

Does inequality affect the consumption patterns of the poor? – The role of “status seeking” behaviour

Sugata Marjit

Centre for Studies in Social Sciences, Calcutta (CSSSC)

&

Sampling and Official Statistics Unit, Indian Statistical Institute, Kolkata
India

Sattwik Santra

Centre for Studies in Social Sciences, Calcutta (CSSSC)

India

Koushik Kumar Hati

Centre for Studies in Social Sciences, Calcutta (CSSSC)

India

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Abstract

We consider a situation where the relatively ‘poor’ are concerned about their relative income status with respect to a relevant reference group. Such a concern is explicitly introduced in a utility function to study the consumption and saving behavior of the poor in terms of a static and dynamic model. The static model points toward a possible conflict between income based and nutrition-based measure of poverty. The dynamic model exhibits the possibility of a higher rate of accumulation coupled with an inadequate nutritional intake, relative to a situation where there is no such concern for status. Thus, growth with malnutrition may also imply a conflict between different measures of poverty. Both the models point toward a direct and negative relationship between inequality and share of nutritional consumption as reflected in the consumption of food. Finally the paper looks at the empirical relationship between inequality and consumption across districts within states of India. The hypotheses that inequality impacts consumption patterns via status effect cannot be rejected. In fact the impact seems to be significant across a number of the Indian states.

Keywords: Status; Consumption pattern; Inequality; Poverty; Growth;

JEL Classification: C13, C14, C51, D01, D12, O40

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I. Introduction

A fundamental query involving the preference pattern of any individual in a society, has to deal with the influence of the society on the consumption behavior of the individual. The idea of conspicuous consumption and the so-called Veblen effect are quite well known in economics. Very recently, Sivanathan and Petit (2010) have confirmed the fact that individuals are quite sensitive to their relative status in the society and would like to ‘mend’ their ‘self’, under constant attack from various social pressures, by taking recourse to status-signaling consumption behaviour. A series of experiments confirms such a pattern of human behaviour. This is one of the building blocks of the utility function that we use in the subsequent analysis. Early literature includes Frank (1985) who talks about context dependent preferences and the concern for status as we discuss in this paper, is an issue related to a particular social context. More recently, Mujcic and Frijters (2013) have explicitly and convincingly demonstrated a method for measuring the willingness to pay to move up the status ladder.

The paper starts off by highlighting a well-observed empirical phenomenon, discussed extensively in the literature on poverty in India. Patnaik (2007) and Deaton and Dreze (2009) have dealt with the conflict between income-based measure and nutrition-based measure of poverty. In India people moving above the poverty line with greater monthly expenditure on overall consumption demonstrate lower nutritional intake. Thus Patnaik (2007) asserts that actual poverty estimate is far greater than the optimistic figure provided by the government. While Deaton and Dreze (2009) analyze various reasons for such a behaviour, not much emphasis is given to the role of a status-driven consumption pattern, although they do not altogether ignore such a possibility. That social inequality can influence individuals’ consumption and induce greater consumption of the so-called status good, becomes quite relevant for such analysis. Thematically this is undermined and under-explored in the poverty literature. We will eventually demonstrate how preexisting social inequality can lead to the conflicting measures of poverty. Patnaik (2007)’s analysis shows that the official level of poverty (which has been very optimistic of lately) has been highly underestimating the true scenario. The paper further focuses on the contradictory empirical finding that states having higher value in poverty index using income-based measure may have higher calorie intakes and the vice-versa. Such contradictions in results with the two different measures have been found for states in India like Gujarat and Bihar, Orissa and Andhra Pradesh. The paper also highlights the fact that calorie intake alone, cannot measure poverty to its maximum precision. There are many cases where high income groups consume

lower levels of calories in comparison to their age and sex. This might be due to their job requirements, or their amount of physical labour might be low and due to certain health conditions.

Deaton and Dreze (2009) analyse the reason behind the discrepancies in the results of the two measures of poverty. They observe that nutritional intake, proxied by calorie intake, has been declining with rising incomes as a result of change in activity structure affecting the food intake pattern in both rural and urban societies. Though they emphasize that calorie intake in itself cannot measure the well-being of the society as other nutrients are also equally important. There is also an indication to the possibility of a squeeze in the food budget of poor household for increase in non-food expenses like schooling and other social necessities.

A paper by Radhakrishna and Ravi (2004) explores an empirical relationship between malnutrition and poverty for the rural India, along with a logit regression using maximum likelihood method to identify the determinants of rural malnutrition. Their findings suggest that even though there is some achievement in poverty reduction, India has not been very successful in reducing malnutrition. In a working paper by Mukherjee, Rajaraman, and Swaminathan (2010), they have modeled both under nutrition and over nutrition in India along with which they have discussed the role of different forms of economic inequality, and various behavioral variable (such as diet and activity) that affect nutrition. Analysis of under and over weight in India using data from 1998-1999 have found individual socioeconomic status to be an important predictor of being overweight [Griffiths and Bentley (2001)]. Peter Svedberg (2008) addressed the question as to why high overall economic growth in India has failed to alleviate child malnutrition. This paper tries to provide firm empirical and quantitative evidence of female subjugation relative to poverty income as a reason for stunted growth in nutritional status.

Nevertheless, not much focus has been given in India on the role of status affecting the consumption pattern of the poor people. Most of the explanations regarding falling nutrition levels, provided till date, have been related to stagnation in agricultural production with more than 50% of the population being employed in agriculture. But the last few decades have seen a large shift in the sectoral composition of employment structure as well and so there is a need to explore further avenues to explain the contradictory results with the two measures of poverty. In general there is a need to understand the impact of status on consumption patterns of individuals for tax and welfare related policies in general.

