

Prior-Mag Theorem as Fundamental Theorem in Behavioral Economics

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Abstract

Behavioral economists have developed theories proving that decisions involving consumers' choices made in the market are not strictly rational but on many occasions, they are influenced by social, cognitive, psychological and emotional factors. This is in contrast to what many modern economists think. Having researched in many developing countries in the West African, the author's work supports the views that these non-rational decisions made in the market context have consequences for prices, resource allocation, and returns. In this article, the author purposes to develop on the consequences of a recent result to unearth a new theorem that challenges the principle that human rationality is not the only thing that controls market decisions but also other non-logic factors such as sentimental affection behaviors do affect decisions. The **method** used in this investigation was the deductive method. The deductive method, which is a scientific method, is more superior and allows empirical scientists to test its results later. The **results** of this article, together with behavioral concepts, direct our attention to the fact that investors and consumers' behaviors in economics do not inhere in the rational domain alone, but also on emotional factors, cognitive, and social psychological factors that powerfully influence activities in the world market and businesses. The **conclusion** also shows that individuals have no cognitive forebodings concerning the way they make priority needs the choice over magnitude needs in the world of economics where profit orientation task and rationality are appraised as superior to sentimental affections choice. Finally, this behavioral economics theorem will have a tremendous effect and shall illuminate the study of market behavior and finance.

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Keywords: behavioral economics, decision, risk-taking, psychological, cognitive, emotional factors, finance

INTRODUCTION

We live in the modern world where the global economy and businesses often compel individuals and potential businessmen to make choices that could affect their return on their investments. In the extremely competitive business world, people continually have to deal with choices, which concern their preferences and values as well. These could also occur in periods when there is uncertainty regarding the choice of these values or even commodities. Should they choose something that they prefer to utilize because of its priority demands that entice them in the interim or should they make value to be seen in terms of the magnitude that appears increasingly important to commodity or investments impinge on their mental capabilities? Here, mathematical methods must be employed to help clients make choices which at the same time carry the notion of value, priority demand or interest. In this article, we investigate the notion of priority need choice and the magnitude needs choice from a purely mathematical standpoint. Then later we can examine how to apply these notions to problems which concern consumers' preferences and values as understood in modern behavioral economics (Aggarwal, 2014: 79 ff.).

Statement of the Problem

This article endeavors to develop behavioral economics theorem in the domain of modern mathematical economics, utilizing certain salient economic concepts found in the market and financial economics. The use of scientific tools in the search for scientific theory and its appropriate employment of systematic procedures in searching for knowledge is always stressed by serious researchers. Mathematical economics has led to tremendous illumination and the solving of important problems in the financial world. This has helped the world environment and its human capital as well as its corollary infrastructural development to accelerate at a speedy pace. In this study, mathematical principles are brought to stress on strategic essential factors, which are required for successful adaptive developments in comprehending modern economic behaviors.

The Methodology of the Study

Using the deductive method, the study presents some useful principles and definitions by which other propositions or theorems are deduced from for further analyses and discussions. The deductive method as a scientific method leads to scientific knowledge that is

superior which could later be tested empirically by scientists. By this design, we shall offer premises in the form of definitions and then use observation, empirical materials, and reason to prove them. We will, therefore, premise this investigation with definitions, for as Aristotle and some later scientists saw this clearly, the basic premises of demonstrations are definitions. With the definitions and the premises, we can then move further to deduce the theorems for the field of behavioral economics.

Significance of the Study

Despite the well-developed field of behavioral economics, the field has no theorems of its own. The results of recent diligent studies in the field have furnished us with these theorems which we intend to recapitulate and make a deeper analysis of. This attempt to deduce a theorem from certain principles and definitions will help champion the usefulness of the field of mathematical behavioral economics, which of late has become popular in the study of human science and human beings market behaviors. When behavioral economics obtains its theorems, tremendous illumination will be made in the study of market behavior and finance. The current theorem, which is developed with the help of mathematical principles, will be used to help discussions involving this useful discipline because of its probabilistic nature.

