Availability, Affordability and the Bandwagon Effect

A challenge in formulating a rational theory for conspicuous consumption that there can be differences between what people can buy (available options for a given price and budget) and what they wish to buy (options that are either not available locally or are available in excess). All concerns of price and budget cathen be termed as concerns of affordability. Affordability is furthest scope of consumption surveys. Whether consumers like an item more than the other is captured by the substitution effect on the item. The elasticities of products interpreted from the consumption data explain the relative preference of products (more particularly the substitution and income effects) but they cannot measure how consumption might be transformed if new items were introduced. Observing differences between regions that have an item available vs places where the item is completely unavailable can potentially measure this effect. This is why availability is introduced as a concern different from affordability.

In developing countries, the issue of availability is particularly relevant. Rural areas in the developing world are faced with sheer unavailability of services and goods that are available (even though limited) in the urban areas[1]. In the data, region dummies are quite significant in consumption of items in the survey and there are some items that are completely unavailable in certain regions. In the data from Tanzania, availability of electricity can transform the income elasticities of demand for marriage). A model that we wish to develop for appeal of an item attempts to include this difference in availability between regions.

Scarcity is a confusing term - because what we mean by scarcity is a physical scarcity (unavailability) and the perceived scarcity (what we feel as scarce). An physical scarcities are indeed felt as scarce as well. Therefore one can define social scarcity as something that is not physically scarce (it is available and affordable) but is just felt to be scarce. It is the perceived scarcity that we intend to measure (i.e. a combined affect of availability and social scarcities).

. The nature of item matters since the direction of the effect of popularity on perceived scarcity can reverse depending on the "appeal" of the item (visual or status-related). If everybody has a certain item, then consumers may not consider it as important to acquire the item (since everyone else already has it) whereas for other types of item, consumers may rush to the item solely because there is a trend amongst everybody else to. These are the snob and bandwagon types of item considered in the literature [2][2]. The pressure scarcity arises only for items that are physically scarce (unavailable and/or unaffordable).

If F is the set of items that one feels are scarce and S is the set that is physically difficult to achieve (unavailable and/or unaffordable) then we can say that $S - F \neq \phi$ - i.e. there can be items for which scarcity is not felt despite being available and affordable (or even if they're popular as is the case for snob

[1] The unavailability can spiral into severe demand pressures by cause pressures on urban migration.

[2] Researchers have used an extended social-means model to measure these in experiments[3].

items). It is safe to suggest however that

$$F - S = \phi \tag{1}$$

i.e. items that are not scarce (i.e. both affordable and available) cannot be felt as scarce. Thus one can say that $F \subset S$. In other words, conditions for physical scarcity - when included with snob and bandwagon effects must capture all conditions for scarcity (even those that are felt).

The percentiles might help in determining whether people in lesser and higher income percentiles have different consumption levels for the quantity. The time-series of expenditure can help us understand the trend in rushing towards certain items. These can then be classified as snob or bandwagon type of items.

The crowding effect is to be measured in popularity (affordability) of the item. An item usually turns popular after it has been scarce for some time - while it stops being scarce the moment it becomes popular[4]. The usage of the item therefore guides us in classifying an item as a scarce good (and whether it is of snob or bandwagon type). It is worth reiterating that revealed preference methods have no way of knowing whether an item is associated with status or not - and thus they must rely on the type of crowding effect inherent in the item. For snob items, limited supply would mean higher preference but high supply would mean less preference - for bandwagon type items limited or high supply would imply higher preference. Thus it is the supply elasticity of demand that differentiates snob type from bandwagon type items. Notice that snob or bandwagon effects must be seen in combination with affordability and availability. The snob or bandwagon nature of the item matters only when an item is is affordable (thus popular) as well as available (if the item is not affordable or not available then it is already scarce). This is in accordance with Equation 1.

Scarcity in terms of Availability, Affordability, Popularity and the Bandwagon effect

Scarcities develop through physical availability and social communication. In a simple model, the degree of scarcity of a certain commodity is provided by its availability, affordability, popularity and bandwagon effect. Availability encompasses all issues that put an item in the market. Regional and supply-side issues thus affect availability. In absence of the data on supply of the items, we assign availability as a binary variable which is set to true in a region when the item appears in the consumption data for the region. Affordability, on the other hand, sums up price-related concerns on the demand-side - an item is affordable solely based on the price of the average consumption unit. Further, the popularity of an item is measured as percentile of users of item i.e. the percentile which consumes the quantity. Popularity of an item may increase or decrease the consumption of an item based on whether the item is a snob or

bandwagon type. An individual is likely to lose interest in a particular jewelry product if it the latter is available and affordable to everybody. The effect of popularity on the appeal of the item is measured by bandwagon effect. Snob items are considered the negative bandwagon effect in this study.

A physical scarcity (from the Hirschian terminology) is only realized by the availability of an item while social scarcities matter through the rest of the 3 parameters.

Measuring Affordability

While availability is a binary variable (an item is either available or it is not) in this model and can be measured by simply checking whether an items appears in the consumer basket (within reasonable threshold), affordability requires a discussion of utility curves. For now we use the word affordability instead of using utility because utility must encompass the overall preference of the consumer (including scarcity). In the $n-$commodity world, the elasticities would explain us the relative preference of items.