One issue that is empirically relevant for research on poverty and nutrition, has to do with the causal relationship between inequality and poverty. The conventional wisdom that poverty causes inequality needs to be reexamined if the status effect is important. Faster growth rates do not mean that the increment is equally shared by various income classes. Rising inequality accentuates status effect and compels people toward status-based consumption pattern and may adversely affect poverty in terms of nutritional measure. Social perception about status might be related to the information about global consumption standard as projected through electronic media. These effects must be seriously looked into.

Indian Economy has experienced a robust growth phase for a considerable length of time growing at an average rate of 7 - 8 % and often hailed as the 2nd fastest growing nation in the world, next to China. The distribution of benefits from such a remarkable expansionary trend has not been shared equally across income classes with the lower income classes sharing smaller proportion of such expansion. This was pointed out in the economic survey by the Government of India (2011-12). In simple terms, this means that the lower income earning classes will have their income levels falling behind relative to the average income, a sign that inequality is on the rise. However, such a process does not undermine the fact that in absolute terms even the lower income classes are better off but a sense of falling behind in the race cannot be ignored. This plays a critical role in any analysis that relates status driven consumption with the perception of social inequality. The growth literature related to status often highlighted the aspiration effect i.e., the drive towards a higher social status and in the process undertaking growth augmenting investments such as in education. But even in the presence of such a positive effect, inequality driven consumption of status good by driving consumption away from nutritional good may affect the nutritional sustainability of such a growth process.

One must mention that there is a literature on status and growth pioneered by Cole, Mailath, and Postlewaite (1992) and later extended by Corneo and Jeanne (2001). The message of this literature is that the aspiration effect i.e., the effort to attain higher status induces agents to over-accumulate relative to the standard case i.e., without such concern for status. In a general context, therefore, two offsetting effects must be considered, one that pushes the individual to consume more and the other when saving intensity is higher. We will reflect on this issue in course of our analysis. Interestingly, to highlight our concern we have a way to block the 'over-accumulation effect' due to concern for status.

A voluminous literature discusses the impact of social status, relative income and relative rewards on productivity such as Hopkins and Kornienko (2010), Ku and Salmon (2009), on optimal taxation such as Beath and Fitzroy (2010), Kanbur and Tuomala (2010) and on networks such as Ghiglino and Goyal (2008). There is also a huge literature that has empirically examined the relationship between relative societal position and well-being. The papers by Easterlin [(1974), (1995) and (2001)] note that income and self-reported happiness are positively correlated across individuals within a country. The author interprets these findings as evidence that relative income rather than absolute income matters for well-being. Using European micro data, Van de Stadt, Kapteyn, and Van de Geer (1985), Clark and Oswald (1996), Senik (2004), and Ferrer-i-Carbonell (2005) find that well-being is partly driven by relative position, where reference groups are defined by demographic characteristics. Using U. S. data, McBride (2001) finds evidence that relative income affects subjective well-being, but they caution about the statistical reliability of their findings. Also, the paper by Luttmer (2005) using NSFH data finds that, controlling for an individual's own income, higher earnings of neighbors are associated with lower levels of self-reported happiness and that increased neighbors' earnings have the strongest negative effect on happiness for those who socialize more in their neighborhood. However, these papers do not deal with the issues we are discussing in this paper.

Status led consumption can hurt the level of intergenerational bequests and increase the probability of a poverty trap with imperfect credit markets as demonstrated in Moav and Neeman (2012). Status seeking behavior may impact risk-taking attitude of individuals with interesting consequences. Such issues have been discussed by Robson (1992) and Ray and Robson (2012). Concern for relative income status may affect the pattern of trade of a poor economy. These have been dealt with, in Marjit and Roychowdhury (2012).

We have felt the importance of introducing the concept of status in a simple utility function that can capture the essence of the issue and then try to assess its implications. In the first phase of the paper we precisely do that and build up a case that increasing absolute level of purchasing power may actually increase nutritional measure of poverty, where food effectively turns out to be an "inferior" good if the status-concerned consumer internalizes the distributional implication of an overall change in income. Later we show that growth by itself, does not remove this problem and one can have growth with malnutrition. Both these results work through a direct impact of inequality on consumption, in particular on food to non-food consumption. Then we

proceed to test this hypothesis in terms of the most widely used data set in India, the National Sample Survey Organization data on household level consumption with the latest two rounds of data across Indian states for the rural and urban sectors. Another motivation for using a large sample is that in earlier works, experiments, anecdotal observations, case studies (see Luttmer (2005), Fafchamps and Shilpi (2008), Banerjee and Duflo (2011), etc.) do point toward such behavior. Natural question is whether large data set and wider variations accommodate such claim.

The paper is structured as follows. The second section develops two models, one a static model explaining the conflict between income and nutrition-based measures of poverty. The second is a dynamic model relating growth with malnutrition. The third section deals with the empirical evidence on inequality and poverty using the National Sample Survey data for Indian states and districts. The last section concludes.

II (a) Static Model - Explaining the Conflict between Income and Nutrition

We start from two axioms on how perceived social inequality affects the individual welfare.

Axiom 1: Inequality hurts

This implies that having below average income in a society reduces individual utility. Our assumption will be that being above average does not matter, but being below definitely hurts. This asymmetry is deliberate to highlight the implications of belonging to the downside of inequality.

