

REVISITING HUMAN BEHAVIOUR THROUGH DEMAND ANALYSIS: WHY A DEMAND CURVE MAY NOT BE DOWNWARD SLOPING?

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Abstract

Assumption of a downward sloping demand curve establishes a negative relationship between price and quantity demanded. Unfortunately, in real life, we do not come across such downward sloping demand curves. On the other hand, what we observe in real life is, within a specific price range, a consumer consumes fixed amount of a commodity irrespective of the price and abandons the commodity beyond the price range. The paper argues that a consumer classifies different commodities as necessary and unnecessary and develops a sort of inertia of demand loyalty for the specific commodities she consumes. During price fluctuations, she may have to spend more or less of money on the commodity, but her consumption remains the same. Therefore, the demand curve should be a vertical straight line irrespective of the levels of prices. A typical consumer would switch over to another new commodity and will not reduce the quantity consumed of the existing commodity if she finds the present commodity more pricy or the other more affordable. The paper draws on some of the available literature on the critical analysis of demand as a concept and makes an effort to present the understanding through arguments and some real life examples.

Keywords: Demand analysis, downward sloping demand curve, inertia of demand loyalty, demand price relationship, consumer behaviour

INTRODUCTION

A downward sloping demand curve is the cornerstone for all microeconomic analyses. In popular economics literature, a demand schedule is noted to represent the law of demand. The law of demand has been so prophetic that all analyses of microeconomics have actually taken it uncritically and have extended the science on its premise. The present paper is an effort to present some of the difficulties in comprehending the inverse relationship between price and demand as it has been explained in the science of economics so far and subsequent difficulties in understanding microeconomics. This paper presents an overview of the law of demand, some

arguments that contradict the very assumptions of the grand demand theory and some explanations for what a more realistic demand curve should be in the context of a price change.

LAW OF DEMAND IN THE HISTORY OF 'ECONOMICS'

John Locke probably gave the first precise explanation to what came to be known as the law of demand later. In his letter sent to a Member of Parliament, 7 November 1691, he wrote; '*The price of any commodity rises or falls by the proportion of the number of buyer and sellers.....that which regulates the price... [of goods] is nothing else but their quantity in proportion to their rent*' (Locke, 1691). Here, by quantity he probably meant supply and rent as the basis for demand. Later, the concept was made more precise with the use of terms like 'demand' and 'supply' as market forces determining the price of a commodity through some sort of price adjustment process leading to a steady state price where market clears. The concepts developed further through the explanations by James Denham-Steuart (1767), Adam Smith (1776), David Ricardo and Antoine Augustin Cournot in the first half of the 19th century and thinkers like Stanley Jevons, Carl Menger, Léon Walras, Fleeming Jenkin and most prominently by Alfred Marshall in the last half of the 19th century. Such were the influences of these works that a graphical model of demand and supply interactions with assumptions of independence of these market forces and a fixed resource constraints was developed and popularised as Marshallian cross with a downward sloping demand curve and an upward rising supply curve depending on price movements (Cohen, 1983; Jenkin, 1870 ; Humphrey, 1992; O'Sullivan & Sheffrin, 2003). The Marshallian analysis of demand came under criticism by Sraffa (1926) and Samuelson and many other economists (Cohen, 1983; Samuelson, 2000).

The paragraph above is just an account of the evolution of views around the concept of demand and its presentation. In no way it tries to compare and qualify views. It is necessary to acknowledge here that the concept of demand as a declining function of price have evolved through views of classical economists and neo-classical economists although the views and approaches presented by neo-classical economists got a lot of patronage by the elite intellectuals in teaching and learning in economics. The critics of neo-classical economics have criticised the paradigm due to its lack of objectivity and absurdity of assumptions (Alfred & Kregel, 1975). But still, the paradigm dominates the field of economics so much that what we currently study as mainstream economics in our schools and colleges is neoclassical economics only along with a limited exposure to other viewpoints. One may refer to works by Sraffa, Kurz, Keen and others for a better understanding of the neoclassical viewpoint and its major flaws (Kurz, 2000; Keen, 2001).In the limited scope of this paper, we shall focus only on the logical flaws in assuming the inverse relationship of demand with price of the commodity which continues to be the cornerstone of most microeconomic understanding in economics education programmes.