One can arrive at a rank of affordability by observing the lowest non-zero quantity on the utility curve (of the average individual). If a utility function for every individual is $u = f(q_1, q_2...q_n)$ for n commodities in the consumer universe (notice that don't have income information and the budget constraint is Σq_i). Every consumer wishes to maximize utility with quantities $q_1, q_2...q_n$ - and usual assumption that a consumer would like to have highest as possible of these quantities applies. If the quantity is near zero for the average consumer, we consider it unaffordable.

We can use a preliminary analysis (probably a regression) to measure the bandwagon effects of the items in consideration to and then to run another regression for elasticities of the item.

Fitting the utility curve

The condition for optimization is the utility. We're not looking for a magic set of quantities $q_1, q_2, q_3...q_n$ that optimize the function (in fact $q_{1i}, q_{2i}...$ for consumer i are fixed) but the parameters of the function f that optimizes the set of data. A non-parametric method specified by Afriat and Varian must follow[1, 5].

To understand what affordability encompasses, we consider a two-good world - food and education which are the only goods consumers are assumed to be interested in. If a Cobb-Douglas function is chosen as $u(x, y) = Ax^{\alpha}y^{1-\alpha}$where x, y are food and lodging quantities respectively[3]. If we calibrate $\alpha = \alpha_0$ for a vector of observations X and Y. α is essentially measuring whether consumption is complementary (high α) or necessary (low α). The shape of the curve (marginal propensity to consume) can tell us which product is preferred more over the other. Thus the total expenditure elasticities of demand can give us

[3]A utility curve can be visualized as $y = e^{\frac{(lnu - lnA) - \alpha lnx}{1-\alpha}}$ or `a=.8;plot(x,exp(-(a/(1-a))*log(x)),xlim=c(0,100),ylim=c(0,1))`

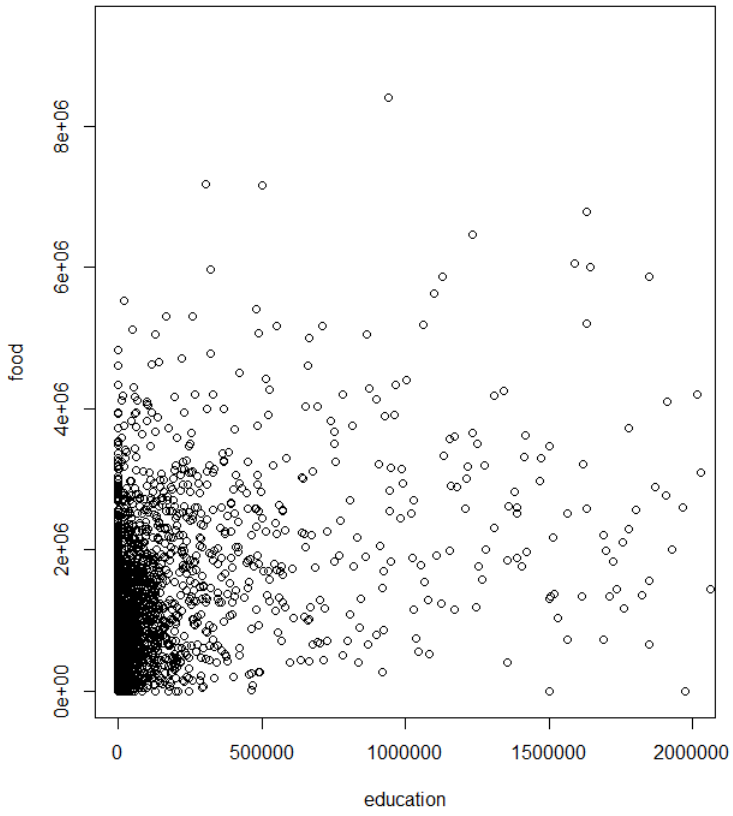

Figure 1: Education vs Food expense in LSMS data

an idea of what is effectively more affordable or preferable for (affordability is essentially preference). Notice that we cannot use total expense here and hence education expense must be divided by the price of education in the area (which is calculated as an average over the region) and food is divided by the respective quantity in the survey.

Afriat's utilities consider prices and quantities that sum up to the total expenditure. In our case, we would need to back out prices from the microdata. Still what Afriat utilities gives us a utility function consistent with data. With this utility function, one may say whether a consumer consumes more of a certain with increasing income or not. But this can also be said with Engel curves (permanent income elasticities) (the kind of analysis we've been doing with instrumentation). The method of affordability is actually the same of elasticity. In the two commodity world of food vs education may suggest that

food is more necessary (or more affordable in our warped sense of the word) than lodging.

Popularity vs Affordability

Clearly the definition of affordability essentially points to elasticity itself. What revealed preference methods essentially measure is popularity of the item (which creates is the social scarcity). If items A and B are bought by 90% and 50% of the population, then one can say that A is more popular than B (not necessarily more affordable than B). More popular items (e.g. watches, clothes, shoes) leave scope for signaling and so do less popular items (jewelry). The utility curve/elasticity methods can point this out.

