# De Gustibus Non Est Deisputandum

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## 1 Introduction

Try to use calculus of utility-maximizing behavior to explain widespread and/or persistent behavior without introducing the qualification that taste remains the same.

## 2 Analysis

### 2.1 The New Theory of Consumer Choice

Household seeks to maximize

$$U = U(Z_1, ...Z_m) \tag{1}$$

with

$$Z_i = f_i(X_{1i}, ...X_{ki}, t_{1i}, ...t_{li}, S_1, ..., S_l, Y_i), i = 1...m \tag{2}$$

where $Z_i$are the commodity objects of choice. $f_i$is the production function or the ith commodity, $X_{ji}$is the quantity of the jth market good or services used in the production of the ith commodity. $t_{ji}$is the jth person's own time input, $S_j$is the jth person's human capital and $Y_i$represents all other inputs. $Z_i$have no market prices but have shadow prices, $\pi_i$ determined by their costs of production. The real income of household now is not equal to its money income deflated by an index of the prices of market goods, but equals to its full income (which include value of "time") deflated by an index of the prices $\pi_i$.

### 2.2 Stability of Tastes and Addiction

In this section, introduce the model for taste of music and then, generalized the application of the model to other goods. Now, consider the utility maximization of two goods(music and other goods):

$$U = U(M, Z) \tag{3}$$

$$M = M_m(t_m, S_m)$$

$$\frac{dM_m}{dt_m} > 0 \quad , \quad \frac{dM_m}{dS_m} > 0$$

$$\frac{d^2M_m}{dt_m dS_m} > 0 \tag{4}$$

where M measures the amount of music "appreciation" produced and consume, and Z the production of other other goods. $t_m$and $S_m$ are the time allocated for music production and other human capital conducive to music appreciation respectively. By (4), increase in music capital increases the productivity of time spent listening to music.

Introduce time flow to the model. The amount of appreciation at any moment j, $M_j$ would depend on the time allocated to music and the music human capital at time j: $t_{mj}$and $S_{mj}$. he latter is produced partly through "on-the-job" training or "learning by doing" by accumulating the effects of earlier music appreciation:

$$S_{mj} = h(M_{j-1}, M_{j-2}, ..., E_j) \tag{5}$$

$E_j$ is education and h is increasing in it (not important...). By definition, the addiction is beneficial if

$$\frac{dS_{mj}}{dM_{j-v}} > 0 \text{ ,all v in equation (6)}$$

For simplicity, the individual's utility function is a discounted sum of functions like the one in (3), where M and Z. The optimal allocation from FOC is the ratio of marginal utilities and shadow prices

$$\frac{MU_{mj}}{MU_{zj}} = \frac{dU}{dM_j} / \frac{dU}{dZ_j} = \frac{\pi_{mj}}{\pi_{zj}}$$

The shadow price of music at time j, $\pi_{mj}$equals to

$$\pi_{mj} = \frac{wdt_{mj}}{dM_j} - w \sum_{i=1}^{n-j} \frac{dM_{j+i}}{dS_{mj+i}} / \frac{dM_{j+i}}{dt_{mj+i}} \frac{1}{(i+r)^i} = \frac{wdt_{mj}}{dM_j} - A_j = \frac{w}{MP_{tmj}} - A_j$$

where $w$ is the wage rate, $r$ is the interest rate, $n$ length of life, and $A_j$ the effect of addiction, measures in the value of saving in future time inputs from the effect of production of M in $j$ on subsequent music capital.

If no addiction, $A_j = 0$. With addiction, $A_j$ is positive as long as music is beneficially addictive and tend to decline as j increases ( as the person gets older) and approaches zero as $j$ approaches $n$; $A_j$does not change much with age at young ages because the percentage decline in the number of remaining years is small . The term $w/MP_{tm}$ declines with age for a give time input as long as music capital grows with age. To ease analysis, Becker assume that the decline of $w/MP_{tm}$ is larger than that of $A_j$, so $\pi_m$ declines continuously with age. Important messages of the model:

- If $\pi_z$ does not depend of age, the relative price of music appreciation would decline in age. Hence, the consumption of music appreciation rises with exposure not because of tastes shift in favor of music, but because its shadow price falls as skill and experience in the appreciation of music are acquired with exposure.
- Addiction would increase time spent on music at younger ages: some of the time would be considered an investment that increases future music capital.
- Although the price of music tends to fall with age, and the consumption of music tends t i rise, the time spent on music need not rise with age because the the music capital is growing.
- The time spent on music is likely to be addictive - to rise with exposure of music - the more elastic the demand curve for music appreciation

- If music capital has depreciation, the stock of music capital might fall and the price of music appreciation rise at older ages because the incentive to invest in future capital would decline as number of remaining years declined, whereas the investment required simply to maintain the capital stock intact would increase as stock increased. Consequently, the observed addiction to music may be stronger at young ages than at old ages.