Limitation and Scientific merit of the Study

The author is conscious of the work's limitation which is that, presently, the deductive is being used instead of empirical materials which have been pointed out elsewhere in previous discussions (Ayim-Aboagye, 2016). Despite this limitation, the work merits scientific investigation so that it can add new knowledge to existing data on human market behaviors. The work is not far from other problems being treated in the economic domain. It has a current concentration on why human beings are not strictly rational beings but also reveal animal behaviors that are enshrined in them (Aggarwal, 2014). The strength of the method is that it captures the rigorous approaches which are hardly utilized in modern behavioral economics. It will thus further illuminate the impact of deductive reasoning on quantitative measures which are judged to be procuring precision in scientific analyses.

Preliminary Notes and Definitions

Let us commence by giving careful mathematical definitions of some familiar terms (Arrow, 1953).

Magnitude Need Choice (MNC)

Definition 1.

The Magnitude Need Choice is called a higher magnitude of value when a value choice between consumer twin choices of MNC & PNC is greater if $MNC(p) \geq 1$ for an individual consumer K.

The first question one would ask is whether companies or a group of individuals could make such value choices between twin choices. The answer is yes, as we can see from the discussion that would follow later.

Priority Need Choice (PNC)

Definition 2.

The Priority Need Choice is called a higher need for value when a value choice between consumer twin choices of MNC & PNC is greater if $PNC(p) \geq 1$ for an individual consumer K.

Sentimental Affection (SA)

Definition 3.

In modern economic human interactions concerning investments, the Sentimental Affection is when a choice value is made on the condition that an individual consumer K has some attachment purposes in mind concerning a commodity or investments that compels him or her to make choices relating to the basis of this attachment motive (Aronson, Wilson & Akert, 2006).

No Sentimental Affection (NSA)

Definition 4.

The No Sentimental Affection is when a choice value is initiated or exhibited on condition that an individual consumer K has no probable sentimental affection in mind which is attached to the value choices made (Arrow, 1963: 1ff.).

Remarks

It would therefore be stated that, what qualifies a choice value that has been made as significant will vary from situation to situation, but often on the X- and Y-axes and intercepts, a point known as value choices are of interest to the economist. Whenever possible, one should be able to produce two graphs that show separately each value choice with its attachment motive or no attachment motive and also a single graph that portrays all value choices points on the graph. The latter is chosen and presented below in Figure 1. *Needs rated in Priority and Magnitudes (Consumer values, preferences or demand)*.

MAIN ANALYSIS

GRAPHS

Magnitude Need Choice (MNC) versus Priority Need Choice (PNC) in Behavioral Economics

Let us review the graph below which explains how consumers choose from one of the two choices confronting them. In the graph, a higher percentage of 70 % indicates a higher priority than 10 %. Magnitude increases in numbers, so that a need of 20 is more rated higher than say 5.

