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 [1] - 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 [2]).

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 ([23, 14]). 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 addressed 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

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[1] "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."([39]

[2] "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".[39]

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 ([14]) 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 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 [22, 24])

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 ([39]). It encompasses not just goods available for purchase in the market
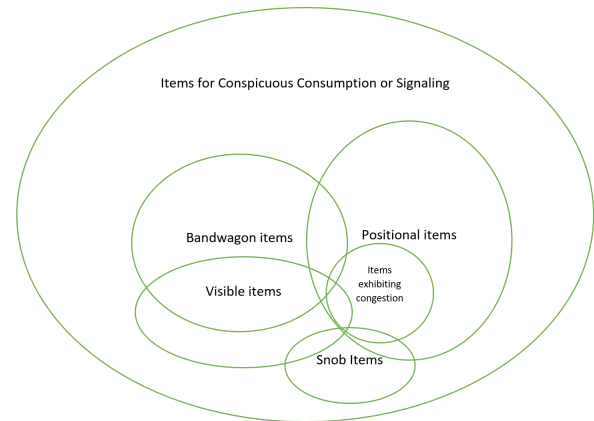
Figure 1: Terms associated with conspicuous consumption (drawn not to scale)

(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[3]. 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.

2 Status consumption - a literature survey

2.1 Status Competitions and Consumption

Both Fred Hirsch and Joseph Schumpeter - whose works are frequently referred to in the study - had viewed industrial revolution as a legacy of

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[3]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 [17]).

liberal capitalism - a race amongst the middle classes to achieve the higher social positions once held by the feudal elite[23, 36]. Focusing primarily on the post-war developments in the Western society, Frederich Hirsch argued that the human needs have expanded manifolds since the time when Adam Smith's invisible hand was known to work [23, 16]. 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[4].

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 semantic 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. In this view, the difference between scarcity of an item and competitions for the item is no longer trivial.

Measuring and empirically verifying the cultural trends identified by both Hirsch and Veblen is far from trivial. Even if we were provided the 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 and the influences social groups have on each other. The perceptions of quantities like status are not directly measurable - and our understanding of the

psychological motivations still basic. Operating in a more controlled environment, behavioural sciences often create contexts where subjects can choose amongst well-defined options. While it is difficult to scale up results from such smaller, often artificial, environments to higher levels of organisation in the society, such experiments remain an important tool to identify factors that have a clear impact on human motivations for consumption.

Inspired by this possibility, we aim to test for presence of status competitions in empirical data on consumption - instead of attempting to comment on wide-ranging cultural trends. 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([14]). The empirical examples to support for this argument are abound. Exploring incomes amongst professors competing for grants - for example - Frank[14] 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[5].

As mentioned before, while instances of status competitions can be verified easily in a small environment, asserting the presence of larger socio-cultural concepts like commercialisation([23]) isn't easy to justify. The current study does not attempt to relate status competitions - which operate at finer levels in society (particularly in the institutions of family and similar social networks) - to wider cultural trends. Instead, the focus remains in measuring status competitions in the context of consumption.

Despite wide disparities in the cultural and historical contexts between the developed and the developing world, many studies have discovered the presence of status competitions[26, 25, 27] in the latter. 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

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[4]

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[37, 36].

[5]

The argument that Frank presents is in fact stronger. He argues that attributes such as workplace safety get deprioritised because of status maximization goals[14].
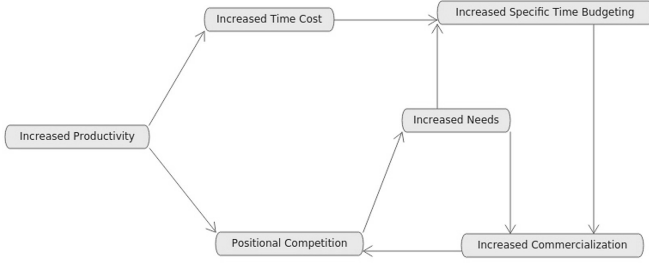
Figure 2: Hirsch's model for positional competition

competitions is still relevant (and in agreement with Veblen's claims). Conspicuous consumption is a side-effect of rising incomes and preliminary model which - as we outline - considers both the expected and current rise in income a driver of conspicuous consumption[6]. While the recent processes of industrialisation may have changed the environment of consumption significantly, it remains to be seen if the recent trends of "commercialisation" ([23]) in the developing world would bear similarities with the changes in the post-war Europe.

With the context of conspicuous consumption narrowed to status competitions, we find a wealth of literature that finds status competitions to have an effect on consumption (see Section 2.4). Hirsch's ideas of scarcity and congestion are indeed relevant in the developing countries (scarcity being the lack of supply or unavailability of a particular commodity while congestion being the changes in income levels within social groups). The goal of conspicuous consumption in a developing economy - as much as anywhere else - is to allow a given population of individuals to associate themselves to those with perceived higher status (due to direct income or otherwise) in society.

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 growing 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 erstwhile lower classes emulated higher social classes with newly acquired economic freedoms[38]. 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[7] 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[8]. The political landscape of many Asian and African economies is dominated by the effects of decolonization in the late last century - a process that encompasses the loosely similar post-war political voices in Asia and Africa aspiring to establish nation-states. 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.

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

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[6]We note that Hirsch's "scarcity through overuse" (which is emphasized as the engine of social scarcity in the modern Western society) is less relevant in the developing world where there simply aren't enough items to be consumed (a case of physical scarcity - using Hirsch's terminology).

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[7]

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")[23].

[8]

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.

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 problem of measuring status perceptions in a society, therefore, we limit ourselves to the characteristics that may represent status in a society.

In the context of status competitions, we wish to explore the possibility that the overcrowding and competition for industrial goods may have allowed the status competitions to continue in the hastily developing urban settings - instead of the earlier tribal or local settings [28]. 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[41].

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 [30]. 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[30].

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 Nyerere. 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 Nyerere. 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[29].

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)[29]. 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[35]. 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[21]. 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[21]. 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[34].

2.3 Status and Consumption in the Developing world

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[40]. 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 spending 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.

In the developed world, 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[9]. In the developing world, on the other hand, the basic needs for the masses have still not been addressed. One could expect the exchange between rich and poor to draw the masses out of poverty - but we argue that there are limits to how much success can be achieved in the developing countries - the essential goods often lack robust markets 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. More so in the context of conspicuous consumption than elsewhere, an commodity 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 other words, the limitations of status competitions matter in the developing world because the institutions in these countries are generally weak and have developed on the path to achieving goals of nationalism. The developing countries often face the problem of institutions just not being strong enough to allow the exchange between the rich and the poor to thrive. In the new urban settings in Africa, both tribal identities and the hierarchies formed through education, money or industrial

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[9]In other words, the price of luxuries has exceeded the opportunity cost to the rest of the society [23].

assets can contribute to status competitions. While this development can encourage institutions of money and education[10], 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.[11]). 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 [13][30] and the complicated changes in identities themselves (which are homogenising with the expansion of internal trade[12]).

We only consider district level residence and primary spoken language as the demographic factors that may affect status consumption. Amongst all the factors that one may find relevant for status in a society, we find wealth, ownership of assets and the degree of crowding towards new items (loosely determining the barriers to status) of key importance.

2.3.1 Wealth and Assets

Assets and the barriers to acquiring them are the long term determinants of status. Any item that is owned on a permanent basis (rented or borrowed items are not considered assets, but gifted or inherited items are) indicates a sense of security of position both to oneself and to the social network around oneself.

2.3.2 Social or regional identity

While the buyer of an item indicates her status to the immediate local surroundings through her consumption, the items she ends up buying depend on more than just her preferences - since there can be wide disparities in the environments where consumers in a population reside. If the items available to the consumers in different regions within an economy are disparate, then it is no longer trivial to identify items relevant for status and infer demographic unevenness in the purchase of status items.

Let's take example of the availability of electricity in Tanzania. If only the rich could afford electricity, then it being used by a smaller and richer part of the population may seem to have less significance than weddings - which are ubiquitous in the population (a regression with quantities consumed as dependent variable would bear more significance for items consumed by more consumers). One may be tempted to argue that items consumed by more people carry more significance for status than the item that is hardly accessible to the wider population, but status in a society is driven by both the supply of the item and the ability of the individual to purchase the item (disposable income). The interplay of supply, wealth and assets determine status in a society and thus belonging to a region or a social network where an asset is available asymmetrically, would also drive status.

2.3.3 Overcrowding

While supply and wealth influence the long-term development of status, the introduction of new industrial goods can create demands and distort the distribution of resources (through industrial development, migrations etc.) in the short-run. With the introduction of a new status item e.g. a new electronic product, there is a tendency amongst the consumers to flock towards the item. The demand for certain status items is enhanced by the popularity of the item itself. Enhanced by the advertising effects, such items often create a market of their own. This so-called "bandwagon" effect is essential to indicating one's social standing (see Corneo et al. [7])[13].

Not all status goods need to exhibit flocking of consumers. If the item has been restricted to the

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[10]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.

[11]The LSMS data is available to enumeration-area levels in the crowded regions (which are over-represented in the samples).

[12]

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.

[13]

Empirically, the change of the budget share (or elasticities) of the item over a time-period with respect to lagged consumption, income and supply can indicate how such a bandwagon-effect develops. 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).

richer section of the society for a long time, then increase in abundance of the item can actually cause disinterest in that item. These are considered the snob items in literature[14]. 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.

