Status, Poverty and Trade

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ABSTRACT

The conflict between the income based and nutrition based estimates of poverty is a widely debated issue in economic literature. This paper, using a two commodity framework, attempts to show that in presence of inequality, a status driven utility function can reconcile the conflict between the two measures of poverty. In addition, a simple general equilibrium model using such a utility function is constructed to analyse the implications of social inequality on relative prices and the emerging pattern of trade.

Keywords: Inequality, Nutrition good, Poverty, Status good, Trade, Utility

JEL Classification: D63, D11, D50, I3, 012

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1. Introduction

A fundamental query involving the preference pattern of any individual in a society has to deal with the social influence on individual consumption behaviour. The idea of conspicuous consumption and the so-called Veblen effect (Veblen, 1899) are quite well known in economics. Very recently Sivanathan and Pettit (2010) have confirmed the fact that individuals are quite sensitive to their relative status and would like to "mend" their "self" under constant attack from various social pressures by taking recourse to status signalling consumption behaviour. A series of experiments confirm such a pattern of human behaviour. This is one of the building blocks of the utility function that we use in the subsequent analysis.

The paper starts off by highlighting a well observed empirical phenomenon discussed extensively in the literature on poverty in India. In this context Patnaik (2007) and Deaton and Dreze (2009) have discussed about 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 demonstrates lower nutritional intake. Thus Patnaik (2007) asserts that actual poverty estimate is far greater that the optimistic figure provided by the Government. While Deaton and Dreze (2009) analyze various reasons for such behaviour, not much emphasis is given to the role of status driven consumption pattern, although they do not ignore such a possibility. That social inequality can influence individual's consumption and induce greater consumption of the so called status good, becomes quite relevant for such analysis. Reflecting on this phenomenon, Banerjee and Duflo (2007) have emphasized the puzzling consumption behaviour of the poor. Reporting on various country studies, they find that the poor in general spend more on "entertainment" rather than on "food" and conclude that the primary reason behind such a consumption pattern perhaps is that the poor have to "keep up with their neighbours". Fafchamps and Shilpi (2008) have also demonstrated how the presence of richer persons in a community affects the well being of the individuals. Such perceptions coupled with the status driven consumption behaviour can lead to a bias towards consumption of the status good. However, thematically the relation between social inequality and consumption behaviour of the poor is undermined and under-explored in the poverty literature. We shall demonstrate how pre-

existing social inequality influence social choices of the poor and how this in turn can lead to the conflicting measures of poverty as highlighted in previous literature.

Another objective of this paper is to analyze the impact of income distribution on relative price of food or what we call the nutrition or necessary good. This analysis is carried out primarily for the purpose of exploring the pattern of trade that might emerge between two economies with different levels of social inequality. Towards this end, a general equilibrium analysis, as an extension to our main model, is carried out. Essentially, we intend to integrate models capturing influence of inequality on consumer preferences with traditional theory of competition and pure exchange in markets.

One must mention that over the last few years a voluminous literature discussed the impact of social status and relative income on conspicuous consumption[1]. Also there is a related body of literature that analyze the linkages between relative status and "happiness" as surveyed by Clark et al. (2008). However, these papers do not deal with the issues we are discussing in this paper.

The paper proceeds as follows. In the next section we discuss the issue of possible conflict between income and nutrition based measures of poverty. In the third section we analyze the impact of social inequality on pattern of trade and relative price of food in a simple general equilibrium framework. The last section concludes the paper.

2. Basic Framework

We start from two possible axioms as to how perceived social inequality affects 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 does not matter, but being below definitely hurts. This asymmetry is deliberate to highlight the implications of belonging to the downside downside of inequality.

[1] Galor and Zeira (1993), Beath and Fitzroy (2007), Mujcic and Frijters (2010), Ghiglino and Goyal (2010) etc. have all related individual economic choices to relative status in different contexts.

Axiom 2: Inequality increases marginal utility 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 the experimental psychology literature where intensity of desire to consume the status good seems to be greater among those who are psychologically affected by social inequality.

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

$$U = f\left(\frac{\bar{y}}{y}\right)\left[\log N + \phi\left(\frac{\bar{y}}{y}\right)\log L\right] \tag{1}$$

$\bar{y}$ is average income of the reference social group. y is individual income levels.

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

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

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

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

We shall not discuss price effects at this moment and assume prices to be equal to one.