The law of demand establishes an inverse relationship between price and quantity demanded of a normal good keeping other variables affecting demand as constant, although there are certain exceptions known as Giffen goods and Veblen goods (Mankiw, 2007; O' Sullivan & Sheffrin, 2003). The law is based on several limiting assumptions such as; the relationship is studied at a static time when habits, tastes, preferences, income of the consumer and prices of related commodities remain unchanged and the expectations about future prices also remain unchanged. Larsson presents a summary of some very interesting derivations of demand law and establish the relationship (Larsson L. G., 2008 ; Larsson L.-G. , 2010).

The concept of demand for a commodity is integrally related to another concept in economics known as 'utility'. Although widely debated, 'utility' as a concept has been in the forefront of economic analysis of consumer behaviour in many ways. Adam Smith expressed it as the value in use as against the value in exchange; Jeremy Bentham expressed it as the intensity, duration, certainty and propinquity of a hypothetical measurement of quantities of pleasure and pain. David Ricardo, a 'pragmatic reformer' in the domain of ideas in economics expressed it as a value in use but did not approve any measure for its quantitative assessment. In the chapter titled 'Mr. Malthus's Opinion on Rent' of his book 'On The Principles of Political Economy and Taxation' he asserted, '*Value in use cannot be measured by any known standard; it is differently estimated by different persons*' (Ricardo, 1817). Ricardo never believed in the property of diminishing marginal utility. It was Jules Dupuit, an engineer by profession, who developed the concept of utility maximisation for determining the optimum toll for bridge passages. Heinrich Gossen gave the first principle of the marginal utility theory i.e., $MU_1/P_1 = MU_2/P_2$. Jevons, Menger, Walras, Marshall and Clark were the economists who gave the modern shape to the utility analysis with precision and arguments against the Ricardian views. The list of authorities discussed here is not at all comprehensive. The concept broadly developed as the Ricardian views around non-measurable use value of a commodity and the neoclassical notion of utility that can be measured to different extents. Some measured it in terms of numbers, some by ranks and some by the measuring rod of money (Stigler, 1950). It is worthwhile to mention here that although the concept of demand and utility were related, they evolved separately in the history of economics. The inverse relationship of demand with price of a commodity was accepted as an axiom of consumer behaviour and it is so even in most recent textbooks being taught in classrooms across the globe.

In the traditional point of view, since utility function is considered as an increasing quasi-concave function of quantity consumed subject to a budget constraint, when the utility function is maximised we get a negative relationship between price and demand for a product (Jehle & Reny, 2001). In a authority textbook by Hall Varian, such a relationship is contextualised as, "If

the demand for a goods increases when income increases, then the demand for that goods must decrease when its price increases” (Varian, 2006). Some other authorities in microeconomics extend this inverse relationship between price and demand to the whole of market (Quah, 2000; Hildenbrand, 1983; Härdle, Hildenbrand, & Jerison, 1991). Even JR Hicks (1939) in his discussions in ‘Value and Capital (Chapter-II)’ states very prophetically that ‘a study of individual demand is only a means to the study of market demand’ (Hicks, 1939) while discussing the consumer’s demand. A function relating quantity demanded inversely with price makes the rest of the analysis in economics simplistic. In other words, assuming a downward sloping demand curve makes smooth some associated analysis in economics such as the theory of consumers’ surplus, consumer equilibrium and so on. Such an inverse relationship is also a basis to many new paradigms of economics such as environmental economics and some notable discussions on policy for environmental protection in a market economy.

The forthcoming paragraphs attempt to highlight some possible flaws in a downward sloping demand curve. Some of such flaws presented below have been highlighted earlier by several other thinkers in their attempt to question the mainstream economics. The most recent wave of such questioning is currently being pioneered by the heterodox economists. The arguments below are only an attempt to highlight the confusions created by the assumption of a downward sloping demand curve, although we have also made a useless attempt to present a demand curve in relation to prices as the author believes that demand for a commodity never responds to a price change *ceteris paribus*.

SOME POSSIBLE FLAWS IN A DOWNWARD SLOPING DEMAND CURVE

A downward sloping demand curve is easy to believe and makes the life of an economist easier by extending all further discussions in economics through a cross equilibrium. Only one assumption of existence of God makes our life so easy that not only we internalise the assumption, but also extend it for finding solutions to different other puzzles of life. The assumption of a negative price-demand relationship has similar problem solving abilities although the solutions are absurd. What makes the author doubt this established relationship is the difficulties in understanding the way the market demand for commodities (supposed to be normal goods) react to changes in prices. The flaws in such relationship as highlighted below are therefore no new findings, but a set of confusions emerging out of inconsistencies between the state of mind of the author trained in mainstream economics and the learning gathered from the observation of real life behaviour of consumers and markets.