The demand for industrial goods is particularly relevant in the sub-Saharan African context. 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 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 and hence the expansion of informal economy has continued with the migration to urban areas increasing significantly over the last decades. The interaction between urban and rural regions is of significance to any study of consumption in the sub-Saharan Africa.

Often viewed as a necessary phase of development, urban migration leads to the competition between industrial and agricultural sectors for labour and food (see Lewis[20] model - which expects the prices of food to rise as labour moves from agriculture to industry). In our view, the flight to urban areas is not merely an escape from despondent circumstances but also the access to an expanded consumption basket and a chance for improbable social mobilities. The introduction of industrial goods and the status needs of the consumers is therefore relevant to the trend of urban migration in sub-Saharan Africa. The observation that the indigenes have recently displaced non-indigenes or the more educated have replaced the less educated in conventional occupations in many sub-Saharan African countries for example, may very well have a detectable impact on status consumption.

While the data on social identity was not available for this study, we have used population density to proxy some of the effects of migration. We observe that the population density bears significance with consumption of items relevant for status. 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 ([14]) 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[14]. In the data we used from LSMS for Tanzania, however, the lack of availability of similar products in the rural areas tends to dominate the effect of population density.

2.4 Studies on visible consumption

The presence of conspicuous consumption in developing countries has been a recent topic of interest ([27],[25]). 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)[15]. The visibility index computed from survey responses was found to have a significant predictive power for total expenditure elasticity[16]. Robustness tests (regressions for different quantiles and across

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[14]Hirsch's argument for "overuse" being a criterion for signaling items - i.e. the decline in signaling qualities of an item when the consumers use it too much - essentially points to the existence of snob items.

[15]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?" [22]. 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.

[16]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 the model provided by Ireland et al ([24]). 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 $e_v = \frac{d\hat{v}}{dy} \cdot \frac{y}{v} = a((1+\beta)\frac{v}{y} - \beta)^{-1}$.

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[22] . Many studies have relied on the basket defined by Charles et al[17][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)[32]. 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[15]. 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[26] (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[18]. 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 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[18]. 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[25] (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

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[17]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].

[18]Khamis et al[27] 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.

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).

2.5 Scarcity as the context of visible consumption

Heffetz finds that the degree to which people notice items improves the explanatory power for (permanent) income elasticities. This observation has provided the basis for inspection of visible consumption in many studies thereforth. For the literature that considers the developing world, we believe that severe inequalities make visible consumption less relevant. This is because the items available to higher status individuals may never be accessible to lower status individuals in such societies with severe inequalities. Further - as noted by much of the literature - the significant social differences between groups might cause the individuals with perceived higher status to notice items differently from how the lower status individuals notice them.

A lot of interest has thus also been generated in identifying the social factors that are relevant for the difference in visible preferences. 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 mundane and seemingly unvaried expenditures (lesser number of status items) are 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 [27] 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 expectation of how others infer the increases in total expenditure (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 a developing economy, the criterion for status consumption is clearly not just noticeability any more. Visible consumption does detail the mechanics of status competitions in a narrower 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 why other factors dominate is that markets are underdeveloped in the developing world and social status is largely yielded through sever-income differences 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[39]).

An interpretation of visibility as status consumption 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 (see Corneo et al. [7]). The separability criterion unfortunately is not observed in all the literature around conspicuous consumption. While it may be convincing to argue that watches and makeup products don't serve any utility other than status, it is very difficult to argue that housing or shoes offer only status benefits. If the assumption of conspicuous goods being completely futile (from a utilitarian perspective) is relieved, then combining the consumption on identified visible goods as conspicuous consumption (as has been done in some of the literature) is problematic.

We adopt the view that consumers don't buy an item purely for status needs - more so when the item is a bandwagon item such as a car or an electronics item. Inspired by Hirsch's idea of scarcity[23], we argue that status and scarcity of items must go hand in hand. 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 how reasons such as unavailability of items and disparities of services across regions influence the needs of consumers and thus consumption.

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 - our contention is only that the relevance of economic differences in status consumption should not be ignored in a study on conspicuous consumption.

While we have expressed scarcity as a key idea in the explanations so far, we must admit that the idea does lend itself to some confusion as it encompasses both a so-called physical scarcity (unavailability) and the perceived scarcity (what we feel as scarce). A consumer may feel that the item is scarce because she cannot afford it or because the supply of the item is limited through some other mechanism (i.e. barriers exist in the distribution of the item). While such felt scarcities appear relevant for consumption, we consider them relevant only as long as they arise out of a relevant physical scarcity. Instead of attempting to define or measure felt scarcities themselves (as is done in a special survey), we expand the notion of the physical scarcity to include barriers created through status competitions, advertising or other social-psychological communication that create the sense of urgent demand for a status-carrying good.

The methods to quantify the barriers to status - artificial or social - are viewed as a probabilistic concern in a time-series model and are discussed in a later part of 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)[19].

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[19]An extended social-means model is used by Gierl et al. to measure snob and bandwagon experients through experiments [19].

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 insuranceools 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[26]	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[15]	Regression with demograpic 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[27]	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[32]	Regression with demograpic and time controls	US CEX (expenditure survey)	Clothing (including shoes) from the US CEX categories (Table 1)
Heffetz[22]	Visibility Elasticities estimated through weighted/kernel regression with a Visibility Index (Vindex)	Vindex (surveyed), US CEX (expenditure survey)	Survery of visibility of commodities (See Table 1)
Jaikumar, Sarin[25]	2SLS with Gini-Index as control variable and household assets as instrument for permanent income control (total expenditure)[20]	2005 Indian Human Development Survey (IHDS)[21]	Basket identified by Khamis et al

Table 2: Criteria of Conspicuous Consumption in surveyed literature

3 Status and asset ownership - A simple model

How societies perceive differences in status amongst themselves is difficult to standardize across multiple geographies. As our best effort to stay generic, we claim that status comprises of i) possessions (assets and consumption) and ii) the barriers to possessions. These status determinants enhance status as consumers expend more or buy 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 - to the extent that possessions may translate as status only through barriers (items may exist that have no other value except through barriers which 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 to overcome the "barriers" to status (thus changing them).

The model provided by Coreno et al [7] is instructive in this regard. It 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 consumption (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, if conspicuous consumption does exist in a society, one can claim that the rank of expenditure on expendable items (or utility) and assets rank (or utility) must differ for the consumers in medium quantiles. This verification may serve as the test of conspicuous consumption (the inference is equivalent to one that can be drawn from the permanent income elasticity of consumption of a certain item within different quantiles of a population).

The final ranking of status can be seen as a combination of ranking of expenses on non-durable items and asset ownership rankings. Notice that unlike in the Ireland and Corneo models, we assume that all consumption items can impart status. Thus instead of agreeing on a crisp boundary between conspicuous and non-conspicuous items, we attempt to develop a criterion to sort the items in terms of their status impact (thus arriving at the utility that

a consumer may derive).

A claim that we intend to test later 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 on a time-series can test whether the purchases of status items is different across income quantiles of the society over time (this would be explored in the the later chapters of this study).

3.1 Status utility

To arrive at a status utility function one can either split the consumer basket into positional (status) and non-positional (non-status) items (as is done in most of empirical work) or assign a status-utility to every commodity in the basket. For reasons discussed in the sections 2.5and 3, we choose the latter option.

A consequence of assigning status potential to all items in the model is that the status utility can no longer be viewed as separable overall from the non-status part of utility (there are no purely status goods any more). In this preliminary model, which we use for our empirical work, the consumer utility is considered separable across functional groups such as food, energy, entertainment etc. in the usual sense - and the status items are chosen by the consumer within each category instead of as a separate category. This can be viewed as a two-state budgeting model for the separable functional groups - wherein the representative consumer first allocates money to be spent for the different functional categories (food, energy, etc.) before deciding on status items within each category (in food, energy, entertainment etc.).

We view snob and bandwagon items as not simply the two types of items that exist in the the market for a consumer but rather as two opposing mechanisms a consumer uses to indicate her status. If we could rank all consumers in a population based on their status, then an arbitrarily chosen consumer would like to choose a snob item to protect her position in the ranking and use a bandwagon item to promote herself in the ranking. For a representative consumer, the goal of protecting one's rank with a snob item is achieved by choosing the higher priced items in a category and the goal of advancing one's rank is achieved by acquiring an item that associates oneself to someone who has a

higher rank. We interpret the latter effect as the tendency to choose non-durable expenditure for an asset that is not affordable - hence the bandwagon sense of the choice.

As we decompose status utility into several functional categories, we also need to detail how choices for status in every functional category combine into the final status utility. In the long-run, we argue that the representative consumer develops a preference order of functional groups - food may become less important than housing and personal products etc. (as is indeed observed by the literature on visible consumption). At any given time, therefore, the representative consumer allocates her expenditure based on this preference of categories. The final status utility is aggregated over all the separable categories. For example, a consumer could acquire status by decorating his house or buying expensive cigars. Both housing and entertainment provide utility in the usual sense but paintings and cigars enhance status by letting the consumer derive status sub-utility from both housing and entertainment. The aggregation of sub-utilities in the categories is assumed to be linear - so that the total status utility is a weighted sum of status derived from every category.

