

# Status related consumption in sub-Saharan Africa

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## **Abstract**

The reasons for conspicuous consumption in the developing countries seem minimal if one considers the Maslow hierarchy. The study suggests the measurement of relative benefits to status from consumption and the differences in consumption across social hierarchies before asserting the existence or absence of conspicuous consumption in the developing countries. The study also develops a price-based status signaling model which can be used to understand the changing consumer basket in the sub-Saharan African countries - where recent large-scale urban migrations and proliferation of industrial products have followed an era of national planning. A behavioural model for status as expectation of higher income in the intertemporal substitution problem is also developed as part of this exercise.

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Part I

# Tanzania : Conspicuous consumption in a developing country

## 1 Defining Conspicuous Consumption

The term “conspicuous consumption” traces its roots back to the treatise “Theory of the Leisure Class” authored by Thorstein Veblen in 1899. At about the same time when Marx endorsed the view of all commodities as products of labour (diamond and corn alike), Veblen sought to explore the psychological basis for consumption among the economic classes. His view of conspicuous consumption may at times appear critical of the “bourgeois” wastefulness <sup>1</sup> - but Veblen doesn’t dwell upon the equivalence of labour for exchange of commodities. While he observes the tendency amongst the elite to distance themselves from physical labour - he argues that this tendency has transformed itself into a desire of displaying exploits and has survived in culture from more primitive hunter-gatherer and agrarian societies. This symbolism is inherent in all exchange of goods and services (including devotion and education <sup>2</sup>).

Many studies related to conspicuous consumption have relied on a visibility survey - which quantifies the lot of complex interactions in what may constitute status competitions in a society. A luxury item - for example - needs to be marketed as a luxury for it to both impart visible signals to others and to improve self-perception of the buyer. In Veblen’s original framework, for a product to indicate status it must be rare and superfluous (thus serve as an exploit). That a watch is more noticeable than an insurance policy (and associated with higher income) is not entirely relevant to this framework. Moreover, whether a poor person buying a cheap watch and a richer person buying an expensive watch (probably subject to import restrictions) are both instances of conspicuous consumption or not depends on the context that the observer chooses. Cheap watches may or may not constitute conspicuous consumption - depending on the social welfare function. The wide variety of criteria in conspicuous consumption seem to indicate this ambiguity (See Table 2).

In both the developed and developing worlds, conspicuous consumption is driven by perceived scarcity and competition ([24, 15]). If status were imparted by inherited wealth alone, there would be little conspicuous consumption as the consumers would be quick to realise the futility of buying trinkets. In the developed world, where markets have evolved to address the demands of the population, the positional pressures are readily ad-

ressed by market forces - thus a preference for visible goods indicates a higher price on them and a higher consumption on visible products always “signals” a higher status (a product with a higher status symbol would automatically carry a higher price). In underdeveloped markets, where information asymmetries are abound, the higher signalling (for conspicuous consumption) would not necessarily be achieved with higher spending on visible goods - and other factors (e.g. social standing, asset ownership, social networks and education) start to matter in the combined utility function - as is suggested by data from various cross-section expenditure surveys. These other mechanisms of signaling - although not part of purchases - fall under Veblen’s view of conspicuous consumption.

The criteria of measuring status in society can be difficult to pin down and therefore the terminology surrounding status related consumption isn’t particularly clear. The various terms associated with status-indicating consumption are defined below. Figure 1 summarises the author’s view of terms used in the study.

**Scarcity** - A term used by Fred Hirsch in a theory to explain distribution of resources in a society. Scarcity is the perceived or real lack of products or services created by a competition for them which is intensified by population growth (through increased productivity and time costs). Scarcities can be either direct or indirect and thus - physical or social. Hirsch also points out that social scarcities are becoming physical scarcities (so this distinction isn’t so clear after all).

**Congestion** - The competition for resources in the context of modern Western society where physical scarcities (severe shortages of food and shelter) have been largely conquered. In Hirsch’s theory, congestion is a side-effect of commercialization and removal of older social barriers. Since all goods and amenities are available through money, the competition and scarcity for what used to be accessible to only the top few have intensified. With economic progress therefore, consumers are more - not less - driven by status needs than before. Writing in what is now called the affluent “gilded age” in the United States, Veblen had discussed the same phenomenon that had revived the need for status signaling.

**Status Competitions** - A term used by Robert H. Frank ([15]) to denote the basic needs amongst individuals to feel important relative to others. Status competitions therefore operate at a lower granularity than social congestion.

**Signaling** - The mechanism that consumers use to indicate status in society - a concept strongly tied to

<sup>1</sup>“Throughout the entire evolution of conspicuous expenditure, whether of goods or of services or human life, runs the obvious implication that in order to effectually mend the consumer’s good fame it must be an expenditure of superfluities. In order to be reputable it must be wasteful.”([40])

<sup>2</sup>“The adoption of the cap and gown is one of the striking atavistic features of modern college life, and at the same time it marks the fact that these colleges have definitely become leisure-class establishments, either in actual achievement or in aspiration.”([40])

the idea of indicating status through purchasing of items available in the market (therefore the term is used a lot in the various models for conspicuous consumption [23, 25])

**Positional goods** - Goods that are used to indicate status as opposed to goods that serve individual needs or welfare. The distinction between positional and non-positional goods is often dependent on the welfare function. Also known as status-indicating goods.

**Snob and Bandwagon items** - Snob items are items whose demand declines as they become more popular i.e. are consumed by more people - whereas Bandwagon items are those whose demand increase as more people consume them. These terms are used in a model for conspicuous consumption provided by Corneo et al [7] - where consumers derive their utility from how other perceive or view the user's consumption.

**Visible Consumption** - The consumption of items that are used to indicate status. Visible consumption encompasses the purchase of “signaling” items i.e. items that others can view to infer status of the individual. This definition of conspicuous consumption is particularly tractable to mathematical modeling as measurable status inferences can readily become part of the individual’s utility function.

**Conspicuous Consumption** - The most generic term for status-related consumption provided by Thorstein Veblen ([40]). It encompasses not just goods available for purchase in the market (that are bought by consumers to improve their perceived status) - but also the barriers that may indicate status through rareness. Veblen's was a rather unconventional attempt to link the social barriers with expenditure<sup>3</sup>. Veblen's focus had been the consumption patterns of the richer section of society and the way conspicuous consumption is understood is through to inference of status through continued search for expensive or rare items. Veblen provides a psychological framework to explain the competitions that have survived since barbaric times when insignia were used to indicate status. Status indication - as is noted in the study in the context of developing countries - can extend beyond the purchase of items in the market.

<sup>3</sup>A robber baron, Veblen says, has a better chance of escaping the law than a small crook because “a well-bred expenditure of his booty especially appeals to persons of a cultivated sense of the proprieties and goes far to mitigate the sense of moral turpitude with which his dereliction is viewed by them.” Scholars do not ordinarily associate the disposal of ill-gotten wealth with good breeding (quoted from Galbraith [18]).

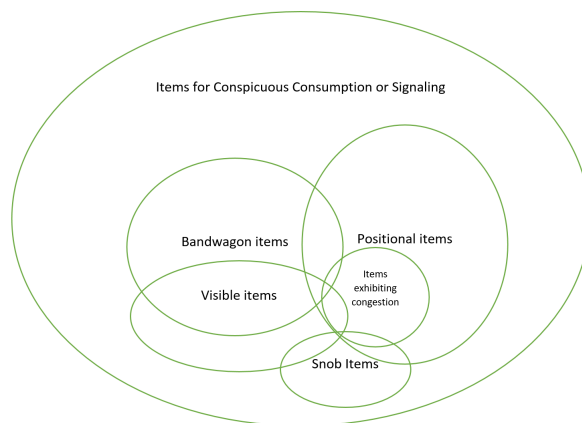


Figure 1: Terms associated with conspicuous consumption (drawn not to scale)

## 2 Status Competitions and Conspicuous Consumption

Both Fred Hirsch and Joseph Schumpeter - whose works are frequently referred to in the study - had viewed industrial revolution as a legacy of liberal capitalism - a race amongst the middle classes to achieve the higher social positions once held by the feudal elite[24, 37]. Focusing primarily on the post-war developments in the Western society, Frederick Hirsch argued that the human needs have expanded manifolds since the time when Adam Smith's invisible hand was known to work [24, 17]. In the Europe of eighteenth century, he argued, the rich could pursue their interests while the poor gained mobility in exchange of their participation but in the modern society - where basic needs had largely been fulfilled - social mobility was no longer lucrative to offer for exchange. Status differentials were necessary to create new markets - where positional goods and advertisement had a major role to play<sup>4</sup>.

Hirsch's model for positional competitions is explained in the Figure 2. With the physical scarcity of goods (food and amenities) largely conquered, scarcity becomes largely social in the developed countries. More commercialization (availability of previous unavailable items through money) leads to more scarcities and more competitions - hence instances of congestion for a good develop - leading to increased positional competition in the society.

A key issue in developing an empirical understanding the relationship between congestion and scarcity is of se-

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Hirsch wasn't alone in pointing out that through an immense success of capitalism by the twentieth century, this exchange between the rich and poor was no longer appealing[38, 37].

mantic nature. Scarcity seems a more general concept than mere unavailability or low supply of an item - as it seems to entail both unavailability of the item and the competition for it. Hirsch does differentiate between the physical scarcity (unavailability) and social scarcity (competition) but he also concludes that the boundary between physical and social scarcities can get blurred as the positional goods create a market for themselves. This makes understanding the relation scarcity and competitions for an item itself somewhat difficult.

One may face similar difficulties in trying to empirically test a lot of the cultural trends identified by both Hirsch and Veblen. Even with access to a reliable microdata on consumption sampled over varied social identities and extending over a period of decades, it is difficult to track and measure the nature of connections between individuals. The perceptions of quantities like status are not directly measurable - and our understanding of the psychological motivations for consumption is still underdeveloped. Behavioural sciences usually get around this problem through carefully designed experiments - by creating contexts where subjects can choose amongst well-defined options. What works in smaller environment might not necessarily scale up to higher levels but often our best effort is to identify factors that have a clear impact under a well-defined setting.

Instead of attempting to comment on wide-ranging cultural trends, we test for presence of status competitions in empirical data. For the implicit assumption that the status competitions are inherent in human society, we bank on Robert Frank's argument that striving to achieve more than others is likely to be ingrained in our hormones([15]). The empirical examples to support for this argument are abound. Exploring incomes amongst professors competing for grants - for example - Franks[15] notes that neither the Permanent Income model nor the productivity model explains the distribution of income. What offers a better explanation is the presence of status competition among the professors. Similarly, he demonstrates that in the absence of monopolies, it becomes difficult for corporations to survive by rewarding talent alone and they are thus compelled to depend on status competitions for income distribution<sup>5</sup>.

While instances of status competitions can be verified easily in a small environment, asserting the presence of larger socio-cultural concepts like commercialisation([24]) isn't easy to justify. We don't engage in the understanding how status competitions - which operate at finer levels in society (particularly in the institutions of family and similar social networks) - develop into wider

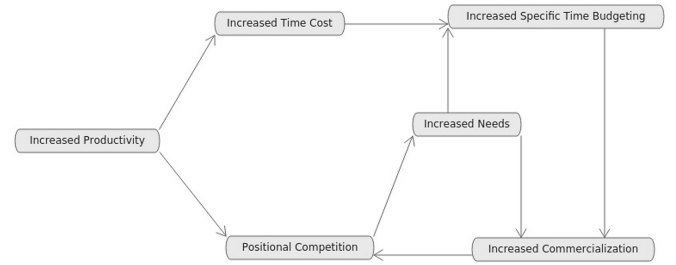


Figure 2: Hirsch's model for positional competition

cultural trends. Instead, we limit ourselves to measuring status competitions in the context of consumption.

Despite the the cultural and historical context in the developing world being far different from that in the developed world, many studies have discovered the presence of status competitions[27, 26, 28]. It is tempting to think that the scarcities may be only physical in the developing countries (and probably as similar to those in the 18th century Europe), but the presence of status related competitions is still relevant (and in accordance with Veblen's claim). Indeed the scarcity through "overuse" (which Hirsch stresses as the engine of social scarcity in the modern Western society) may be less relevant in the developing world where there simply aren't enough status items to be consumed. While the recent processes of industrialisation may have changed the environment of consumption significantly, it is rather difficult to see if the recent trends of commercialisation ([24]) in the developing world would bear similarities with the changes in the post-war Europe - due to vast cultural dissimilarities in the developing world and poorer quality of available consumption microdata in the developing countries.

We can however, rely on the presence of status competitions. A wealth of literature on conspicuous consumption in the developing countries finds that status competitions do have an effect on consumption. Relying only on the presence of status competitions, we consider Hirsch's ideas of scarcity and congestion relevant in the developing countries - interpreting scarcity as the consumed quantity in the markets (or supply/unavailability) of a particular commodity - and congestion as the changes in status levels within social groups (family, locality or higher orders).

How consumption affects and is reflected by status differences in the society may vary across societies. Focusing primarily on status differences in society, we attempt to understand to what degree consumption is used by a given population of individuals to associate themselves to those with higher status in society. If we can establish

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The argument that Frank presents is in fact stronger. He argues that attributes such as workplace safety get deprioritised because of status maximization goals[15].

a standard way to measure conspicuous consumption in the society, we may test the claim whether with more unequal societies have more reasons to rely on status classifications. Despite social changes, the status competitions might be perpetual and an end to the securities of old status hierarchies may go hand in hand with the provision of alternative securities.

## 2.1 Status as lagged asset ownership and consumption

How a society perceives differences in status is difficult to record - let alone standardize it across multiple geographies. Relying on the consumption microdata, we only record the assets and income of individuals that the higher-status individuals are more likely to acquire than the low status individuals. This serves as the input of our measurement of status. Our view of status comprises strictly of i) possessions (assets and consumption) and ii) the barriers to possessions. These status determinants enhance status by more consumption or more assets - in the sense that consumption and assets add to existing possessions. An individual is imparted a higher status when more barriers exist for others to acquire the possessions than those that exist for herself. It is possible that possessions translate as status only through barriers (items that have no other value except through barriers that exist to acquire them). The role of conspicuous consumption then is to distort the status derived from other determinants of status. Through consumption, status items may be used to overcome the “barriers” to status (thus changing them). Buying an item that was previously limited to someone with a higher status than oneself invariably enhances one’s status. Indeed consumption is not all that enhances (or distorts) status in society - inherited or acquired assets also have the same effect - it is only that consumption of expendable items is less expensive than buying long-term assets and may be more prevalent as a low-hanging fruit for fulfillment of status needs.

All barriers themselves can be expressed either in terms of weights of the personal characteristics of an individual (e.g. locality, age, gender, ethnicity) or the asset prices in the market. For such barriers to make sense empirically, the barriers borne out of personal characteristics can carry more status where there are social disparities in the society. More barriers (weights of a certain personal characteristic) may mean that more consumption may be needed by individuals of a different personal characteristic to achieve the same status in society. The model provided by Coreno et al [7] is instructive in this regard. The model ([7]) considers a ranking function for every individual where consumption is seen as a way to transform the income ranking of a population i.e. individuals improve their perception in society through con-

sumption (and/or asset ownership) to overcome their income rank in the society. It can be asserted that anyone in less than the highest income group (more specifically -the highest quantile of the all status determinants minus that of consumption) would benefit from a short-term expense on status-related consumption. Therefore, one can claim that the consumption rank (or utility) and non-consumption status rank (or utility) must differ for the consumers in medium quantiles - if conspicuous consumption exists in a society (in other words, the measures of income and rest of the determinants of status must not be correlated with consumption). This verification serves as the test of conspicuous consumption (also indicated roughly with the permanent income elasticity of conspicuous consumption).

The above claims however rest on a conspicuous good being well-defined. One can verify or measure the degree of conspicuous consumption in terms of the consumption ranks with a good that is well-understood to be a status good - but finding out what goods may be of status significance is non-trivial. Since we don’t already know which items can impart status - we assume that all consumption items can impart status (particularly when the items for status are subject to change over time). We also treat expensive varieties of an item as of potential status value (thus treating the expensive variety of an otherwise commonplace item as a status good). Instead of agreeing on a crisp boundary between conspicuous and non-conspicuous items, therefore, we attempt to develop a criterion to sort the items in terms of their status impact (i.e. the status utility that a consumer may derive). We focus on how items are selected for status related consumption, and use a selection criteria which involves considering how rare an item or costly an item is. This is explained in a later section.

A claim that we intend to test is whether the consumption on items that have a high impact on status must decrease (increase) with the decrease (increase) in gaps in assets and other barriers in the society over time. In other words, more significant differences in determinants of status must correspond to an increase in consumption of the consumers for those with a medium rank of status. A quantile regression can be used to test whether the purchases of status items is different across income quantiles of the society. This is to be explored once a model for status is developed satisfactorily.

## 2.2 A Historical Context of Status Differences in the sub-Saharan Africa

The developments of the last century in Africa and Asia - bear some similarity with the rise of a middle class in the post-medieval Europe. In both Asia and Africa, a new working class has clashed with and replaced the feudal or colonial systems of the century before. The grow-



ing competitions for status amongst the nascent working classes have been a subject of sociological study in the late 20th century. In India of the 1950s, for example, this competition was termed as Sanskritization when erst-while lower classes emulated higher social classes with newly acquired economic freedoms[39]. Elsewhere too, the habits of the upper economic classes expanded to middle and lower classes with urban developments over the decades following the second world war (see section).

Neither this economic development nor the collective defense of non-positional goods<sup>6</sup> that the nationalist developments had promised in the developing world have materialised. The industrial class in the African countries is still poor in absolute terms and the problems of extreme poverty have remained largely unresolved in large swathes of Asia and Africa. The administrative successes and stabilities of post-colonial governments are varied and have depended on the extent of agrarian empires that had existed before<sup>7</sup>.

Institutions of a society are critical in both maintaining the purchasing power of its individuals and engineering a certain faith in equality, fairness and social mobility amidst them. The strength of institutions are varied in the developing world and measuring the effect of cultural contexts on the status consumption across countries spread across continents often requires excessive generalisations. Since we have limited our scope to status competitions, we focus only on the differences in status in the respective societies. Further, we express status strictly in terms of possessions - which are acquired through income and purchase of items. Instead of dealing with the social psychological problem of measuring status perceptions in a society, therefore, we limit ourselves to the characteristics that may represent status in a society.

With that disclaimer about the importance of specific cultural contexts, we do note that certain contexts bear striking similarity with each other. The political landscape of many Asian and African economies seems to be dominated by the effects of decolonization in the late last century - a process that encompasses the loosely similar

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Both Hirsch and Frank have argued for policy control of status competitions for positional goods. Hirsch summarizes the problems of controlling distribution as an “adding-up problem” [sic] - where a group of individuals fail to pursue a common goal (e.g. defence of public goods or safety) as it isn’t broken down into individual responsibilities (“when everyone stands on tiptoes, no one sees better”)[24].

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The extractive administrative frameworks of Ottoman or Moghul empires, for example, could be adapted well by European colonists in Asian countries when compared to the administrative units (much as the political boundaries themselves) created in sub-Saharan Africa.

post-war political voices in Asia and Africa aspiring to establish nation-states. Some of these backgrounds are discussed for a few countries in Africa. While centralization was attempted for decades in both Asia and Africa (often curtailing local-level status competitions and individual freedoms alike) their limited reach and success leaves the possibility of having left the status differences intact. It is even possible that the status competitions that may have otherwise been limited to tribal or local levels could have now found expressions in the hastily developing urban settings [29]. Status competitions - which may thrive in an environment of social differences - are difficult for us to measure other than through consumption. The effect of status competitions on consumption through the development of modern identities and the industrialisation is a task we wish to undertake in our analysis.

The next subsections describe the background of some of the countries in the sub-Saharan Africa in the context of conspicuous consumption.

### 2.2.1 Nigeria

Differential access to education because of varied successes of missionary education has created regional disparities in current education levels between North and South of Nigeria. North has had a higher Islamic influence and the uniformity desired by the post-colonial government had initial challenges.

The participation of native authority had been an essential part of the British rule - where the market forces had been left relatively untouched. The wage labour surviving on the peasantry was a trend that continued well into the post-colonial era. With the movements of African socialism, the power of merchant class became limited. In more recent decades, when MNCs could have brought more power to a working middle class, their presence didn’t change the state of capital being controlled by a small minority - an environment where only the state monopolized industries and the informal sector seem to have expanded[42].

While the BoP (Base of Pyramid) initiatives may not have created sufficient base for entrepreneurs, they have revived a focus on education and expanded the market for industrial goods. An average of 42% workforce in Nigeria have secondary education or higher. Upto 28% of those in mere survival activities have a secondary school certificate, and 12% have post-secondary qualifications [31]. Newly urbanized indigenous tribes and newly educated classes have taken up jobs that had earlier required a much lower level of education. The crowding hardly resolves the underlying problems with the economy - as the formal sector is in doldrums. The state of

economy, rapid population rise and the resulting migration from rural areas has given rise to conditions where social scarcities may thrive[31].

### 2.2.2 Tanzania

Tanzania was no less than an epicentre for the African socialism movements. In 1974, it was even interested in Mozambique to assist in liberation movements. Planned economy seemed the way forward under influence of Nyrere. However, once the political independence was achieved, the membership of nationalist parties declined and soon the separation of civil service from political institutions became less important.

The reduction of private sector didn't experience much opposition under leadership of Nyrere. With lack of support from workers and ban of producer-consumer societies, inconsistencies surfaced in the socialist model. The industrial sector also suffered because of import subsidies. The approach of ISI (import substituting industrialization) led to oversubsidizing when capital flows had to be adjusted to prevent starvation. The rent-seeking in bureaucracy and usage of a capital-intensive technology soon resulted in oversubsidizing across sectors, over-reliance on capital for development and a consequent decline in capacity utilization of the industry[30].