(1) What may be a normal good in the world we live in?

In economics literature, a normal good defined as a commodity whose demand increases with the increase in income (Economist, 2013). Apart from such a vague definition, we really have

little explanation for what may be considered as a normal good. If we say that demand law applies to normal goods only and normal goods are those for which law of demand holds; it does not make any sense. It is like what Joan Robinson once observed about utility when she criticised the concept for being a circular non-explanation. She wrote, 'Utility is the quality in commodities that makes individuals want to buy them, and the fact that individuals want to buy commodities shows that they have utility' (Robinson, 1962). We hardly observe anything in this world that can be termed as a normal goods as per such a relationship with income. Although varies in intensity, the demand for all the tradable commodities in the world varies directly with income of the consumer even in case of the so called Giffen goods as long as the consumer is not abandoning the goods completely, if we are considering a *ceteris paribus* conditionality. Notwithstanding the interesting observation of the paradox by Robert Giffen from the spending behaviour of the poor consumers during Victorian Era, we cannot relate price changes with demand when all other variables are also changing. Unfortunately, the dynamic economies are not like a lab based systems of observation where other variables can be significantly controlled. What a normal good is, therefore, is a matter of debate and there seems to be a lack of coherence in its existing explanations. We cannot brand any commodity as inferior goods or normal goods as conceptually demand for a commodity has nothing to do with the physical nature of the commodity; rather the 'use value' specific to consumers. A consumer's branding goods as normal or inferior for consumption depends on the ability of the consumer to fulfil her desire. For that matter, it is really not the price but the income of the consumer that determines the demand for a commodity. What the consumer does is to prioritize her choice of goods depending on her ability and her perceived notion of utility from the consumption of that commodity. Therefore, what a consumer can at best do is to classify commodities as necessary and unnecessary items for consumption; not normal and inferior. We may define a necessary commodity as something without whose consumption the perceived welfare of the consumer declines. An unnecessary commodity may be one for which the consumer may be indifferent between consuming and not consuming.

(2) *What may constitute a 'static time' in a downward sloping demand curve?*

Another critical issue about a downward sloping demand curve is in the assumption of time of consumption being static. During a consumption process, what we assume in a downward sloping demand curve is the activity of consumption being undertaken in a single time point in which price varies and income remains constant. Since the ability of the consumer to fulfil her desire is what determines her demand, it may also be rational to assume that the time that is taken as static is the time span in which income remains static. If this is so, then we also need to assume that the demand of a commodity in such a static time period constitute the sum of all

purchases done in that period only (in which income remains static) irrespective of the fluctuations in price. In reality, people do earn their income as daily or weekly or monthly basis. So, we need to consider the consumption also in the same time context, i.e, daily, weekly or monthly. Since prices can change at any moment within this time context, a consumer adjusts her purchases of commodities accordingly. When the prices go down, the consumer makes more purchases so that she can compensate her loss in consumption with rising prices within the same time frame. When such an increased purchase occurs, it is only rational to believe that the consumer is undertaking an advance purchase against her future purchase schedule with an anticipation of future rise in prices. The extra purchases made will be considered as planned inventories and shall not be a part of current consumption demand. Let us try to comprehend this issue through an example. For a consumer who earns an income monthly, her consumption cycle is also to be considered on a monthly basis. What actually constitutes a demand in this cycle of consumption is the total amount of goods purchased by the consumer as perceived necessities irrespective of the fluctuations in the price as well as her daily purchases of that commodity. Therefore, in a static consumption time context, what influenced demand for a product are the consideration of the commodity as a necessity and the income of the consumer in the specific time context. Price of the commodity hardly plays a role.

(3) *Contradictions in assuming a downward sloping demand curve and the assumption of rationality.*

To be frank, we do not consider rationality a core issue in understanding economics. But in the mainstream economics, rationality assumption has remained a significant building block. The belief in the downward sloping demand curve also faces the challenge of rationality of the individual consumer. In a downward sloping demand curve at two points of consumption (say A and B in figure-1), the consumer demands more of a commodity X at point B with lower price and less at A with higher price. Logically, a consumer facing a *ceteris paribus* situation should make a transition from B to A only when she at least compensates this loss with the consumption of another commodity say Y with the money saved (if any) from this lowered consumption of X. Let us assume that the total utility she was deriving from consumption of B amount of X was U_B and the new utility the consumer is deriving from consumption of X at A is U_C , which is a function of consumption of less amount of X and some amount of another commodity Y.