Axiom 2: Inequality increases MU for status good

Having lower than average income increases the marginal utility of conspicuous consumption or consumption of the status good. This is directly drawn from experimental psychology literature where intensity of desire to consume the status good seems to be greater among those who are affected by social inequality.

We now invoke a simple utility function with N , the consumption of nutrition good and L , the consumption of luxury or status good or non-nutritious good.

$$U = f\left(\frac{\bar{y}}{y}\right) \left[N^\alpha + \phi\left(\frac{\bar{y}}{y}\right) L^\alpha \right] \quad 0 < \alpha < 1 \quad \dots (1)$$

where $\bar{y}$ is average income of the reference social group and ' y ' is the individual's level of income.

$$f\left(\frac{\bar{y}}{y}\right) \begin{cases} = 1 & \text{for } y \geq \bar{y} \\ < 1 & \text{for } y < \bar{y} \end{cases} \quad \dots (2)$$

And $f' < 0$. [Follows from Axiom 1]

$$\phi\left(\frac{\bar{y}}{y}\right) \begin{cases} = 1 & \text{for } y \geq \bar{y} \\ > 1 & \text{for } y < \bar{y} \end{cases} \quad \dots (3)$$

And $\phi' > 0$. [Follows from Axiom 2]

We will not discuss price effect and assume prices to be equal to one.

Insert Figure: 1 here

If inequality truly hurts,

$$f\left(\frac{\bar{y}}{y}\right) \left[\tilde{N}^\alpha + \phi\left(\frac{\bar{y}}{y}\right) \tilde{L}^\alpha \right] < \left[N_0^\alpha + \phi\left(\frac{\bar{y}}{y}\right) L_0^\alpha \right] \quad \dots (4)$$

Where $(\tilde{N}, \tilde{L})$ are optimal consumption levels for $y < \bar{y}$ and the same are denoted by (N_0, L_0) for the benchmark case with $y = \bar{y}$.

Invoking the Envelope property it is straightforward to interpret (U) as

$$\frac{dU}{dy} = f'\left(-\frac{\bar{y}}{y^2}\right) \left(\tilde{N}^\alpha + \phi\left(\frac{\bar{y}}{y}\right) \tilde{L}^\alpha \right) + f \cdot \phi'\left(-\frac{\bar{y}}{y^2}\right) \log \tilde{L} > 0$$

$$\text{Or, } -\left(\frac{\bar{y}}{y^2}\right) f' \tilde{N}^\alpha - \left(\frac{\bar{y}}{y^2}\right) L^\alpha [f' \phi + f \phi'] > 0$$

Since $f' < 0$ and $\phi' > 0$, a sufficient condition is given by:

$$[f' \phi + f \phi'] < 0 \quad \dots (5)$$

Note that if 'y' moves up the ladder ' $f(\cdot)$ ' increases but ' ϕ ' drops. Or put differently if 'y' drops from ' $\bar{y}$ ', ' $f(\cdot)$ ' goes down to a value less than unity, but ' ϕ ' increases, the net effect has to be negative if inequality has to hurt in equilibrium.

It is obvious that in equilibrium

$$\tilde{N} = \frac{y}{1+\phi^{\frac{1}{1-\alpha}}} \quad \text{and} \quad \tilde{L} = \frac{\phi^{\frac{1}{1-\alpha}}}{1+\phi^{\frac{1}{1-\alpha}}} \quad \dots (6)$$

Note that as long as ' ϕ ' does not change i.e. the distribution remains invariant ' $\tilde{N}$ ' must increase with 'y'. Also if 'y' increases and ' $\bar{y}$ ' remains the same, ' $\tilde{N}$ ' increases on both counts i.e. because 'y' increases and the distribution become more egalitarian. When $\phi = 1$, by virtue of having this specific utility function, $\tilde{N} = \frac{1}{2}y$. However, when $\phi > 1$ and if both 'y' and ' $\bar{y}$ ' increase when

we increase ‘ y ’, relative social status can worsen leading to an increase in ‘ ϕ ’ and a net reduction in ‘ $\tilde{N}$ ’. We are contemplating a situation where ‘ $\bar{y}$ ’ is increasing at a faster rate than ‘ y ’ i.e. the distribution is worsening when ‘ y ’ is increasing.

It is easy to check that $\frac{d\tilde{N}}{dy} < 0$ iff $\mu\sigma > (1 - \alpha)(1 + \frac{1}{\phi^{1-\alpha}})$... (7)

Where, $\mu = \frac{d\phi}{d(\frac{\bar{y}}{y})} \frac{\bar{y}/y}{\phi}$ and $\sigma = \frac{d(\frac{\bar{y}}{y})}{dy} \frac{y}{\bar{y}/y}$

As $y \rightarrow \bar{y}$, $\phi(\frac{\bar{y}}{y}) \rightarrow 1$, RHS in (7) $\rightarrow 2(1 - \alpha)$

As $y \rightarrow 0$, $\phi(\frac{\bar{y}}{y}) \rightarrow \infty$, RHS in (7) $\rightarrow (1 - \alpha)$

Insert Figure: 2 here

If $(\frac{\bar{y}}{y})$ increases with ‘ y ’, the consumption of ‘ N ’ reacts according to the magnitude of ‘ μ ’ and ‘ σ ’. While ‘ μ ’ reflects the cultural perception of relative status i.e., how sensitive the society is to the status factor, ‘ σ ’ reflects the elasticity of distribution. If either of them is very weak, we should not have any conflict between two alternate measures of poverty. If either of them is zero, we are back with the standard case. If either of them is very high we shall have our interesting results. Also greater is $(\bar{y}/y)$ and lower is $1/\phi$ chances are greater that the conflict will arise. Inequality has a direct bearing on the nutritional estimate of poverty.