The weights of the sum are simply the respective preference of categories developed over the long-term through experience and supply of items and assets. In other words, there is an *apriori* knowledge of status-carrying potential for every category. This weighted sum of utility over categories is where the model overlaps with the idea of visible consumption described in the literature). However, within every category (food, housing, entertainment etc.), visibility has no consequence towards status. A representative consumer selects w_i to maximise combined utility (status + non-status utility) category for a given $x = \sum p_i q_i$ (or equivalently, minimises cost for a given u) in the category so that the status utility is a function of a status-enhancing factor apart from the quantities consumed. In other words, a consumer chooses status power of a good (the enhancing factor) just the way she chooses quantities of the good in every category.

The factor can be seen as part of a two-stage budgeting model - where the first stage is one where consumers allocate income to wider separable categories (food, energy, entertainment etc.) that include status utilities. The consumers never allocate income to a status good per se - but they rather decide the weights of status utility they want to derive from every category. In the second phase, the consumers decide which items within every category may provide them a higher status. For items where there is a way to distinguish oneself through the purchase of a high-price durable item i.e. price differentiation [22]exists, the consumer purchases the high-priced item for status in accordance with the first-phase allocation. When there is no price-differentiation in the category, the relative positioning is enhanced only through pecuniary emulation i.e. through purchase of items that may compensate for not having a related asset. The two tendencies are a direct consequence of our model for status.

To explain the utility from such an allocation with an example, let's consider energy, food and entertainment as the only three categories which all consumers derive utility from. In a model without status, the non-status utility u_{ns} is written as

$$u_{ns} = f(g(x_{energy}, p_{energy}), g(x_{food}, p_{food}),$$
$$g(x_{entertainment}, p_{entertainment}))$$

Here, $x_{c \in \mathscr{C}}$ is the expenditure in the category $c \in \mathscr{C}$ ($\mathscr{C}$ being the set of all categories e.g. {energy,food, entertainment}) and g is the Marshallian demand function. Now if higher priced items are available only for food and energy while entertainment category has no variants of different price, then the status utility would be

$$u_s = f(g(x_{energy}, \lambda_{energy}, p_{energy}), g(x_{food}, \lambda_{food}, p_{food}),$$
$$g(x_{entertainment}, \zeta_{entertainment}, p_{entertainment}))$$

Here, $\lambda_{energy}, \lambda_{food}$ are utility enhancing (status) factors for energy and food options respectively (which are determined by the high-priced items purchased by the consumer) and $\zeta_{entertainment}$ is the status enhancing factor that measures the expenditure relative to the asset ownership. $\lambda_{c \in \mathscr{C}}$ merely represents the purchase of the high-price item in the category and $\zeta_{c \in \mathscr{C}}$ represents a consumer compensating for lack of a relevant asset through durable expenditure on related items. $\zeta_{c \in \mathscr{C}}$ is therefore inversely proportional to the assets she owned. This is because there are diminishing returns to status expenditure through pecuniary emulation with regards to the relevant assets one acquires. Thus for example, if a consumer buys music then $\zeta_{entertainment}$ in a population may be

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[22]An implicit assumption is that if two items with differences in their status carrying ability are available in the market, then their prices would be different.

proportional to $\frac{q_{c\in\mathscr{C}}}{A_{\{piano,musicsystem\}}}$ i.e. having had a piano or a music-system diminishes the utility derived from purchase of music[23].

Status in this model is thus influenced predominantly by the price differences (which change λ) and asset distribution (which change ζ). The effects of changes in prices, introduction of new items and visibility preferences orders are second-order factors that affect λ, ζ. The following discussion details these factors.

3.1.1 Effect of Price differences

Price differentiation in the market matters for the way a consumer sets herself apart from others through selection of higher-priced items. The more the price differentiation exists within a functional category, higher is the likelihood for the consumers to indicate status through purchase of higher priced item. If markets of items are perfect and differences in status as well as prices exist in an economy, then it is certain that those with higher purchasing power would attempt to maintain their status with the purchase of higher priced items. Wherever available, price serves as an indicator of whether an item can exhibit any status or not. The lack of detailed price information in a survey (and/or unsuitability of using prices inferred from cost-quantity due to severe measurement errors [24]) does present severe limitations to this measure - but one can inspect the distribution of usage of expensive options for a category of items to understand the how much status the representative consumer may derive with the choice for expensive items in a category.

Given our earlier discussion on scarcity, we must clarify that rareness alone does not contribute much in determining status. For example, maternity

products or musical instruments would always be limited to a certain section of the population - they become a status product *only* if there are low-price substitutes that exist for them. Therefore, an item's low distribution counts towards status only as long as it can be viewed as superior to other substitutes (through price if the markets exist for the category).

Notice also that participation of consumers in the same market is key in the view of the status advantage through 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). When comparing two consumers in different areas M and N where a commodity is both available and consumed in M (but not in N), the status impact of M should adjust the utility enhancing factor (through a Heckmann selection or otherwise).

The issue of availability is particularly relevant in the developing countries since the rural areas are faced with unavailability of services and goods that are available (although limited) in the urban areas[25]. 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).

3.1.2 Effect of Asset distribution

Other than projecting their status through higher priced items, the consumers also wish to associate themselves to those who they perceive to have a higher status. Acquiring long-term assets are the

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[23]These claims are extremely sensitive to categorisation of items and asset - one may not treat the cheaper electronic assets and expensive assets such as housing or cars the same way.

[24]In absence of observed prices p_1, p_2, one can instead estimate prices as e_A/q_A and e_B/q_B. However, one cannot rely on total quantity (q) consumed of an item or the expenditure ($e = q \cdot p$) on the item alone as a metric of status-carrying-potential since it obfuscates the sense of status consumption. If for example, 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. 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 $p_1 \cdot q_A < p_2 \cdot q_B$ s(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.

[25]

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

surest way to ascertain one's status in society[26]. For others to associate with such asset owners, the consumers are likely to own what they may fit within their budget. 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 the 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 that through owning a less expensive house by simply renting the item instead. 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-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.

Due to above tendency of the consumer, the status utility from monthly expenditure and that from owning assets are not independent of one another. There would always exist items for monthly consumption that are either closely related or are substitutes of the corresponding owned assets. The status utility from electricity in a developing country, for example, would be achieved not only by having access to electricity but also (and more so) by running other appliances that depend on electricity. More expenditure on electricity itself doesn't derive any status - which is instead derived by usage of owned or rented assets that use electricity. The status utility (or ranking) from monthly expenditure therefore depends very much on the related assets in such a case. In case of mortgages, as another example, the boundary between asset ownership and monthly expenditure itself isn't very clear. The status utility from assets and consumption are therefore deemed not separable in our model of status utility i.e. assets and monthly non-durable expenditures simultaneously contribute to status.

Notice that the consumption of a lot of status items is 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. In reality, when the consumers in an area don't have access to electricity, they lose collectively in the status hierarchy simply by being residents of the region. In such a case, it's there is simply no opportunity to overspend on electricity to emulate those who have electricity. Thus a whole category (of energy in this case) may be ignored for the purpose of status consumption in such cases.

3.1.3 Effect of Visibility

The assumption that a consumer establishes the preference of categories for status consumption over a longer period of time (i.e. she doesn't decide to overspend on food if she couldn't find a status item in housing for example) is aligned with the literature on visible consumption [22] - which notices consumers' significant response to visible category of items. Further, the way we incorporate visible categories in our model does not suffer with measurement errors for a visibility index (used by Heffetz[22] and Khamis et al. [27]). This is simply because we are not concerned with whether items within a functional group are more or less visible with respect to each other (e.g. shampoo vs body-oil). In other words, an order of functional categories (food,energy, housing etc.) implies that clothes are more visible as opposed to an investment policy - but a more specific order of visibility within a category - e.g. whether shampoo is more visible than body-oil is rather meaningless in the current model.

3.2 Effect of price changes over time and introduction of new items

While not used within the empirical work in this part of the study, the effect of the emergence of new commodities on the tendencies to purchase high-price items and to compensate with non-durable expenditure is worth commenting on. A new commodity that is not traditionally guarded by social networks can change old barriers to status - particularly when deeper economic changes take place. Electronic goods, cars, education or media may fall under this category. 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

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[26]The definition of asset is driven by consumer's intent of permanent ownership.

an existing item category[27]. The equilibrium price of the items would be one where lower income individuals are priced out of an item whose selling price can no longer be lowered further with innovation.

To outline a simple model for how prices may respond to status differences, remember 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 $i_1 > i_2 > ... > i_n$. All n clusters that observe 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[28]. 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 ownership identities. The consumption of a status item either improves or protects the status position of the consumer. The two rather opposing behaviours of the status item are indeed the two tendencies of high-price selection and pecuniary emulation in the model. 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 $i_1 > i_2 > ... > i_n$ as well as the consumption on the status item.

It is worth emphasising that both the tendencies of high-price selection and pecuniary emulation are necessary for the status model - particularly for an equilibrium to exist once a new product is launched.

To illustrate this, consider a population high, middle, low classes and two variants of an item being sold at prices 10,20 - which are accessible to high, middle (but not low) classes. If a new commodity is introduced at price 15, then only the high class has access to it. As such, this would result in a stronger status advantage to the high class - unless the middle class switches to item at price 15 or a new commodity in the same category is introduced at the same price. This is essentially how new products shape the status utilities. Further, if the market is flooded with cheaper substitute of price 5 then all classes would have access to the item and the commodity would no longer offer any status advantage. Even though the consumption of the commodity may momentarily increase for the new item at price 5, there is no status advantage in the long-run.