For every individual an item is more affordable if it's cost is within the threshold percentage of the (permanent) income. This however must be interpreted in the narrow sense of price. People could spend a lot on rice (or buy just rice) - but that doesn't make rice unaffordable - the price of the item compared with the total expenditure - still does provide us the affordability estimate. At least semantically, affordability is about price in the market.can be calculated from the percentile of consumption - an item consumed by more let's say more than 20% of the people spending less than 20% of their consumption should be considered affordable and popular. In summary popularity and affordability of the item both count towards its scarcity. The reference level of needed quantity is also necessary. If people buy more rice than necessary then it seems rice is being used for something other than consumption. In absence of variables indicating stocking, we are likely to ignore this and look only at reference expenditure. We would therefore be asking if consumers are spending more outside of the reference range on rice (against their family size). Reference quantity is decided for eveary commodity and is strictly based on the per-head consumption possibilities. More likely to be in the sense of permitted minimum rather than the average. For example, we might be using the min-max bounds on electricity, rice rather than the average recommended consumption levels.

For example, if we have families A and B of size 4 and 2 - (who live in different areas) spending 20 and 10 GBP on unit of electricity of 3 and 4 units respectively, then the price per unit is 6.67 per unit 2.5 per unit for them. The quantities consumed per head for them are .75 and 2 each. We need to check whether consumption depends on per-head at all. For consumption on electricity, number of heads is important - but other entities like the air-conditioner it may not be linear. To answer whether AC is more affordable than electricity, we decide only based on price. Price of air-conditioner decides whether it is more affordable than electricity or not. However, one cannot have A.C. without having electricity - so even if A.C. is was cheaper (or more affordable based on our definition) than electricity, people wouldn't be buying A.C. or electricity - thus it would be less popular. Scarce items are popular or not based on their practical value (popularity which causes social scarcity) and price.

Multiple Prices and Affordability

We note that can prices can be significantly different between regions. As discussed There are categories for which difference prices may exists within the same region.

Scarcity in terms of availability and affordability

For simplicity scarcity can be specified as a multinomial variable - taking discrete value. depending on the degrees of affordability and availability. Since scarcity is only the explanatory variable, it is worthwhile to consider affordability and availability as proxy for scarcity.

Measuring Reference Popularity

This would be the the measure of availability in the reference area - i.e. the percentile of consumers using the product.

Measuring the Bandwagon effect

Bandwagon effect is the measure of increase in appeal if the popularity in reference area were to increase (through increase in local availability).

if d(rho_reference) >0 then d(appeal)/d(local_av) >0

However, we don't observe the appeal directly. In fact we need to calculate b for the item even when it's not locally available. We compute b for when the item were to become available - thus our computation of bandwagon effect does not consider the local availability. From the reference popularity alone (percentile users in the reference area), b can be interpreted as the tendency to flock i.e. changes in quantity demanded as the popularity of the item grows i.e. $\frac{\partial A}{\partial \rho} \sim \frac{\Delta q}{\Delta \rho}$. If for an increase $d\rho$ in the reference popularity, the appeal of the item available locally increases by dA , then $dA/d\rho$ would denote the bandwagon effect This can be observed with the term series. As a first-cut analysis, we may approximate the change in quantity demanded in two randomly selected trials with respect to the change in observed popularity (percentile of non-zero consumption). If slightly different quantiles of the society are spending more or less on the item then it may allow us to compute the $\Delta q/\Delta \rho$. More specifically, for two samples M and N, we look for $(\bar{q}_M - \bar{q}_N)/(\rho_M - \rho_N)$. The quantity $(\bar{q}_M - \bar{q}_N)$ represents the combined effect of differences in income, education level etc. between the two samples as well. A regression on the in-sampled data - `lm(expenditure~ total_expenditure + consu + highest_educ + age + occupation_rank+housingstatus` - can thus provide a rough estimate of $\frac{\partial q}{\partial \rho}$(notice that region - which cannot be ranked easily - is excluded from this equation - since we only consider the reference region).[4].

[4]To consider differences in categorical (dummy) variables - we use a transformation of every categorical variable into an ordered variable (education becomes education level, region becomes an order of uranbization etc.). The transformations are considered only as long as

Bandwagon Effect for Services

Services follow the same treatment in this analysis.

Scarcity Maps

Scarcity maps can be drawn for every commodity. If commodities are ranked by scarcity, they would be very likely to be visible. Within those that are scarce, the visible commodities (i.e. those that are talked about often in society) might have higher income elasticities and exhibit variations across social clusters. The analysis looks at overall alignment of visible ranking with that of scarcity ranking.

Lagrange Multiplier Example

As an example one can look at the maximization of curve $f(x, y) = x^2 + y^2$ subject to constraint $2x + 3y = 5$. Note that we don't really have a budget constraint available - because we don't have prices for the items.

References

References

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the sorting criteria is significant (using regions sorted based on popdensity for example would treat two regions with same popdensity as equivalent - this may or may not be desirable).