Let us discuss the case from a comparison of the following scenarios.

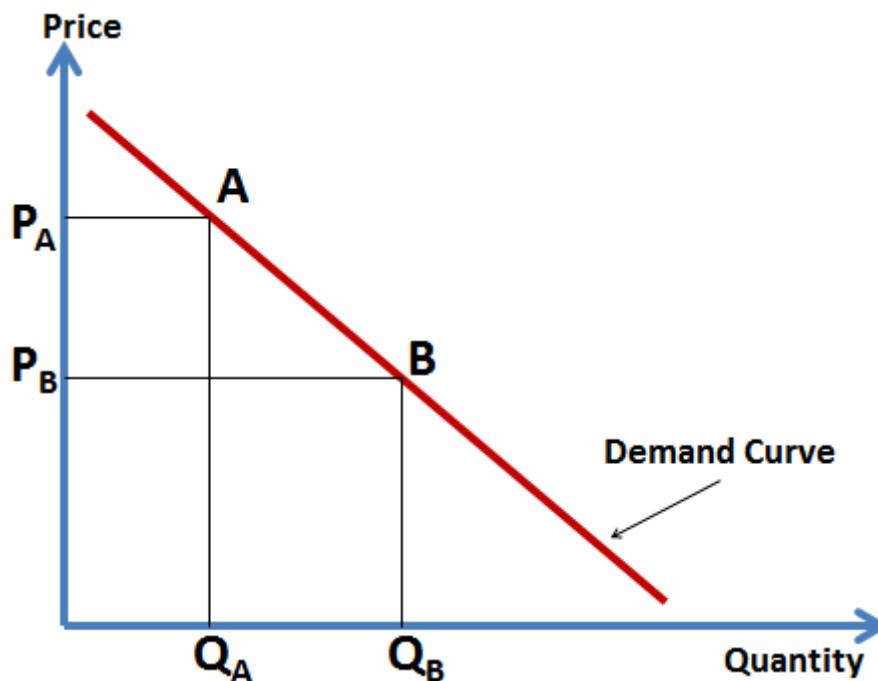
Scenario-1: $U_B = f(Q_B \text{ of } X)$

Scenario-2: $U_B \leq U_C = g(Q_A \text{ of } X, Q_C \text{ of } Y)$

Scenario-3: $U_C \leq U_D = h(Q_D \text{ of } Y \text{ only at lower price than that of } X)$

Where, Q_C of Y (substitute) has been purchased at price P_C which has not changed in all the scenarios. Here P_C has to be lower than P_B to the extent that the total expenditure on Q_C is at best equal to the savings made in lower consumption of X . If the consumer is not able to achieve this, she may not be a rational consumer. But if she is a rational consumer, then why did she accept scenario-1 in the first place when scenario 3 could have given her more utility than all other scenarios. Therefore, it is difficult to rationalise a downward sloping demand curve. The point is why the consumer did not go for the low priced substitute in the first place itself as she could have more total utility that way?

Figure 1: The Conventional Demand Curve



Source: (O'Sullivan & Sheffrin, 2003)

(4) *A downward sloping demand curve and limitlessness of human wants*

With a downward sloping demand curve, the consumer may realise that she should not assume utility to be a function of the quantity of goods consumed. Even if the goods become free commodity one would demand only that much which she requires (the point at which the demand curve may touch the demand axis when price is zero). Such a realisation may lead us to assume that the wants have finite spread only. Even if we assume an asymptotically declining demand curve then we may face another problem that the total utility should never fall. So, consumption should never drop if we can afford it. The reality is, we only demand a finite amount of commodities to the extent we consider them necessary.