With this outline of a model, our assumption of the market being able to fairly price the status 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 using our model that the old status hierarchies can stay the same if status goods are only produced to limit price differences within a class or a group - thus explaining the commonly observed phenomenon that luxury products don't always benefit from reaching out to a wider audience.

4 Empirical Methodology

4.1 A preliminary budget share analysis

The Engel curve formulation is often the first step in an understanding of items expenditure in the cross-section of a population. A preliminary analysis is presented here only to motivate the discussion on measurement of status consumption in cross-sectional data. To view "elite" consumption, we can choose the portion x_θ of total expenditure x so that an expensive product is identified as one with $e_i/q_i > \gamma x_\theta$ (γ being the threshold proportion of total expenditure , q_i being the quantity

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[27]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). In a static cross-sectional model, however, we assume the price to already have arrived at this equilibrium.

[28]The probability of each of these n cases can be empirically calibrated while considering the club-building power of the status item.

consumed and e_i the expenditure on the item). For example, if we want to consider any item that costs more than half of the total expenditure of 80% of a population, we set x_θ to be the 80% quantile of the total expenditures in the population and $\gamma = 0.5$. This provide us the items that are more expensive for most people (the average quantity $p_i q_i / \sum p_j q_j$ i.e. the average budget ratio of all items would provide same measure). Items thus identified are not necessarily status items - but interesting solely as being the less affordable items that one may consider as those carrying some status.

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 θ) percentile of the consumption of the commodity is ignored. Ignoring the bottom θ percentile of the consumption of a visible commodity is equivalent to treating the bottom θ 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 θ (starting with the lowest percentile θ 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 (θ) provides a 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).

A quantile regression of consumption of a particular item's budget ration i.e. the following

equation ran across different quantiles can give us similar insights into the disparity in the item's consumption and an idea of what may be driving status in an economy.

$$w_i = \beta_1 log(x) + \beta_z z + \beta_p \sum_j log(p_j) + \epsilon \quad (2)$$

(where w_i is the budget ratio, x is the total expenditure, p is the price vector, z is the vector of household characteristics, P is a true-cost of living index).

In the data from Tanzania, the descriptive statistics shows that while the top 56% of consumers having 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 causes disparity in consumption.

Applying the same analysis to the Consumer Expenditure Survey (CEX) data from the US in years 2004,2010 and 2014, one can see slight differences in how the consumption profile of scarce products (jewelry) differs from that of cheaper products (fruits). See how the fitted slope in Figure 8 is slightly steeper than those in other plots. The disparity of consumption observed in such a way is a first step in understanding how certain items may develop into status items due to their distribution into a population.
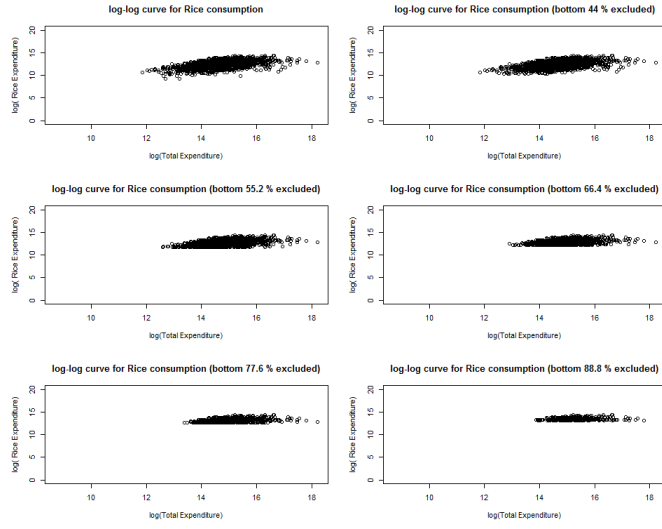
Figure 3: LSMS Tanzanian 2010: Percentiles of nonzero consumption of rice
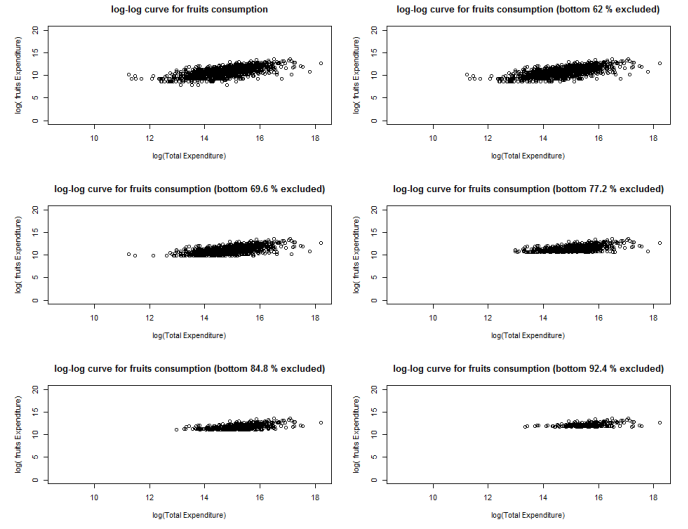

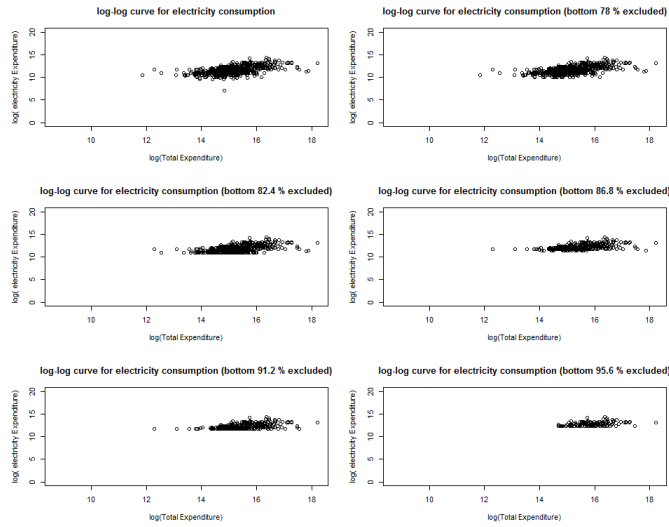Figure 5: LSMS Tanzanian 2010: Percentiles of nonzero consumption of fruits

Figure 4: LSMS Tanzanian 2010: Percentiles of nonzero consumption of electricity
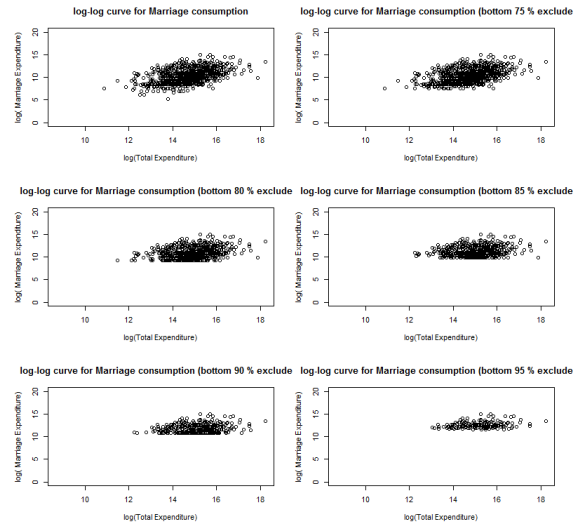
Figure 6: LSMS Tanzanian 2010: Percentiles of nonzero expenditure on marriage
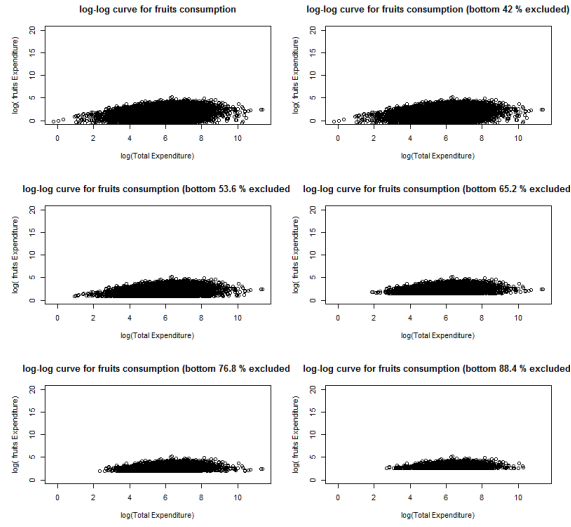
Figure 7: US CEX (2004,2010,2014): Percentiles of non-zero consumption of fruits
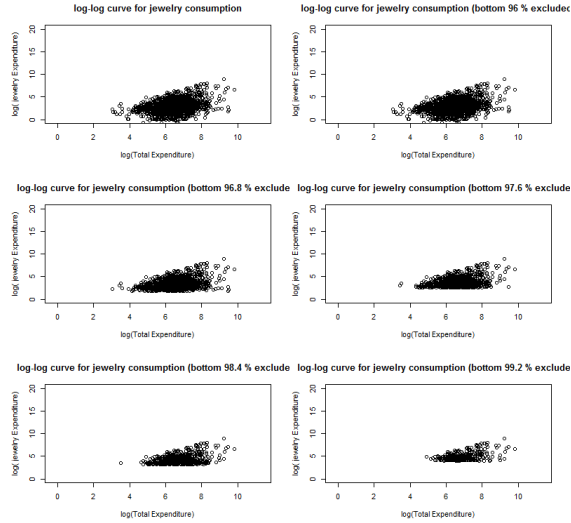
Figure 8: US CEX (2004,2010,2014): Percentiles of non-zero consumption of jewelry

4.2 Econometric methods for the asset based model

The assumption of separability of utility into categories energy, food, personal care, social functions and land-ownership allows us to view status utility within every category - allowing our representative consumer to choose the weight on a status-vector within every category. As argued earlier, visibility does not matter at a level finer than the broad consumption categories of food,

energy, transport, personal care, social functions and housing in this model. Therefore, while a consumer may find food consumption less visible overall than energy, we don't recognise a difference in visibility between mangoes and spam as relevant in the two-state budgeting status utility model for the consumer. Instead, the differences in price and in perceived quality-of-life (signaled through consumption) between any two options within the category are what motivate the consumer (not the sense of visibility). These factors are measured with the price differences within the items in a category and the substitution between consumption and assets for similar needs. The Table 3 details this view of status consumption[29]. As shown in the table, visibility has no role to play other than the weight consumers collectively put on the widely defined categories of food, energy, personal care, social functions, transport and housing. The consumers differentiate themselves from others in their social surrounding by buying more newer, higher priced items as well as overspending on consumption categories that help them remain in the asset ownership club. Notice also that a category is either implied to exhibit price differentiation or pecuniary emulation (compensation for lack of relevant assets with expenditure on non-durable items) - but not both.