Proposition 1

A growth in income may reduce consumption of food and hence nutritional intake if it is accompanied by a worsening of income distribution. Thus food will look to be an “inferior” good and income based and nutritional-based measures of poverty will not match. If income distribution remains unchanged, there will be no such conflict.

Proof: See the discussion above. Q.E.D.

II (b) A Dynamic Model Relating Growth with Malnutrition

Next we consider a simple infinite horizon model where a poor status affected individual makes a rational judgment on consumption and saving or investment over time. This is an individual choice problem where the social average income of the reference group is taken as a parameter and the agent chooses consumption and investment as a response to her concern for social status as dictated by the given social parameter i.e., the average income. The choice is between the quantities of consumption of the nutritious good ‘ N ’ and the luxury good ‘ L ’ on one hand and how much to save and consume on the other. Since we are not interested in relative price effects, we continue to choose units in such a way that relative price is constant at unity. We argue that a status concerned individual will tend to accumulate more, relative to the benchmark case (i.e., without any status effects) but in the process will consume less of the nutritious good and if the nutritional intake falters for people with low absolute income we shall have a case for growth with malnutrition.

Given ‘ $\bar{y}_t$ ’, the average income at period ‘ t ’, an individual decides on consumption and saving which can be in terms of a non-depreciating capital and she has to allocate her income between ‘ N_t ’ and ‘ L_t ’. While taking such decisions, ‘ $\bar{y}_t$ ’ and its distribution over time is treated as endogenous and ‘ N_t ’, ‘ L_t ’ and saving will be conditional on ‘ $\bar{y}_t$ ’. To simplify further we assume:

$$f(.) = \frac{y}{\bar{y}} \text{ and } \phi(.) = \frac{\bar{y}}{y}$$

Note that such simplification is consistent with our earlier specifications. The maximization problem faced by the representative agent is given by:

$$\text{Max}_{\{N_t, L_t\}} \sum_{t=0}^{\infty} \beta^t \left[\frac{y_t}{\bar{y}_t} N_t^\alpha + L_t^\alpha \right], \quad 0 < \beta = \frac{1}{1+\rho} < 1 \quad \dots (8)$$

$$x(k_t) - N_t - L_t - k_{t+1} + k_t = 0 \quad \dots (9)$$

Where $x(k_t)$ is the standard production function with $x' > 0$, $x'' < 0$, $x(0) = 0$

The dynamic programming problem is characterized by:

$$\text{Max} \left(\frac{y_t}{\bar{y}_t} N_t^\alpha + L_t^\alpha \right) + \beta V(\bar{y}_{t+1}, k_{t+1}), \text{ where } V(\cdot) \text{ is the optimal value function.}$$

$$\text{s.t. } x(k_t) - N_t - L_t - k_{t+1} + k_t = 0 \quad \dots (10)$$

$$\text{Define } Z_t = \frac{y_t}{\bar{y}_t} N_t^\alpha + L_t^\alpha + \beta V(k_{t+1}, \bar{y}_{t+1}) + \lambda_t [x(k_t) - N_t - L_t - k_{t+1} + k_t]$$

The associated first order conditions are:

$$\frac{\delta Z_t}{\delta N_t} = 0 \Rightarrow \frac{x(k_t)}{\bar{y}_t} \alpha N_t^{\alpha-1} = \lambda_t \quad \dots (11)$$

$$\frac{\delta Z_t}{\delta L_t} = 0 \Rightarrow \alpha L_t^{\alpha-1} = \lambda_t \quad \dots (12)$$

$$\frac{\delta Z_t}{\delta k_{t+1}} = 0 \Rightarrow \beta \frac{\delta V}{\delta k_{t+1}} = \lambda_t \quad \dots (13)$$

$$\frac{\delta Z_t}{\delta \lambda_t} = x(k_t) - N_t - L_t - k_{t+1} + k_t \quad \dots (14)$$

$$\text{Now, } V'(k_t) = \lambda_t [x'(k_t) + 1] + \frac{x'(k_t)}{\bar{y}_t} N_t^\alpha$$

Updating,

$$\beta V'(k_{t+1}) = \beta [\lambda_{t+1} [x'(k_{t+1}) + 1] + \frac{x'(k_{t+1})}{\bar{y}_{t+1}} N_{t+1}^\alpha] \quad \dots (15)$$

Equating (13) and (15)

$$\beta [\lambda_{t+1} (x'(k_{t+1}) + 1) + \frac{x'(k_{t+1})}{\bar{y}_{t+1}} N_{t+1}^\alpha] = \lambda_t \quad \dots (16)$$

In steady state $k_{t+1} = k_t = k^*$, $\lambda_{t+1} = \lambda_t = \lambda^*$

$\bar{y}_{t+1} = \bar{y}^*$, $N_t = N^*$, etc.