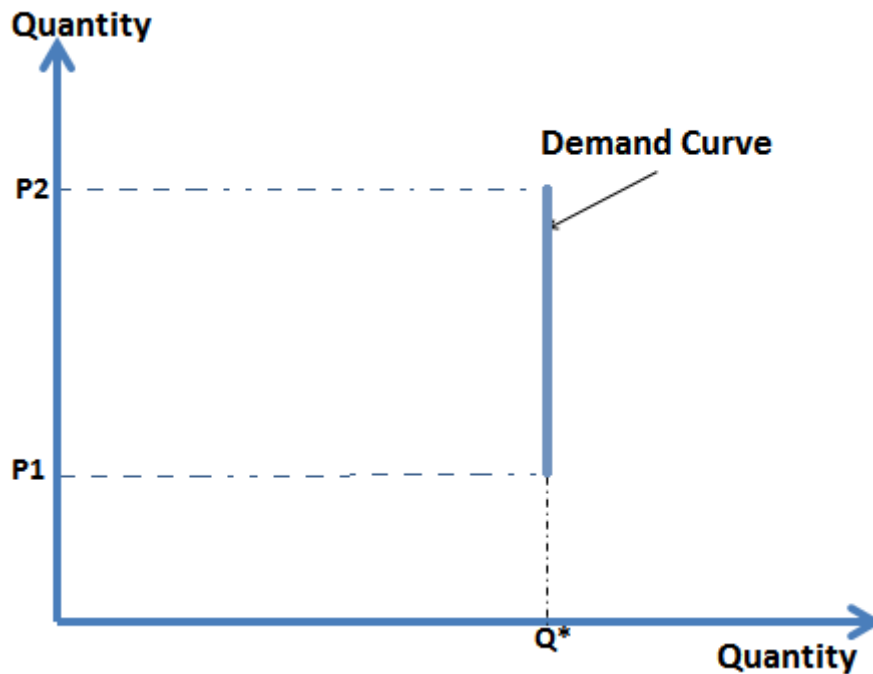
(5) *Demystifying the Downward Sloping Demand Curve through Commodity Life Cycle*

If one tries to find an answer to why we demand a specific commodity and prepare our commodity bundle in the first place from among the set of infinite types of available and related commodities, one would not be surprised to notice that it is not the price of a commodity that shaped our demand basket. When a commodity enters into the market for the first time, there are only a few takers for that commodity for whom price is never an issue. For example, in many parts of a country like India, there are people who are not aware of a commodity like 'Tofu' (a cheese like substance made of soybean milk). Those who are not aware of the product do not have any demand for it. Those who are aware, and do have a demand for the product do not bother for the price. 'Tofu' is currently available in major cities and in the modern retail stores frequented by the high income groups. There will possibly be a time when 'Tofu' will be a popular food item and will be available on the shelves of food shops even in remote villages and the commodity will have a place in the consumption basket of the majority of population. Some five decades ago, *Hukka* (a traditional equipment of inhaling tobacco smoke through a long pipe) was in the set of necessary items in most of the households. Now *Hukka* is seen used popularly in some pockets of the country and very rarely in other places. Whether it is the story of 'Tofu' or 'Hukka', all the commodities that are traded in the markets today, must have gone through this transition of product development (creation), use by a small group near the production centre, popularisation of the commodity and then a decline in its use. In all the stages of its transition, it remains in the set of necessary goods for some consumer or others. How does this transition take place? Possibly there are only two ways for the commodity to find a place in the consumption basket of a consumer as a necessary item; (a) awareness about the product (be it called information or a socially constructed choice) and (b) the affordability of the commodity to fit in the basket of necessary items of an individual consumer, determined by the income of the consumer and not the price of the product. Do we increase the frequency of our visit to workplace if fuel prices fall? If fuel prices rise, do we reduce our visit to the workplace? The answer probably is 'NO'. In the process of consumption, a consumer may develop a sort of loyalty for the product or the brand of the product that enables the product to enjoy a constant demand from the consumer as long as income allows the consumer to demand that commodity. In the event of a price rise, in the initial stages, the consumer expresses her resistance against price rise, by curtailing her savings and not by reducing her demand for the goods. Consumers loyal to a commodity (already in the basket of necessary items) will initially have a wait and watch policy by changing her purchase plans in her adjustment with price change, but not by reducing consumption in the same income cycle. Only when the consumer is convinced that she may derive at least the same utility from the consumptions of hitherto unnecessary goods (she might already have some information from previous experimental consumptions, or through reference from society) that may substitute the current goods, she will not shift from the

consumption of the current commodity, even if she may have to temporarily dis-save. A person who may not enjoy a surplus income (in the form of savings) shall immediately switchover to cheaper substitutes whenever a price change affects affordability. So, instead of reducing or increasing consumption with the price change, the consumer will shift altogether to the consumption of another commodity. At the moment, we may term this behaviour as 'inertia of demand loyalty'.

Thus, with the difficulties in conceiving a downward sloping demand curve from the discussions above, what may constitute a more realistic demand curve is discussed in the following section.

Figure 2: A More Realistic Price-Demand Curve May be a Vertical Line with finite spread



WHAT MAY CONSTITUTE A MORE REALISTIC DEMAND CURVE?