LSMS does record the total number of assets owned by a household. Thus we use an asset-ownership score as a control variable - calculated with the binary flags of different assets owned. For example, if we were to measure asset scores for items $\{Land, TV, Iron\}$, then a consumer who owns just an iron has a score $\log(1)(1 \times 2^0 = 1)$, one who owns just a TV has $(log(2)(0 \times 2^0 + 1 \times 2^1)$ and one who owns all the assets has the score $\log(7)$ $(1 \times 2^0 + 1 \times 2^1 + 1 \times 2^2)$. The asset control variable thus obtained can help determine whether asset ownership changes consumption on non-durable items.

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[29]Notice that education - which is acquired over long-term - is viewed as an asset. Notice also that we consider it impossible to overspend on public transport to substitute for not owning a car. Hence there is no status advantage derived by overspending on public transport as consumption.

Category (in increasing order of visibility)	Price differences	Compensation for lack of relevant assets with expenditure on non-durable items
Energy	Electricity, gas vs kerosene	None
Food	Expensive vs cheaper options	None
Personal Care	Not significant	beauty-products vs watches/jewelry
Transport	Car vs bike	None
Social functions	None	Social Events, Marriage, Funeral, Donations vs Education
Housing and Land	None	carpets, appliances, decoration vs house ownership

Table 3: Dimensions of status potential within every functional category when all items are available to the consumer

5 LSMS 2010 Tanzania Data

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 microdata 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[27] is presented in the Table 6.

5.1 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.

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[30].

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[31]. Given the sparsity of available income data, however, instruments for age and occupation codes were chosen for the current study.

5.2 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 <u>ignored</u> (not included in total consumption)

   (b) Gift quantities were <u>ignored</u> for consumption (median ratio of gift to total diary consumption was zero - only 132/3828 households had this ratio 1% or higher)

   (c) Weekly diary data was multiplied by 52 (to <u>estimate</u> annual consumption)

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[30] To test the significant of this issue, one can test whether the surveyed households are equally likely to overspend in the recorded week

[31] If there are X individuals with $n_i(i \epsilon X)$ 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.

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) - except for repair related cost which we only multiplied by 2 (assuming that repair frequency is ~6 months for all items to be repaired)

(e) All expenditure from (c)-(e) above were summed up as total expenditure

2. Read Assets from Section N and calculated asset scores

3. 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 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)

4. 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

5. 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%)

   (c) Ignored data with more than 30 times the median cost (ensuring that no more than 3% of the data is ignored)

6. 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

5.3   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 $ln(q) \sim ln(x) + d + region$. 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 ηp_A and ηp_B stockpilers (where η 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 η, we should observe fixed differences (clusters) in all regions (since η 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.

5.4 Discussion of results

We note that food is a significant portion of total spending overall. More importantly, those in non-agrarian professions spend about as much of their total expenditure on food as those in agrarian occupations. A significant part of non-food the expenditure is spent on housing, education and energy requirements as well as various household products.

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 cannot be assessed from the household survey by itself. We present results for various items that could be of status value based on their price and usage in Section 5.4.1 only as a means to demonstrate how further one can go with the use of techniques surveyed in the literature and to motivate the need for a time-series model. The methodology described in Section 4.2 is the used to provide the results discussed in Section 5.4.2.

For reasons discussed in the section 2.4, we avoid combining the consumption on status items into "status consumption" category to interpret status-related consumption.

5.4.1 Income elasticities for individual items

The results from the regression based on the following equation 1 used in the literature (as discussed in section 2.4) are presented for comparison.

$$ln(vis_i) = \beta_0 + \beta_1 \cdot Dem_i + \beta_2 \cdot ln(pInc_i) + \epsilon \quad (3)$$

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^2	0.063

p-values in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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 6: Items of status interest (see [27])

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 , $ln(highest\_education)$, $cubic(highest\_education)$ [32].

Table 7,8 and 9 summarize the results obtained by running regressions on several commodity-categories. A column in the Table 7 also suggests the percentile of consumers using the commodity (electricity for example is used amongst those having top 22% of total expenditure). As seen from the results, 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 seems 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. Following are some other claims that were tested with expenditure on individual items:

1. **Effect of occupation -** Income data in LSMS is not available for all the surveyed households. 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 can 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 commodities in Table 6. The results are shown in Table 8.

2. **Effect of Education Level** - One of the claims to be evaluated on the LSMS data is whether education has a significant correlation with consumption 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.

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[32]All 2sls regressions involved 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.

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 be 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) .

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 8). 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.

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. A urban/rural dummy created by classifying districts based on their population densities is found significant for some items.

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. **Services as Visible Consumption** - One of the interesting observations in the Vindex survey (Heffetz[22]) 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 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.

8. **Age** - Age does have an influence on many items that we consider relevant for status. It does appear that the consumers with a higher age have less expenses on education and more on housing.
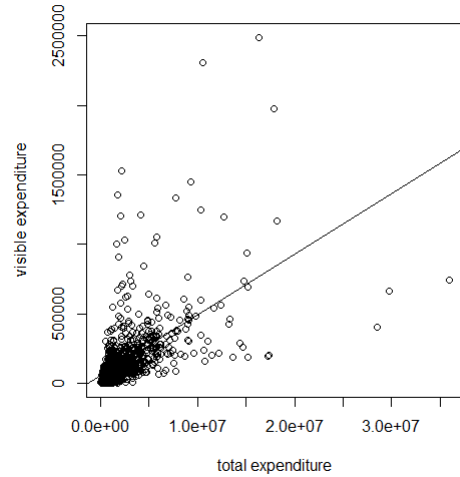
Figure 9: Visible Expenditure vs Total Expenditure for LSMS 2010
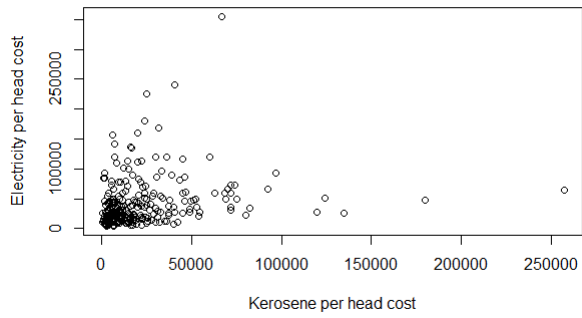
Figure 10: Electricity vs Kerosene costs per head in Dar-es-salaam

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

Table 7: Control variables significant for consumption of select individual items

Table 8: Regression for scarce commodities with no instrumentation

| | Dependent variable: consumption | | | | | | | | | |
| | depvar | | | | | | | | | |
	carpetsrugs(1)	education(2)	electricity(3)	houserent(4)	personalitemsrepair(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)	3.296*** (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)
hsize	-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			0.782*** (0.295)							
isrural			-6.468*** (0.642)	-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*** (0.953)		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*** (0.366)						
years_community						-0.073*** (0.015)	-0.026** (0.013)		-0.054*** (0.014)	
Constant	-71.251*** (4.287)	-64.314*** (3.438)	-85.424*** (4.610)	-31.269*** (2.689)	-33.945*** (2.214)	-47.620*** (4.026)	-21.851*** (3.020)	-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	2,965	2,963
R^2	0.126	0.322	0.437	0.502	0.029	0.084	0.094	0.059	0.101	0.073
Adjusted R^2	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)	11.595 (df = 2229)	8.929 (df = 2957)	7.386 (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)	61.522*** (df = 3; 2961)	66.629*** (df = 5; 2957)	46.343*** (df = 5; 2957)

Note: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Table 9: Instrumented Regression for scarce commodities

	Dependent variable:									
	lnvis	lndseducexpense	lnvis	lndshouserent	lnvis					
	carpetsrngs(1)	education(2)	electricity(3)	houserent(4)	personalitemsrepair(5)	personalprods(6)	skincream(7)	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)	3.216*** (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)
hsize	-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			-0.723 (0.451)							
isrural			-3.861*** (0.883)	-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
R²	0.126	0.321	0.367	0.502	0.028	0.069	0.080	0.043	0.090	0.078
Adjusted R²	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)

Note: *p<0.1; **p<0.05; ***p<0.01

5.4.2 Results from the assets based model

As discussed in section 4.2, the assumption of separability allows us to split the consumer basket to observe the factors relevant for status consumption as detailed in Table 3. As one can only be as accurate for the conclusions on status consumption as are the categories identified in the survey, we include as many LSMS expenditure items as possible for our analysis.