Now, we analyze harmful addiction, which is defined by

$$\frac{dS_j}{dH_{j-v}} \quad < \quad 0 \text{ , all v in (6)}$$

where H is a harmfully addictive commodity. An increase in consumption of H at any age reduces the capital stock of consumption available subsequently and this raises the shadow price at all ages. This would induce consumption of H to fall with age and exposure. The inputs of goods and time need not fall with exposure because capital stock of consumption falls. Indeed, the input are likely to rise with exposure if the commodity's demand curve were elastic. Important messages:

- Consider commodity "euphoria" produced with input of heroin. An increase in the consumption of current euphoria raises the cost of producing euphoria raises the cost of producing euphoria in the future by reducing the future stock of "euphoric capital". This would reduce consumption of euphoria in the future. However, if the demand curve for euphoria were sufficiently inelastic, the use of heroin would grow with exposure at the same time that euphoria fell.

- Note that an addiction to heroin -a growth in use with exposure- is the result of an inelastic demand for heroin, not the cause of an inelastic demand.

- A exogenous rise in price of addictive goods or time has less effect on harmfully addictive goods compare to beneficially addictive goods. Excise tax and imprisonment (increase prices of addictive goods) mainly transfer resources from addicts if the goods are harmfully addictive, and mainly reduce the consumption of addicts if the goods are beneficially addictive.

- with no addiction, shadow price is just the marginal cost. With positive addiction, cost tend to decrease over time because the effect on the marginal product of the time inputs would tend to dominate the effect on addiction.

## 2.3 Stability of tastes and custom and tradition

- Behavior is relatively stable in the face of temporary changes. This is because to make decisions(such as buying a new item rather the one usually bought) in response to changes in environment is costly. Making decisions requires information, and the information must be analyzed. The cost of searching and applying new information to a new situation are such that habit is often a more efficient way to deal with moderate or temporary changes in environment.

- Now, switch to the model in previous subsection(for the remaining bullet points). Behavior is stable in the face of temporary changes because it would not pay to disinvest the capital accumulated(for producing M), or to accumulate different types of capital.

- An unexpected change in environment does not induce a major response immediately because time is required to accumulate the appropriate the appropriate knowledge and skills. Explain why short-run demand and supply is inelastic.

- A permanent change in the environment (economics development) causes greater change in the behavior of young than of old person ( young people are more readily seduced away from customs and tradition). This is because in response to change in environment, people have to either disinvest their capital that was attuned to the old environment or invest in capital attuned to

the new environment. Since old people have less number of years to collect returns on new investments, and more old human capital to be disinvested, old people have less incentive change their behavior relative to young people. By the same token, young people has more incentive to attuned to new environment since they have more years to live.

## 2.4 Stability of Tastes and Advertising and Fashion

- Motivation: A consumer may indirectly utility from market good, yet the utility does not depend only on the quantity of good but also on the consumers' knowledge of its true and alleged properties. For example, if he does not know whether the berries are poisonous, they are not food.
- Similar to previous models, the ultimate object of choice are commodities (Z) produced by each household with market good, own time, and 'knowledge'. Knowledge is produced by the advertising of produces.

The model:

$$\begin{aligned} Z &= f(x, A, y) \\ \frac{dZ}{dx} > 0 \quad &, \quad \frac{dZ}{dA} > 0 \\ x &= \text{Output of a particular firm} \\ A &= \text{Advertising of x by the particular firm} \\ y &= \text{Other inputs} \end{aligned}$$

To further simplify

$$\begin{aligned} Z &= g(A, y)x \\ \frac{dg}{dA} = g' > 0 \quad &, \quad \frac{d^2g}{dA^2} < 0 \end{aligned}$$

with A, E, y held constant, the amount of commodity produced and consumed by household is assumed to be proportional to the amount of firm's output used by that household. If the advertising reaching any household were independent of its behavior, then

$$\begin{aligned} \pi_z Z &= p_x x \\ \pi_z &= \frac{p_x}{g} \end{aligned} \tag{6}$$

where $p_x$is the price of $x$. Important messages:

- An increase in advertising may lower the commodity price to household(by raising g), and thereby increase its demand for the commodity(Z) and change its demand for the firm's output(x). Consequently, advertising affects consumption in this formulation not by changing tastes, but by changing prices.
- Even a firm faced with a fixed commodity price($\pi_x$) in a perfectly competitive commodity market can sell its product at different prices($p_x$) by varying the levels of advertising. Since an increase in advertising would increase the commodity output that consumers received for a given amount of firm's output, the price of the product($p_x$) would then increased relative to the fixed commodity price($\pi_x$).