Instead of relying on industrialization, Tanzanians seem to have moved to a subsistence through cultivation approach. Only public officials have had the advantage in becoming entrepreneurs and even though imports could have improved the Tanzanian exchange rate - the problems around corruption have always posed limitations to trade reforms in Tanzania (particularly in the energy sector)[30]. With state regulated economy having had no ways to expand, the growth of parallel economy has been unavoidable. The parallel illegal markets that expanded in the Tanzania in late 1980s and 1990s as well as the rampant corruption has produced a disconnect between parallel markets and the protectionist trade policy.

Firms from South Africa and China have increasingly participated in Tanzania in the more recent past. Conflicts often develop between miners and SA migrant labour - while many Tanzanians are sent to South Africa for training[36]. The sociological conflicts arising in Tanzania continue to impose limits to trade - making the infrastructure problems and need for reforms severe in Tanzania. Electricity is only available to 10% of the population (10% of their household income of users of electricity in rural countries is spent on its bill). The use of internet communications is higher in Tanzania than in Africa's average but access to finance is low (albeit rising) for the private sector. Quality of life differs significantly between urban and rural regions and the size of the informal sector (60%) is significant[1]. We intend to explore the differences in social scarcities between urban and rural areas to commend on the effect of local

political economies on consumption.

### 2.2.3 Angola

Angola achieved independence from Portugal in 1975, after which the competition between different movements that were vying to lead the country descended into civil war. The Popular Movement for the Liberation of Angola (MPLA), a Marxist-oriented group that included urban intellectuals, nominally led the country[22]. Similar to the other post-colonial developments, state-controlled companies were to thrive. Sonagol, the state oil company, seems to play a quasi-fiscal role according to economists from the Western economies. The economy's dependence on oil revenues also makes economic diversification difficult[22]. Business with China is booming and it could be interesting to look at proliferation of industrial goods in Angola.

### 2.2.4 Kenya

The politics in Kenya often appears to be an equilibrium of multiple ethnicities - where clan dynamics are of significant importance. When resettlement was attempted under Kenyatta's leadership, the non-Kikuyu population was quick to express their discontent. Other attempts at nationalization - taking control of foods sales and establishment of purchase centres - have met with similar disappointments.

The economic data recorded (by surveys like IRS) had severe shortcomings that led to overstated improvements in household rights, womens' conditions and the overall health of economy. The prevalence of small-scale independent works and lack of support offered to them has not been addressed either by the socialist governments or the growing private sector[35].

## 2.3 Status and Consumption in the Developing world

With the view of status we have adopted, the differences in purchasing power between the sections of a society and the mobility between them are key drivers of status-related consumption. That status and mobility can contribute to the economic development of a society is a belief that goes back to Adam Smith - who had proposed that the economic progress can be achieved by letting an exchange between the rich and poor thrive. To use Wicksteed's words, trinkets could be turned into bread in this world-view[41]. One could argue that more spending on a conspicuous item would benefit the society as a whole - since the money obtained from the rich on the item could potentially fund employment and other opportunities. Electricity in Africa, for example, would be a model item for this purpose - an item whose consumption can drive the expansion of power plants and make electricity cheaper for everyone. More spend-

ing on signaling goods does not appear to be a social waste from this perspective. However, we note that not all marketable goods are as desirable as electricity and there may be goals more desirable than what the exchange between rich and poor can provide. Unlike in the Western world - where the differences between the rich and poor have purportedly been reduced to a level that this exchange could not be made lucrative to the poor any more<sup>8</sup> - the basic needs for the masses haven't been addressed in the developing world. While one could expect the exchange between rich and poor to draw the masses out of poverty in Africa, there are limits to how much success can be achieved in the developing countries. This is because the essential goods often lack a market in the developing countries and since marketable goods often create needs on their own, the development of market for conspicuous goods may prevent the status competitions from achieving the goals of social welfare. Particularly in the context of conspicuous consumption, anything exclusively available to the richer sections of the society can easily become a status good and thus the possibility of a social waste due to spending on status goods cannot be ruled out in the developing countries either.

These limitations of status competitions matter since the institutions in developing countries are generally weak and have developed on the path to achieving goals of nationalism. The developing countries now face the problem of institutions not being strong enough to establish the exchange between the rich and the poor or to let it thrive. In the new urban settings in Africa, both tribal identities and the hierarchies formed through education, money or industrial assets can contribute to status competitions. While this development can encourage institutions of money and education<sup>9</sup>, the status competitions in the absence of welfare-centered institutions can limit themselves to markets not developed enough to undertake severe scarcities.

The relationship between education, urban developments, income levels and tribal identities is difficult to assess without the access to the microdata on tribal identities and regional migration. In absence of this data (as is the case with LSMS used in the study), we consider other proxies that may be correlated with social identities (e.g. family income levels, language spoken, locality etc.<sup>10</sup>). Still, the measurement error for variables in any claimed relationship between identity and purchasing power in Africa can be severe - due to a bulky

informal sector (which may have expanded due to recent economic developments), expansions in the areas of micro-credit as well as mass education [14][31] and the complicated changes in identities themselves (which are homogenising with the expansion of internal trade<sup>11</sup>).

The current study so far considers only the district level residence and the primary spoken language as the demographic factors that may contribute to status consumption. We intend to understand the factors that influence either status differences or the status-related consumption. Urban migration and industrial developments (through increased wealth and few industrial goods) can increase status differences in society while the status-related consumption is influenced by supply or scarcity of the status-related items (which also drives the demand of the item) as well as the growth in income of the individuals in the society. These factors are briefly discussed in the following subsections.

### 2.3.1 Wealth

Status is the most strongly indicated by the amount of wealth someones amasses. A key argument that we rely upon is that status related consumption exists because i) those in the middle-rank of wealth might want to indicate more status than is indicated by their real wealth and ii) wealth is often not directly visible. Status-related consumption is therefore universally relevant for status competitions.

### 2.3.2 Supply

In simple terms, a status item indicates the buyer's status to the immediate surroundings. Status being a sociological phenomenon, it becomes non-trivial to classify a good as a status or signaling good. If for example, only the rich could afford electricity in a society, electricity may not appear as a signaling product for most of the population. From the point of view of consumption, a good being used by a smaller and richer part of the population may seem to have less significance than a good used by the majority of the population. One is tempted argue that items consumed by more people carry more significance in deciding whether a good is a status good or not<sup>12</sup> (i.e. an instance of congestion), however, we must also consider the supply of the item and the wealth of the consumer purchasing the item before declaring an item more status-bearing than the other. When an item is in limited supply, only those consumers with higher

<sup>8</sup>In other words, the price of luxuries has exceeded the opportunity cost to the rest of the society [24].

<sup>9</sup>Status differences can spur consumption on status goods - and can be particularly relevant to social welfare - for example - if education turns out to be a status good.

<sup>10</sup>The LSMS data is available to enumeration-area levels in the crowded regions (which are over-represented in the samples).

<sup>11</sup>

There are regional disparities in the foreign investment in sub-Saharan African countries. In Tanzania, for example, the investments from South Africa and Western countries have expanded significantly. Not all countries in the region have seen a similar scale of investments.

<sup>12</sup>A regression with quantities consumed as dependent variable would bear more significance for items consumed by more people.

purchasing power (or those who must pass some other barrier) would have access to it. For example, if electricity is not available throughout the country, then only those with higher income or with residence in certain areas (where there is electricity) can have their signaling needs fulfilled with the item. Hence, when expenditure on the item is limited to the richer sections of society, then the item is a status good merely through being a statement of wealth. Despite its usage being limited to a limited section of the society, electricity would be considered a status item in our study - simply because its low supply indicates richness and a higher status explicitly.

### 2.3.3 Overcrowding as a barrier

Other than the price of the item in the market or other barriers to distribution of the desired item, what characterises a some status improving commodities is the tendency of the consumers to flock towards the item. The demand for certain status items is enhanced by the popularity of the item. Newly introduced goods thus often create a market of their own - a mechanism often accentuated by the advertising effects. This so-called “bandwagon” effect is essential to indicating one’s social standing (see Corneo et al. [7]).

A crude way to demonstrate or test this tendency (not used in the model), one may use the time-series change of the budget share (or elasticities) of the item to see how sensitive the budget share of the item is to time, income and supply. The budget share for an item can shift when its supply is increased (more electrical power plants or cheaper alternative energy would reduce the budget share on electricity). If the budget share of electricity increases then we conclude that people may be flocking to the commodity (after accounting for income effects).

Not all status goods need to exhibit flocking of consumers. If the item has been restricted to the richer section of the society for a long time, then increase in abundance of the item can actually cause disinterest in that item. As new items can always appear in the market through innovation or imports, a consumer uses both snob and bandwagon items to indicate her status. But as long as everybody wants higher status it can be argued that all newly introduced status goods would exhibit a change in budget share with respect to supply <sup>13</sup>.

### 2.3.4 Urban Migration

The African context presents a unique opportunity to study the demand for industrial goods. As discussed in previous sections, the outreach and resources of the governmental institutions in African countries are limited and a large industrial sector at the scale of China

<sup>13</sup>Hirsch considers “overuse” as a criterion for signaling items i.e. when individuals use a commodity too much, its signaling qualities decline.

has been out of reach for most African countries[3]. The small-scale private enterprise - which forms the majority of non-agrarian workforce in sub-Saharan Africa - receives very little governmental assistance. Hence the expansion of informal economy has continued and the migration to urban areas increased significantly in sub-Saharan Africa. The interaction between urban and rural Africa is of prime significance in any study of consumption.

The dynamics of urban migration can serve as a test-bed of consumption patterns in the presence of industrial goods and the difference between urban and rural areas. A flight to urban areas is often not simply an escape from despondent circumstances but also a chance for improbable social mobilities. Yet the opportunities of income and social mobility are not all that are offered by the migration to urban areas - the availability of the range of products that are entirely absent from the agrarian rural settings also have a role in the promise of a better lifestyle. A model cognisant of the demand for these items can enhance the model based on the expected income payoff from migration (where the payoff itself is often not known nor assessed by the migrant).<sup>14</sup>.

### 2.3.5 Population density

Overpopulated urban areas are commonplace in sub-Saharan African countries - particularly because of the expansion of informal economy and recent developments in the economy. Population density does seem to bear significance with consumption of status items - but this is more likely due to urban and rural differences than population density itself. If similar products were available in both rural and urban areas, one may expect that the more communication between individuals that may potentially intensify the bandwagon effects and status competitions. While studying the effect of social interaction on income distribution, for example, Robert H. Frank ([15]) finds the effect of status competitions significant in overpopulated suburban areas of big cities in the US where lower status individuals are huddled together and are likely to have more signaling needs[15]. One might expect this to be true in the developing countries too - as the perceived hierarchies in the society matter for the demand of a status goods in both developed and developing economies. However, the lack of availability of similar products in the rural areas by far dominates the

<sup>14</sup>Urban migration is often seen as a necessary phase of development - one that is followed by the competition between industrial and agricultural sectors for labour and food. This model provided by Lewis[21] expects the prices of food to rise as labour moves from agriculture to industry. This model can be enhanced by considering that the demand for urban products could be higher due to status related pressures - which in the context of Africa could be driven by the trends of indigenes displacing non-indigenes or the more educated replacing the less educated in conventional occupations.

effect of population density in the developing countries in Africa.

A counter-argument to our conclusion of the dominance of supply issues could be that the rural areas don't have enough status needs to motive industrial development and for status goods to matter. After all the bulk of nationalist ideas which the region has experimented with in the past decades relies on the fundamental belief that the unified group identities can address physical scarcities and drive economic development. We don't however see a negative effect of population density on status consumption in the overcrowded areas. The data doesn't seem to support the theory that individuals staying close together leads to rejection of the demand for status goods. Thus while we cannot support Robert H. Frank's findings in the data from Tanzania, we do not find a proof of the opposite either (after accounting for the differences in the consumer basket between rural and urban areas). Unfortunately the unavailability of micro-data on social identities in rural areas makes it difficult to draw detailed conclusions on social identities.

### 3 Analysis of Visible consumption and income elasticities in the literature

The presence of conspicuous consumption in developing countries has been a topic of recent research interest ([28],[26]). Table 2 summarizes the data and methodologies for some of the studies. The studies have been based on a visible basket classified first by Heffetz - where the consumer basket constituents were sorted by a visibility measure based on a survey of 480 respondents. Conducted in US, the respondents were asked how long it took them to notice the consumption for commodities in the US CEX categories (listed in Table 1)<sup>15</sup>. The visibility index computed from survey responses was found to have a significant predictive power for total expenditure elasticity<sup>16</sup>. Robustness tests (regressions for different

quantiles and across multiple demographic categories) reported an all through significance of the Vindex regressor (normalised measure of the response from users for how much they would notice the consumption on a certain commodity).

A survey of visibility of commodities was not repeated by many other studies conducted on the developed world works[23]. Many studies have relied on the basket defined by Charles et al<sup>17</sup>[5] (See Table 2). The definition of visible consumption is often adjusted in these studies depending on the socio-cultural context (See Table 2). Omori-Smith ignore all visible consumption categories from the Charles et al study except that of clothing (including shoes)[33]. Friehe-Mechtel used several definitions of the visibility basket (i.e. drop items from the basket to address various interpretations of visibility) to study the robustness of their results[16]. A study of the consumption in South Africa by Kaus chose a basket of products as close as possible to that in the Charles et al study[27] (to find differences in consumption of visible commodities among different social groups).

The need for a survey to measure visibility of items in the basket is however necessary when conducting similar studies in the developing countries<sup>18</sup>. Visibility is a socio-cultural judgment - and the visibility basket from the developed world cannot be translated as such into disparate geographies and cultural environments of the developing world. One can in fact arrive at wrong conclusions on visible consumption for a consumer group if a visibility basket was chosen from a different cultural environment. For example, hair-products may be associated

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the model provided by Ireland et al ([25]). Using an individual's sensitivity to social status signals in the model, they use a utility function  $U = (1 - a)f(v, w) + af(\hat{v}, \hat{w})$  (where  $\hat{v}, \hat{w}$  are societies' view of the consumption and  $a > 0$ ). Solving for a separating equilibrium, this results in  $y = \frac{1+\beta}{a+\beta} + Cv^{-\frac{\beta}{a}} (a > 0)$  where  $C = \frac{a}{a+\beta} (\frac{\beta}{1+\beta})^{\frac{\beta}{a}} b^{\frac{a+\beta}{a}}$  ( $C$  is derived by considering the utility maximization at lowest income level  $b$  as the boundary condition for the utility maximization problem). Elasticities in this model are  $e_v = \frac{dv}{dy} \cdot \frac{y}{v} = a((1 + \beta)\frac{v}{y} - \beta)^{-1}$ .

<sup>17</sup>Charles et al themselves ignore housing expenses - despite its clear visibility- because of the known housing differences in the US between black and white social groups[5].

<sup>18</sup>Khamis et al[28] ask two key questions to respondents in an online survey conducted in India. First asked them how closely they needed to interact with their neighbour (with similar demographic characteristics) in order to observe above average spending for a list of items (Options were -'1: No Interaction', '2: Occasional Interaction', '3: Friend', '4: Close Friend' or '5: No matter how much one Interacts'). An item where >20% respondents report 1 or 2 was considered a visible item. A second question asked them what they'll expect of the consumption of an item after a sudden 20 percent rise in their neighbor's income '1: Fall', '2: Stay the same', '3: Increase by less than 20 percent', '4: Increase by 20 percent' or '5: Increase by more than 20 percent'. The list of items in these questions attempted to match the consumption categories in the IHDS. An item is associated with higher income if more than 20% of respondents reported 2,3,4 or 5.

<sup>15</sup>The exact question was - "Imagine that you meet a new person who lives in a household similar to yours. Imagine that their household is not different from other similar households, except that they like to, and do, spend more than average on [jewelry and watches]. Would you notice this about them, and if so, for how long would you have to have known them, to notice it? Would you notice it almost immediately upon meeting them for the first time, a short while after, a while after, only a long while after, or never?" [23]. Responses were coded from 1 (almost immediately) to 5 (never). The question was repeated for each expenditure category (randomly ordered). A normalized measure was then used as the visibility index.

<sup>16</sup>The utility function is modeled as a combination of a private consumption function and an observable consumption function. Considering the Cobb-Douglas utility function  $f(v, w) = \beta_v \cdot f(v, w) + \beta_w \ln(w)$  over constraint  $y = v + w$  where  $y$  is the budget constraint and  $(v, w)$  are visible and non-visible good quantities respectively. Instead of the standard Engel curve model :  $v = \frac{\beta}{1+\beta}y$  and  $w = \frac{1}{1+\beta}y$  (where  $\beta = \frac{\beta_v}{\beta_w}$ ), the authors use

with a higher visibility (and promise) in the developed world but in the developing world their purpose could be just utilitarian (poor quality of production, cultural factors etc.). Attributing lower visible consumption based on a low consumption of hair-products would thus be erroneous.

Another practical problem arises in the developing world because of the predominant use of recall method in expenditure survey. A relevant anomaly is the Deaton Paxson paradox([9]) - i.e. the observed decrease in food expenditure per head as household size rises (with constant total outlay per head). The likely cause for the paradox is presence of errors correlated with household size in the data that results in possible overestimation of the consumption of recalled items[19]. Caution must therefore be taken (or a correction applied) when mixing expenditures from recall and diary methods.

While the visibility elasticities may not be compared across countries without above considerations but a comparison within the country can provide insights into the effect of certain demographic factors on visible consumption. This has been the central theme for most of the studies surveyed in this note. More than to improve the measurement of visibility, the studies are interested in identifying the demographic parameters that explain the log-expenditure of visibility basket as is. The general regression equation for such a study is the following:

$$\ln(vis_i) = \beta_0 + \beta_1 \cdot Dem_i + \beta_2 \cdot \ln(pInc_i) + \epsilon \quad (1)$$

Here  $vis_i$  is the total visible consumption of the household  $i$  (accumulated over the chosen visibility basket),  $Dem_i$  is a vector of demographic indicators under consideration and  $pInc_i$  is the permanent income - proxied by total expenditure. Households with higher total expenditure are far more likely to be those with higher visible expenditure. Thus, total expenditure (on the right side of the equation 1) makes it an endogenous variable for the dependent variable :  $\ln(vis_i)$ . A different approach is taken by Jaikumar et al who use weights in the basket rather than visible expenditure levels - so that visible expenditure is not subject to the endogeneity problem that arises due to total expenditure being on the right hand side and visible expenditure on left hand side of the equation[26] (The proportion of visible expenditure with respect to the total expenditure could be the same for those with higher total expenditure and lower total expenditure). However, since data on income is often poor or sparse in the developing countries, total expenditure turns out to be the most frequent choice for a proxy of permanent income ( $pInc_i$  is a key control parameter for the analysis of visible consumption). In most of the studies, the said endogeneity of total expenditure is resolved by a choice of appropriate instruments - e.g.

income, cubic-income, positive-income dummies or occupation codes. These instruments identified by Charles et al.[5] are reported to be quite strong in the studies surveyed as part of this note (Sargan and Wu-Hausman tests confirm endogeneity and the effectiveness of chosen instruments).

Tobacco products like cigarettes, cigars, and pipe tobacco  
 The purchase of new and used motor vehicles such as cars, trucks and vans  
 Clothing and shoes, not including underwear, undergarments and nightwear  
 Home furnishings and household items, like furniture, appliances, tools and linen  
 Jewelry and watches  
 Computers, games, TVs, video, audio, musical and sports equipment, tapes, CDs  
 Dining out at restaurants, drive-throughs, etc, excluding alcohol including food at school  
 Alcoholic beverages for home use  
 Barbershops, beauty parlors, hair dressers, health clubs, etc.  
 Alcoholic beverages at restaurants, bars, cafeterias, cafes, etc.  
 Cable TV, pets and veterinarians, sports, country clubs, movies and concerts  
 Books, including school books, newspapers and magazines, toys, games and hobbies  
 Education, from nursery to college, like tuition and other school expenses  
 Food and nonalcoholic beverages at grocery, specialty, and convenience stores  
 Rent, or mortgage, or purchase, of their housing  
 Mobile phone services  
 Airline fares for out-of-town trips  
 Lodging away from home on trips and housing for someone away at school  
 Public transportation, both local and long distance, like buses and trains  
 Vehicle maintenance, mechanical and electrical repair and replacement  
 Gasoline and diesel fuel for motor vehicles  
 Medical care, including health insurance, drugs, dentists, doctors, hospitals etc.  
 Contributions to churches or other religious organizations and other charities  
 Laundry and dry cleaning  
 Home utilities such as electricity, gas, and water; garbage collection  
 Home telephone services, not including mobile phones  
 Legal fees, accounting fees, and occupational expenses  
 Vehicle insurance, like insurance for cars, trucks, and vans  
 Homeowner's insurance, fire insurance, and property insurance tools and licenses  
 Life insurance, endowment, annuities, and other death benefits; insurance  
 Underwear, undergarments, nightwear, and sleeping garments

Table 1: Consumption Categories in CEX ordered by visibility rankings

Authors	Estimation Procedure	Data Sources	Basket constituents
Kaus[27]	Cross-sectional 2SLS with demographic and time variables	IES(expenditure survey) - visible categories through vindex	Baskets from Charles et al - selecting personal care, cars, jewelry and apparel (including footwear) products
Charles et al[5]	Cross-sectional 2SLS with demographic and time variables	CEX(expenditure survey) - visible categories same through vindex. Despite its visibility, housing has been excluded from the list.	Clothing/Jewelry/Shoes (029) Clothing Services (030) Jewelry and Watches (031) Personal Care (032) Barbershops, Beauty Parlors, and Health Clubs (033) Motor Vehicles (052) Repair, Leasing, Greasing, Washing, Parking, Storage, and Rental Services(054) Reduction of Principal on Vehicle Loan (096) Tires, Tubes, Accessories, and Other Parts (053)
Friehe, Mechtel[16]	Regression with demographic and time controls	EVS (expenditure survey) - visible categories through vindex. Items that are subsidized e.g. housing, pharmaceuticals or those with no significant visibility are ignored.	Basket from Charles et al, Heffetz (Table 1)
Khamis, Prakash, Siddique[28]	Cross-sectional 2SLS with demographic and time variables	2005 Indian Human Development Survey (IHDS) The commodities were sorted based on a visibility survey conducted in an Indian university.	Personal Transport Footwear Vacations Furniture Social Functions Repairs Clothing Jewelry Recreation Goods
Omori, Smith[33]	Regression with demographic and time controls	US CEX (expenditure survey)	Clothing (including shoes) from the US CEX categories (Table 1)
Heffetz[23]	Visibility Elasticities estimated through weighted/kernel regression with a Visibility Index (Vindex)	Vindex (surveyed), US CEX (expenditure survey)	Survey of visibility of commodities (See Table 1)
Jaikumar, Sarin[26]	2SLS with Gini-Index as control variable and household assets as instrument for permanent income control (total expenditure) <sup>19</sup>	2005 Indian Human Development Survey (IHDS) <sup>20</sup>	Basket identified by Khamis et al

Table 2: Criteria of Conspicuous Consumption in surveyed literature



## 4 Scarcity and Status consumption

Heffetz finds that the degree to which people notice items explains the corresponding (permanent) income elasticities better. This observation has provided the basis for inspection of visible consumption in many studies therewith. In an environment of inequalities, however, it is likely that i) the items available to higher status individuals may never be accessible to lower status individuals and ii) the individuals with perceived higher status may notice items differently from how the lower status individuals might notice them. The social factors thus relevant for the difference in visible preferences are sought in the studies on visible consumption in the developing countries. In India, these factors are religion and caste - while in South Africa and United States, race seems to have significance. The developing countries may also offer a less consumerist and less individualistic agrarian environment where expenditure is less varied (lesser number of status items) and more visible than in a relatively more individualistic and industrialized society.