Note that ' $\bar{y}$ ' is not chosen by the individual. Hence, ' $\bar{y}^*$ ' is exogenously specified.

$$\text{Therefore } \beta(x' + 1) + \beta \frac{x'}{\bar{y}^* \lambda^*} N^{*\alpha} = 1$$

$$\text{Or, } x' + 1 + \frac{x'}{\bar{y}^* \lambda^*} N^{*\alpha} = \frac{1}{\beta} = 1 + \rho$$

$$\text{Or, } x' = \frac{\rho}{1 + \frac{1}{\bar{y}^* \lambda^*} N^{*\alpha}} \quad \dots (17)$$

Note that for $y \geq \bar{y}$, equation (17) reduces to $x' = \rho$, the well-known steady state condition.

Since LHS in (17) is less than ' ρ ', the status effect exerts a positive impact on the accumulation process. This result echoes earlier results as in Cole et al (1992), Corneo and Jeanne (2001), etc.

Substituting for ' λ^* ' from (11) into (17) we get

$$\begin{aligned} x' &= \frac{\rho}{1 + \frac{1}{\bar{y}^*} \frac{N^{*\alpha}}{x(k^*) \alpha N^{*\alpha-1}}} \\ &= \frac{\rho}{1 + \frac{N^*}{x(k^*) \alpha}} \end{aligned} \quad \dots (18)$$

Also $x(k^*) = N^* + L^*$

$$\text{Or, } N^* = \frac{x(k^*)}{1 + [\frac{x(k^*)}{\bar{y}^*}]^{\frac{1}{\alpha-1}}} \quad \dots (19)$$

For $y \geq \bar{y}^*$, $N^* = \frac{x(k^*)}{2}$

Since $\frac{x(k^*)}{\bar{y}^*} < 1$ and $0 < \alpha < 1$

$\left(\frac{x(k^*)}{\bar{y}^*}\right)^{\frac{1}{\alpha-1}} > 1$ Which in turn implies that ' N^* ' will be lower on that count. But note that ' k^* ' assumes a bigger value in the model which includes the concern for status. Therefore ' N^* ' can be higher than ' N_0 '.

From (18) and (19) we can determine ' N^* ' and ' k^* '.

It is easy to check that if (k_0, N_0) is the solution to the problem without concern for status, then $k^* > k_0$

Therefore, $N^* < N_0$ if and only if $\frac{x(k^*)}{1 + \left(\frac{x(k^*)}{\bar{y}^*}\right)^{\frac{1}{\alpha-1}}} < \frac{x(k_0)}{2}$... (20)

Simplifying (20) we get,

$$\frac{2x(k^*) - x(k_0)}{x(k_0)} < \left[\frac{\bar{y}^*}{x(k^*)}\right]^{\frac{1}{1-\alpha}} \quad \dots (21)$$

Let $x(k^*) = \mu x(k_0)$, $\mu > 1$

Hence, $N^* < N_0$ iff $\frac{\bar{y}^*}{x(k^*)} > (2\mu - 1)^{1-\alpha}$... (22)

However, (22) implies the fact that both ' k^* ' and hence ' μ ' will be affected by ' $\bar{y}^*$ '. To see the direction of the impact, follow (18) and (19).

From (18) we can derive figure-3 representing the LHS and RHS in (18) as function of ' K^* '.

Insert Figure: 3 here

If ' N^* ' increases RHS (18) shifts down and ' K^* ' increases.

This defines kk in figure-4. Similarly, (19) defines NN in figure-4 with ' k^* ' adjusting along kk and ' N^* ' adjusting along NN . An increase in ' $\bar{y}^*$ ' shifts NN to the right lowering ' k^* ' and ' N^* '.

Insert Figure: 4 here

Therefore (22) can be rewritten as

$$\frac{\bar{y}^*}{x[k^*(\bar{y}^*)]} > [2\mu(\bar{y}^*) - 1]^{1-\alpha} \quad \dots (23)$$

Insert Figure: 5 here

Figure - 5 derives the critical level of ' $\bar{y}^*$ ' as ' $\tilde{y}^*$ ' such that $\forall \bar{y}^* > \tilde{y}^*, N^* < N_0$

Note that as $\bar{y}^* \rightarrow 0$, $N^* \rightarrow x(k^*)$

As $\bar{y}^* \rightarrow 0$, LHS in (23) $\rightarrow 0$ and RHS in (23) $\rightarrow$ a positive value.

Similarly, as $\bar{y}^* \rightarrow \infty$ LHS will entirely dominate RHS. Thus $\tilde{y}^*$ is unique.

Thus we can state the following core proposition of the paper.

Proposition 2

If the degree of inequality of income crosses a critical threshold, status concerned individual will consume less of the nutritious good and may be malnourished even if she accumulates more than an individual who is not concerned for the relative status.

Proof:

For $\bar{y}^* \in (\tilde{y}^*, \infty)$, $N^* < N_0$, though $k^* > k_0$. If N^* drops substantially, it may fall below the critical minimum required for nutrition. Q.E.D.

Our paper shows that if people care about social status, they will accumulate more because they value improvement in their relative status. But they cannot avoid a critical substitution effect. Status concerned individual will try to signal their status by consuming more of the status-good and less of the nutritious good. Thus, concern for status will lead to greater accumulation and less nutrition. But that critically depends on the extent of the income effect i.e., $x(k^*) - x(k_0)$. An increase in $\bar{y}^*$, the average income of the reference group, will also reduce the rate of accumulation as the marginal utility from status declines with the increase in ' $\bar{y}^*$ '. However, the level effect will be dominating, meaning $k^* > k_0$. If income effect of status is not substantial, nutrition is likely to suffer due to the substitution effect.