Finding that the data on food is far more detailed than that from others (recorded with diary rather than recall method), we use both the cost incurred and quantity purchased to decide the high-price and low-price categories (see Table 5.4.2). Given the detailed sub-categories of food items, we mark the higher priced categories within the every sub-category e.g. starch, meat etc. (see Figure 11) within the food category. A purely utilitarian consumer would thus simply choose the cheaper option for every tree in the Figure 11 if she were to move towards low overall consumption on food.

For non-food categories, where the data is less detailed, there were some necessary adjustments to be made. The adjustments related to extrapolation of costs [33] were trivial, while others related to classification anomalies were resolved using the context of the item's utility. If the item performs two functions e.g. a musical instrument (or any entertainment-related item), it could be classified either as an appliance or a personal product. The social context of the item's usage helps resolve this ambiguity. Similarly, the regional variation and supply-asymmetries related to the item can also complicate how an item is classified. Mosquito-nets (which available in the survey), for example, may seem relevant to land & housing - and therefore relevant for potential status value. However, they can hardly be considered a candidate for pecuniary emulation - since there is no asset which a consumer overspends on mosquito nets to compensate for. Moreover, even if there was price differentiation in mosquito-nets (and we were to consider them for status consumption), we would need to observe the effect of climate on the consumption - since the need for mosquito nets is removed in a drier and cooler climate. Just the way one cannot view the lack of electricity (or a similar commodity) within a region as the consumers' lack of preference towards it in the region, one cannot view any other item whose

distribution is skewed due to region without considering the region of availability as a control variable. While we do include region in all our analysis (see expensiveregion dummy in the results), there are cases when consumption may be driven by unobserved variables (e.g. insurance costs associated with theft frequencies). In such cases, we have no choice but to remove the item from the consideration towards status consumption.

To measure the consumption discussed in Section 4.2, we use the following regression equations. For the set of categories $\mathscr{P}$ where price differentiation exists, we have

$$w_{c \in \mathscr{P}} = ln(x) + z + \mathbb{I}_{high} \qquad (4)$$

$$w_{hl,c} = ln(x_{c \in \mathscr{P}}) + z_i \qquad (5)$$

Here, x is the total expenditure, z is the vector of household characteristics and $\mathbb{I}_{high}$ is the dummy variable that indicates whether the consumer can spend on the high priced categories. $\mathbb{I}_{high}$ represents price effects of the more general demand equation 2 [34]. $w_{hl,c}$ in the equation 5, represents the weight of high-group in the consumption in category $c \in \mathscr{P}$. With the energy category of expenditures for example, $w_{hl,c}$ would be ratio of the expenditure on electricity, charcoal and gas to to the expenditure on kerosene. This effectively proxies λ. Thus, $\lambda_{energy} \propto w_{hl,energy} = \frac{q_{gas} + q_{electricity} + q_{charcoal}}{q_{electricity} + q_{gas} + q_{kerosene} + q_{charcoal}}$ where q_i is the expenditure on item i.

For the set of categories $\mathscr{E}$ where price differentiation does not exist, we have

$$w_{c \in \mathscr{E}} = ln(x) + z + A \qquad (6)$$

$$\zeta = \frac{ln(q_{c \in \mathscr{E}})}{A} = ln(x) + z_i \qquad (7)$$

Here, A denotes the asset score (as described in Section 4.2) and $q_{c \in \mathscr{E}}$ denotes the spending in category c, while ζ is the measure of pecuniary emulation. There are categories for which we do not have any asset prices or asset quality available in the survey. In those cases (as in the case of transport where the monthly expenditure on vehicles is not available to us or in the case of housing where house

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[33]Repairs and maintenance costs etc. are provided in the weekly diary - but they cannot be simply extrapolated to annual consumption without a consideration of the average life of the item being repaired or maintained.

[34]We ignore cost-of-living index control variable - this being a cross-sectional analysis.

prices are not available), we simply use the asset-score as an approximation. Thus for transport and housing, the Equations 4 and 6 are used for first-stage and second-stage regressions. We do note that in categories like housing, the monthly expenditures on housing-related items is nearly zero - thus a Heckmann selection may be needed for a more robust interpretation of results.

Notice that the above equations 4, 5, 6 and 7 are not demand equations by any means - they're merely a way to understand the role of factors identified in Section 4.2. A fuller set of demand equations would require formulating more detailed equations for the panel data. This is to be considered at a later point in this study.

Looking at the first-stage regression results in Table 10 (for Equations 4, 6), we find that permanent income (total expenditure) seems significant for all categories except social functions but has positive effect only for food and transport. Population density has an economically weak but statistically significant effect on budget share. The housing-status variable (1=owned house, 2=employer subsidized housing, 3=employed provided housing 4=rented housing 5=free housing) serves as a key household characteristic - allowing use to see that those with rented housing spend proportionately higher on personal products and less on transport, food and housing-related expenditures. Given our classification of assets and monthly expenditure (as detailed in Table 5.4.2), we see the pecuniary emulation less significant than the differences in spending due to the type of housing a household has (i.e. consumers who rent tend to spend differently from those who own their houses - a tendency that is stronger than the act of compensatory expenditure for lack of housing/assets). As a more specific example, one finds that those who rent housing are more likely to buy carpets (a tendency that is prominent in both level and log levels of consumption). This pattern is significant even when the owner and non-owners both have the same floor type (households with earth - as floor type are less likely to buy carpets). The number of household members (variable consu) seems to have a weaker influence on first-stage regression.

The second-stage regression results in Table 11 provide further details of the utility-enhancing-factors (λ/ζ which we proxy with quantities in Equations 5 and 7). It is easy to see that the effect of income is strong for λ as well as ζ. Predictably, the effect of income is positive since

those with higher income are better positioned to choose the higher-priced items. The reliance on public transport in busy areas becomes clear with the negative sign on public transport. Once again, those who rent housing spend proportionately higher on monthly expenditures in energy, food and housing categories.
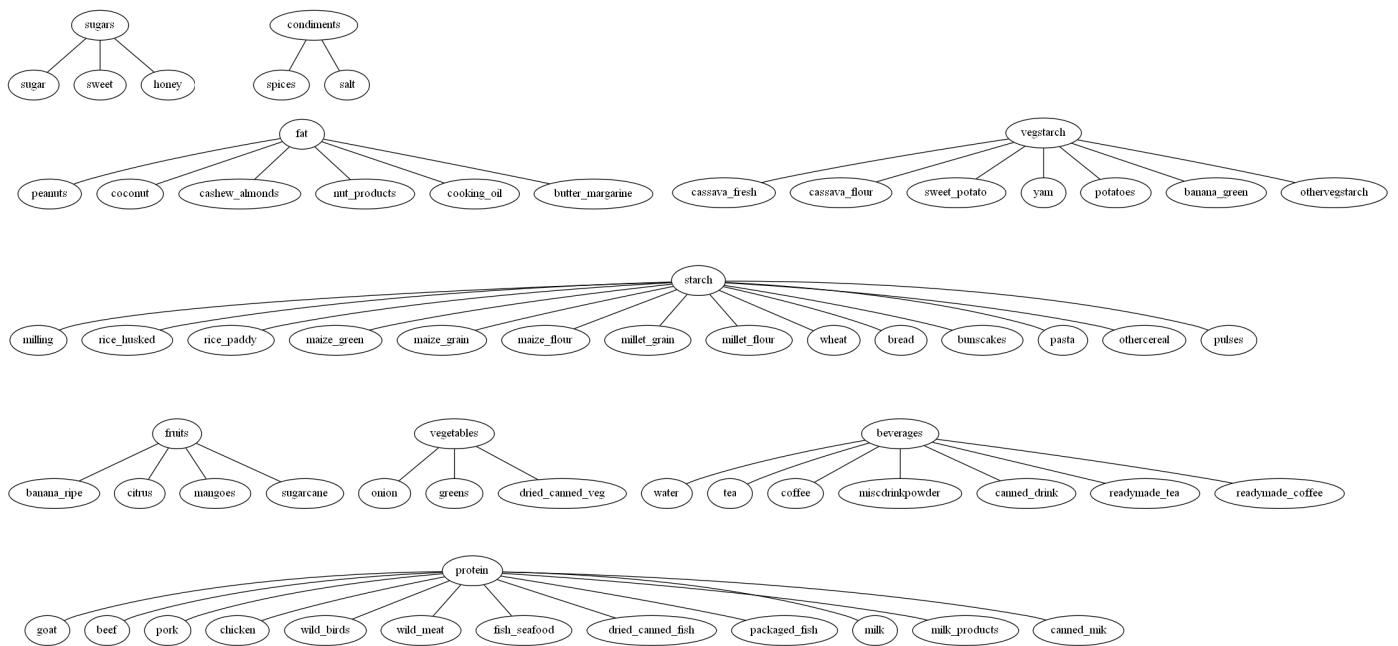
Figure 11: Group of food items to infer high and low price consumption