- A firm can have many perfect substitutes in the commodity market even if there are only a few firm that produce the same physical product. For instance, a firm may be a sole designer of jewelery that contribute to the social prestige(commodity) of consumer, but there are many products that contribute to social prestige such as fashionable clothes, race car, and etc.

The optimal advertising for a firm can be found by maximizing its income

$$\begin{aligned} I &= p_x X - TC(X) - Ap_a \\ TC(X) &= \text{Total cost of production} \\ p_a &= \text{Cost of a unit advertising} \end{aligned}$$

By (6), can be rewritten as

$$I = \pi_z g(A) X - TC(X) - Ap_a$$

The FOC w.r.t X and A are

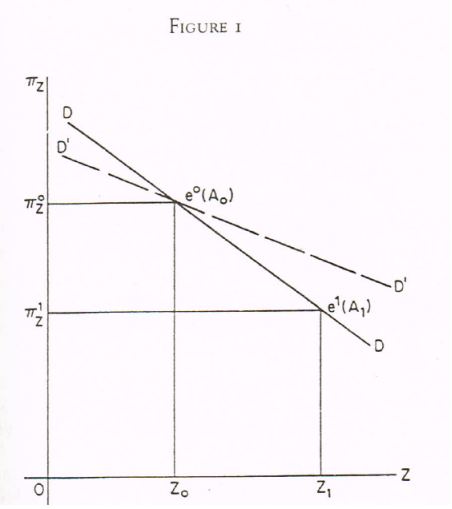
$$\begin{aligned} p_x &= \pi_z g = MC(X) \\ \frac{dp_x}{dA} &= \pi_z X g' = p_a \end{aligned} \tag{7}$$

By (7), marginal cost and marginal revenue of advertising are equal, where marginal revenue is determined by the level of output and the increase in product priced "induced" by increase in advertising. Important messages:

- Although commodity price is fixed, an increase in advertising increase the firm's product price by an amount that is proportional to increased capacity of its product to contribute to commodity output.
- In the model, consumers have imperfect information, including misinformation, and a skilled advertiser might well be able to differentiate their product from other similar product.
- If different firms were producing the same physical product in the same competitive commodity market, and had the same marginal cost and advertising-effectiveness, they would produce the same output, charge the same product price, and advertise at the same rate. If their marginal cost or advertising effectiveness differed, they would charge different product prices, advertise at different rates, and yet still by perfect competitors.

Now, assume a finite commodity demand elasticity and consider figure 1:

FIGURE 1



The curve DD gives the firm's commodity demand curve. The firm production of X is held fixed so that Z varies because of variations in advertising. An increase of advertising from $A_0$to$A_1$would increase $Z_0$ to $Z_1$. The decline of $\pi_Z$ induced by the increase in Z would be negatively related to the elasticity of the commodity demand curve: it would be less, for example, it the demand curve were DD' rather than DD. Since the increase in $p_x$ is negatively related to the decline in $\pi_z$, the increase in $p_x$, and thus the marginal revenue from the increase in A, is directly related to the elasticity of the commodity demand curve. Important message:

- Optimal level of advertising would be positively related to the commodity elasticity

## 2.5 Fashion and Fades

- The ares in which the rivalry of fashion takes place are characterized by public exposure and reasonably short life because an unexposed good cannot be judge as to its fashionables, and fashions in a good whose efficient life is long would be expensive

Now, introduce the commodity of social distinction. Social distinction of the ith person can be written as

$$R_i \quad = \quad D_i + h_i$$

where $D_i$ is the contribution to his distinction of his social environment while $h_i$ is his own contribution. Each person maximizes a utility subject to a budget constraint that depends on his own income and exogeneously given social environment.

- An increase in i's income would increase his demand for social distinction and other goods. If the social environment is unchanged, the whole increase in his distinction would be produced by an increase in his own contributions to distinction-producing goods(fashion). Hence, an average income elasticity of distinction would imply how income elasticity for distinction producing goods, which is consistent with common judgment that fashion is luxury good

- If other person increase their contributions to their distinction, this may lower i's distinction by reducing his social environment. Hence, person i is induced to increase his effort to achieve distinction by demanding new fashions.

- Therefore, an increase in all income incomes induces an even greater increase in i's contribution to his distinction than does an increase in his own income. This is because in addition to his own income effect, the increase in income of others lowers i's social environment further, inducing i to spend more on his distinction. Hence, we expect wealthier countries to pay more attention on fashion.