For visibility to bear significance in an environment of severe inequalities and scarcities, an association with higher income becomes relevant. Khamis et al [28] therefore perform a slightly more detailed survey by asking what an individual whose consumption is noticed would do when her income rises (by 20%). This quantifies the expectations from others associates the total expenditure with higher-income. The items where consumers expect the consumption to rise with increased income are those that associate with higher income and are declared “conspicuous” in the study.

In a developing economy, the criterion for status consumption is clearly not just noticeability any more. Visible consumption may detail the mechanics of status competitions in a narrow sense where consumers participate in a market to increase their perceived status - but it does not provide an adequate picture of status consumption. One reason is that markets are underdeveloped in the developing world and social status is largely yielded through economic classes and social strata. The second and probably more significant reason is that status signaling does not exist in a society as an inherent need for visible appeal amongst humans. Instead visible consumption matters because the item in consideration is associated with higher status (in the same sense that Veblen had talked about in his 19th century treatise[40]).

The association of visibility with status is therefore essential to conspicuous consumption. Veblen’s assertion that conspicuous goods are essentially futile can be quite helpful in ensuring the separability of the visible/status utility. By assuming that a visible (or conspicuous) good serves no utility other than of status, we can be sure that the item in consideration does not have any utilitarian

value and combine all the products to talk about the status benefit that the consumer receives. The separability criterion unfortunately is not observed in all the literature around conspicuous consumption. It may be convincing to argue that watches and make-up don’t serve any utility other than status but it’s difficult to argue against the status benefits from housing or shoes. If the assumption of conspicuous goods being completely futile from a utilitarian perspective is relieved, then combining the visible goods (as has been done in a lot of literature) is problematic (Corneo et al. [7] skillfully use this assumption for a simple model for signaling).

The view of status consumption we consider relevant for developing economies relies on Hirsch’s idea of scarcity. We argue that status and scarcity of items must go hand in hand in a study of conspicuous consumption. So instead of limiting ourselves to visible consumption as the particular mechanics of status signaling - where consumers buy items in a common market and (presumably) over-weigh on items that are more noticeable - we attempt to understand the reasons behind the signaling through consumption by looking at the differences in patterns between the richer and poorer sections of society and attempt to understand how unavailability of items (scarcity) as well as disparities of services across regions and classes in a society are reflected in both price and consumption of commodities.

This is not to discount a study of visible consumption or the importance of a visibility survey in any way. In fact, visible consumption that affects status competitions encompasses more than just scarcity - but we argue that the relevance of economic differences in status consumption cannot be ignored in the developing countries.

Before we attempt to measure just how scarce an item can be, we must clarify the definition of scarcity - which lends itself to confusion as it encompasses both a so-called physical scarcity (unavailability) and the perceived scarcity (what we feel as scarce). The perceptions of quality of life are entities that cannot be measured easily but still may qualify as felt scarcities. For simplicity, we assume that all felt scarcities are physically scarce - or else consumers would acquire the item that is meant to be physically scarce. This requires us to assume perfect markets in the supply of items. If  $F$  denotes the felt scarcities and  $S$  the direct physical scarcities, then for our assertion  $F \subset S$  requires us to extend our notion of physical scarcity to include the barriers in society that may cause felt scarcities  $F$ . Instead of attempting to define or measure felt scarcities  $F$  themselves (as is done in a survey), we expand the notion of  $S$  to include barriers created through status competitions, advertising or other social-psychological communication that create the sense of urgent demand for a status good.

Our simplifying assumption allows us to look for pa-

rameters that can affect the demand for status items better. We surmise that conditions of availability and prices must encompass all what we consider as barriers to a possession of an asset. To avoid relying on the vague proxies for barriers, we view barriers to status - artificial or social - as a probabilistic concern which we discuss later in the study. The essential idea behind this view is that a commodity can indicate status through either being a snob type (where it has already been associated with high-status individuals in the past) or by being a bandwagon type item (where there is a clear competition to achieve a new item)<sup>21</sup>.

## 5 Deriving Status from Consumption in a Developing Economy

To measure status-related consumption one can either split the consumer basket into positional and non-positional items or assign a status-utility to every commodity in the basket. For reasons cited in sub-section 4, we choose the latter option. The criterion of classification of a status item (or assignment of such the status carrying power to every item) is inspired by Hirsch's notion of congestion - a herding of consumers to the desired commodity that drives scarcities and status consumption<sup>22</sup>. Since we do assume that markets can evolve in the long-run to price the status differences fairly in the market, we assign the status advantage of an item simply in terms of the difference in prices (wherever available) of an item in the market. The more price differentiation exists, higher is the likelihood for the consumers to indicate status through purchase of higher priced item. The claim that a consumer indicates higher status by choosing the higher priced variety of an item also follows from the perfect markets assumption and prices (inferred or directly observed) being exogenous.

Since price is the simplest of all barriers to acquiring an item, a rough estimate of the price of an item may be a good indicator of whether that item can exhibit any status or not. Unfortunately, a detailed price information for all products is not always available in the consumption data. Relying on total quantity ( $q$ ) consumed of an item or the expenditure ( $e = q \cdot p$ ) on the item can obfuscate the sense of status consumption. If a consumer

accumulates cheaper varieties of the an item instead of accumulating the higher priced varieties of the item, the comparison of quantities would no longer provide an accurate representation of the status-related consumption. To illustrate this with an example, if the prices of an item are  $p_1, p_2$  (where  $p_1 > p_2$ ) - which can be consumed by  $A, B$  so that  $p_1 \cdot q_A < p_2 \cdot q_B$  (or  $e_A < e_B$ ). Since  $q_A < q_B$ , consumer  $B$  accumulates cheaper varieties of the item. If we don't observe  $p_1, p_2$  directly but observe the total consumption on the item by  $A (= e_A)$  and  $B$ , then even  $e_A < e_B$  does not necessarily imply that  $A$  derives less status than  $B$  by consuming the variants of the same item. The status utility may not be the same for the two variants of the item with different prices. The choice of prices are therefore important (unless every variant of the item with a different price is treated as a separate item). In absence of observed prices  $p_1, p_2$ , one can instead estimate prices as  $e_A/q_A$  and  $e_B/q_B$ . These prices (direct or inferred) must then be compared with (higher) prices of the variants consumed by the richer quantiles of the population. Given our lagged asset view of status (see Section 2.1), we assert that whether a consumer accumulating cheaper varieties of an item gets more status than another consumer status depends on whether the consumers with higher assets (and thus higher status) also spend on the higher-priced varieties or not. More simply put, whether the higher priced variety of an item can indicate more status than a cheaper variety or not depends on how many people already above that person in the order of status or asset possession already have that item. For every consumer  $i$  and an item that has  $k$  variants, the  $(p_i - \max_j(p_{k,i})) \times q_i$  (negative by definition) can give us a rough estimate of the status that the consumer  $i$  may derive from the item  $k$ . We can call this the **affordability factor** for further reference.

Notice that participation of consumers in the same market is key in the above argument of price differences. Certain items may have higher price varieties due to transport costs - so if the markets where consumers  $A$  and  $B$  participate are affected by different supply-side issues then it would be erroneous to consider status differences on grounds of price differences observed by  $A$  and  $B$ . All supply-side issues are to be considered as barriers to status (which can either improve or affect status) - i.e. being in a region, neighborhood or social network where certain commodities are exclusively available, a consumer may be imparted status advantage (or disadvantage). It makes sense therefore to think of the gain (loss) of status by being in a region where more items are available (unavailable). This could be equivalently called **availability factor** for future reference.

The emergence of new commodities is worth commenting on in light of the two factors we've define. A new commodity that is not traditionally guarded by social

<sup>21</sup>If everybody has a certain item, then consumers may not consider it so important to acquire the item (since everyone else already has it) whereas for other types of item, consumers may rush to the item solely because there is a trend amongst everybody else to acquire. These are the snob and bandwagon types of item considered in the literature [7]. A few researchers have used an extended social-means model to measure these in experiments[20].

<sup>22</sup>

The difference between physical and social scarcities is not considered relevant (a clarification on the notion of scarcity is provided in Section 4).

networks may appear to change old barriers to status - particularly when deeper economic changes take place. Electronic goods, cars, education or media could fall under this category of items. Based on our assumptions so far, the status advantage of a new commodity should also be explained by the affordability factor ( i.e. the commodity  $p_i - \max(p_k) \cdot q$ ). If the market is assumed to be able to price a status commodity fairly (i.e. the new items introduced would have a price reflecting their status advantage), then we may treat the new entrant as a higher priced variety of an existing item category<sup>23</sup>. It may however be a strong assumption for empirical work that the prices of status goods at any time accurately represent the status benefits of the new item or in other words, status is priced fairly in the market at all times<sup>24</sup>. In reality, it may take years for a new entrant item to develop into a status product which then would be subject to price changes as well as introduction of further new variants (possibly of lower quality to let consumers more subscribe to the item). The equilibrium price would be one where lower income individuals are priced out of an item whose selling price can no longer be lowered further with innovation. Except at this long-term equilibrium, the prices cannot be considered as an accurate representation of status. We may get away with some of such problems by viewing prices as exogenous - but one still needs to understand how prices evolve in response to status differences in society and how status consumption reflects status differences in the long-run.

To outline a simple model for how prices may respond to status differences, we consider that the status advantage of an item is dependent on the status of individuals who already have access to it (or would have easier access to it). A new entrant in the market is typically limited to exclusive social sections or is priced high enough to prevent lower income consumers from acquiring it - just the same way the other items are. To be more specific, let's assume that there are  $n$  clusters in a society that are sorted by their income and asset ownership as  $i_1 > i_2 > \dots > i_n$ . All  $n$  clusters observing the launch of a new product (e.g. a new phone category or a car) would result in  $n$  cases where every case  $k$  corresponds to clusters with income rank lower than  $i_k$  ( $0 \leq k \leq n$ ) not having access to the new product<sup>25</sup>. Further, an item imparts status by both limiting the item to one of the  $n$  clusters and improving status of individuals by letting consumers move to higher cluster by establishing own-

ership identities. In other words, the consumption of a status item - by definition either improves or protects the status position of the consumer. The two rather opposing behaviours of the status item are indeed what is described in the literature as snob and bandwagon types - the snob types protecting the status while bandwagon types improving it. We argue that not only would the market put a high price on the new entrant status item but would be often compelled to introduce substitutes of the new entrant if  $k$  is low (i.e.  $k \sim i_n$ ). The introduction of a new item at price  $p$  would enhance status by both pricing out some consumers and by encouraging some others to purchase the status item. Over time, lower price substitutes may reduce the impact of the snob advantage so that the status at any time is a combination of the asset/income hierarchies  $i_1 > i_2 > \dots > i_n$  as well as the consumption on the status item. One therefore needs to delineate how consumption transforms the existing cluster hierarchy over time in order to comment on stability of prices of status goods. This is attempted in a later section of the study. Without the consideration of how status may be transformed by consumption, we're left with using the affordability factor alone<sup>26</sup>.

That said, even with this outline of a model, it is clear that our assumption of the market being able to price the status fairly implies that the status advantage does not just depend on the price differences alone but also on whether the status items let the consumer form an identity or club of its owners or not. This is because status consumption must result in real status advantages (i.e. the mobility to a higher status group) over a long period of time for it to justify the long-term price of the status item(s). This is made possible by the market being free to launch new products and open status items to wider sections of society - thus arriving at a long term equilibrium of the price of the status good. One can also claim from this view that the old status hierarchies can stay the same if status goods are only produced to limit price differences within the cluster - thus explaining the commonly observed phenomenon that luxury products don't always benefit from reaching out to a wider audience.

For further clarity, let's consider a simpler numerical example with high, middle, low classes and two variants being sold at prices 10,20 - which are accessible to high, middle (not low). If middle classes consume 10, high classes 20, then the affordability factor becomes  $\{-20q, -10q, 0\}$  for  $\{\text{low}, \text{middle}, \text{high}\}$  incomes classes. If a new commodity is introduced at price 15, then only the high class has access to it. If someone in high class or middle class switches to item at price 15 then the AF becomes

<sup>23</sup>Notice that if the consumer cannot access the item then the status advantage is simply  $-\max(p_k) \cdot q$ .

<sup>24</sup>Another practical consideration for affordability factor is the requirement that the old categories of items be generic enough for us to accommodate a new item as a higher price variant of a category.

<sup>25</sup>The probability of each of these  $n$  cases can be empirically calibrated while considering the club-building power of the status item.

<sup>26</sup>Notice that we don't use budget ratios ( $q/x$ ) anywhere in the analysis so far. This is because status determinants - assets and barriers - depend on total consumption  $q_i$  (and  $p_i$  if an item has multiple prices) rather than  $q_i/x_i$  of the status item for the consumer  $i$ .

-5q instead of 0,-10q respectively (if all high classes together move to the item priced 15 then the price 20 item would be out of the market and the AF would remain 0). Now if a new commodity in the same category is introduced at price 5 then everybody has access to it and the new distribution may be  $\{-15q, -10q, 0\}$  (assuming the middle class and high class consume price 10 and price 20 items respectively). The apparent 5q improvement for the lowest class might not translate to an actual status promotion in the long-run. Consumption may just increase for the new item but the status advantage may be minimal in the long-run. By the same argument, the status advantage may be significant in the short-run if the consumers have not had access to the item for a long time (forcing the market to bring new status items with higher price). The impact of consumption on status is a probabilistic concern which we visit later in the study.

In summary, while the price distance (simple difference in price or standard deviations from the highest quantile) may give us a rough estimate of the status advantage associated with the item, we must acknowledge the segmentation in society that excludes a certain region or section of society from consuming certain items as well as the process of how these asset hierarchies evolve with changing economic conditions. Strictly speaking, we cannot arrive at the status advantage from an item or even declare an item a status good without this consideration.

## 5.1 Practical considerations in measurement of Availability and Affordability factors

While the idea of scarcity is an appealing one, our difficulty to distinguish perceptions from economic conditions can make its measurability rather difficult. While we're inspired by scarcity, we only concern ourselves with the economic conditions that may contribute to scarcities. In the developing countries, the issue of **availability** is particularly relevant since rural areas are faced with unavailability of services and goods that are available (although limited) in the urban areas<sup>27</sup>. In the data from Tanzania, for example, we find not only that the region dummies are significant in consumption of certain items in the survey (particularly with respect to such as electricity which is completely unavailable in large parts of the country), but the availability of electricity seems to transform the income elasticities of demand for other expenditures as well (e.g. marriage).

The consumption of a lot status items could be dependent on each other - i.e. the status disadvantage from

not consuming an item  $A$  may add up towards the disadvantage from not consuming  $B$  if the consumption on  $A$  is dependent on consuming the item  $B$ . For example, the status disadvantage from not consuming electricity may include the disadvantage of not having AC, stereo speakers etc. Fortunately, if we use a standardized basket for comparing consumption amongst individuals, the affordability factor already would already sum up the disadvantages from all items that depend on a certain item - a consumer not having access to electricity would also be disadvantaged by not having access to stereo equipment, TV, AC etc. In other words, when the consumers in an area don't have access to electricity, they lose collectively in the status hierarchy by being residents in of the region. This approach can be used to understand the affect of personal characteristics on status e.g. residence locality and education etc. as well.

The calculation of affordability factor from price differences can be non-trivial due to lack of rich data on price of the items. Wherever available, the total expenditure and the unit quantity of the item (consumed on average) can be used to measure the affordability factor - which is the distance of the average consumption of the family on an item from the maximum (or top quantile) average consumption on any item of that category. The items in the diary recall section that don't have the quantities of consumption recorded in the survey (only the total costs of certain item are available) pose a further challenge to the affordability factor calculation. These items can be either ignored for status consumption - or their prices can be approximated by scaling the consumption cost by the household size.

The price comparison of asset vs expendable goods and its relation to status is worth commenting on as it brings oneself back to the perfect markets assumption. It may at first seem that an asset should carry more status than the consumption as the former is more difficult to acquire and the status difference between asset and expendable good should be priced fairly in the market. However, this assumption disregards the status needs of the consumer. Despite the same monthly expenditure, for example, rented housing for the same cost may carry more status simply because the houses that are less affordable to own can be made affordable by offering as rental housing. This is equivalent to the earlier problem of market forces presenting the consumer with cheaper substitutes - in the sense that the consumer doesn't need to own the item (not having to pay the full-price of the item desired) but is able to signal more status than otherwise by simply renting the item instead of owning that provides less status. In general, wherever posed with the choice between owning and consuming the same item, the consumers may prefer to fulfill short-term status needs (in hope of future mobility) instead of owning either a high-

<sup>27</sup>

This unavailability can spiral into severe demand pressures through pressures on urban migration.

price asset (which would require saving until a longer time) or a lower-priced asset (which would have significantly lower status advantage). This is simply because the markets may address status needs sooner than they address long-term needs.

## 5.2 Expenditure of status goods in the data from Developing vs Developed economies

The differences between amounts spent by the lowest and higher percentile of spenders of a particular commodity are expected to be higher when a commodity is a status-good than when it is of common utility. The illustrations show non-zero log-level expenditure on a few commodities when the lower (let's say  $\theta$ ) percentile of the consumption of the commodity is ignored. Ignoring the bottom  $\theta$  percentile of the consumption of a visible commodity is equivalent to treating the bottom  $\theta$  percentile expenditure as non-visible consumption (If we consider  $\theta = 10\%$  for electricity, then bottom 10% percentile of the consumption on electricity would be considered non-visible and anything above that level would be considered visible). The plots of log-expenditures are shown with rising  $\theta$  (starting with the lowest percentile  $\theta$  that corresponds to lowest non-zero log-level of consumption of the commodity).

For a good that is not status-related, one expects that the consumers from lower and higher quantiles of total expenditure (x-axis) would consume similar amounts of the good (y-axis). For a positional good, the consumers spending higher expenditure on the good would lean towards consumers with higher total expenditure. This does not indicate signaling in any way - but tests only whether a commodity is consumed uniformly amongst those with lower and higher total expenditure outlays (this is rather a measure of scarcity of the item than of its visibility). Choosing different thresholds ( $\theta$ ) provides a control on the degree to which a certain commodity can be included in a supposed conspicuous consumption basket. Instead of asking whether marriage spending is visible or not - for example - the test asks if only the richer consumers can afford a significant expenditure on marriage (while varying the degree of visibility attached to spending on marriage).

In the data from Tanzania, while top 56% of consumers show spending on rice, electricity appears to be a luxury when only top 22 % of consumers spend on it. This does not necessitate that a higher consumption of electricity indicates higher status but a higher threshold for electricity certainly indicates its physical scarcity which may permit status competitions.

A similar analysis of Consumer Expenditure Survey (CEX) data from the US in years 2004,2010 and 2014 similarly shows clear differences between expenditure on jewelry and fruits. It is evident that jewelry is not popu-

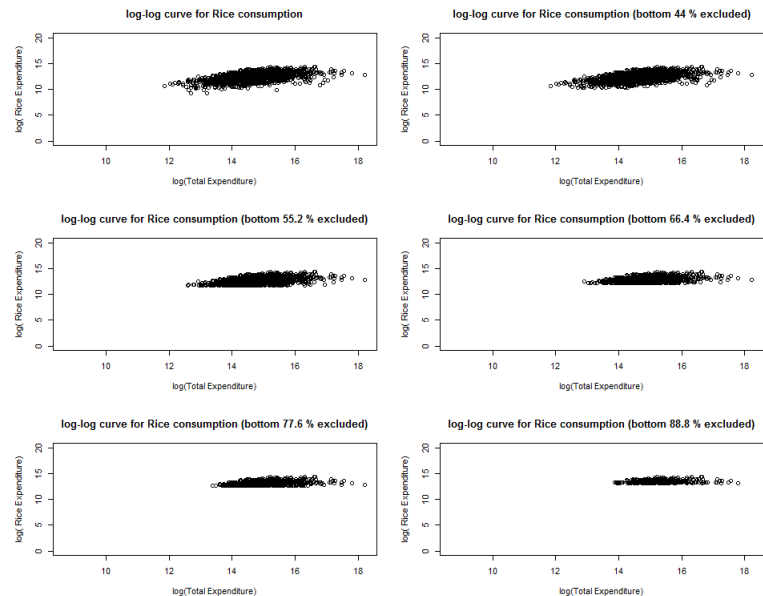


Figure 3: LSMS Tanzanian 2010: Percentiles of nonzero consumption of rice

lar amidst the relatively poor and that richer consumers spend a higher portion of their total expenditure on jewelry than on fruits (curve being steeper for jewelry). While we don't use this disparity in the classification of status, we expect the observed phenomena to be explained by affordability factor measurements.