Table 12: Classification of items for asset-based model of status

Category	Group	Item shortname
food	low	cooking_oil
food	high	butter_margarine
food	high	rice_husked
food	low	rice_paddy
food	low	maize_green
food	low	maize_grain
food	low	maize_flour
food	high	millet_grain
food	high	millet_flour
food	high	wheat
food	high	bread
food	high	bunscakes
food	high	pasta
food	high	othercereal
food	high	pulses
food	low	sugar
food	high	sweet
food	high	honey
food	low	peanuts
food	low	coconut
food	high	cashew_almonds
food	high	nut_products
food	high	milk_products
food	low	fresh_milk

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Table 12 – *Continued from previous page*

Category	Group	Item shortname
food	high	canned_milk
food	high	goat
food	high	beef
food	low	pork
food	high	chicken
food	low	wild_birds
food	low	wild_meat
food	low	fish_seafood
food	high	dried_canned_fish
food	high	packaged_fish
food	low	eggs
food	low	beer
food	low	brews
food	high	winespirits
food	high	spices
food	low	salt
food	low	onion
food	low	greens
food	low	dried_canned_veg
food	low	cassava_fresh
food	low	cassava_flour
food	low	sweet_potato
food	high	yam
food	high	potatoes
food	high	banana_green
food	low	othervegstarch
food	high	tea
food	high	coffee
food	low	miscdrinkpowder
food	low	canned_drink
food	high	readymade_tea_coffee
food	high	banana_ripe
food	high	citrus
food	high	mangoes
food	low	sugarcane
energy	low	kerosene
energy	high	charcoal
energy	high	gas
energy	high	electricity
energy	high	petrol
personal_products	expenditure	cellphone_voucher
personal_products	expenditure	bar_soap
personal_products	expenditure	clothes_soap
personal_products	expenditure	toothpaste
personal_products	expenditure	toilet_paper
personal_products	expenditure	skin_cream
personal_products	expenditure	other_personal
personal_products	expenditure	misc_cleaning
personal_products	expenditure	household_products_repair
personal_products	expenditure	consumer_durables_repair
personal_products	asset	sports_hobby

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Table 12 – *Continued from previous page*

Category	Group	Item shortname
personal_products	asset	camera
personal_products	asset	watch
personal_products	asset	phone
personal_products	asset	radio
personal_products	asset	landline
personal_products	asset	mobile
personal_products	asset	videoplayer
personal_products	asset	computer
personal_products	asset	iron
personal_products	asset	stove_electricgas
personal_products	asset	stove_other
personal_products	asset	waterheater
personal_products	asset	musicplayer
personal_products	asset	musicsystem
personal_products	asset	bookexschool
transport	low	public_transport
transport	high	motor_repair
transport	high	petrol
transport	low	bicycle_repair
social_functions	expenditure	services
social_functions	expenditure	bride_price
social_functions	expenditure	marriage
social_functions	expenditure	funeral
social_functions	asset	refrigerator
social_functions	asset	tv
social_functions	asset	ac_fan
social_functions	asset	dishtv
social_functions	asset	videoplayer
social_functions	asset	computer
social_functions	asset	waterheater
social_functions	asset	musicplayer
social_functions	asset	musicsystem
social_functions	asset	land
housing	expenditure	light_bulbs
housing	expenditure	carpet
housing	expenditure	linen
housing	expenditure	mat
housing	expenditure	mosquito_net
housing	expenditure	mattress
housing	expenditure	building_material
housing	expenditure	insurance
housing	expenditure	bamboo
housing	expenditure	grass
housing	asset	refrigerator
housing	asset	sewingmachine
housing	asset	tv
housing	asset	chair
housing	asset	sofa
housing	asset	table
housing	asset	bed
housing	asset	cupboard

Table 12 – *Continued from previous page*

Category	Group	Item shortname
housing	asset	lantern
housing	asset	mosquitonet
housing	asset	wheelbarrow
housing	asset	livestock
housing	asset	poultry
housing	asset	engine_outboard
housing	asset	donkey
housing	asset	land
housing	asset	house
housing	asset	ac_fan
housing	asset	dishtv
housing	asset	hoe
housing	asset	spraymachine
housing	asset	waterpump
housing	asset	reaper
housing	asset	tractor
housing	asset	trailer
housing	asset	plough
housing	asset	harrow
housing	asset	milkingmachine
housing	asset	harvester
housing	asset	handmill
housing	asset	coffeepulpingmachine
housing	asset	fertiliserdistributor

Table 10: First-stage regression for separable categories with w as dependent variable

	(1) food	(2) energy	(3) transport	(4) personal_products	(5) social_functions	(6) housing
ln_tot_exp	0.0681***	-0.00613**	0.0107***	-0.0548***	-0.0000297	-0.0108***
	(0.000)	(0.003)	(0.000)	(0.000)	(0.982)	(0.000)
highest_educ	-0.00733***	0.00270***		0.00216***		
	(0.000)	(0.000)		(0.000)		
consu	-0.00772***		-0.00218***		-0.000845***	-0.000960**
	(0.000)		(0.000)		(0.000)	(0.008)
age	0.000403		-0.000350**	-0.000439**		-0.000237
	(0.223)		(0.004)	(0.002)		(0.065)
0.expensiveregion	0	0				0
	(.)	(.)				(.)
1.expensiveregion	0.0180	0.0223***				-0.0194***
	(0.135)	(0.000)				(0.000)
popdensity	-0.0000425***	0.00000790***	0.00000900***	0.0000128***	0.00000254**	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	
1.housingstatus	0		0	0	0	0
	(.)		(.)	(.)	(.)	(.)
2.housingstatus	0.00282		-0.0384***	0.0283	0.0138	-0.0113
	(0.957)		(0.000)	(0.329)	(0.310)	(0.170)
3.housingstatus	-0.0560		0.0205	0.0436	-0.000689	-0.0129
	(0.089)		(0.213)	(0.080)	(0.835)	(0.185)
4.housingstatus	-0.0557***		-0.00124	0.0223***	-0.00303	-0.0164***
	(0.000)		(0.823)	(0.000)	(0.152)	(0.000)
5.housingstatus	0.0149		0.00693	0.0168*	-0.000392	-0.0206***
	(0.335)		(0.322)	(0.027)	(0.898)	(0.000)
roomsnum	-0.0185***			0.00342**	0.00150**	0.00276**
	(0.000)			(0.002)	(0.005)	(0.004)
0.is_resident	0	0	0		0	
	(.)	(.)	(.)		(.)	
1.is_resident	0.0463***	-0.0193***	-0.00623		0.00400*	
	(0.000)	(0.000)	(0.108)		(0.040)	
years_community		0.000343**				-0.000251*
		(0.002)				(0.011)
0.has_high			0			
			(.)			
1.has_high			0.0948***			
			(0.000)			
ln_asset_score				0.00377***		0.00110
				(0.000)		(0.079)
_cons	-0.202*	0.0883**	-0.0780**	0.837***	0.0116	0.216***
	(0.013)	(0.001)	(0.008)	(0.000)	(0.508)	(0.000)
N	2483	2483	3257	2483	3257	3257
R^2	0.134	0.145	0.092	0.216	0.009	0.067
adj. R^2	0.130	0.143	0.089	0.213	0.006	0.064

p-values in parentheses

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

Table 11: Second-stage regression for separable categories with λ/ζ as dependent variable

	(1) food	(2) energy	(3) transport	(4) personal_products	(5) social_functions	(6) housing
ln_tot_categ_exp	0.0798***	0.223***	0.0499***			
	(0.000)	(0.000)	(0.000)			
highest_educ	0.00315***	0.00359**	0.0129***	-72.15**		
	(0.000)	(0.003)	(0.000)	(0.002)		
consu	-0.00364***			95.15*		-4.400**
	(0.000)			(0.046)		(0.003)
popdensity	0.00000594*		-0.0000307***		0.0695*	-0.0383*
	(0.041)		(0.000)		(0.015)	(0.020)
1.housingstatus	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)
2.housingstatus	0.116***	0.00831	-0.0767***	1692.5	846.6	125.8*
	(0.000)	(0.730)	(0.000)	(0.682)	(0.090)	(0.012)
3.housingstatus	0.0160	0.0770*	-0.00171	-2427.4***	19.60	118.0*
	(0.463)	(0.047)	(0.964)	(0.000)	(0.621)	(0.040)
4.housingstatus	0.0205*	0.119***	-0.0523***	-1473.3***	380.4***	418.8***
	(0.024)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
5.housingstatus	0.0224	0.107***	-0.0288	-1038.4	291.2*	133.5**
	(0.109)	(0.000)	(0.152)	(0.076)	(0.045)	(0.006)
age		-0.000938*		-41.62**		-1.584
		(0.022)		(0.004)		(0.058)
0.expensiveregion		0	0			
		(.)	(.)			
1.expensiveregion		0.0362**	0.0423*			
		(0.007)	(0.046)			
roomsnum		0.0114***		-228.9**		-9.524
		(0.001)		(0.005)		(0.065)
0.is_resident		0				
		(.)				
1.is_resident		-0.0180				
		(0.138)				
years_community			0.000873			
			(0.058)			
ln_tot_exp				-1273.9***	42.61***	-13.01
				(0.000)	(0.000)	(0.463)
_cons	-0.711***	-2.215***	-0.754***	24575.1***	-604.5***	357.5
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.153)
N	2419	2317	1381	2283	2933	3239
R^2	0.219	0.678	0.197	0.038	0.045	0.051
adj. R^2	0.216	0.676	0.191	0.034	0.043	0.048

p-values in parentheses

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

Part II
Definition and measurement of status-related consumption

6 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[24] and Arrow, Dasgpnta [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[24] where consumers attempt to maximise a combined utility of visible (public) and non-visible (private) consumption[35]. 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[22] using this model involved surveying a few hundreds of respondents asking them - quite literally - just how visible every item is for a typical consumer [24].