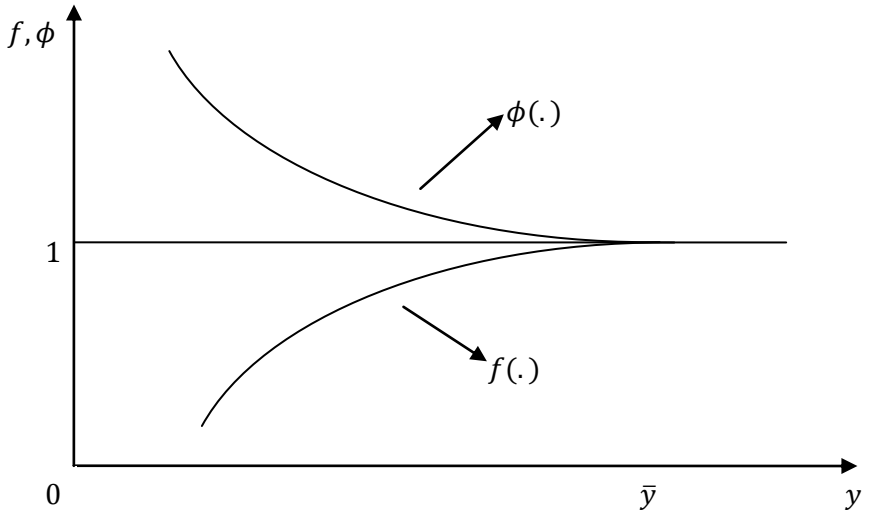

Figure 1

If inequality hurts,

$$f\left(\frac{\bar{y}}{y}\right)\left[\log \tilde{N} + \phi\left(\frac{\bar{y}}{y}\right)\log \tilde{L}\right] < f\left(\frac{\bar{y}}{y}\right)\left[\log N_0 + \phi\left(\frac{\bar{y}}{y}\right)\log L_0\right] \tag{4}$$

where $(\tilde{N}, \tilde{L})$ are optimal consumption levels for $y < \bar{y}$ and (N_0, L_0) are the same for the benchmark case with $y = \bar{y}$, i.e. the social average income rises without a decline in individual income.

Invoking the Envelope property it is straightforward to interpret U as

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

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

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

$$[f'.\phi + f.\phi'] < 0 \qquad (5)$$

Note that if y moves up the ladder $f(.)$ increases but $\phi(.)$ drops. Or put differently, if y drops from $\bar{y}$, $f(.)$ goes down to a value less than 1, but $\phi(.)$ increases, the net effect has to be negative if inequality has to hurt in equilibrium.

It is obvious that in equilibrium

$$\tilde{N} = \frac{y}{1+\phi} \qquad (6)$$

We are interested in the level of consumption of N as y increases from below $\bar{y}$. Given $\left(\frac{\bar{y}}{y}\right)$, (6) is a very standard outcome. When $\phi = 1$, by virtue of having this specific utility function, $\tilde{N} = \frac{y}{2}$. 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 $\tilde{N}$.

$$\frac{dN}{dy} < 0 \text{ iff } \mu\sigma > \frac{1+\phi}{\phi} \qquad (7)$$

where $\mu = \frac{d\phi}{d\left(\frac{\bar{y}}{y}\right)}.\frac{\bar{y}/y}{\phi}$ and $\sigma = \frac{d\left(\frac{\bar{y}}{y}\right)}{dy}.\frac{y}{\bar{y}/y}$.

As y $\longrightarrow$ $\bar{y}$, $\phi\left(\frac{\bar{y}}{y}\right) \longrightarrow 1$, $\frac{1+\phi}{\phi} \longrightarrow 2$.

As y $\longrightarrow 0$, $\phi\left(\frac{\bar{y}}{y}\right) \longrightarrow \infty$, $\frac{1+\phi}{\phi} \longrightarrow 1$.