## 6 LSMS 2010 data on Tanzania

Tanzania is the first country to be analysed in the study. With recent economic growth and a history of nationalization, the country provides a much desired snapshot of the consumer world of developing sub-Saharan Africa. The data chosen for the preliminary analysis is from the Living Standard Measurement Study (LSMS) conducted by the World Bank. LSMS includes expenditure micro-data from about 10,000 households - with many of the expenditure categories of potential status significance. An attempt to include the categories identified by Khamis et al as far as possible[28] is presented in the Table 3.

### 6.1 Descriptive Statistics

The preparation of the data involved normalizing the data for total expenditures by combining expenditure on items collected through recall and diary methods. The summary statistics are shown in Table 4.

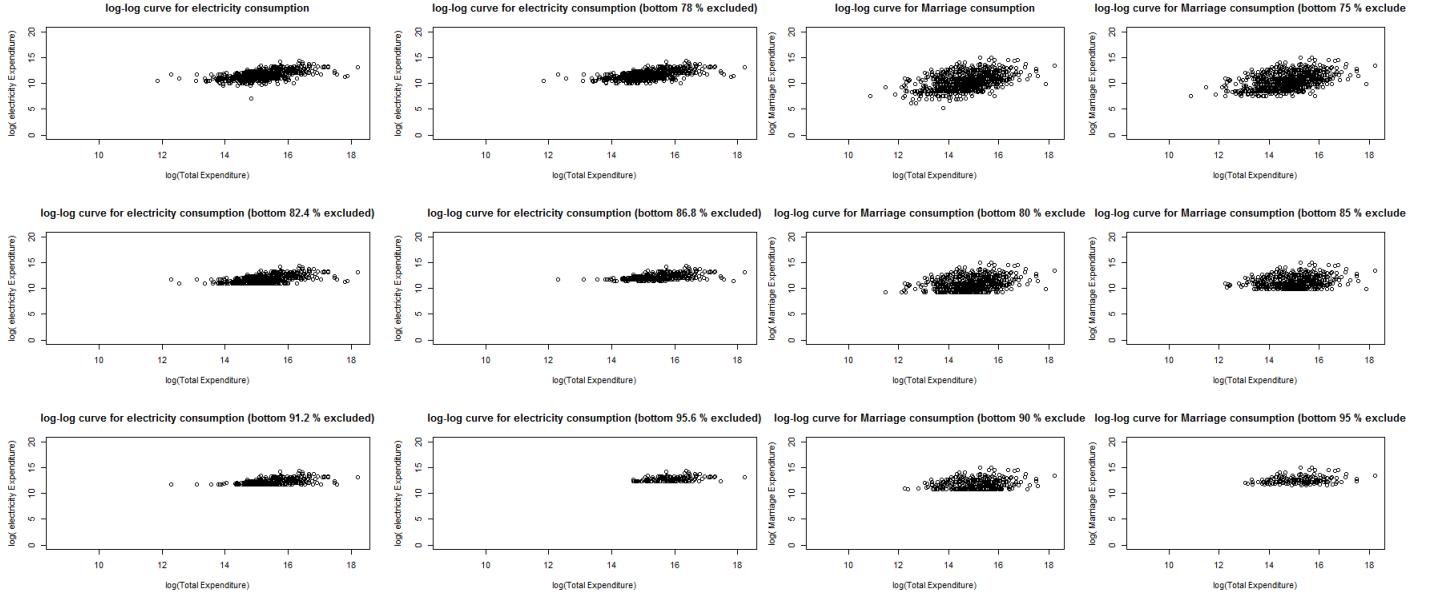


Figure 4: LSMS Tanzanian 2010: Percentiles of nonzero consumption of electricity

Figure 6: LSMS Tanzanian 2010: Percentiles of non-zero expenditure on marriage

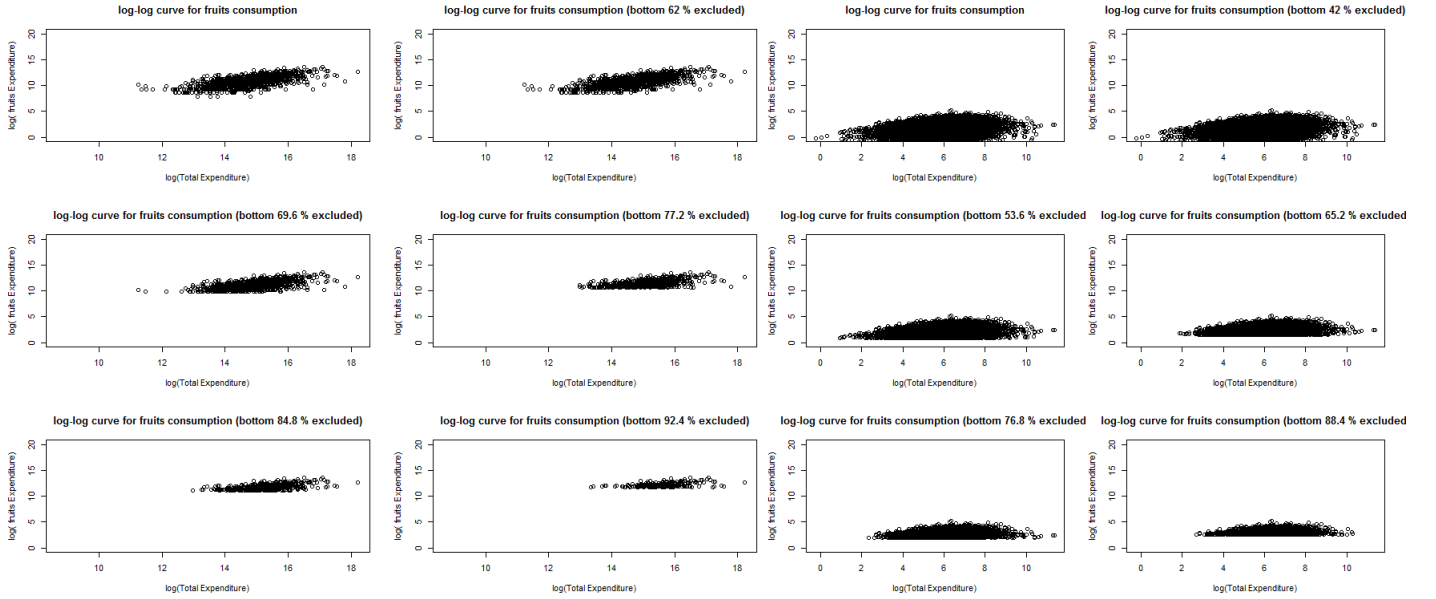


Figure 5: LSMS Tanzanian 2010: Percentiles of nonzero consumption of fruits

Figure 7: US CEX (2004,2010,2014): Percentiles of non-zero consumption of fruits

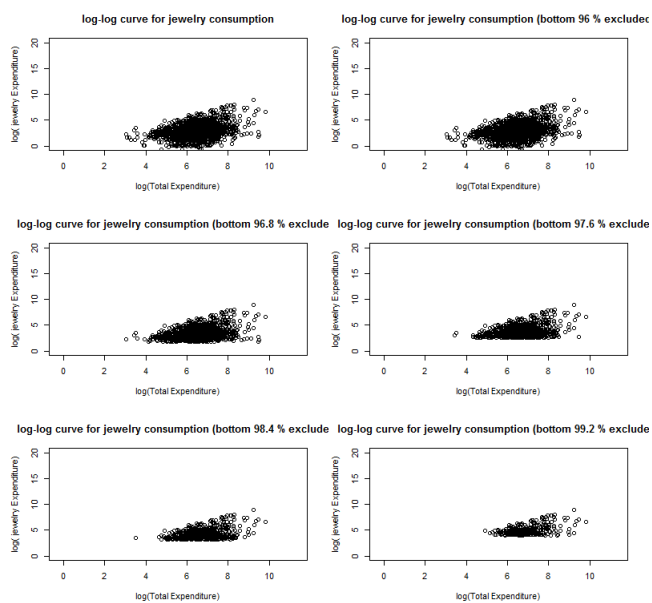


Figure 8: US CEX (2004,2010,2014): Percentiles of non-zero consumption of jewelry

Visible Commodity Code	Description
202	Electricity
213	Skin Creams
214	Other personal products (shampoo, razor, cosmetics etc.)
224	Repairs to household and personal items
301	Carpets, rugs
306	Sports & hobby equipment, musical instruments, toys
313	Marriage Ceremony
314	Funeral

Table 3: Visible commodities in LSMS data

Mean Household size	5.27
Mean age of household head	46.36
Average number of rooms per household	3.33
Percentage with household head educated secondary or higher	16.14
Mean Total Expenditure (Tanzanian Shillings)	2471122
Percentage Employed in Agriculture	47.76
Total Number of Households	2979

Table 4: Descriptive statistics for LSMS Tanzania 2010



Note that obtaining consumption elasticities (using equation 1) from recall method while computing total expenditure (food etc.) based on diary method can result in measurement errors discussed in the previous section (it is argued that larger families are more likely to underestimate their purchases when recalling). When the weekly data is mixed with yearly data - the extrapolation of past week's consumption may possibly overestimate food costs<sup>28</sup>.

We find that the income spectrum is heavily skewed in the developing world. In Tanzania, only around 30% of heads of the recorded households have any reported income. Having two jobs and owning multiple self-owned (small) businesses is not uncommon and the mode of payment is often not in cash. The amount of income recorded for the household is thus frequently based on the person's estimate of the item provided as income. All of these can make the incomes estimates noisy at best. The income levels themselves seem poorly correlated with expenditure levels. One possible way to measure this noise is by observing the variance of income in the same region<sup>29</sup>. Given the sparsity of available income data, however, instruments for age and occupation codes were chosen for the current study.

## 7 Analysis of LSMS 2010 Data

### 7.1 Steps in preparing LSMS data (2010)

Following steps were performed before running the regressions on the household consumption data from LSMS 2010.

1. Read weekly diary data from Section K (a table of items with the quantities consumed and cost associated with the item for every household).
  - (a) All items that had no cost associated with them were ignored (not included in total consumption)
  - (b) Gift quantities were ignored for consumption (median ratio of gift to total diary consumption was zero - only 132/3828 households had this ratio 1% or higher)

<sup>28</sup>To test the significant of this issue, one can test whether the surveyed households are equally likely to overspend in the recorded week

<sup>29</sup>If there are  $X$  individuals with  $n_i$  ( $i \in X$ ) sources of income each, then it is safe to assume that workers in the same region and same employment-type have reasonably similar incomes. The variance in incomes recorded for the same local group can give an estimate of how noisy the data is due to self-reporting.

- (c) Weekly diary data was multiplied by 52 (to estimate annual consumption)
    - i. Weekly recall items were also multiplied by 52 (to estimate annual consumption)
  - (d) Monthly recall items were multiplied by 12 (to estimate annual consumption)
  - (e) All expenditure from (c)-(e) above were summed up as total expenditure
2. Obtained Personal Data from Section A,B,C and J files
    - (a) Section C\_CB was read to obtain market facilitycode and gauge the accessibility of a market in every district. The closest accessible market could be either within the district or outside the district at a given distance. If a market was within the the district or less than 10 kms away it was deemed "accessible". Urban/rural classifications based on population density could be inserted at this stage (population density in not available in LSMS).
    - (b) Read section B and C files
    - (c) Calculated age of member by subtracting YOB (year-of-birth) from 2010 (survey year)
    - (d) Read section J for housing data (total house rent, number of primary/secondary rooms)
  3. Obtained income data from Section E (currently ignored for analysis for it being sparse). Here, the recorded pay frequency was in hours, days, weeks, months, fortnights, months, quarter, half year or year - while the mandatory fields corresponding to all of these units were i) number of hours worked per week ii) number of weeks worked per month and iii) number of months worked in an year .
    - (a) When pay was on a per-hour basis, the number of hours worked per week (provided) was multiplied with the number of weeks worked per month (provided). This product was then multiplied with the number of months worked per year (provided) to estimate the annual income.
    - (b) When pay was per-day, a 10 hour working day was assumed to obtain the effective number of

work-days per week (based on the number of hours worked per week). This was then multiplied with the number of weeks worked per month in the year and then further multiplied with the number of months worked in an year to obtain the estimated annual income.

- (c) When pay was per week, the number of weeks worked per month was multiplied with the number of months worked per year.
- (d) When pay was in fortnights, then twice the number of months worked in an year was used to calculate the total income received over the year.
- (e) When pay was per-month, then the multiplication factor was just the number of months worked per year
- (f) When pay was per-quarter, then the effective number of quarters were inferred from the number of months worked per year (number\_of\_months/3) and multiplied with the number of months worked per year to obtain the estimated annual income.
- (g) For self-employed income, the work-months in an year was similarly used to compute total income from self-employment in the year
- (h) All members less than 5 year old were ignored from the income data
- (i) For wage workers:
  - i. summed up wages into column yearly pay
  - ii. summed up values under “other forms of payment”
  - iii. sum up values as secondary of payment (for wage-workers)
  - iv. only primary job was used to identify the employer type of the individual
  - v. added other wages from secondary job by summing up yearly-income from all sources into the yearly income

#### 4. Ignored bad data (outliers)

- (a) Ignored 5 households with exceedingly high expenditure on marriage (more than reported annual income)
- (b) Ignored households in the income table but with zero income (number of households with income data thus ignored were under 2%)

#### 5. Merged all data

- (a) Set education expense of houses with education expenses= NA as zero
- (b) Summed up educational expense and total house rent from personal data into total expenditure (both weren’t a part of diary data)
- (c) Obtained personids of the house-heads and the following variables for household-head: education-level, age, years in community, language, occupation
- (d) Obtained visible expenditure by summing up expenditure on visible items
- (e) Merged all data into one table

## 7.2 Possible sources of Error

We extrapolate weekly diary to annual expense in Step 1. With large size of families (40% of households have size 5 or higher), it may be common to stock items for consumption. Items such as soap, skin creams are likely to be purchased in bulk in large families. The frequency of purchases gets lower as the quantity of bulk purchases increase- this may cause us to overestimate consumption significantly. One way to adjust the quantity is by estimating the storage using the number of rooms as a proxy of storage space. However, the store and consume consumption pattern does not require plenty of storage space and may not depend on the number of room. Another way to test for store-and-consume pattern is testing the closest market from the household. The data for distance from market (or the cost of public transport) is quite sparse (a lot of NAs). The NAs in the data could be because the market as described in the survey is never visited or that it doesn’t exist in the immediate region. Assuming that the habit of stocking is uniform throughout the country (this may sound a sweeping assumption - but since we do take region into account - we should be able to account regional differences), we can find household factors (e.g. household size or distance from market) that may affect consumption.

To test whether the store-and-consume habit is significant, we have the expenditure on the item  $q$ , the total expenditure  $x$  and the distance from the market  $d$ . We have assumed that anybody recalling the purchase in the last month would be repeating that purchase every month. This ignores that those who are stockpiling might not need to purchase the item again for another few months - which can overestimate the purchases for stockpilers - whose habit is unobservable in the model  $\ln(q) \sim \ln(x) + d + \text{region}$ .  $q$  is endogenous in the model

where stockpiling behavior may influence  $q, x$ . A reasonable assumption is that the percentage of stockpilers to the regional population is constant i.e. there are no reasons why the percentage of stockpilers would change within a region within a period of a few years. We can thus assume in any two regions A, B with populations  $p_A$  and  $p_B$  respectively would have  $\eta p_A$  and  $\eta p_B$  stockpilers (where  $\eta$  is the fixed frequency of stockpilers). These stockpilers would buy less frequently but there is no reasons to believe that they would consume more than the non-stockpilers. Thus if stockpilers and non-stockpilers live within a region in the same ratio  $\eta$ , we should observe fixed differences (clusters) in all regions (since  $\eta$  is fixed). We perform this analysis at the region level (the data on district level is limited - at times only 7 consumers in the district). Some region dummies do appear significant - but only for more populous regions. Overall the effect of hsize dominates even if we resample the data in smaller samples. In summary, given the low effect of the travelcosts on ratio  $\log(\frac{q}{x})$  (as shown in Table 5) and the lack of different means in the region, we can be assured that stockpiling is not significant. It is more likely that larger families buy more quantities of goods such as skincream.

Another source of error is the over-representation of the urban areas in the survey. The weights provided in the survey would be included in the subsequent analyses.

### 7.3 Claims Tested

#### 7.3.1 Effect of occupation

Income data in LSMS is not available for all the surveyed households. This may indicate the presence of informal sector in Tanzania. A few occupations in the survey are neither well defined nor are truly an indicator of total income. The presence of categories like unpaid-family-work and of individuals with no-primary-job getting a significant income from their secondary occupations makes the task of associating the primary occupation of the household head with her income rather difficult (i.e. occupation - which is available for all household heads cannot be used as a proxy of household income - which is not available for all households in the survey). Grouping the occupations into fewer categories than in the survey (by putting paid/unpaid family work and agriculture under the same category for example) allows for the smoothening of the effect of individual occupations and may serve as a proxy of socioeconomic classes in the country. Without or without this grouping, the effect of occupation has been found significant on the consumption of scarce commodities. The results are shown in Table 9.

#### 7.3.2 Effect of Education Level

One of the claims to be evaluated on the LSMS data is whether education has a significant correlation with con-

Table 5: Skin Cream Consumption

	(1)
consu	0.494*** (0.000)
popdensity	-0.0343* (0.011)
travelcost	-0.000270 (0.291)
1.region	0 (.)
2.region	-10.56* (0.029)
3.region	-7.382 (0.076)
4.region	-7.445 (0.100)
5.region	-2.778 (0.612)
6.region	-3.269 (0.602)
7.region	97.56** (0.009)
8.region	-5.601 (0.274)
9.region	-6.144 (0.163)
10.region	-10.00* (0.049)
11.region	-8.248 (0.134)
12.region	-3.888 (0.477)
13.region	-1.114 (0.839)
14.region	-1.302 (0.810)
15.region	-2.881 (0.625)
16.region	-0.508 (0.927)
17.region	-0.996 (0.822)
18.region	-4.266 (0.351)
19.region	4.314 (0.191)
20.region	-14.04** (0.004)
51.region	-5.924 (0.297)
52.region	10.02 (0.057)
53.region	3.437 (0.302)
54.region	-1.093 (0.702)
55.region	0 (.)
0.accessiblemarket	0 (.)
1.accessiblemarket	1.172 (0.367)
_cons	-4.661 (0.368)
N	1746
R <sup>2</sup>	0.063

p-values in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

sumption on status items. If the education level of NA is considered as none (for nearly 30% of the recorded individuals), then highest education level of the household held is found quite significant for many commodities.

### 7.3.3 Effect of Immigration

With a significant migration from rural areas, one of the claims to be tested is whether those resident in the community spend less on positional consumption. While this does seem to be a significant factor, it has a weaker effect than age or household size (which is to be further split as number of children and the number of members minus the number of children) .

### 7.3.4 Urbanization Effects

Most of Tanzania appears to be sparsely populated with little access to basic services and it is likely that the administrative classifications of rural-urban areas do not reflect the consumer markets so well. Still, “is\_rural” dummy is found significant for house-rent and electricity (since most of rural Tanzania does not have electricity - See Table 9).

If one were to use a dummy for accessible markets (created using the distance from the surveyed household location to the closest daily market ) - the effect of such a dummy is not so significant on positional consumption. The region dummies - on the other hand - are found to have more significance - indicating regional disparities for conspicuous consumption in the country.

### 7.3.5 Population density

Population density is a crude measure for crowding in the cities. The regions with higher population density do have a slight effect on consumption of scarce commodities. It is hoped that a urban/rural dummy created by classifying districts based on their population densities (or at a finer granularity than regional levels) may give a more detailed view on the effect of population density on status-related consumption.

### 7.3.6 Household size

A comparison of a spatially or economically excluded area with denser urban areas provides further insights on status competitions. Testing whether the proxies of social interaction (family members etc.) have an impact on status-related consumption or not, we find there are many products that seem likely to have signaling effects but for which the number of family members is not statistically significant.

### 7.3.7 Services as Visible Consumption

One of the interesting observations in the Vindex survey (Heffetz[23]) is the clustering of services and products. It is found that services tend to be less “visible” in the Western consumer world. The clustering might not

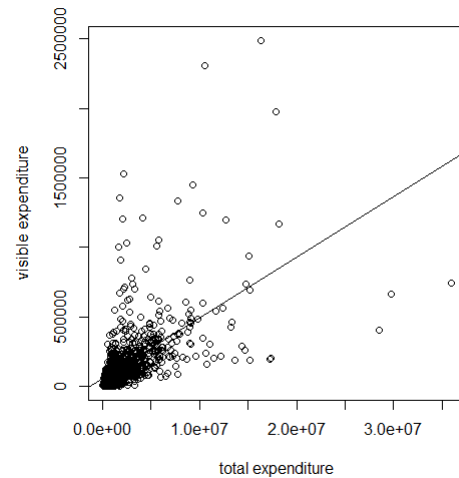


Figure 9: Visible Expenditure vs Total Expenditure for LSMS 2010

be as clear-cut in the developing world - where social stratification is severe and many services are contractual (non-monetary). The socio-cultural barriers might have an effect through access to services.

