way of adjusting for harvest quality is to estimate the growth rate between the 1957-63 sub-period and the 1974-84 sub-period (where each sub-period income is the simple average of the two respective survey years, and each pair includes one good and one poor agricultural year). The trend growth rate calculated in this way is about 2.2%.

xiv Only in the case of the Atkinson measure of inequality with an inequality aversion parameter value of 2 or higher does inequality in 1983-4 exceed that in 1957-8 survey. The 1974-5 survey year appears unambiguously the most equal and the 1962-3 survey year the most unequal. See Lanjouw (1994) for an analysis of inequality in Palanpur within the stochastic dominance framework.

xv Lanjouw and Stern (1998), chapter 3, indicate that even after controlling for wealth position and education levels, Jatabs are significantly less likely to find regular employment in the non-farm sector.

xvi There are 8 social groups in Palanpur (combining caste criteria as well as the Hindu-Muslim distinction) and one residual category. In order to avoid having to make 9! calculations of between-group inequality (363,880) we have dropped the Other category from our calculations when treating each caste as a separate group. This leaves us with only 40,320 calculations with the 8 groups.

xvii Since the conventional between-group contribution and the Elbers et al statistic are capturing very different aspects of inequality, the simple fact that one is higher than the other does not have any particular meaning. What one is looking for is a clear different qualitative assessment of inequality suggested by the fact that orders of magnitude are widely different across the two indicators.

xviii The "classic" between group contribution in this case is 2.7%.

xix In Palanpur there are 6.4 bighas in an acre.

xx One might conjecture that the Sugao data are very noisy and that this explains the high inequality. But a simple regression model of per capita income on household demographics, caste and occupational characteristics yields a very high R2 in all three survey years – between 0.5 and 0.6. This is very similar to what is reported in Lanjouw and Stern (1998) for Palanpur based on a similar specification. In both village studies income data were collected by economists with considerable experience and there is little reason to think that the Sugao study suffers from any particular problems in this regard.