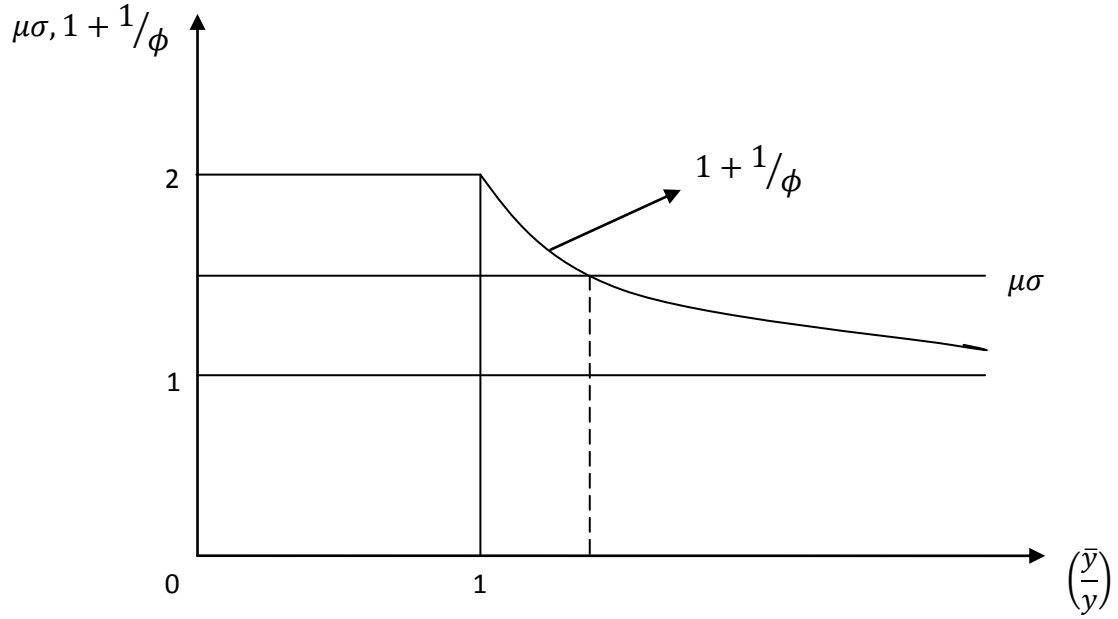

Figure-2

If $\left(\frac{\bar{y}}{y}\right)$ 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, σ reflects the elasticity of distribution. If either of them is very weak, we should not have any conflict of 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 $\left(\frac{\bar{y}}{y}\right)$ and lower is ${}^{1}/_{\phi}$ chances are greater that the conflict will arise. Inequality has a direct bearing on the nutritional estimate of poverty.

3. Extension

We shall now use the status utility function in a simple general equilibrium framework involving two agents A and B and two goods N and L whose interpretations are as same as before. Let P_N and P_L denotes the market prices of the two goods respectively. We assume that the two agents enter into the market with fixed endowment of both the goods. Let $(\Omega_{\mathrm{A}}^{\mathrm{N}}, \Omega_{\mathrm{A}}^{\mathrm{L}})$ denote the fixed endowment of goods N and L for consumer A and $(\Omega_{\mathrm{B}}^{\mathrm{N}}, \Omega_{\mathrm{B}}^{\mathrm{L}})$ denote the same for consumer B. Also let y_A and y_B denote income of A and B respectively. The problem facing the agent i is

$$\max_{\{N_i, L_i\}} \quad f_i\left(\frac{\bar{y}}{y_i}\right)\left[\log N_i + \phi_i\left(\frac{\bar{y}}{y_i}\right)\log L_i\right]$$

Subject to the budget constraint

$y_i = p_L L_i + p_N N_i$

where $i = A, B$

Simple optimization yields the demand functions:

$$\widetilde{N}_A = \frac{y_A}{(1+\phi_A)p_N} \tag{8}$$

$$\tilde{L}_A = \frac{\phi_A}{1+\phi_A}.\frac{y_A}{p_L} \tag{9}$$

$$\widetilde{N}_B = \frac{y_B}{(1+\phi_B)p_N} \tag{10}$$

$$\tilde{L}_B = \frac{\phi_B}{1+\phi_B}.\frac{y_B}{p_L} \tag{11}$$

Now in equilibrium, money income of individual i is given by the value of his or her endowment. Thus

$$y_i = p_L\Omega_i^N + p_N\Omega_i^L \tag{12}$$

Let us denote the aggregate excess demand function for the two goods N and L by z^N and z^L respectively.

By definition of aggregate excess demand function we have,

$$z^N(p_N, p_L) = \widetilde{N}_A + \widetilde{N}_B - \Omega_A^N - \Omega_B^N$$

$$= \frac{y_A}{(1+\phi_A)p_N} + \frac{y_B}{(1+\phi_B)p_N} - \Omega_A^N - \Omega_B^N$$

$$= \frac{1}{(1+\phi_A)}.\frac{p_N\Omega_A^N + p_L\Omega_A^L}{p_N} + \frac{1}{(1+\phi_B)}.\frac{p_N\Omega_B^N + p_L\Omega_B^L}{p_N} - \Omega_A^N - \Omega_B^N \tag{13}$$

and,

$$z^L(p_N, p_L) = \tilde{L}_A + \tilde{L}_B - \Omega_{\mathrm{A}}^{\mathrm{L}} - \Omega_{\mathrm{B}}^{\mathrm{L}}$$

$$= \frac{\phi_A}{1+\phi_A}.\frac{y_A}{p_L} + \frac{\phi_B}{1+\phi_B}.\frac{y_B}{p_L} - \Omega_A^L - \Omega_B^L$$

$$= \frac{\phi_A}{1+\phi_A}.\frac{p_N\Omega_A^N + p_L\Omega_A^L}{p_L} + \frac{\phi_B}{1+\phi_B}.\frac{p_N\Omega_B^N + p_L\Omega_B^L}{p_L} - \Omega_A^L - \Omega_B^L \tag{14}$$

Let p_L be the numeraire price. In order to derive the equilibrium relative price we substitute $p_L = 1$ in both in the aggregate excess demand functions and set either (13) or (14) equal to zero (assuming that in equilibrium markets clear for both the commodities) and solve for p_N. According to Walras' Law we should get the same equilibrium price no matter which equation is solved.