What may look like a more realistic demand curve is shown in Figure-2. To our considered opinion, the demand curve for a particular commodity remains fixed in a range of prices. A commodity may be unnecessary at a price below P_1 and is both unnecessary and unaffordable above P_2 price. A consumer may once in a while consume the commodity when the price of the commodity is not within the range P_1P_2 , as an experimental consumption or temporary substitute consumption. But the commodity may not be considered as a part of the demand basket if the price is not within this range. The amount of consumption of the commodity is zero outside this range of prices.

SOME REAL LIFE EXAMPLES OF THE PROPOSED DEMAND CURVE AND PURCHASE ADJUSTMENTS

Here are some examples of how in real life our proposed demand curve works.

Although, a consumer's set of desired commodities consists of all goods she is aware of as useful, her actual demand basket only consists of commodities she and her society have taken time to test and approve as necessary commodities. Income of the consumer, and not the price of the product, plays a critical role in such approval. For example, the number of telephone calls a consumer may make in a month is more or less fixed around a finite amount unless it changes due to shocks and emergency situations. The consumer tries her level best to adhere to her approved level of calls and does not increase it if the price falls or reduces it if the price rises. Similarly, a consumer acquainted with eating four boiled eggs per day does not increase her eating to 8 eggs per day if the price halves. If the savings due to fall in prices are so much that the income of the consumer increases by sufficient amount to enable the consumer opt for a better commodity instead of boiled eggs, she will stop consumption of eggs and/or add a new commodity to her basket of goods that she may think necessary in the new situation. A person building a house would require only a finite quantity of house building materials and would not increase the number of windows in her material purchases if the price of windows decline. She would not change the plan of her house with the change in prices of specific raw materials. Of course, she may build a different house if the changed prices make a better house affordable with her income. If education fees are lowered, students do not get enrolled in many colleges simultaneously. Of course she may go for a better college or a better degree as per her perceived notions constructed socially. In all the cases, whenever a consumer takes a decision on changing her original plan of consumption, she changes the commodity itself and not the quantity consumed of the commodity. So, prices hardly matter when it comes to the nature of the demand curve. Rather, we may conclude that it is the income of the consumer and the socially constructed notions of necessity that makes the quantity consumed of a commodity fixed in a specific time frame. We may keep on adding examples.

CONCLUDING NOTES

The purpose of this paper is not to present a critical analysis of the understanding surrounding a downward sloping demand curve. There is no disagreement that the concept of demand holds a lot of significance in understanding our social and economic relations. There also is no disagreement that knowledge and ideas evolve through the churning process of highlighting contradictions and through a dialectical process leading to better and clearer horizon of knowledge today than yesterday. For that matter, ideas with substance and scientific rigor are always weighed precious than illogical and absurd ones. What the author fails to understand is the mysterious neglect of the logically grounded and better views of Ricardian analysis that

surfaced before two centuries and the persistence of absurdities of the so called 'mainstream economics' that takes more things as granted than the absurd solutions it provides. As a learner of economics in the twenty first century, the author is often surprised to compare the ease of understanding offered by the earlier views with the absurdity and confusions created by the modern views. One such absurdity is the 'downward sloping demand curve'.

The downward sloping demand curve has remained the cornerstone of most economic analyses so far. However, more often than not, such a curve does not give a convincing explanation of the reality. The paper suggests that in real life people construct their demand on the basis of income and their perceived notion of the commodity being necessary (and/or urgent) for their consumption. A change in price does not affect the demand situation for a product as long as it does not make the consumer fail to afford it. As long as the consumer can afford the commodity, the consumption of that commodity remains intact irrespective of the changes in price due to 'inertia of consumption loyalty' developed through a period of consumption of the said commodity. A rational consumer will not substitute consumption of a commodity partly. She will switch-over to a substitute completely only when she finds the price of the commodity so high that she cannot afford the consumption with her income in a particular time period. Therefore, the demand curve should be a vertical straight line only and that too for a particular range of prices. There may be instances when a consumer may undertake test consumption of commodities not commonly included in her consumption basket. Such an action of the consumer is only for gathering information about a commodity and a consumer never substitutes such test commodities with her current basket of commodities. Again, such test consumptions occur only when the commodity is available to the consumer without paying for its actual price or the social prescription is so strong that the consumer cannot help consuming the test commodity. Under both the circumstances, the choice of the consumer is not her own but is influenced by other factors restricting the decision of the consumer.

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