Remarks

One implication of the result derived in the paper is relevant for the debate on the conflicting measures of poverty as reported in Patnaik (2007), Marjit (2012), etc. Consider a situation where

the representative agent's income $x(k_0)$ is below poverty line defined in terms of income. If she is concerned about status, she will choose a $k^* > k_0$. $x(k^*) > x(k_0)$ indicates an improvement in terms of the poverty measure. In particular if ' $\tilde{x}$ ' represents the poverty line, $x(k^*) > \tilde{x} > x(k_0)$ means an end of poverty for the agent. However, by the same argument if $\tilde{N} > N_0$ represents the poverty line in terms of nutrition, $N^* < N_0 < \tilde{N}$ will mean a further increase in the incidence of poverty. Thus in terms of income measure poverty rate will decline, while in terms of nutrition there will be more people under poverty line. Thus growth with malnutrition will also imply conflicting measures of poverty.

III. Empirical Analysis:

Given the massive impact that distribution of income has on one's perception of her status in the society and thus her consumption decisions, it becomes vital at this stage to see the impact of such perceptions on one's decision making process, empirically. As the theory has already established that status concerns have an adverse effect on the nutritional state of the people, even in the face of rising incomes, here we exemplify the existence of such a phenomenon empirically. For our purpose, we take up India, as a prospective candidate and look for the prevalence of status, affecting the relative consumptions of commodities.

In India, it is often observed that higher levels of overall consumption expenditure (which is approximated as a proxy for income levels) among the poor do not imply higher nutritional intake which is quiet contrary to general perception. World Bank Data reveals, in the past decade, India has seen high annual growth rates from about 4 percent to an average of 8 percent peaking to about 10 percent in 2011. Also the poverty levels (according to World Bank data) have reduced over years. But the nutritional status of many states of the country does not show respectable levels of improvement. Svedberg (2008) found that between 1993 and 2006, net state domestic product per capita grew by about 4.5% per year on an average, nearly a doubling of real income, while the prevalence of child stunting and underweight reduced by a meagre 23 percent to 12 percent over the past 13 years. Whereas in China, child stunting fell from 33 to 10 percent during 1992-2005 and child underweight was practically eliminated. Also prevalence of

under nutrition in adult women in 2005-2006 was 33%, down only by 3 percentage points from 36 percent in 1998-1999¹.

The reason behind such perverse outcomes, have been attributed in our paper to a status effect (the inherent tendency to consume status goods rather than nutritious goods to conform to societal status) prevailing among the population which interacts with the income effect and determines the overall relative consumption patterns. In many middle income countries it has been observed that as the income levels of the people rises, with a rise in income inequality, the low income people try to mimic the consumption pattern of higher income class, thereby bringing a shift in their expenditure structure toward luxury goods and thus affecting their nutritional status. This would imply another aspect of income inequality – that income inequality distorts consumption and expenditure patterns among the poor. In accordance with the theory developed so far, we consider a situation where the poor people are concerned about their relative social status. In a society with unequal distribution of income, to keep up with the standards of the high income class, low income people try to spend more on luxury goods so as to retain their relative status. In other words, income inequality in a society has an impact on the tendency to retain relative social status among the poor. This can be quantified by the spending on non-food luxury items in comparison to food items.

The following section elucidates the methodology of our analysis and the assumptions of the model used along with the results obtained thus.

IV. Data and Methodology

The entire empirical analysis is entirely based on the extensive dataset provided by the National Sample Survey Organization of India viz. the NSS 66th and 68th round all India unit level survey on consumption expenditure (Schedule1.0, Type 1 and 2). The dataset includes household level observations on item specific expenditure and various household specific characteristics. Apart from this, data is also provided on the households' localization, such as the sector (Rural or Urban), district and state. The total number of household level observations in our analysis is 201649 for the 66th round and 203313 observations for the 68th round. The data spans thirty five states and union territories. The total number of districts in our analysis is 612 for the 66th round and 625 for the 68th round.

¹International Institute of Population Sciences, Research Brief, No. 2, (2007).

Tables 1a and 1b summarize some of the key statistics related to the principal variables of our analysis namely the monthly per capita expenditure which is further subdivided into monthly per capita expenditures on food and non-food commodities. These statistics are reported for both the rounds and are categorized according to the individual states and sectors as well as for the overall country as a whole. As a preliminary exercise, we separate the rural and urban sectors of the country and for every district, calculate the average food to non-food expenditure ratios of the households who's monthly per – capita consumption expenditures lie within a range² of 250 rupees above or below the district's lowest quintile (i.e., 25th percentile) of monthly per – capita consumption expenditures. We plot these figures against the respective district wise median monthly per – capita total consumption expenditure in a scatter diagram. We do this separately for both rounds of the data. The result from this exercise is depicted in figure – 6. We find that each of the scatterplots depicts a negative relationship between the district wise average expenditure ratios and the corresponding district wise median total consumption figures. To illustrate this clearly, we have also, we fitted a linear trend line to each of the scatterplots. This figure is in line with our conjecture and bears out the fact that relatively poor individuals belonging to a particular class of income (here proxied by total consumption expenditure), do tend to “mend their self” by revising their consumption patterns in a way that mimics the consumption patterns of the relatively richer sections in their societies.

Insert Figure: 6 here

With this initial result, in the subsequent paragraphs, we develop a detailed and robust statistical framework to study the nature and significance of the role of status in shaping individuals' consumption patterns.