The equilibrium price of the nutrition good relative to the status good is found to be

$$p_N^* = \frac{\Omega_A^L (1+\phi_B) + \Omega_B^L (1+\phi_A)}{\Omega_A^N (1+\phi_B)\phi_A + \Omega_B^N (1+\phi_A)\phi_B} \tag{15}$$

Let us now move on to explore the possibility of trade between two countries with different levels of social inequality. Let the two countries be called country 1 and country 2 respectively. For simplicity, we also assume that both the countries comprise of only two individuals. Let the individuals be denoted by A^1 and B^1 in country 1 and A^2 and B^2 in country 2 and let y_A^1 and y_B^1 and y_A^2 and y_B^2 represent their income levels respectively.

We assume that there is no social inequality in country 1. That is both the individuals have same level of income in country. As such,

$$y_A^1 = y_B^1$$

and,

$$\phi_A^1 = \phi_B^1 = 1 \tag{16}$$

Where ϕ_A^1 and ϕ_B^1 denotes the value of ϕ of the two individuals in country 1.

Substituting (16) in (15) we get

$$p_N^{*1} = \frac{\Omega_A^L + \Omega_B^L}{\Omega_A^N + \Omega_B^N} \tag{17}$$

where p_N^{*1} denotes the equilibrium relative price of the nutrition good in country 1.

Country 2, unlike country 1, is assumed to be affected by social inequality. We assume the two individuals have different levels of income with A^2 being "richer" than B^2. That is,

$$y_A^2 > y_B^2$$

As such it is straight forward to argue that

$$\phi_A^2 = 1 \text{ and } \phi_B^2 > 1 \tag{18}$$

Where ϕ_A^2 and ϕ_B^2 denotes the value of ϕ of the two individuals in country 2.

By similar substitution as before we obtain the equilibrium relative price in country 2 to be

$$p_N^{*2} = \frac{\Omega_A^L(1+\phi_B^2)+2\Omega_B^L}{\Omega_A^N(1+\phi_B^2)+2\Omega_B^N\phi_B^2} \tag{19}$$

In order to compare p_N^{*1} and p_N^{*2} we subtract (19) from (17) and simple manipulation yields

$$p_N^{*1} - p_N^{*2} = \frac{\Omega_B^N\Omega_A^L(\phi_B^2-1)+\Omega_B^L\Omega_A^N(\phi_B^2-1)+2\Omega_B^N\Omega_B^L(\phi_B^2-1)}{(\Omega_A^N+\Omega_B^N)[\Omega_A^N(1+\phi_B^2)+2\Omega_B^N\phi_B^2]} > 0 \quad [\text{as } \phi_B^2 > 1] \tag{20}$$

$$\Rightarrow p_N^{*1} > p_N^{*2}$$

which means that equilibrium relative price of the nutrition good is lower in the country with greater degree of social inequality other things remaining the same. As such, the magnitude of social inequality has a direct effect on relative prices. Therefore following the doctrine of "comparative cost", country 2 which is affected by inequality will export the nutrition good and import the luxury good.

4. Conclusion

The purpose of this paper has been two fold. First, to provide a theoretical explanation behind the conflict between nutrition and income based measures of poverty when consumption depends on the relative income status. The second motivation has to do with exploring the effect of social inequality on the pattern of trade by determining the relative prices in a set up where consumption is driven by relative status. The pure exchange general equilibrium model deployed identifies the degree of inequality of an economy to have major implication on its pattern of trade.

The log-linear utility function we work with yields standard outcomes when the concern for social status is absent. But drastic alterations of results are possible when we introduce the idea of relative social status in an otherwise simple utility function. The result on the

measurement of poverty obtained by using such a status driven utility function yields a theoretical insight towards one of the most worrying consequences of growth.

The result on the emerging trade pattern is derived in a simple 2x2x2 pure exchange framework independent of any other behavioural assumptions using the same log linear status driven utility function. Results point out that an economy with more skewed distribution of income will export the nutrition good and import the luxury good. The extent of inequality thus becomes a determining factor behind "comparative advantage". A more equitable distribution of income worldwide will increase relative food price.

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