Towards that claim, English education as a control parameter is found quite significant for positional consumption. Those who identify themselves as English speakers tend to spend more on scarce commodities. This indicates that English education may be quite scarce - and while it isn’t reflected in the consumer expenditure market data so easily - it’s likely to play a role in status competitions.

## 7.4 Analysis and Discussion

Food is a significant portion of total spending overall<sup>30</sup>. More importantly, those in non-agrarian professions spend about as much of their total expenditure on food as those in agrarian occupations<sup>31</sup>. The other half of the expenditure is spent on housing, education and energy requirements as well as various household products<sup>32</sup>.

While a commodity for private consumption (e.g. skin-cream or hobby-equipment in the LSMS data) might have an appeal for everyone - whether it signals high-status or not is a social psychological concern and can-

<sup>30</sup>50% of those surveyed spend 60% or higher of their total expenditure on food - subject to estimation errors.

<sup>31</sup>The median ratio of food-expenditure to total expenditure for agrarian occupation households is 60% while for non-agrarian occupations the median is 57%. Around 54% of the total surveyed households were in agrarian occupations.

<sup>32</sup>Note that we may have slight errors in recording of food expenditure due to extrapolation of the weekly diary

not be assessed from the household survey by itself. In the absence of a visibility survey (asking the respondents how much they notice a product and whether they associate the product with high-income or not), one may still continue the discussion of the potential conspicuous value of items by looking at how scarce the item is (based on the percentile of consumers of the commodity). This is akin to repeating the analysis of visible expenditure with a given commodity as the only constituent of the visibility basket. For reasons discussed in the section 4, we avoid combining the consumption on status items to interpret status-related consumption. The percentile of consumers using a given commodity (e.g. top 22% for electricity) and the slope of  $\log(\text{commodity} - \text{expenditure})$  vs  $\log(\text{total} - \text{expenditure})$  tells us if richer sections of society spend more on a certain commodity and if the poorer sections of society consume the chosen commodity at all (the commodities chosen in the Table 8 are those where this slope is significant). The regression based on data prepared from the last step attempts to calculate the coefficients of the following equation:

$$\ln(vis_i) = \beta_0 + \beta_1 \cdot Dem_i + \beta_2 \cdot \ln(pInc_i) + \epsilon \quad (2)$$

Here  $vis_i$  is the total visible consumption of the household  $i$  (expenditure on a chosen commodity such as electricity, sports equipment),  $Dem_i$  is a vector of demographic indicators under consideration and  $pInc_i$  is the permanent income - proxied by total expenditure - which has been instrumented using *age*, *cubic(age)*, *occupation*, *highest\_education* level,  $\ln(\text{highest\_education})$ , *cubic(highest\_education)*<sup>33</sup>.

Table 8,9 and 10 summarize the results obtained by running regressions on several commodity-categories. A column in the Table 8 also suggests the percentile of consumers using the commodity (electricity for example is used amongst those having top 22% of total expenditure). The usage of commodities such as skincream and other-personal-products (shampoos, razors etc.) are widespread compared with sports or hobby equipment and electricity. For commodities that are rare and consumed only amongst the richer sections of the society (those with higher total expenditure) the effect of English literacy is significant. Similarly, *hsize* has a significant effect on both educational expense and personal products (using number of children instead of *hsize* could provide better association with education expense).

We cannot claim from the results that the population spends more on status commodities than on education. What we can claim however, is that electricity is more

scarce than education. Further, in areas where food is expensive, spending on marriage reduces - particularly by the occupations that may bring higher incomes. This marks a preference towards industrial goods in the urban (expensive) areas.

Another observation that presents an opportunity to combine status needs is that the scarcity of items occurs in clusters of objects. Carpets-rugs require a certain housing status and access to English depends on region. Similarly, many hobby equipment may require access to electricity etc. The clustering of these items essentially point to the urban-rural differences in the country. We also find that the prices can be significantly different between regions. The dummies “expensive\_region” are in found significant for some commodities.

If consumption pressures are explained by the level of urbanization, population density and interaction (family members etc.) then we can better understand what drives conspicuous consumption - addressing which can relieve on urban migration pressures and help reduce the size of informal sectors.

## 7.5 Status ranking from the consumption and asset data

The LSMS survey records neither the price nor the quantity consumed for any non-food quantities. Instead of differences in prices (which are unavailable), we test whether differences in per-head consumption in the population within a region could represent the variants of different prices which can be used to calculate the affordability factor (i.e. the quantity  $p_i - \max(p_k)$ ).

This exercise is neither trivial and not fully reliable at this point - but an effort to detect the variants of the same item or group of items with different prices in the market. In the absence of price data, we hope to use some knowledge of the supply side to improve our interpretation of price from average cost data. We begin with identifying clusters in the per head consumption cost after accounting for control variables related to usage of the item e.g. more per-head electricity costs should be scaled with number of appliances the household may have (which is available in data). In absence of prices, this ad-hoc test needs to be performed on a case-by-case basis.

The significance of control variables denoting the usage of related assets owned by the consumer and the lack of any clustering (in average consumption scaled by usage) would imply that the status is indicated by the asset ownership instead (and thus the average consumption consumption doesn't need to be counted for the status impact). For example, since per-head electricity cost is higher for those with electronic equipment - we would conclude that consumer raises her ranking

<sup>33</sup>All 2sls regressions involved performing three diagnostic tests provided by the function *ivreg* of package *AER* in R. These tests are - i) a weak instrument test ii) a Wu-Hausman test for endogeneity and iii) a Sargan test for validity of instruments.

by owning electronic equipment and having electricity - rather than by choosing a higher price option for electricity. We thus ignore the consumption of electricity for testing of signaling quantities.

If clusters of prices are observed after scaling (regression) with the usage variable, we use the cluster prices as input to our affordability factor calculation. As a sanity check, we may also verify the factors that may influence the choice of a higher price item - e.g. with a probit on the dummy of cluster's average-consumption being above or below the cluster price threshold as the dependent variable and the total expenditure, housingstatus, education, relevant asset etc. as control variables. This however, is not the part of the methodology to detect price difference through average consumption.

Our eventual goal is to identify the price differences which the consumer observes to build her utility tree. These trees are shown for Tanzania LSMS data in the Figures 10 and 11. The overall status from consumption of an individual consumer is simply the aggregation of affordability factor (or a similar metric) at the root of the tree.

Taking an example where this methodology might work, we consider the cost-per-head for kerosene which varies a lot in dar-es-salaam (region 7)<sup>34</sup>. We clearly cannot claim that the differences in consumption cost per head imply a price differentiation for kerosene - simply because availability of electricity in dar-es-salaam can change the usage of kerosene in the household (see Figure 12). What we can do for dar-es-salaam (or any region where electricity is also available) is to consider electricity and kerosene as the variants of energy level in tree and treat electricity as a higher price variant of the energy-source.

Not all problems can be circumvented with such an aggregation either. One cannot for example, use per-head consumption costs to detect price differentiation for cigarettes - where the most significant factor affecting high consumption is simply be the addiction of the consumer - the data on which is not available in the survey. We are compelled to ignore smoking for our analysis.

It is also possible that the asset itself - related to the consumed good whose average consumption we test for price-differentiation - has more variants of different prices than those of consumed good. For example, detergent that serves clothes may not be varied but the washing machine where detergents are used could be more nuanced. Unfortunately we do not have even the cost estimate on assets owned by the household - so we are left with ignoring this possibility at the moment.

For most other non-food commodities, either aggregation and/or cluster-detection could help identify the

price-differentiation. If we look at the per-head consumption cost on bar soap, there seem to be two cost clusters in region dar-es-salaam - the dummy of per-head-consumption-cost <6000 (i.e. the cluster dummy) finds roomsnum, language and occupation all significant (total expenditure is not) i.e. those with a better-paying occupations and English-speaking abilities tend to spend disproportionately on bar-soap - this difference in consumption per-head costs could be used as the price-difference in our original sense. The similar cluster dummy for detergent is not found significant (except for roomsnum in dar-es-salaam ) - hence we ignore detergents for price-differentiation. It can't be denied that such inferences are ad-hoc and dependent on whether there are any assets that may justify higher per-head consumption cost or not.

Our end-goal is to differentiate the status-impact of consumption from the status-impact of assets and then consider a combined status impact form assets and consumption - so we may fit the function for consumption from status goods into the intertemporal substitution problem. The relative assets-ownership ranking of consumers is an important part of this exercise. The LSMS data does not have even the cost information for assets owned, so we only consider the number of items owned for asset-ownership ranking of consumes i.e. if someone has more assets than another person who has less or none of the same asset, then all else being equal the former is invariably of higher status than the latter. Since our goal is to finally combine the asset-ranking and consumption ranking, we avoid double-counting the role of assets - since a lot of items are not consumed simply because the asset related to it is not owned by the consumer.

<sup>34</sup>We have assumed there are no secondary markets or hoarding for items in consideration

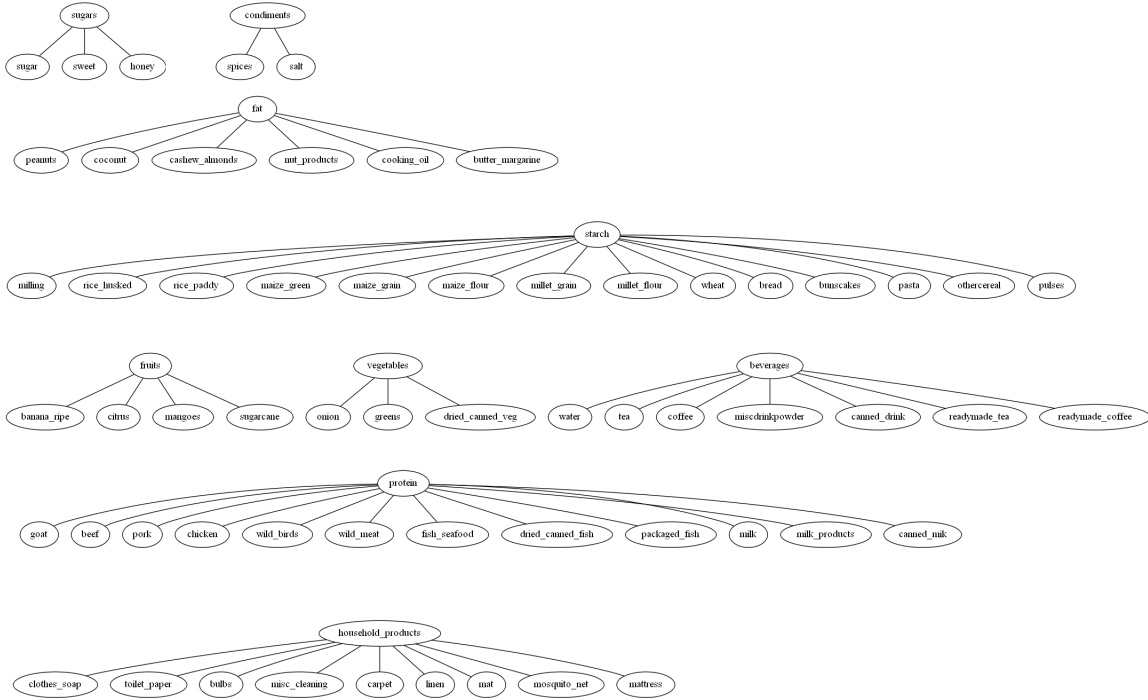


Figure 10: Utility tree for Tanzania LSMS items (1)

## 8 Further discussion - Price of food vs non-food items

The literature surveyed in the study has not used extensive panel data in the context of conspicuous consumption. While an influence of rising prices can complicate the analysis of visible consumption indicators, the insights from demand elasticities are essential to understanding the relative effect of status-related consumption against other commodities. Higher price of food items may suppress consumption on food - but one cannot answer whether an increase in price of food suppresses its consumption more than it suppresses consumption of non-food items or not - without an estimation of demand elasticities. Such details of consumption patterns are basket-dependent and cannot be explained without a record of prices of all types of items in the basket. Unfortunately, a lack of prices for non-food items in the LSMS prevent this much desired time-series analysis.

Even though an analysis on non-food prices is inaccessible with the unavailability of price data in most consumption surveys (e.g. LSMS), a time-series analysis based on food prices alone can provide insights into the pressures on food consumption. Using historical prices on calorie consumption in India, Deaton and Jean Dreze point out that the overall calorie consumption has declined while the total outlay has increased in India ([12]). The change in positional value of food - determined by price differentiation in the market and scarcity - can potentially help explain some of this decline. While such a decline is reported to be less in the case of sub-Saharan African countries than in India, the regional differences within the country could be explained by the change of food's position in the consumer universe (i.e. the so-called "Sen argument"[12]).

Population density and migration data may provide better insights in the interplay of food and non-food consumption. We find that in certain areas in Tanzania - prices for food vary a lot more than they do in others. This is a phenomenon that varies from commodity to commodity. For example, the prices for onions and sugar don't vary so much by area code as they do for meat and chicken. The regions Dar-es-salaam, Mbeya mwanza, Mjini/Magharini unguja stand out for higher prices for multiple items. In a preliminary analysis, a indicator dummy for these regions is found significant - but it is also noted that these areas are urban settlements where electricity is available and population is significantly high (See Table 6).

Certain food items for example, have more price-differences overall than others - rice (husked), maize(grain), sweet potatoes, Irish potatoes, groundnuts(shelled), goat meat, chicken and canned milk correspond to numerous (>4) region-codes where they're reportedly sold in different prices ranges. While it is tempting to claim that price differences in

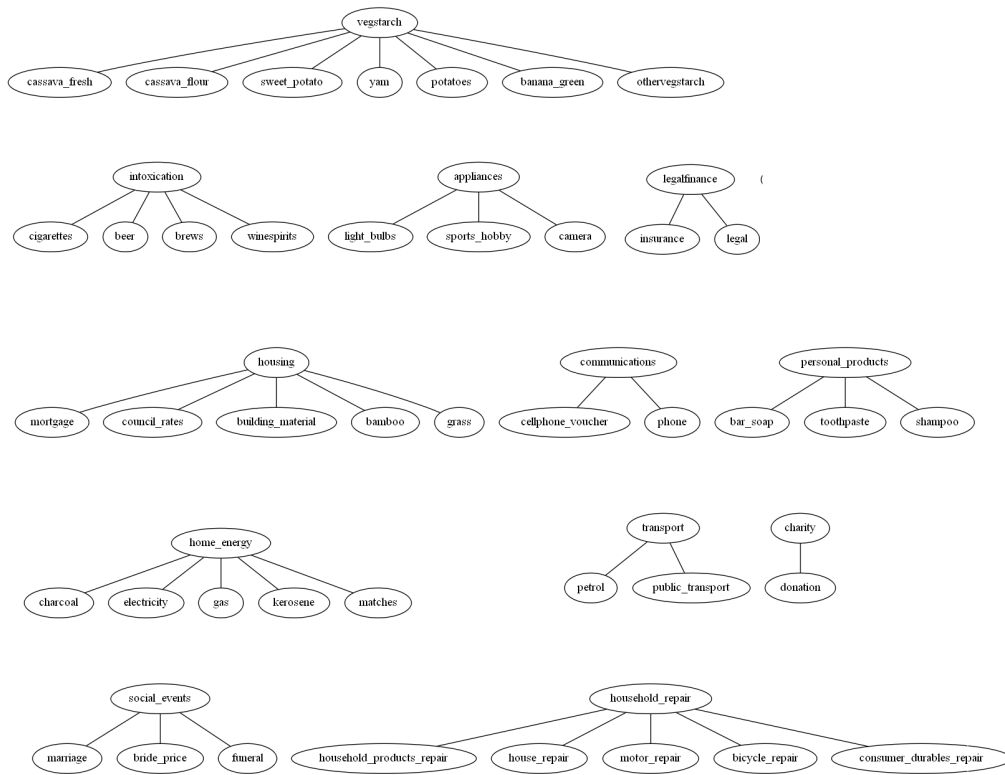


Figure 11: Utility tree for Tanzania LSMS items (2)

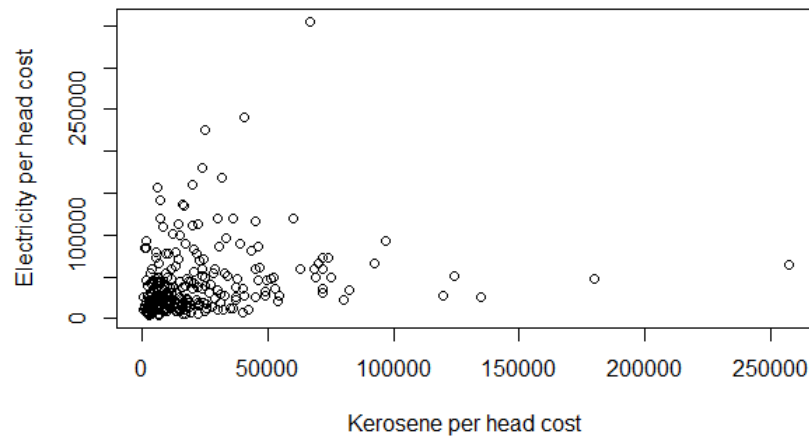


Figure 12: Electricity vs Kerosene costs per head in Dar-es-salaam



the market indicate that there is more price-differentiation and possibly more competition - one needs to consider the overall scarcity of the commodity (the percentiles of the commodity expenditure in the threshold method) as well as the preference for the item amongst the rich (measured by higher expenditure with income) for the item to be considered a status-signaling item. See Table 7. It is hoped that a further understanding of how status is influenced by consumption in short-run vs long-run can help explain whether status consumption may have a role to play in the reduction in food budget ratios.

Table 6: No instruments regression with population density and expensive-food dummy included

	Dependent variable:									
	depart									
	carpetsrugs(1)	education(2)	electricity(3)	housrent(4)	personalleisurepaid(5)	personalthrods(6)	skisrcoun(7)	funeral(8)	marriage(9)	hobbyequipment(10)
hupinc	5.095*** (0.365)	3.979*** (0.269)	3.940*** (0.342)	0.991*** (0.171)	0.667*** (0.128)	3.439*** (0.281)	1.894*** (0.253)	1.644*** (0.322)	2.494*** (0.275)	1.017*** (0.159)
age	-0.114*** (0.023)	0.085*** (0.017)		-0.070*** (0.011)			-0.042** (0.019)		-0.036*** (0.017)	-0.045*** (0.010)
hsize	-0.522*** (0.116)	2.109*** (0.090)	-0.404*** (0.104)			-0.506*** (0.104)	0.285*** (0.082)			
housingstatus	0.675*** (0.213)	-0.923*** (0.190)	0.871*** (0.192)	4.250*** (0.131)	0.191** (0.091)					0.413*** (0.111)
occupation_rank								-0.081** (0.0320)		
lsrural			1.012*** (0.296)							
			-3.120*** (0.660)	-3.952*** (0.410)						
highest_educ	-0.284*** (0.075)		0.472*** (0.067)				-0.120** (0.047)		-1.517** (0.764)	-1.331*** (0.449)
expensivevregion										
popdensity	-0.001*** (0.0003)	-0.001*** (0.0002)	0.001*** (0.0003)		0.0002* (0.0001)			0.003*** (0.0003)	0.003*** (0.0003)	0.001*** (0.0002)
english	2.829*** (0.951)		4.425*** (0.840)						1.913** (0.774)	1.132** (0.453)
years_community			0.094*** (0.020)			-0.073*** (0.015)				
roomsnum				-0.915*** (0.101)		0.442*** (0.169)		0.923*** (0.166)	0.936*** (0.150)	
is_resident	-1.873*** (0.650)		-2.607*** (0.732)	-2.113*** (0.366)						-0.683** (0.335)
Constant	-74.486*** (4.891)	-69.443*** (3.771)	-81.739*** (4.640)	-29.257*** (2.666)	-31.468*** (1.794)	-47.620*** (4.096)	-17.262*** (3.271)	-35.574*** (4.281)	-52.757*** (3.857)	-33.680*** (2.368)
Observations	2,240	2,965	2,240	2,965	2,965	2,965	2,240	2,963	2,963	2,963
R <sup>2</sup>	0.135	0.324	0.427	0.499	0.020	0.084	0.056	0.063	0.120	0.062
Adjusted R <sup>2</sup>	0.132	0.323	0.424	0.498	0.019	0.082	0.054	0.062	0.118	0.060
Residual Std. Error	13.331 (df = 2231)	13.441 (df = 2959)	11.705 (df = 2228)	8.962 (df = 2958)	6.930 (df = 2961)	14.910 (df = 2960)	9.888 (df = 2234)	15.481 (df = 2960)	13.698 (df = 2956)	8.010 (df = 2955)
F Statistic	43.602*** (df = 8; 2231)	283.994*** (df = 5; 2959)	150.867*** (df = 11; 2228)	490.157*** (df = 6; 2958)	20.278*** (df = 3; 2961)	67.497*** (df = 4; 2960)	26.536*** (df = 5; 2234)	50.102*** (df = 4; 2960)	67.163*** (df = 6; 2956)	27.977*** (df = 7; 2955)
Note:	*p<0.1; **p<0.05; ***p<0.01									