But before constructing a formal statistical model, we first need to identify the households who are subject to the aforementioned status concerns. So, we consider each hamlet–group/sub–block of every first stage sampling units (FSU)³ and admit into our analysis only those households whose monthly per capita consumption expenditures (which serves as a proxy to the respective

² Taking into consideration the number of data points available for the analysis.

³ These FSU's are the 2001 census villages (Panchayat wards in case of Kerala) in the rural sector and Urban Frame Survey (UFS) blocks in the urban sector. In addition, for the 66th round, two towns of Leh and Kargil of Jammu & Kashmir are also treated as FSUs in the urban sector. These FSUs are further subdivided into hamlet–groups for rural sector and sub–blocks for urban sector, in case the population of a FSU is found to be more than a certain

household's per capita income) lie below the hamlet-group's/sub-block's median per capita consumption expenditure level. Next, in order to define a status variable for these households, we take up every prospective household satisfying the above criterion and for each of these household, consider those households which reside in the same hamlet-group/sub-block but having per capita consumption expenditures above the hamlet-group's/sub-block's highest quintile (i.e., 75th percentile) and take the logarithm of their median per capita consumption expenditure as the status variable of the prospective household. The status variable constructed thus, also makes our analysis robust to specification biases. This follows since the manner in which the status variable of a household is defined makes it irresponsive to the household's income up to a certain extent thus guarantying that this variable truly represents the households' responsiveness to its societal position rather than capturing certain nonlinearity of the households' income.

For our statistical model, we divide the consumables into two categories: food, and non-food and consider the ratio of food to non-food expenditure. To test for the presence of status concern of the selected households, we look at the relationship of their expenditure share on income level (proxied by per capita expenditure), the status variable and a few other covariates which act as controls.

Our underlying theoretical model to this empirical exercise assumes that the ratio of expenditure on food to non-food has a multiplicative relationship with income and status, which is given by:

$$S = \left(\frac{E_f}{E_{nf}} \right) = G_1(p)G_2(M)G_3(D)G_4(Z)\mathcal{E}$$

In the above relation, E represents the total expenditure on the subscripted commodity which may be food (f), or non-food (nf), p denotes the vector of prices of the consumables, $G_i(\cdot) \forall i = 1$ to 4 are arbitrary functions, M , D denote income and the status variable respectively, Z represents a vector of other control variables and $\mathcal{E}$ represents a log-normal error term.

Taking natural logarithm of the above equation, we get a log linear relationship as:

$$\ln S = F_1(p) + F_2(M) + F_3(D) + F_4(Z) + \varepsilon \quad \dots (24)$$

where $F_i(\cdot) \equiv \ln G_i(\cdot) \forall i = 1$ to 4

threshold (1200 for most cases and 600 for other areas), more or less equalizing the population in each hamlet-groups/sub-blocks.

Note that our previous assumptions on the error component imply that ε follows a normal distribution with mean zero and some variance.

We estimate equation (24) with some additional structure particularly on the functional forms of $F_i(\cdot)$'s as well as on the error term. Specifically we estimate the system:

$$\ln S_{ij} = \alpha_i + \beta_i \ln M_{ij} + \gamma_i \frac{1}{M_{ij}} + \delta_i \frac{1}{M_{ij}^2} + \theta_i \ln D_{ij} + \rho Z_{ij} + \varepsilon_{ij} \quad \dots (25)$$

where $\varepsilon_{ij}|M_{ij}, D_{ij}, Z_{ij} \sim N(0, \sigma_i^2)$, the subscript 'i' indexes the possible combinations of states and sectors while 'j' indexes the households belonging to the particular combination of state and sector indexed by 'i'.

In the above equation, the state-sector specific intercept term: α_i not only takes care of the functional dependence of the consumption share with the prices which are assumed to be invariant within any the state-sector 'i', but also includes any other state-sector specific "fixed effects" that may be correlated with the other exogenous variables. Also the coefficients associated with both the status variable and the different functional forms of income, are allowed to vary across the states and sectors so as to permit changes in the patterns of consumption across the different states and sectors of India. For the control variables, we have incorporated a number of household specific characteristics that include: the household size, the average level of education⁴, the median age, the number of females, the principal occupation class⁵, the inverse of the principal occupation class, and indicators for the social group⁶. The above system is estimated using generalized least squares. The results of this empirical exercise are elucidated next.

V. Results and Discussion

If poor people are indeed concerned about their relative standing in the society then it must get reflected in our empirical exercise as a significant θ_i : the coefficient associated with the log of

⁴ The general educational level of an individual is indicated by numbers where – not literate: 0, literate without formal schooling: 1, literate with formal schooling below primary: 2, primary: 3, middle: 4, secondary: 5, higher secondary: 6, diploma/certificate course: 7, graduate: 8, postgraduate and above: 9.

⁵ The principal occupations are divided into the following categories – legislators, senior officials and managers: 1, professionals: 2, technicians and associate professionals: 3, clerks: 4, service workers and shop & market sales workers: 5, skilled agricultural and fishery workers: 6, craft and related trades workers: 7, plant and machine operators and assemblers: 8, elementary occupations: 9, new workers seeking employment or workers reporting occupations unidentifiable or workers not reporting any occupations: 10.

⁶ The social groups are – social group : Scheduled Tribes: 1, Scheduled Castes: 2, Other Backward Classes: 3 and the rest: 9.

the variable indicating status effect. If θ_i is significantly negative, it indicates that for the particular state and sector indexed by 'i', a rise in income inequality coerces the individuals who are relatively poor, to consume food commodities in relatively lesser quantities compared to other non-food items.