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[36]. In its original sense, conspicuous consumption is an ecological concern and plays within the realms of sociology[37]. 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 [38].

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[35]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.

[36]"No class of society, not even the most abjectly poor, forgoes all customary conspicuous consumption[39].

[37]"Increased mobility of the members has also added to the facility with which a "social confirmation" can be attained within the class."[39]

[38]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[26]. Khamis et al find that the Muslims spend less on visible consumption items when compared to Hindus of same economic standing[27].

7 Status differences and Conspicuous consumption

We find the role of perceived status differences more general and relevant to conspicuous consumption ins societies. As argued before, the role of conspicuous consumption is to signal a higher status. The need for conspicuous consumption is shaped by the owned assets as well as lack of availability of items (particularly 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[24] - 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).

7.1 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.

8 A brief review of the demand theory

8.1 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 $(\Sigma p_k q_k = x)$. The adding-up constraint is often written as $\Sigma p_k \frac{\partial q_k}{\partial x} = 1$; $\Sigma p_k \frac{\partial g_k}{\partial p_i} = -q_i$ (for a good $i \epsilon [1, n]$) while the homogeneity restriction as: $\Sigma_k \frac{p_k}{q_i} \frac{\partial q_i}{\partial p_k} - x \frac{\partial q_i}{\partial x} = 0$ [12].

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 α, β are regression coefficients) - one needs to make sure that the adding-up and homogeneity restrictions apply on the data (i.e. $\Sigma \alpha_i = 1$ and $\Sigma \beta_i = 0$)[39].

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[39]Notice that no commodity specific information is used in the semi-logarithmic equation of the Working-Leser model.

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 [33]. 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 [33]) 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 [33]. 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]).

8.2 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 [40]. 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[41]) 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 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 $r \epsilon G$, the consumer is meant to optimise $c(u_r, p_r) = min[x = \sum q_i p_{i,r}$ 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:

$$C(u, p) = min[x = \sum p_G q_G \ for \ u_G(x, p) = u \quad (8)$$

The problem can be easily solved if the prices $p_{g \epsilon G}$ 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"[12]. One possible restriction is the $C(u_G, p_G)$ being of the form $\theta_G(u_G) \cdot b_G(u_G)$ (where θ_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[12]. 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.[42].

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 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

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[40]In practice these properties may not be exactly true for the data.

[41]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.

[42]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:

$$c^h(u^h, p, a^h) = m(a^h, u^h) \cdot c(u^h, p) \quad (9)$$

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

$$w_i^h = \frac{ln \ c(u^h, p)}{\partial \ ln \ p_i} \quad (10)$$

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 [31].

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])[43]. 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[24] 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 **??**). In this view, the study of cluster and spatial variations in demand employed by Deaton is quite relevant[11]. It is summarised as the following demand equations:

$$ln \; q_{Gic} = \alpha_G^0 + \beta_G^0 ln \; x_{ic} + \gamma_G^0 \cdot z_{ic}$$
$$+ \sum_{H=1}^{5} \theta_{GH} ln \; p_{Hc} + (f_{Gc} + u_{Gic}^0) \quad (11)$$

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[43]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.

$$ln \; v_{Gic} = \alpha_G^1 + \beta_G^1 \; ln \; x_{ic} + \gamma_G^1 \cdot z_{ic}$$
$$+ \sum_{H=1}^{5} \psi_{GH} ln \; p_{Hc} + u_{Gic}^1 \quad (12)$$

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.

9 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 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 7.1 .

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.

9.1 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 ρ. 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 optimises is thus a function of consumption c (where c_i can be 0), assets owned A and the personal characteristics ρ. 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 $r\epsilon(0,1)$ yielded to an individual in terms of ranks (utilities) from consumption, assets and personal characteristics. Thus the rank r may be expressed as:

$$r = \phi(r_C, r_A, r_\rho) \qquad (13)$$

where r_C is the rank (or utility) obtained by consumption, r_A is rank derived from assets and r_ρ is rank derived from personal characteristics ρ (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 ϕ. 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.

9.2 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 economy over time. An essential property of this barrier is also that it changes to maintain the boundaries between the status clusters[44]. If we assume a linear transformation β from personal characteristics ρ to r_ρ (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 ρ_t.

A threshold function of the form β 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 β 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 $\rho_1, c_1 A_1$, ρ_2, c_2, A_2 and ρ_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 $k_1 \epsilon s_1$

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[44]This is to be ensured through a choice of the utility functions rather than enforced boundary conditions.

and $k_2,, k_3 \epsilon s_2$. 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 $k_1, k_2 \epsilon s_1$ while $k_3 \epsilon s_2$. There is also the chance that ρ_1 might even start to carry more weight than ρ_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.

9.3 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 $(s_1, s_2...)$ 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 individual 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 less relevant than local status needs.[45] 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

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[45] 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.

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 an exchange of personal characteristics in personal interactions rather than through a deeper understanding of economic factors [46] 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[47]. 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 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.

9.4 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[48] and increase her chances (as well as those of her progeny) to belong to a higher status cluster in society [49].

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 improvemnt) at every time period given the uncertainty around the income process. We summarise these in the following equations.

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

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

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

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[46]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.

[47]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.

[48]The difference between private and public consumption i.e. the extent to which one's happiness is defined by one's surroundings is different from 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.

[49]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.

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

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

Here, assets, personal characteristics and consumption are denoted by A, ρ and c respectively. Λ denotes the stochastic process of income i for every individual[50] and π 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, α is the portion of income spent on assets and σ 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, ρ and c. The representative consumer modifies α to maximise the chances of state promotion - which she decides based on the knowledge (or belief) status promotion function π - due to her lack of perfect knowledge of Λ and σ. 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 π.

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 depend on the probability which the consumer believes in.

9.5 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 σ in a personal characteristic selection function Π (that determines which personal characteristic denote high status) and characteristic weighting function λ (which determines how much status impact is granted by the characteristics chosen by Π in $t+1$).

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

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

As time moves on, Π 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 ρ_i would be 0. For example, if only city-dwellers enjoy a certain amenity - then moving to the city would be factored in by Π. If consumers of a different personal characteristic ρ_k start consuming expensive housing (i.e. a characteristic that dominated 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 λ 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 Π 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

[50]We may choose the evolution of income of every status cluster for simplicity.

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 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.

In reality, education has both the properties of an asset that can be exchanged through social networks or institutions and the sort of prestige that is more than the market-value of skills it offers. In the latter sense, it is the good that Veblen emphasised on - one that doesn't carry any utility in itself except the advantage in the social status it offers.

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).

9.6 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.

10 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.

10.1 South Africa - Income and Expenditure Survey[26]

A study by Kaus([26]) 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)[51][52] (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)[53] .

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[51]lm(lnvis~black_dummy+coloured_dummy)

[52] 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.

[53]lm(lnvis~black_dummy+coloured_dummy+ lninc) - where lninc is log(income_household_head). Notice that only log

The coefficients for black and coloured groups are even higher when expenditure is added(III)[54]. 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[55] and the other with education-dummies as control variables (while still using instruments)[56]. The instrumentation thus performed (Specification IV in Table 13) results in 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 [57].

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.

10.2 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 "horref1" 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 horref1 variable is considered hispanic for the study) the number of Hispanics in the survey almost doubles. Starting with no controls(I)[58] (with 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)[59] .

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)[60]. 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[61] and then with education-dummies as control variables (while still

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of income level is found significant when used along side with income-level-cubic and income level.

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

[55]`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.

[56]`ivreg(lnvis~black_dummy+coloured_dummy+ lnpinc +lsecd | . - lnpinc + cbinc+lninc +incpsv)`

[57]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

[58]`lm(lnvis~black_dummy+hispanic_dummy)`

[59]`lm(lnvis~black_dummy+coloured_dummy+ lninc+incpsv+cbinc)` - where lninc is log(income), incpsv is dummy for positive income and cbinc is income-cubinc.

[60]`lm(lnvis~black_dummy+coloured_dummy+ lnpinc)` - where lnpinc is log of total expenditure (the proxy for permanent income)

[61]`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.

using instruments)[62]. The instrumentation thus performed (Specification IV in Table 15) 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.

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[62]`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 13: Results from regressing ln(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 14: Results from regressing ln(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 15: Results from regressing ln(visible_consumption) against respective set of control variables

Part III

A Behavioural Experiment for Status Competitions

11 Status and Consumption as games

Behavioural games have been used in the developing countries to gauge motivations of the participating consumers [63]. While the visibility surveys ([27, 22]) 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 12 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.

12 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 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 12.2)

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[64]

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

12.1 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,

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[63]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.

[64]It is necessary to estimate the price of products and services for the purchasing game to emulate the market.

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)

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)

12.2   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).

13   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 12.2, 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 12.2).

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 [27, 22]). 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.

14   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 be 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.

15   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 circumstances. Unrealistic values may disqualify you from the game.

16   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 [14] 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[23]). 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[33]) - 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, healthcare and food items may help consumers prioritize their needs.

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