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 7: Instrumented regression with population density and expensive-food

	invis carpetsrugs(1)	hdseducexpense education(2)	invis electricity(3)	hdsoutscreent housrent(4)	personalitemsepair(5)	personalprods(6)	skincream(7)	invis funeral(8)	marriage(9)	hobbyequipment(10)
lnphc	5.814*** (1.149)	4.758*** (1.010)	10.958*** (1.512)	0.635 (0.425)	0.988*** (0.302)	3.216*** (0.565)	0.982 (0.612)	1.828** (0.902)	1.465* (0.781)	2.074*** (0.705)
age	-0.115*** (0.023)	0.092*** (0.018)		-0.077*** (0.016)			-0.029 (0.021)		-0.044* (0.023)	-0.037*** (0.011)
hsize	-0.607*** (0.173)	2.011*** (0.152)	-1.248*** (0.209)			-0.518*** (0.140)	0.383*** (0.102)			
housingstatus	0.657*** (0.215)	-0.951*** (0.194)	1.091*** (0.214)	4.363*** (0.157)	0.163 (0.109)					0.471*** (0.118)
occupation_rank			-0.660 (0.475)					-1.030** (0.485)		
isrural			-0.763 (0.872)	-4.273*** (0.557)						
highest_educ	-0.330*** (0.102)		0.134 (0.101)				-0.045 (0.066)			
expensiveregion			3.131*** (0.820)						-1.465 (0.908)	-1.433*** (0.457)
popdensity	-0.001*** (0.0004)	-0.001** (0.0005)	0.0002 (0.0004)		0.0002 (0.0002)			0.003*** (0.0004)	0.003*** (0.0004)	0.0003 (0.0003)
english	2.659*** (0.983)		3.306*** (0.945)						2.879*** (0.996)	0.243 (0.736)
years_community			0.094*** (0.022)			-0.077*** (0.020)	-0.054*** (0.018)			
roomsnum				-1.001*** (0.133)		0.589*** (0.197)		0.729*** (0.227)	0.962*** (0.196)	
is_resident	-1.655** (0.730)		-1.151 (0.854)	-2.425*** (0.492)						-0.324 (0.410)
Constant	-83.338*** (14.297)	-79.925*** (13.633)	-171.598*** (19.424)	-23.645*** (6.290)	-35.904*** (4.260)	-44.482*** (8.068)	-6.160 (7.528)	-36.943*** (11.996)	-38.454*** (10.595)	-48.819*** (10.115)
Observations	2,240	2,965	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,963
R <sup>2</sup>	0.134	0.322	0.318	0.496	0.020	0.069	0.051	0.054	0.106	0.048
Adjusted R <sup>2</sup>	0.131	0.321	0.315	0.495	0.019	0.067	0.048	0.053	0.104	0.046
Residual Std. Error	13.343 (df = 2231)	13.460 (df = 2959)	12.765 (df = 2228)	9.550 (df = 2233)	7.418 (df = 2236)	14.768 (df = 2235)	9.917 (df = 2234)	15.652 (df = 2235)	14.160 (df = 2233)	8.070 (df = 2955)

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Commodity	Significant Variables	Non-consumer Percentile	Variables significant after lnpsc instrumentation
carpetsrugs	lnpsc, age, hsize, housingstatus, highest_educ, english	78	lnpsc, age, hsize, highest_educ, english
educexpense	lnpsc, age, hsize, housingstatus, occupation	35	lnpsc, age, hsize, housingstatus, occupation
electricity	lnpsc, age, hsize, housingstatus, occupation, isrural, highest_educ, region, english, is_resident	78	Chosen instruments (occupation, ln_highest_educ ) did not demonstrate endogeneity of lnpsc
houserent	lnpsc, age, housingstatus, roomsnum	84	lnpsc, housingstatus
personal items repair	lnpsc, highest_educ, region	96	lnpsc, highest_educ, region
personal products	lnpsc, hsize, roomsnum, years_community	37	lnpsc, hsize, roomsnum, years_community
skin cream	lnpsc, age, hsize, isrural, region, years_community	12	lnpsc, age, hsize, region, years_community
funeral costs	lnpsc, region, roomsnum	54	lnpsc, region, roomsnum
marriage costs	lnpsc, region, english, roomsnum, years_community	75	lnpsc, region, english, roomsnum, years_community
sports and hobby equipment	lnpsc, age, housingstatus, region, english	93	lnpsc, age, housingstatus, region, english

Table 8: Results from regression over selected variables

Table 9: Regression for scarce commodities with no instrumentation

	Dependent variable: consumption									
	depar					depar				
	carpetsrugs(1)	education(2)	electricity(3)	housrent(4)	personallitemspair(5)	personalprods(6)	skincream(7)	funeral(8)	marriage(9)	hobbyequipment(10)
lnpinc	4.708*** (0.328)	3.574*** (0.239)	4.391*** (0.332)	1.154*** (0.173)	0.843*** (0.170)	3.439*** (0.281)	2.145*** (0.207)	2.759*** (0.260)	3.206*** (0.261)	1.214*** (0.142)
age	-0.106*** (0.023)	0.086*** (0.017)	0.067*** (0.020)	-0.067*** (0.011)			-0.042*** (0.015)			-0.038*** (0.010)
lnsize	-0.459*** (0.115)	2.160*** (0.089)	-0.529*** (0.102)			-0.506*** (0.104)	0.217*** (0.067)			
housingstatus	0.600*** (0.208)	-1.049*** (0.187)	0.924*** (0.191)	4.280*** (0.131)						0.452*** (0.106)
occupation_rank										
lsrural				-3.501*** (0.419)		1.469*** (0.465)				
highest_educ	-0.295*** (0.076)		0.421*** (0.066)		0.075** (0.035)					
region			0.186*** (0.017)	-0.051*** (0.011)	-0.049*** (0.010)		-0.121*** (0.012)	-0.142*** (0.018)	-0.034** (0.016)	-0.066*** (0.009)
english	3.146*** (0.353)		2.949*** (0.840)						1.976** (0.794)	1.633** (0.455)
roomsnum				-0.919*** (0.100)		0.442*** (0.169)		0.625*** (0.157)	0.654*** (0.146)	
is_resident			-1.956*** (0.558)	-1.977*** (0.306)						
years_community										
Constant	-71.251*** (4.287)	-64.314*** (3.438)	-85.424*** (4.610)	-31.260*** (2.689)	-33.945*** (2.214)	-0.073*** (0.015)	-0.026** (0.013)	-46.797*** (3.654)	-61.169*** (3.767)	-36.167*** (2.098)
Observations	2,240	2,965	2,240	2,965	2,240	2,965	2,965	2,965	2,963	2,963
R <sup>2</sup>	0.126	0.322	0.437	0.502	0.029	0.084	0.094	0.059	0.101	0.073
Adjusted R <sup>2</sup>	0.124	0.321	0.435	0.501	0.027	0.082	0.092	0.058	0.100	0.071
Residual Std. Error	13.394 (df = 2233)	13.463 (df = 2960)	11.505 (df = 2229)	8.929 (df = 2957)	7.586 (df = 2236)	14.919 (df = 2960)	10.078 (df = 2958)	15.518 (df = 2961)	13.840 (df = 2957)	7.963 (df = 2957)
F Statistic	53.824*** (df = 6; 2233)	351.136*** (df = 4; 2960)	173.281*** (df = 10; 2229)	426.503*** (df = 7; 2957)	21.953*** (df = 3; 2236)	67.429*** (df = 4; 2960)	51.003*** (df = 6; 2958)	61.322*** (df = 3; 2961)	66.029*** (df = 5; 2957)	46.343*** (df = 5; 2957)

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 10: Instrumented Regression for scarce commodities

	Dependent variable:									
	invis carpetsrugs(1)	hdseducexpense education(2)	invis electricity(3)	hds houserent houserent(4)	personalitemsrepair(5)	personalprods(6)	skincaream(7)	invis funeral(8)	marriage(9)	hobbyequipment(10)
lnpinc	4.665*** (0.657)	3.033*** (0.597)	9.941*** (1.247)	0.982** (0.432)	0.747** (0.321)	3.218*** (0.565)	1.661*** (0.502)	2.770*** (0.484)	3.446*** (0.627)	1.593*** (0.318)
age	-0.106*** (0.023)	0.081*** (0.017)	0.055*** (0.021)	-0.074*** (0.016)			-0.040** (0.020)			-0.060*** (0.014)
lsize	-0.454*** (0.131)	2.227*** (0.112)	-1.182*** (0.178)			-0.518*** (0.140)	0.346*** (0.099)			
housingstatus	0.605*** (0.217)	-0.979*** (0.200)	1.028*** (0.203)	4.402*** (0.157)						0.491*** (0.127)
occupation_rank										
isrural			-0.723 (0.451)	-3.618*** (0.585)			0.951 (0.626)			
highest_educ	-0.292*** (0.089)		0.132 (0.094)		0.084* (0.044)					
region			0.187*** (0.018)	-0.057*** (0.014)	-0.049*** (0.010)		-0.106*** (0.014)	-0.138*** (0.021)	-0.054*** (0.020)	-0.076*** (0.012)
english	3.155*** (0.962)		2.263** (0.903)						2.253** (0.984)	1.574*** (0.577)
roomsnum				-1.020*** (0.132)		0.589*** (0.197)		0.412** (0.186)	0.518*** (0.183)	
is_resident			-0.369 (0.684)	-2.191*** (0.494)						
years_community										
						-0.077*** (0.020)	-0.033* (0.017)		-0.065*** (0.020)	
Constant	-70.746*** (7.971)	-56.921*** (8.229)	-156.675*** (16.113)	-28.337*** (6.362)	-32.733*** (4.088)	-44.482*** (8.068)	-15.511** (7.060)	-46.113*** (6.874)	-62.420*** (9.036)	-40.656*** (4.486)
Observations	2,240	2,965	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240
R <sup>2</sup>	0.126	0.321	0.367	0.502	0.028	0.069	0.080	0.043	0.090	0.078
Adjusted R <sup>2</sup>	0.124	0.320	0.364	0.500	0.027	0.067	0.077	0.042	0.088	0.076
Residual Std. Error	13.394 (df = 2233)	13.474 (df = 2960)	12.299 (df = 2229)	9.500 (df = 2232)	7.386 (df = 2236)	14.768 (df = 2235)	9.766 (df = 2233)	15.740 (df = 2236)	14.286 (df = 2234)	8.484 (df = 2234)

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Note:

Part II

## Definition and measurement of status-related consumption

## 9 Conspicuous consumption and Visibility

Much of the literature surveyed in the study has viewed conspicuous consumption as visible consumption where the wastefulness of consumption by participants is a core concern. In the works of Ireland[25] and Arrow, Dasgupta [2] and elsewhere, conspicuous consumption is seen as a difference between social welfare and market equilibrium. Of particular interest is the model of status-signaling provided by Ireland[25] where consumers attempt to maximise a combined utility of visible (public) and non-visible (private) consumption<sup>35</sup>. The model is of remarkable simplicity but calibrating it involves a sensitivity-parameter of how much visible consumption matters to the consumers. Given the nature of status competitions in society, such a calibration is hardly trivial. A study by Heffetz[23] using this model involved surveying a few hundreds of respondents asking them - quite literally - just how visible every item is for a typical consumer [25].

The choice of visible and non-visible goods matters more in developing markets where a culture of mass consumerism is only nascent and status competitions aren't driven by economic inequalities alone (whereas in developed markets, firms are quick to turn a conspicuous item into a higher-priced commodity). The context of exploits identified by Veblen is however still relevant in the developing markets<sup>36</sup>. In its original sense, conspicuous consumption is an ecological concern and plays within the realms of sociology<sup>37</sup>. The research on conspicuous consumption in the developing world has often found that the consumption of visible items (for a certain selected criterion) differs significantly between social classes<sup>38</sup>.

## 10 Status differences and Conspicuous consumption

We find the role of perceived status differences more general and relevant to conspicuous consumption in societies. As argued before, the role of conspicuous con-

<sup>35</sup>The utility function is modeled as  $U = (1-a)f(v, w) + af(\hat{v}, \hat{w})$ . Here  $\hat{v}, \hat{w}$  are societies' view of the consumption and  $a(> 0)$  is a parameter indicating how much visible consumption matters to the consumer.

<sup>36</sup>"No class of society, not even the most abjectly poor, forgoes all customary conspicuous consumption[40].

<sup>37</sup>"Increased mobility of the members has also added to the facility with which a "social confirmation" can be attained within the class." [40]

<sup>38</sup>Kaus finds that black ethnic groups spend more on visible commodities than the white ethnic population in South Africa - arguing that status is gained through means other than consumption[27]. Khamis et al find that the Muslims spend less on visible consumption items when compared to Hindus of same economic standing[28].

sumption is to signal a higher status - and a comparison of owned assets as well as lack of availability of items are issues that may matter for status in a developing country.

To understand the relation between status differences and consumption, we note that the concept of status has characteristics of a feedback system in the long-run i.e. status may yield income and more assets through established social barriers but status itself often requires income and assets to be acquired. We therefore view status as a combination of the assets and the barriers to acquiring the assets. The Ireland model - popular in the literature - treats status consumption in a slightly different manner. The model views status-signaling as comprising of visible and non-visible goods[25] - where the combined utility for every consumer is  $U = F(f(v, w), s) - f(v, w)$  being the private utility of the consumer and status  $s$  being an increasing function of inference of others. The status inference function is written as  $s = f(v, g(v))$  where  $v$  denotes visual consumption and  $w$  - the consumption that is not directly observable. Every consumer optimizes the combined private and visible utility. A practical consideration in the model is the separation between visible and non-visible consumption - a boundary that requires a socio-cultural judgment and has been drawn using consumer surveys in the literature. This separation is key to additivity assumption which is at the heart of the model.

The parameter of combined utility in a simplified model -  $(U = (1 - a) \cdot f(v, w) + a \cdot f(v, g(v)))$  - can vary for different sections of society in the developing world. A view of status hierarchies is thus relevant in the developing world where status is often yielded through social barriers. We then attempt to connect these identify how these social characteristic may relate to conspicuous consumption in the long-run. For example, English literacy seems to have correlation with the consumption of certain scarce products in Tanzania. In the model of scarcity, English literacy (along with urban residence and other characteristics significant for consumption of scarce commodities) would be seen as a status good that is acquired through spending on education or migration (or other relevant commodities).

### 10.1 A caution against circular interpretations

Notice that one needs to be careful while drawing conclusions based on consumption of commodities that are themselves selected based on the percentiles of consumption levels. We cannot select items that the only richer section of society indulges in and claim that people spending on these selected items indicate higher status. Such a claim is only a restatement of the high permanent income and says nothing more substantial than that the



richer population sections signal higher status. It would be a fallacy to associate visible consumption with household characteristics by only associating household characteristics with permanent income. The interpretation status in terms of the asset ownership and the barriers in society that exist to acquiring these assets - avoids such circular notions of status or conspicuous consumption.

## 11 A brief review of the demand theory

### 11.1 Linear Budget Constraint - General restrictions

The linear-budget in the demand theory poses some constraints on the demand function  $q(x, p)$  (where  $q$  is the quantity demanded,  $x$  is the total expenditure and  $p$  is the vector of prices). The key budget constraints are the homogeneity constraint ( $q(\theta x, \theta p) = \theta q(x, p)$ ) and the adding-up constraint ( $\sum p_k q_k = x$ ). The adding-up constraint is often written as  $\sum p_k \frac{\partial q_k}{\partial x} = 1$ ;  $\sum p_k \frac{\partial q_k}{\partial p_i} = -q_i$  (for a good  $i \in [1, n]$ ) while the homogeneity restriction as:  $\sum_k \frac{p_k}{q_i} \frac{\partial q_i}{\partial p_k} - x \frac{\partial q_i}{\partial x} = 0$  [13].

These theoretical constraints aren't automatically true for empirical data. Instead, their validity needs to be tested. For example, in the Working-Leser model - which provides a simple demand function (as well as the corresponding Engel curve) with the budget share dependent on total expenditure alone ( $w_i = \beta \cdot \log x_i + \alpha$  where total expenditure  $x = \sum p_i q_i$ , budget share  $w_i = p_i q_i / x$  and  $\alpha, \beta$  are regression coefficients) - one needs to make sure that the adding-up and homogeneity restrictions apply on the data (i.e.  $\sum \alpha_i = 1$  and  $\sum \beta_i = 0$ )<sup>39</sup>.

The Engel curves - such as one provided by the Working Leser model - were popularised by Houthakker to obtain income and expenditure elasticities in a cross-sectional analysis of consumption data [34]. One reason why Engel curves have been so popular is their suitability to the idea of equivalence scales (i.e. how different households achieve a same level of living standard). Even though Houthakker's fitting of various Engel curve functions may now appear "unashamedly pragmatic" [sic] [10], it did assist with the an intuitive understanding of the household consumption.

A similar intuition employed by Prais-Houthakker - was that of observed price differences in commodities consumed. Obtained simply by dividing expense with the quantity, Prais-Houthakker [34] calculated the variations in prices amidst different demographics to understand the differences in consumption patterns. The measurement of differences in consumption of expensive

and cheap varieties of a commodity was termed as the quality-coefficient (an intuition relevant to conspicuous consumption as well). Analyzing the tea-consumption in the UK, for example, they concluded that the small-size families spend proportionately higher on expensive tea varieties [34]. The change in quantity consumed is explained in terms of of quantity vs quality changes as:  $dq_i = tp_i \delta p_i + k_i \delta k_i$  (change in quality - indicated by price and change in quantity indicated by  $dq$ ). This leads to  $\frac{x}{q_i} \frac{\partial q_i}{\partial x} = \frac{x}{k_i} \frac{\partial k_i}{\partial x} + \frac{x}{p_i} \frac{\partial p_i}{\partial x}$ . The quality-adjustment to the quantity approach has been used for studying expensive consumption in recent literature as well ([6],[11]).

### 11.2 Shape of the utility curve - Particular Restrictions

The restrictions of adding-up and homogeneity are often too general to provide any meaningful interpretation of utility. The empirical work therefore often involves further restrictions on the shape of utility curves. The most important property of the utility curve arises out of the revealed preference model - which assumes that for set of choices  $q_1$  and  $q_0$ ,  $q_0$  may be *always* preferred in presence of both  $q_0$  and  $q_1$ . In other words, if  $q_0$  is *revealed* as preferred to item  $q_1$ , then  $q_0$  would be preferred to  $q_1$  even if the consumer was compensated more. This was originally proposed by Samuelson and then extended to  $n$  items by Houthakker. The demand functions ( $q = g(x)$ ) are well behaved when revealed preference applies - and lead to the Slutsky equations (that give us the matrix of substitution effects) - which can be summarised as the negative-semi-definiteness of the substitution matrix and the symmetry of cross-substitution effects<sup>40</sup>. The well-known AIDS model - a particular version of the Rotterdam model - follows this analysis.

In the context of conspicuous consumption, the preferences are expected to be comparable and transitive. The axiom of revealed preference is also expected to hold i.e. when an item is revealed preferred to another item - then more income would continue to maintain that item preferred. Assuming any further restrictions on the utility curves may require a theoretical justification as well as the empirical tests associated with assumption of the shape of the utility curve.

A commonly used restriction is that of separability. A convenient way to think of separability (and the necessary and sufficient conditions for it<sup>41</sup>) is to view it as a hierarchy of needs - i.e. a utility tree - where needs are split into multiple groups - each of which further expands into sub-groups which themselves eventually expand into individual items. Separability implies that the items in

<sup>40</sup>In practice these properties may not be exactly true for the data.

<sup>41</sup>The necessary and sufficient condition for separability is the marginal rate of substitution between any two variables in the same group being independent of a variable in any other group.

<sup>39</sup>Notice that no commodity specific information is used in the semi-logarithmic equation of the Working-Leser model.

each group can be rearranged within the group by the consumer without affecting the items in other groups at the same level in the tree (except through the effect of the expenditure associated with the item on the total income). An aggregation of all groups moving upwards in the tree gives us the final utility - a process that is equivalent to the combination of sub-utility functions that each of the branch in the tree corresponds to.

When separability applies, the optimal utility problem amounts to optimising sub-utility functions i.e. the utility in each group. For every group  $r \in G$ , the consumer is meant to optimise  $c(u_r, p_r) = \min[x = \sum q_i p_{i,r} \text{ for } g_r(x, p_r) = u_r]$ . The  $u_r$  in these problems would be chosen subject to the combined utility function  $u_G$  such that the consumer optimises:

$$C(u, p) = \min[x = \sum p_G q_G \text{ for } u_G(x, p) = u] \quad (3)$$

The problem can be easily solved if the prices  $p_{g \in G}$  are known from all individual items, but when this is not possible, some further restrictions must exist for us to solve this so-called “broad group allocation problem”[13]. One possible restriction is the  $C(u_G, p_G)$  being of the form  $\theta_G(u_G) \cdot b_G(u_G)$  (where  $\theta_G$  is a monotone increasing function  $b_G$  is a homogeneous function of degree one). This restriction requires that the budget shares be independent of total expenditure - hence one cannot group necessities and luxuries together[13]. The second solution is the Gorman polar form where the indirect utility function takes the form  $F_G(\frac{x_G}{b_G(p_G)}) + a_G(p_G)$  -  $F_G$  being a monotone increasing function while  $a_G$  a general function.<sup>42</sup>

If conspicuous items were considered as a group, then separability of such a group from other groups of utility such as entertainment, education or even food may not be possible. This is because an item can be of both conspicuous and a more utilitarian value at the same time. The condition for an separable group - after all - is that a consumer can order the items within the group without considering an item outside the group (except through

<sup>42</sup>Muellbauer has enhanced the model by considering every household a multiple of unit  $a^h$  (individual). One considers a multiplicative index  $m(a^h, u^h)$  such that:

$$c^h(u^h, p, a^h) = m(a^h, u^h) \cdot c(u^h, p) \quad (4)$$

Here,  $c(u^h, p)$  is the cost-function for every household. The budget share  $w_i^h$  is independent of  $a^h$ :

$$w_i^h = \frac{\ln c(u^h, p)}{\partial \ln p_i} \quad (5)$$

With derivatives with respect to  $a^h$ , Muellbauer further uses the above equation (and PIGLOG functions) to study the Barten’s model for cost-of-having-children [32].

the effect of the item in the group to the consumer’s total budget). In case of a group comprising of conspicuous items, a consumer can order items within the group of conspicuous items with considering any item outside the group (of non-conspicuous items) only if i) the difference between conspicuous and non-conspicuous items is clear and ii) all conspicuous items don’t belong in any other group. In reality, all items reachable within the budget may be of some conspicuous value to the consumer.