The results estimated NSS 66th round data reveals that status effect among the poor affects more or less symmetrically both the urban and rural sectors of the different states of India. For the urban sector, out of the thirty five states (henceforth, the union territories will be referred to as states) considered, the estimated coefficient of θ is significantly negative in fifteen states. The coefficient of the status variable assumes a statistically significant negative value for the states of Gujarat, Uttar Pradesh, Kerala, Karnataka, Rajasthan, West Bengal, Jammu & Kashmir, Punjab, Bihar, Tamil Nadu, Madhya Pradesh, Arunachal Pradesh, Tripura, Chhattisgarh and D & N Haveli, arranged in terms of increasing absolute value of the said coefficients. [Refer Table: 2a]

For the rural sector, a negative significant coefficient of the status variable has been registered for a total of sixteen out of the thirty five states. The coefficient of the status variable assumes a statistically significant negative value for the states of Maharashtra, Andhra Pradesh, Uttar Pradesh, Madhya Pradesh, Punjab, Haryana, Tamil Nadu, Orissa, Rajasthan, Chhattisgarh, Sikkim, Arunachal Pradesh, Jharkhand, Uttaranchal, Meghalaya and Mizoram, arranged in terms of increasing absolute value of the said coefficients. [Refer Table – 2a].

Similarly, using the 68th round data, we find that, for the urban sector, the coefficient of the status variable associated with the fourteen states have assumed a significantly negative value. These states are Madhya Pradesh, Maharashtra, Punjab, Bihar, Assam, Tamil Nadu, West Bengal, Gujarat, A & N Islands, Pondicherry, Mizoram, Tripura and Chandigarh arranged in terms of increasing absolute value of the said coefficient. For the rural sector, the coefficients of the status variable for the states of West Bengal, Maharashtra, Bihar, Haryana, Karnataka, Madhya Pradesh, Tripura, Gujarat, Chhattisgarh, Himachal Pradesh, Manipur, Assam and Chandigarh arranged in a similar manner, have assumed a significantly negative value. [Refer Table – 2b].

VI. Robustness

In order to further our claims, we forward some additional results that serve as a check for robustness of the relationship between the relative food to non-food consumption share and the status variable. For this purpose, we repeat the above exercise using a semi parametric regression techniques as suggested by Robinson (1988) and checked the variation in our finding. In this alternate formulation, we do not assume any functional form of the association of income with the relative consumption share and estimate the relationship: $\ln S = \alpha + F(M) + \theta \ln D + \rho Z + \varepsilon$, for each possible combination of state and sector separately. The results from this new exercise are summarized in tables 3a and 3b. If we consider only the significance and the sign of the coefficients associated with the status variable and compare the estimates obtained from the semi parametric regression with our previous estimates from the generalized least squares regression, we observe some discrepancies for the states of Arunachal Pradesh, Chandigarh, Daman & Diu, Madhya Pradesh, Tripura and West Bengal using 66th round data and for Delhi, Jharkhand and Andaman and Nicobar Islands using that of 68th Round data. However for a majority of the combinations of states and sectors, the two regression techniques seem to tally both in terms of the sign and significance of the estimated coefficients [Refer Table – 4a and b].

Since for the semi parametric model, we have run our regression separately for every combination of the states and the sectors, we conduct another exercise where we have pooled the data from both the rounds and estimate the semi parametric model separately for both the states and introduce a time dummy with the intercept term to account for the intertemporal changes in prices as well as other factors which may be correlated with the exogenous variables. This approach increases the number of observations available for the regressions and thus provides us a better estimate of the model parameters as well as the associated standard errors. The result from this final analysis is illustrated in table 5. The figures indicate that for this pooled regression, the coefficient of the status variable assumes a significant negative value for a majority of thirty eight – out of the possible seventy possible combinations of states and sectors. Arranged in increasing absolute magnitude of the coefficient associated with the status variable, these combinations are the rural sectors of the states: Uttar Pradesh, Bihar, Karnataka, West Bengal, Orissa, Punjab, Maharashtra, Himachal Pradesh, Gujarat, Haryana, Madhya Pradesh, Tripura, Sikkim, Assam, Arunachal Pradesh, Chhattisgarh, Jharkhand, Meghalaya, Uttaranchal, Mizoram and Delhi, and the urban sectors of the states: Uttar Pradesh, Kerala,

Rajasthan, Gujarat, Karnataka, Chhattisgarh, Madhya Pradesh, Punjab, Arunachal Pradesh, West Bengal, Tamil Nadu, Bihar, A & N Islands, Chandigarh, Mizoram, Tripura and D & N Haveli.

The results obtained from the above regression show that the coefficient of log status is indeed negative and significant for a number of states and sectors indicating the empirical validity of our assumption regarding individuals' status consciousness.

VII. Conclusion

In this paper we wanted to focus on the impact of relative status on the consumption behaviour of the poor who might feel relatively deprived in a society with highly unequal income distribution. We have demonstrated that concern for social status in a situation where a rise individual income is also accompanied by a worsening of income distribution, people may spend less on food and more on status good. Thus income based and nutrition-based measures of poverty will give qualitatively different result and income growth will be consistent with malnutrition. After theoretical demonstration we test our results in terms of the NSSO 66th and 68th round datasets across Indian states and estimation through various methodologies strongly corroborate our claim. In many states we cannot rule out the negative impact of inequality, which is the key force behind the concern for status, on relative consumption of food. Future work will try to explore the implication of such concern for status on health, education and gender related issues.

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