To illustrate this idea, let’s assume that we have only the following items in the consumer universe: cigarettes, cheap and expensive varieties of fruits and cinema. Signaling preference order for one consumer might be cigars > cinema > expensive fruits > cheap fruits. The status needs may be fulfilled for the consumer by either expenditure on cinema or on cigar. Another consumer might be satisfied with expensive fruits for the status need. All consumers can achieve different statuses or signaling benefits from several items. Status is typically derived from a collection of items - the idea of every item imparting a certain “signaling” utility often makes little sense. To model the group of conspicuous items is to model the mechanism that indicates status - which is indicated by consumers trying to associate themselves to a richer (or high status) group of individuals through expenditure (this view of status consumption derives from the literature on snob and bandwagon items[7])<sup>43</sup>. Thus the utility of a status good is bound to overlap with that of other goods - and the status items can be considered separable only if the visible items selected in the visible groups don’t affect other groups at all (given the boundary of visible and non-visible items is clear). For our example, if somebody chooses cinema alone for visibility, then separability is achieved - whereas if one uses expensive potatoes and tomatoes for indicating status, then an overlap with food takes place.

A stronger form of separability is additivity which is also ruled out for conspicuous items. However, if one can organize consumer universe in terms of non-conspicuous and conspicuous groups, strong separability (or even additivity) of groups can make sense (this is indeed used in the Ireland model[25] for visible consumption and that for snob and bandwagon items [7]). It is worthwhile nevertheless to see whether conditions for separability are met empirically or not (by measuring marginal rate of substitution of items).

For the most part, an analysis of cluster differences in consumption of conspicuous items has sparked more interest in the literature on visible consumption (see Section 3). In this view, the study of cluster and spatial

<sup>43</sup>Status isn’t an ordinal concept. Further, it is even difficult to obtain a one-dimensional view of status - both education and watches can indicate status - of different kinds. It may be possible to model status as a configuration of top varieties of all other groups - an idea that too deviates from separability.

variations in demand employed by Deaton is quite relevant[11]. It is summarised as the following demand equations:

$$\ln q_{Gic} = \alpha_G^0 + \beta_G^0 \ln x_{ic} + \gamma_G^0 \cdot z_{ic} + \sum_{H=1}^5 \theta_{GH} \ln p_{Hc} + (f_{Gc} + u_{Gic}^0) \quad (6)$$

$$\ln v_{Gic} = \alpha_G^1 + \beta_G^1 \ln x_{ic} + \gamma_G^1 \cdot z_{ic} + \sum_{H=1}^5 \psi_{GH} \ln p_{Hc} + u_{Gic}^1 \quad (7)$$

Here, quantity of good  $G$  consumed by cluster  $c$  is  $q_{Gic}$ , the associated unit-value is  $v_{Gic}$ , total expenditure is  $x_{Gic}$ , a vector of household demographic characteristics is  $z_{Gic}$  and  $p_{Hc}$  are the unobservable prices. Two error terms used consist of i) a cluster-specific random effect  $f_{Gc}$  along with the error  $u_{Gic}^0$  and ii) idiosyncratic error  $u_{Gic}^1$ . The computation of variance-covariance vectors  $u^0$  and  $u^1$  are used to derive cluster effects e.g. inter-cluster variances and covariances for the separable goods.

Performing a similar analysis on the LSMS data from Tanzania, where we consider asset-ownership and number of young members in addition to the total size of the household  $n^h$  (note that the prices are assumed constant during the snapshot of the recorded week), in a regression  $\ln q_i^h = \alpha_i + \beta \ln x^h + \gamma_i \ln n^h + u_i$ , the size of the household (i.e. number of family members) is a more significant indicator of consumption of commodities like sugar than for fruits or meat.

## 12 Status as ranking and expectation of assets

While consumption on certain items may provide interesting insights into the distribution of consumption items across regions in an economy, a conclusion on the status goods that relies on consumption microdata alone does not claim much about the perceptions of status per se. Our decision of what is a status good or not constitutes a certain implicit definition of status (not necessarily that of the customers). Both status differences in the society and the consumption related to it are social psychological constructs - and one can seldom claim that the real differences in assets or consumption alone cause or represent the perception of status differences.

For example, if given the same levels of economic inequalities between two societies  $A$  and  $B$ , one perceives the status differences differently from the other, it is

hardly trivial to conclude from the consumption data alone that the status consumption is more important in one over the other. This is because what we consider a status good (or the status impact of a good) may differ significantly across the two societies - depending on largely socio-cultural factors. If status perceptions are not recorded in the consumption data, it is difficult to draw conclusions about status from the observed consumption data.

To elaborate the point further - consider the design of a survey that records the perceptions of status across two disparate societies  $A$  and  $B$ . In doing so, one has to level the perceptions between the two societies to a common standard e.g. by translating the survey questions in equivalent terms and metrics. Similarly, when we attempt to answer this question by observing the consumption in  $A$  and  $B$ , we would need a standardized basket to be compared between the consumers in the two societies. The task of standardization of the basket (equivalent to standardised linguistic and cultural constructs in the survey) has some inherent judgment on status measurement- since the standard basket itself is often decided by observing the average consumption on each item. This is not different from the circular definition problem discussed in section 10.1 .

To resolve the issue of status perceptions determining what's a status good and the consumption on them contributing to status in turn, we require a clear feedback model for status - one that clarifies how status differences may affect both the definition of a status good (or the status impact of a good) and the consumption of the status good. Such a model must treat the perceptions of status and the economic determinants that drive status (in the long run) separately - since the two don't always move together. The model we develop in the next few subsections considers the assets, income and the barriers to achieving them as the economic determinants of status. The consumer then overweighs on the item that improve her perceived status in the hope of status mobility (whether it be in the long or short run). The speed with which these economic determinants are achieved or lost constitutes the status of an individual at any given point.

### 12.1 Consumer's status utility

Similar to the model provided by Corneo et al.[7], we assume that status utility for a consumer corresponds to the ranking in a population of  $N$  consumers. This ranking (or utility) can simply be  $r\epsilon(0,1)$  - which is imparted by a combination of consumption vector  $c$ , assets  $A$  and personal characteristics  $\rho$ . Since we don't just consider the items that are pure status goods and have no other utility, we view price differences as an essential measure of status impact. The utility  $u$  that every consumer op-

timises is thus a function of consumption  $c$  (where  $c_i$  can be 0), assets owned  $A$  and the personal characteristics  $\rho$ . In societies  $A$  and  $B$  where the inequalities are the same, we can argue that if people in  $A$  perceive less status differences than those in  $B$ , then they would get less status utility in  $A$  from the same standardized vector  $c$  than when in  $B$  - and thus would care less about status advantages from consumption when in  $A$ . Our utility function includes the belief of the consumer in achieving absolute long-term advantages from a status good in terms of the economic determinants of status (i.e. consumption, assets and personal characteristics).

Not necessarily to solve the model, one can decompose the status score  $r \in (0, 1)$  yielded to an individual in terms of ranks (utilities) from consumption, assets and personal characteristics. Thus the rank  $r$  may be expressed as:

$$r = \phi(r_C, r_A, r_\rho) \quad (8)$$

where  $r_C$  is the rank (or utility) obtained by consumption,  $r_A$  is rank derived from assets and  $r_\rho$  is rank derived from personal characteristics  $\rho$  (e.g. education, skills). We treat consumer's income only as a monetary asset in this model i.e. the income is not directly observed by other consumers. These three ranks represent the immediate status needs of the consumer - they are all what what a consumer may want while purchasing a status item. The consumer does not attempt change the personal characteristics or other barriers while consuming items or owning assets - since the barriers from personal characteristics are constant in the short-run. With these in mind, we can say that the societies  $A$  and  $B$  in the aforesaid example would have different functions  $\phi$ . A further simplification may be possible, if above decomposition is assumed to be separable and additive (so that one can see what portion of budget is spent on which sub-utility). We postpone this simplification until the full specification of the model.

To ensure that we have indeed resolved the circular definition problem with our formulation, notice that increasing consumption on existing status items or newer status items would attempt to level the differences in assets and therefore improve status (without changing the definition of status item instantaneously). This is because the rank of consumption may differ from rank of assets. We are able to measure status consumption in our framework as long as the consumer utility depends on the combined ranking of assets, personal characteristics and consumption. Thus the consumption on an item is never a criterion for it to be defined as a status good. Instead, the consumer's ranking is what drives the status impact of an item.

Notice that the notion of status through ranking also allows us to address the physical vs social scarcity

dilemma that we discussed earlier ( a terminology used by F. Hirsch ). The economic determinants may simply represent the physical scarcities while social scarcities can be measured with the probability of status promotion through consumption.

A possible criticism of our current view of status is that we cannot be certain that some higher priced items are not used for reasons other than status. It could instead be that the people are just interested in new items, rare items or high quality items - not necessarily being cognizant or desirous of the status-bearing qualities of the purchased item. Since the essential goal of our definition of a status good is to present an ontological sense of status in terms of rare item and less achievable item, our counter-argument would simply be that status is constituted solely in the ability to materialise the concerns of quality, novelty or rareness (which too are often of subjective nature). Status is therefore constituted in such concerns - particularly as a reflection of the consumer's belief in a ranking in relation to others.

## 12.2 The notion of barrier and status

The ranking of asset and consumption ( $r_C, r_A$ ) in a population are trivially observable and a disparity between the ranking of consumption on items and the ranking of assets may even serve as a test of conspicuous consumption in societies. However, since the signaling of status through consumption is also one of social mobility, we cannot truly agree with the Veblen's sense of conspicuous consumption being truly futile (an assumption that immensely simplifies the utility function). In our view, status is a record of the race for acquiring assets and security. Hence the notion of barriers to asset ownership is key to our view. Status is constituted not just in owning the assets but the relative positioning with respect to others who don't have the same assets.

Measuring such a barrier to assets requires an understanding of how assets are distributed in society and how likely are those without the assets to acquire them over time. In real terms, the status of an individual is advanced trivially when she owns more assets. In the presence of barriers to asset ownership, if such acquisition of assets or introduction of newer groups of with assets is significant, then the barriers must change in response to the economic changes in order to grant status to the newcomers - since status is nothing more than access to and ownership of assets in our view. A simple way to understand this status barrier in a time-series formulation could be a threshold that rejects those with the combined values of asset, consumption and status-weight of personal characteristics lower than its value at time  $t$ . This threshold must also depend on the past value(s) of itself (i.e. threshold at time  $t-1$ ) - since status has some momentum across time and the assets grow in the econ-

omy over time. An essential property of this barrier is also that it changes to maintain the boundaries between the status clusters<sup>44</sup>. If we assume a linear transformation  $\beta$  from personal characteristics  $\rho$  to  $r_\rho$  (or utility from personal characteristics), then the ranking (utility) could be written  $r_{\rho_{t+1}} = \beta_{\rho,t+1}\rho_{t+1}$  where  $\beta_{\rho,t+1}$  - the threshold - depends on  $r_t$  and  $\rho_t$ .

A threshold function of the form  $\beta$  is however neither observable nor even realistic. Its role here is only to illustrate how status clusters may be formed in a society. To find a more realistic representation of what drives the formation of status clusters - we look at the probability of a status promotion within clusters of a society so that the consumer purchases status goods with an expectation of a bump in her status. The barrier  $\beta$  would correspond to a mapping from consumption and assets onto the net ranking of status of individuals such that those with lower assets consistently spiral into lower status and those with highest status keep or promote their status. Let's consider a three person simulation to describe the workings of this probabilistic model. Starting with three individuals  $(k_1, k_2, k_3)$  and two clusters  $(s_1, s_2)$  with personal characteristics, consumption and asset tuples as  $\rho_1, c_1, A_1$ ,  $\rho_2, c_2, A_2$  and  $\rho_3, c_3, A_3$  respectively. Further, let the initial conditions be  $A_1 = A_2 = A_3$ ,  $c_1 = c_2 = c_3$  and thus  $s(\rho_1) = s(\rho_2) = s(\rho_3)$  - so that statuses are the same for everyone in the beginning (i.e. there are no status clusters). In the next cycle, if the economy progresses in a way that  $c_1 > c_2 (= c_3)$  and  $A_1 > A_2 (= A_3)$  then in the subsequent cycle we'll have  $s(k_1) > s(k_2)$  and  $s(k_2) = s(k_3)$  so that  $k_1 \in s_1$  and  $k_2, k_3 \in s_2$ . This dissimilarity in status at time  $t$  would also imply that the probability of gaining more assets and consuming more in the next cycle  $t + 1$  would be higher for the individuals in  $s_1$  than those in  $s_2$ . On the other hand, if we have  $c_2 = c_1$  and  $c_1 > c_3$  in a subsequent cycle  $t_1$  then there is a chance that  $s(k_{1,t_1+1}) = s(k_{2,t_1+1})$  and hence  $k_1, k_2 \in s_1$  while  $k_3 \in s_2$ . There is also the chance that  $\rho_1$  might even start to carry more weight than  $\rho_2$  for status. The number of clusters stay the same in our model so the consumption probabilities would change in a way that the probability of  $c_3 > c_1$  or  $c_3 > c_2$  in the next cycle is extremely unlikely. While the iterations in the game outline the basic idea of the model, the formulation of the status function  $s$  requires further details for it to make empirical sense.

### 12.3 A probabilistic model of status (under review)

We measure the status impact of the item with the differences in prices of the items consumed. This impact

is known to the consumer in our model but what she doesn't know is whether consuming a status item would get her any real advantages in the long term. We assign a subjective probability as a measure for her motivation to purchase a status item and claim that the inference of status from consumption and asset ownership in the long-run is equivalent to the consumer's degree of confidence in promotion within status hierarchies. In other words, by believing that belonging to a certain status cluster  $(s_1, s_2 \dots)$  may improve her chances of economic success in future (asset ownership in the long run), the consumer believes simultaneously in a mobility through association with high-income consumption (along with asset ownership) and in the ability to improve her own image relative to others around her. The fulfillment of needs for local status competitions and a belief in mobility to a higher status cluster are therefore the same goals in this model (an assumption that is least problematic when the consumers are communicated of the consumer basket of the higher-income individuals through advertisements, common markets etc.). The scope of status competitions being more sensitive to local social contexts than the materialist potential benefits in the long-run provides the dynamics that we intend to model.

While modeling consumer's utility across multiple time-periods in the intertemporal substitution problem therefore (more appropriately called the felicity function in literature [8]), we claim that the status goods don't just grow in value (at a constant interest-rate  $r$  or through the equity payments) but also increase the (subjective) probability of promotion to a higher perceived status level. This shapes the consumer's expectation of future income.

Notice that consumer's belief does not have a direct significance on the economic determinants of status itself - which are based strictly upon the distribution of assets/income (i.e. clusters of society based on the owned assets, consumption and income). The mechanics that we intend to model is how the notion of higher/lower status would develop for our representative consumer towards the individuals with higher assets which are clustered by region or other social characteristics. The belief in status and the confidence that is imparted by consuming goods owned by richer counterparts may have an indirect influence on distribution of assets through flocking, migration or other social choices but the consumption itself doesn't directly create status (as per our definition).

Our approach to status is different from its visible consumption scope, since we claim a belief in hierarchy lies at the heart of conspicuous consumption. That a higher rate and chance of asset growth is guaranteed to a person of a certain characteristic tied with higher status is the core belief of a consumer who purchases status goods. The process of how the income of every individ-

<sup>44</sup>This is to be ensured through a choice of the utility functions rather than enforced boundary conditions.

ual evolves over time - i.e. the accumulation of wealth and long-term status of consumers in the real world - is relatively more nuanced than how our representative consumer perceives it. While the income in the long-run may depend on acquisition of skills, economic development, movement of labor and other macroeconomic variables, the information available to consumers is often disparate and relevant than local status needs.<sup>45</sup> This asymmetry of information can create a competition for status indication through consumption.

The difference between the idea of total net worth of an individual and the status of an individual as observed by the representative consumer could also be viewed as a difference in granularity and of speed of information. The true nature of economic changes are often limited to the informed and well-equipped sections of the society. It is more likely in a population of consumers that the individual motivations for consumption develop through to an exchange of personal characteristics through personal interactions rather than through a deeper understanding of economic factors<sup>46</sup> affecting the growth of economy. Since consumption and advertising are often made more relevant to consumers, their decisions are more likely to be driven by a simpler notion of status-divisions - a tendency that lets status consumption become self-fulfilling prophecy - by letting the status differences and the consumption depend on each other in the short-run. The consumer is more likely to have a status-and-income levels based understanding that is developed over her lifetime experience (by smoothening her expenditure and income) rather than an economic expectation of her surroundings<sup>47</sup>. More differences in society therefore can encourage the consumer to spend more on status goods if she believes in the existence of status differences.

The short-term effect on status determinants are ruled out in our model - but the status perceptions would matter in the long-run as they may bring the consumers spending on status goods in close interaction with those

<sup>45</sup>This is not to suggest that the consumer's belief of clustering of assets is completely ill-founded. Clusters of high or low net asset worth indeed move together as the economy changes. The model only claims that there is asymmetry in how the income process is observed across the spectrum of consumers.

<sup>46</sup>This is a mere restatement of the existence of local status competitions. In personal interactions, one is more likely to observe and influence factors such as owned assets, social connections, social intelligence, family background, social identity, or regional background. Based on arguments similar to those for relevance of visibility, we could argue that family background and regional identity may matter more in rural vs urban settings in the developing world.

<sup>47</sup>Though similar in formulation, the permanent income model treats consumption  $c$  as a multiple of smoothened (permanent) income - an assumption that we don't make in our model. Further, pertinent to status competitions in the society, our model asserts that the consumer saves income not only for income security but for social status that may provide her security in non-financial terms as well.

who have higher status (e.g. through participation in the market, workplace or social situations etc.) or impart confidence and avoid risk-aversion. The entrepreneurs or high-earners may increase their asset worth as the economy progresses - and thus their status advantage would be sooner in the model - compared to the status advantage of a consumer of status goods who hopes to gain through social interactions or with the increased (subjective) probability of becoming rich (which may make her less risk-averse). The gain in status from a lower status through assets acquisition would be faster than the decline in status as the relative ranking through asset ownership ( $r_A, r_C$ ) declines i.e. rising to a higher status through assets purchase is faster than falling from a higher status. Status advantage being relative and slow to decline provides the kind of security that a consumer hopes through status consumption.

## 12.4 Status in intertemporal substitution

Status can be viewed as uncertainty in the intertemporal substitution problem - arising out of the difference between the income process and its status-based perception. From the consumer's perspective, the intertemporal problem is about choosing between assets, consumption and status (which is viewed as the expectation of income improvement). Other than buying assets that grow in value and consuming for pure enjoyment, the representative consumer attempts to fulfill the local status competitions needs<sup>48</sup> and increase her chances (as well as those of her progeny) to belong to a higher status cluster in society<sup>49</sup>.

The status-based belief or the expectation of the income (based on the subjective probability) motivates her to improve her status through a higher priced assets consumption - these mechanisms also set her above the rest in status hierarchy she believes in. The consumer therefore maximises the expected utility (including both income and the probability of status improvement) at every time period given the uncertainty around the income process. We summarise these in the following equations.

$$i_{t+1} = \Lambda(s_{t+1}, \rho_{t+1}, \delta_t)$$

<sup>48</sup>The difference between private and public consumption i.e. the extent to which one's happiness is defined by one's surroundings is different than what could be the person's own practical needs is immaterial for us - since we accept the existence of local status competitions. In fact, when all items can potentially signal status and promote the perceived status, there is no such thing as private consumption.

<sup>49</sup>This belief is accentuated through consumption in a common market - which makes status signals more universal. Whereas earlier a consumer could feel good about herself in the local level, now the knowledge of a more connected world may make bring the goods from the common market essential in the local status competitions.

$$P(s_{t+1}|s_t) = \pi(\rho_t, c_t, A_t)$$

$$A_{t+1} = A_t(1 + r) + \alpha \cdot i_{t+1}$$

$$c_{t+1} = (1 - \alpha)i_{t+1}$$

$$s_{t+1} = \sigma(\rho_t, A_{t-k,\dots,t+1}, c_{t-k,\dots,t+1})$$

Here, assets, personal characteristics and consumption are denoted by  $A, \rho$  and  $c$  respectively.  $\Lambda$  denotes the stochastic process of income  $i$  for every individual<sup>50</sup> and  $\pi$  is the belief of the consumer in moving to a higher status cluster through consumption, assets and personal characteristics.  $r$  is the rate of growth of assets,  $\alpha$  is the portion of income spent on assets and  $\sigma$  denotes the clustering of status based on real assets and consumption in the long-run. Notice that  $s$  doesn't represent a belief in status - but a cluster based on  $A, \rho$  and  $c$ . The representative consumer modifies  $\alpha$  to maximise the chances of state promotion - which she decides based on the knowledge (or belief) status promotion function  $\pi$  - due to her lack of perfect knowledge of  $\Lambda$  and  $\sigma$ . Betting on the status promotion in  $t+1$ , she purchases assets and consumes for security and felicity - but also to ensure higher probability through her knowledge of the promotion function  $\pi$ .

To simulate above model, we can let an income process evolve based on region, education, sectors of industry and overall economic growth. The inputs to this income process are depend on the probability which the consumer believes in.

## 12.5 Status and personal characteristics

The role of personal characteristics in status determination requires a few clarifications. We have so far assumed that personal characteristics are static. However, changes in residence, marriage or social networks can impart a status advantage to the individual (See [4] for a discussion on marriage as conspicuous consumption in India). In a model that considers personal characteristics a determinant of status, the possibility of change in personal characteristics must be acknowledged. Since status is often tied with personal characteristics of those who own more assets, it may be tempting to consider personal characteristics alone for status inferences - and

claim that status perceptions are so slow to change that they're inferred only by observing personal characteristics. The personal characteristics vector in this general view may then include asset ownership and consumer identity (city-dweller, house-owner or car-owner) as well as long-term personal characteristics (whose status determination power depends on the generational record of long-term asset-ownership). One desirable property of such an assumption is the separability of utilities - with personal characteristics being generic and dynamic and not providing any benefit other than that of status. If we were to consider all asset-ownership and consumer-identity as a personal characteristics, then status-changes through change in personal characteristics would become equivalent to consumption and asset ownership. However, the assumption that people change their personal identities just the way they purchase assets or consume can be an oversimplifying one.

If we do continue with the assumption that status is determined by personal characteristics alone, then we can further split status function  $\sigma$  in a personal characteristic selection function  $\Pi$  (that determines which personal characteristic denote high status) and characteristic weighting function  $\lambda$  (which determines how much status impact is granted by the characteristics chosen by  $\Pi$  in  $t+1$ ).

$$s_{i,t+1} = \lambda(\rho_{i,t})$$

$$\rho_{i,t} = \Pi(i, \mathbf{A}_t, \mathbf{c}_t, \rho_{i,t-1})$$

As time moves on,  $\Pi$  picks key characteristics that are significant in the top quartiles of  $A$  and  $c$ . For all characteristics that don't have any status advantage - the value corresponding to  $\rho_i$  would be 0. For example, if only city-dwellers enjoy a certain amenity - then moving to the city would be factored in by  $\Pi$ . If consumers of a different personal characteristic  $\rho_k$  start consuming expensive housing (i.e. a characteristic that dominated the the rich characteristics in the past i.e.  $\rho_{i,t-1}$ ) then the personal characteristic  $\rho_{i,t-1}$  may no longer have a higher status weight in  $\lambda$  than that of  $\rho_{k,t}$ . Further, if somebody with  $\rho_{k,t-1}$  consumes items similar to those consumed by consumers with characteristic  $\rho_{i,t-1}$ , then  $\Pi$  may grant the same characteristic  $\rho_{m,t}$  to those with characteristics  $\rho_{i,t-1}$  and  $\rho_{k,t-1}$ .

Our current approach avoids such a manipulation of personal characteristics vector and fixes the number of characteristics in the model - so consumers can only switch between these characteristics (e.g. by moving, marrying etc.) - the development of the new identities is not allowed in the current model. Consumers may only buy new assets in this model but they don't invent new

<sup>50</sup>We may choose the evolution of income of every status cluster for simplicity.

personal characteristics by doing that. To clarify this, let's consider the ability to speak English in Tanzania or India - where this skill can signal high-status. Our status model would treat being English-speaking as an asset in the marketplace. If English-speaking were a personal characteristic then we would have needed to adopt a model where personal characteristics are dynamic - since people can invest in English education and develop that characteristic. If we don't consider English-speaking a personal characteristic, then it must be seen as an asset and we must adopt a model where status is not determined by personal characteristics alone. We choose the latter view (considering English skills as an asset) combined with a closed set of personal characteristics, a switch between which (e.g. with marriage or migration) can also impart status.

Notice also that assets acquired over a longer period of time through installment payments are still seen as an expenditure on the asset - whose value would be the market value of the equity in the asset at the valuation time - e.g. for housing through mortgages. If the data is not available on the equity at the current time, then the monthly expenditure could be multiplied with the average length of the installments (e.g. mortgage for a house). The developing countries don't have a significant market for mortgages or credit so this problem is less of an issue, but an implication of such a valuation is for an asset such as English or other workplace skills - where the average length of the education/training can provide a running value of the asset (given that the value of English education in the market can be derived).

## 12.6 Limitations to the model

That there is a common ontological basis for status - which we base on scarcity - could be a strong assumption for some. To explain this issue with a paradox, if two groups *A* and *B* just have a bad opinion of each other, then their status inferences would be shaped foremost by their mutual animosity. Such instances are not uncommon in diverse or unstable countries - where the prospect of status promotion through change in personal characteristic or the hope of status mobility through asset acquisition is rather meaningless. No proportion of asset ownership in such cases may change status. However, we have no reason to believe that conspicuous consumption exists in such an environment either. A common market is often a prerequisite for conspicuous consumption - so that the groups *A* and *B* allow the consumption to let identities interchange assets and influence status - while still letting their sectarian identities have a role in status. The possibility of status being observed differently amongst different groups in the model would require a further enhancement.

## 13 Comparing conspicuous consumption in developing and developed economies

A recap of some studies in the survey is presented in the following subsections. This is intended to provide how conclusions from the research may fit into the framework provided by the above model.

### 13.1 South Africa - Income and Expenditure Survey[27]

A study by Kaus([27]) considers a black-dummy and coloured-dummy in regression of visible consumption against demographic, time, permanent income and household characteristics. Starting with no controls(I)<sup>51</sup><sup>52</sup> (with black-dummy and coloured-dummy), the coefficients for coloured and black are negative (i.e. black and coloured social groups spend less on visible consumption than the white population). However, these coefficients flip signs after adding income controls(II)<sup>53</sup>.

The coefficients for black and coloured groups are even higher when expenditure is added(III)<sup>54</sup>. The endogeneity of total expenditure requires instrumentation - Kaus uses instruments suggested by Charles, Roussanov and Hurst - including positive-income-dummy, cube-of-income-level, dummies for under-secondary-education, secondary-education and degree-education. Kaus then performs two 2SLS regressions - one with income controls and total-expenditure as control variables<sup>55</sup> and the other with education-dummies as control variables (while still using instruments)<sup>56</sup>. The instrumentation thus performed (Specification IV in Table 11) results in

<sup>51</sup>`lm(lnvis~black_dummy+coloured_dummy)`

<sup>52</sup> Regressors and instruments in implementation of `ivreg` in R-toolbox AER are specified in a formula with two parts on the right-hand side. The specification - used in this note - can be either of the form `y ~ ex + en | ex + in` or as `y ~ ex + en | . - en + in` (where `ex` is the set of exogenous variables, `en` is the set of endogenous variables and `in` the set of instruments). The latter is the notation used throughout in this section.

<sup>53</sup>`lm(lnvis~black_dummy+coloured_dummy+ lninc)` - where `lninc` is `log(income_household_head)`. Notice that only `log` of income level is found significant when used along side with income-level-cubic and income level.

<sup>54</sup>`lm(lnvis~black_dummy+coloured_dummy+ lninc+lnpinc)` - where `lnpinc` is `log` of total expenditure (which itself is a proxy for permanent income)

<sup>55</sup>`ivreg(lnvis~black_dummy+coloured_dummy+ lninc+ lnpinc | . - lnpinc + cbinc + lsecd + secd + degree)` - where `lsecd`, `secd` and `degree` are education dummies and `cbinc` is income-level-cubic.

<sup>56</sup>`ivreg(lnvis~black_dummy+coloured_dummy+ lnpinc +lsecd | . - lnpinc + cbinc+lninc +incpsv)`



lower coefficients for the black and coloured dummies for both regressions.

When demographic params are added(VI), the coefficients are further lowered (without changing  $R^2$  a lot) - for both types of regressions <sup>57</sup>.

The first-change of sign when income controls are added implies that after accounting for income of household head, the coloured and black groups spend more on visible consumption. Total expenditure is not a perfect proxy of permanent income - which justifies instrumentation. After resolving these endogeneity concerns - with a regression of visible expenditure as dependent variable and total-expenditure as one of the control variables - the signs are revised - although  $R^2$  does not change a lot. Adding demographic controls to the 2SLS regression - shows significance of age, urban/rural area and family size - but coefficients are still not lowered significantly. This confirms that coloured and black social groups spend a rather disproportionate amount on visible consumption. Kaus paper is interested in testing whether the rise in average group income reduces the visible consumption. The regression considers average-incomes of particular provinces for every group (black-/white/coloured). This regression shows the effect more on black-social-group than the white-social-group - a difference that author argues points out alternate ways of signaling for white-social-group relative to black-social-group.

## 13.2 United States - Consumer Expenditure Survey[5]

Charles et al. ([5]) consider a black-dummy and hispanic-dummy in regression of visible consumption against demographic, time, permanent income and household characteristics. The hispanic dummy is inferred by the “horrefl” variable in CEX data - which is recorded side-by-side with the race variable. This means that households/individuals can associate with either white or black while recording their ethnicity. Only about 1489 out of 22980 households surveyed in years 2004, 2009 and 2014, for example, associate with neither white nor black. If that criterion is relaxed (i.e. if anyone reporting the horrefl variable is considered hispanic for the study) the number of Hispanics in the survey almost doubles. Starting with no controls(I) <sup>58</sup> (with

<sup>57</sup>First: `ivreg(lnvis-black_dummy+coloured_dummy+lninc+lnpinc+age+n_members+area_type|. -lnpinc+cbinc+lsecd+secd+degree)` Second: `ivreg(lnvis-black_dummy+coloured_dummy+lnpinc+lsecd+age+n_members+area_type|. -lnpinc+cbinc+lninc+incpsv)` - where `n_members` is the number of members in the household and `area_type` is urban/rural factor

<sup>58</sup>`lm(lnvis-black_dummy+hispanic_dummy)`

black-dummy and hispanic-dummy), the coefficients for coloured and black are negative (i.e. black and hispanic social groups spend less on visible consumption than the white population). These coefficients flip signs after adding income controls(II) <sup>59</sup>.

The authors report problems with the quality of income data in the survey and point out the log-expenditure is a better candidate for the study. Using total expenditure as a control, the coefficients for black and hispanic groups rise significantly(III) <sup>60</sup>. The endogeneity of total expenditure requires instrumentation - these are positive-income-dummy, cube-of-income-level, dummies for under-secondary-education, secondary-education and degree-education. The 2SLS regression is performed with education as instrument variables <sup>61</sup> and then with education-dummies as control variables (while still using instruments) <sup>62</sup>. The instrumentation thus performed (Specification IV in Table 13) results in lower coefficients for the black and hispanic dummies. When demographic params are added(VI), the coefficients lower - however more for the hispanic\_dummy than for the black\_dummy.

<sup>59</sup>`lm(lnvis-black_dummy+coloured_dummy+lninc+incpsv+cbinc)` - where `lninc` is log(income), `incpsv` is dummy for positive income and `cbinc` is income-cubic.

<sup>60</sup>`lm(lnvis-black_dummy+coloured_dummy+lnpinc)` - where `lnpinc` is log of total expenditure (the proxy for permanent income)

<sup>61</sup>`ivreg(lnvis-black_dummy+coloured_dummy+lninc+lnpinc|. -lnpinc+cbinc+lsecd+secd+degree)` - where `lsecd`, `secd` and `degree` are education dummies and `cbinc` is income-level-cubic.

<sup>62</sup>`ivreg(lnvis-black_dummy+coloured_dummy+lnpinc+lsecd|. -lnpinc+cbinc+lninc+incpsv)`

	Controls	Black	Coloured
I	No Controls ( $R^2 = .05$ )	-1.03	-0.91
II	Income Controls ( $R^2 = .26$ )	0.37	0.30
III	Log Expenditure ( $R^2 = 0.41$ )	0.74	0.46
IV	2SLS Regression ( $R^2 = \{0.41, 0.41\}$ )	$\{0.62, 0.71\}$	$\{0.41, 0.43\}$
VI	2SLS Regression with Demographics ( $R^2 = \{0.41, 0.41\}$ )	$\{0.36, 0.47\}$	$\{0.19, 0.24\}$

Table 11: Results from regressing  $\ln(\text{visible\_consumption})$  against respective set of control variables

	Controls	Black	Coloured
I	No Controls ( $R^2 = .07$ )	-0.22	-0.16
II	Income Controls ( $R^2 = 0.09$ )	-0.18	-0.14
III	Log Expenditure ( $R^2 = 0.16$ )	-0.10	-0.10
IV	2SLS Regression ( $R^2 = \{0.14, 0.16\}$ )	$\{-0.15, -0.10\}$	$\{-0.12, -0.10\}$
V	2SLS Regression with year-dummies ( $R^2 = 0.14, 0.16$ )	$\{-0.16, -0.10\}$	$\{-0.13, -0.10\}$
VI	2SLS Regression with Demographics ( $R^2 = \{0.17, 0.17\}$ )	$\{-0.16, -0.12\}$	$\{-0.11, -0.09\}$

Table 12: Results from regressing  $\ln(\text{visible\_consumption})$  against respective set of control variables for years 2005 and 2010

	Controls	Black	Hispanic
I	No Controls ( $R^2 = 1e - 3$ )	-0.133	-0.009
II	Income Controls ( $R^2 = 0.059$ )	0.035	0.13
III	Log Expenditure ( $R^2 = 0.217$ )	0.126	0.131
IV	2SLS Regression ( $R^2 = 0.161$ )	0.258	0.202
VI	2SLS Regression with Time ( $R^2 = 0.158$ )	0.271	0.215
VII	2SLS Regression with Demographics ( $R^2 = 0.157$ )	0.269	0.187

Table 13: Results from regressing  $\ln(\text{visible\_consumption})$  against respective set of control variables

**Part III**

## **A Behavioural Experiment for Status Competitions**

## 14 Status and Consumption as games

Behavioural games have been used in the developing countries to gauge motivations of the participating consumers<sup>63</sup>. While the visibility surveys ([28, 23]) attempt to study how consumption on certain commodities may signal status, the goal of the proposed game is to characterise environments under which the perceptions of a higher-status may develop. The game attempts to emulate i) the consumer market and ii) the mechanism through which status may be assigned within a group of consumers. It therefore relies on participants playing the dual role of a consumer and status-observer.

The activities of purchasing and assigning status are separate in the game. Since a simulated purchase performed by the participants in the game (given a list of commodities, prices and outlay) is quite likely to deviate from their real world purchases and their real needs, the participants are instead asked what additional items they would purchase for a given a basket of commodities that they already possess (using a cumulative voting scheme that emulates selection of commodities in a market - see section 15 for details). The second part of the game emulates status assignment - where participants assign a score of status and effectiveness each to 3 (or more) other participants in the game by looking at the quantities of the item categories possessed and purchased by the latter. The judgment of status in the real world does not involve direct observance of prices and thus it is only the quantity of the identified items consumed or already possessed that matters in the status-assignment part of the game. The end-goal of the game is to purchase a basket most desired by others - the winner achieves this goal by purchasing commodities of her choice that are most desirable by everyone and are indicative of a rank higher than everyone else in the game.

## 15 Purchasing Mechanism

It is difficult for players to conduct a “simulated shopping” in a way that truly represents their needs. Hence, instead of asking the respondent how they’ll spend the given outlay of a 1000 dollars over a set of commodities, they are asked how they would spend the additional 100 dollars for a given 1000 dollars of outlay (or more) value of items that they already have stocked up. The “stock” items can be chosen by the players as a first step in the game and is intended to match their own consumption

<sup>63</sup>A study by Sophie Clot studies the effect high and low effort work on consumption by conducting an experiment at the payment office where some amount of pay is distributed for low-effort work and some for high-effort work.

pattern. While the “stock” is made of non-positional items, the participants choose 3 items from a mix of non-positional items and positional items - given the 10% extra outlay. Since all participants cannot be assumed to be equally numerate, the game uses a scheme similar to cumulative voting - where 10 virtual coins are provided to the participant and the participant is asked to distribute the coins amongst a set of available items (both positional and non-positional). The provided outlay in the game (number of coins) may vary for participants - in proportion to the income distribution that is observed in the relevant consumption surveys (e.g. LSMS for Tanzania).

In summary the following steps are taken in the game:

1. Choose a stock basket that is closest to one’s own consumption pattern (no more than 5 basket classifications are provided to choose from)
2. Acknowledge the real-life constraint (see Section 15.2)
3. Use the given additional outlay (10 or less virtual coins) to purchase and add (positional and well as non-positional items) to the strictly non-positional stock basket that was selected in the step 1<sup>64</sup>
4. Provide a score (1..5) on effectiveness and status to 3 other participants whose total outlay and the choice of items purchased (along with number of coins used for every item) is also known

### 15.1 Mixes in the Consumer Basket

While the basket for every consumer can be varied to model urban/rural differences or the distance /accessibility of the particular commodity classes, the game ensures that all participants have reasonably similar consumer universe. Consequently, no category is intended to be completely removed from the basket (i.e. all baskets have the same set of categories). Following are the categories for which the positional/non-positional variants are sought:

1. Food - Fruits, Meat, Baked Goods or Nuts/Cereals and Pulses, Milk (minor items such as salt and spices are not included), Tea, Soda/ Beer and Wine
2. Household products (Detergent, Electronics)
3. Personal Products (Clothes, Shoes, Makeup)

<sup>64</sup>It is necessary to estimate the price of products and services for the purchasing game to emulate the market.

4. Household services (House refurbishments) and Energy (electricity/kerosene)
5. Savings for future Asset purchase
6. Entertainment/Dining Out/Travel/Travel Abroad
7. Health
8. Education (School/University)

## 15.2 Constraints and Assets

The game attempts to measure status and consumption with respect to high asset ownership, social class or familial responsibility. Since players choose between physical needs and positional needs in the game, a different circumstance is likely to affect their choice and hence their perceived status. The game presents a precondition to the player - indicating high asset ownership, a chosen social class or a familial liability. For example, to test a participant's choice between food and electricity, the game can present a large family as a constraint, and record the choice between spending more on food vs installing electricity. The game thus measures indirect effects of reward or constraints on status by allowing participants to gauge the suitability of a participant's choice in the status game in the presence of constraints (familial) or rewards (asset-related).

Notice that the constraint variable is only planned to be binary in the current scheme i.e. it is either a reward or a liability (when present). The two values are expected to have an opposite affect on the purchase of new items. Admittedly, the binary values of constraints vs rewards circumvent the difficulty in comparisons between disparate needs of the consumers - e.g. a large family, senior member or a social event (e.g. marriage/funeral). While a multi-valued variable (if adopted) can potentially provide better insights into the relative effects of these several types constraints, the goal of the current exercise is to test for a direct effect of constraints on status (rather than relative effect of the various possible constraints).

## 16 Status ranking

The status-ranking activity involves a student assigning a status score by looking at i) what the other participant with a given income level does with the extra outlay and ii) what the participant already possesses. In the ranking scheme, the participants provide a score on effectiveness as well as status to all the other (3 or more) participants observed. Notice that in presence of constraints specified in section 15.2, regardless of whether

one is selfish or not, a participant would tend to penalise someone else who she thinks is going to be more selfish than herself. Since the game provides a way to penalize selfishness by status ranks, the participants are discouraged from indicating status through overspending on positional items. The penalty for not caring for a sick parent may be huge in the society but so can be the penalty for being stingy. Similarly, while some may want to indicate wealth by buying a watch they may also fear disrespect for not taking care of a sick family member. The scores on effectiveness and status are thus not only a way to discourage the consumer from limiting the unrealistic purchases in the simulated purchasing part of the game, they also track the effect of the externalities such as sickness or age (measured through the binary variable discussed in section 15.2).

While consumers try to maximise their utility by purchasing more items for a given limited outlay - they also manage their prestige by letting others have a better opinion of themselves. The status game can thus be seen as an enhanced version of the survey that asks people to imagine a neighbour who spends more than them on a chosen commodity (used in [28, 23]). The proposed game attempts to measure how consumers might act given a certain circumstances while both status and welfare (effectiveness score can be seen as a proxy of concern for others) become part of the payoff function in the game.

## 17 Welfare and Status competitions

The solution of this game for a set of rational players remains a pending exercise in this study. The key motivation for the analysis at this point is that fundamentally all social welfare concerns are concerns of Pareto optimality. Moreover, the payoff function for effectiveness in the game is meant to be a proxy for welfare.

With Pareto optimality in mind, more spending on education, health seems desirable - but it may become distant for consumers due to their immediate needs - whether positional or non-positional. A comparison with what is observed in consumption data versus what is observed about positional consumption in games can provide some insight into the social status that can influence the desired welfare equilibrium.

## 18 Survey Questionnaire

You have 10,000 (or 100) to spend today. What are the objects that you would purchase if you were to enter the market today? Please take a look at the constraints that might affect your consumption. Try choosing the smartest way possible - the prices. You would also need to compare 2 other candidates as part of this game (as others would rate you). Try being close to your real cir-

cumstances. Unrealistic values may disqualify you from the game.

## 19 Policy implications

The discussion so far leans towards permitting status competitions rather than attempting to tax or control them. This is in line with the suggestions offered by Robert H Frank [15] favouring a non-monetary market of statuses only so that status games (which are a necessity) do not overlap with the market for real goods. Due to structural reasons of the modern economy, advertising efforts can turn a social scarcity into a physical scarcity (to use the Hirsch's terminology[24]). A profit-driven industry and the advertising pursued by the companies tend to increase the status competition for a commodity. Instead of letting status competitions modify the distribution of that physical goods through competition (and thus do little to avoid the problem of physical scarcities in the developing countries), policy can attempt to provide status-games in a world of non-necessity items - in some ways to diffuse the status competitions in the society.

In poor and non-pecuniary societies, the desire to become rich or the benefit of inheriting money and education is often less reachable. Status and money translate into social securities in unstructured societies. These may well be detected in the countries in Africa - but limited data on household characteristics in Tanzania (related to ethnicity or religion) have prevented us from such an analysis for Tanzania.

The question that we seek the answer for in the context of Tanzania (or another developing country) is whether the expenditure on high-status or scarce items (an analysis similar to one conducted by Prais Houthakker for expensive and cheap tea varieties amongst social classes in the UK[34]) - is actually more desirable than on housing and education. The designed experiment intends to find answer to this question. If the answer is indeed the former, then it makes sense to limit the status competitions through policy to support status competitions on non-essential items (possibly by introducing brand differentiation). Attaching glamour to education, health-care and food items may help consumers prioritize their needs.

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