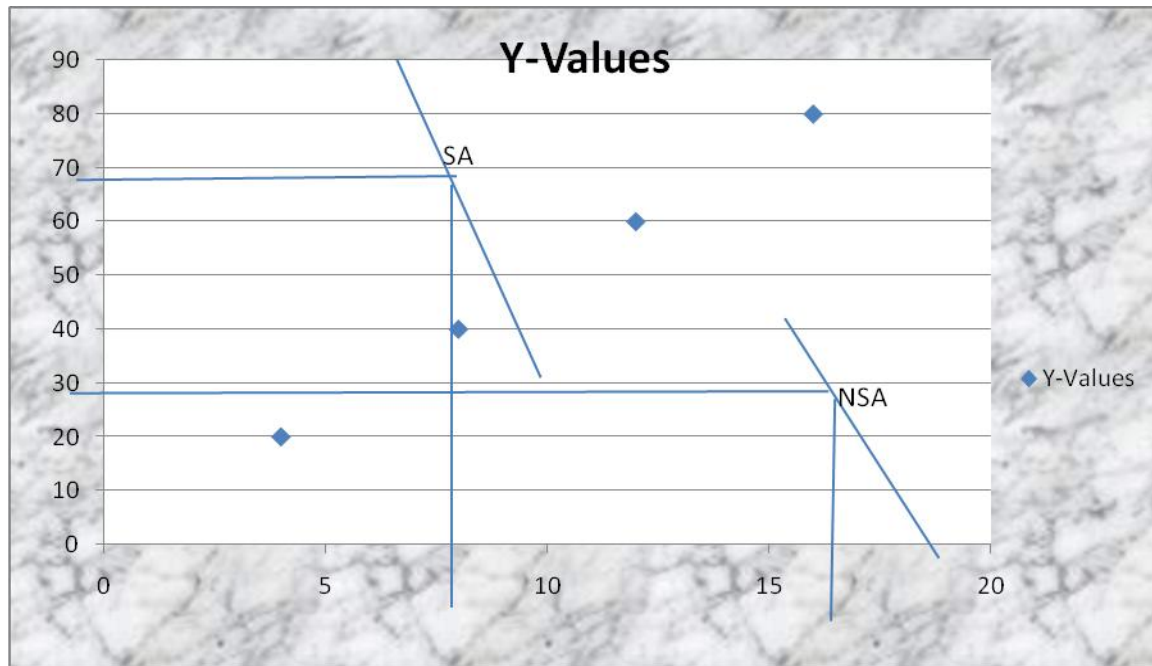


Figure 1. Needs rated in Priority and Magnitudes (Consumer values, preferences or demand)

Low
Needs rated in Magnitude

The graph above therefore shows priority needs as well as magnitude needs at the moment for the consumer K. Here magnitude need of 7 (x-axis) is given priority of 69 % (y-axis) while Magnitude need of 16 (x-axis) is given only 29 % (y-axis) to signify that the former which has Sentimental affection (SA) involved means a lot for K. It is clear on the y-axis that priority needs have double strength, that is, 7 as against the magnitude needs of 16 which have only 29 because of lack of Sentimental affection (NSA).

FORMAL STATEMENT OF THEOREMS

Let us state formally two theorems (Ayim-Aboagye, 2016).

Theorem 1.

Suppose there are two exclusive choices {MNC, PNC}, such that one of these alternatives is to be picked by an individual A ($A \in N$) in a situation when there are extreme economic consequences connected with these said choices. Suppose further that the individual A has NSA or SA with a third party B and the probability that any of the choices mentioned above could be selected as appropriate or better alternatives. Then Prior-Mag Theorem states that the probability that any Individual A ($A \in N$) will choose MNC as against PNC which will exceed p and approaches 1 will depend on whether A has NSA with this other individual B.

High

Theorem 2.

Suppose there are two exclusive choices {MNC, PNC}, such that one of these alternatives is to be picked by an individual A ($A \in N$) in a situation when there are extreme economic consequences connected with these said choices. Suppose further that the individual A has NSA or SA with a third party B and the probability that any of the choices mentioned above could be selected as appropriate or better alternatives.

Then Prior-Mag Theorem states that the probability that any Individual A ($A \in N$) will choose PNC as against MNC which will exceed p and approaches 1 will depend on whether A has SA with this other individual B.

RESULTS

Proof of Examples

Mr. Charles Trump and his family need to purchase a new flat-screen TV which they have had a discussion concerning it for several months at home (Magnitude Need). In a similar situation, Mrs. Trump needs some nice utensils which could be used now and then when her visitors come around. She does not discuss this frequently with the family at the home environment though she has the intention of securing them when the opportunity arises (Need with some motive of priority). Suddenly, one sunny Sunday afternoon in a Walmart supermarket they discovered Mrs. Trump carrying some nice Chinese utensils (priority need) in her hand as all the family members approached the payment counter. So Agnes Trump, a daughter to Mr. Trump

shouted, "Dad, but we said we would purchase the Flat Screen TV today, why?" Mr. Trump then answered, "Honey, it is not my fault; it is your mother's who wants us to" (Sentimental affection). "If SA is involved, then priority need choice is greater, $P > 1$ "

This is a clear proof of a situation where priority needs or demand makes the wife of Mr. Trump make value choices about that and by doing so neglect the choice of magnitude needs value which all members in the family agreed to. It is possible that such a value choice could cause some contentions in the family as the sons may agree with Agnes, who even though they have the same gender as the mother, still disagrees with her concerning the choice made in the interim.

The "America first slogan" of the current President of the USA also has an affinity with this theorem; here tremendous stress is put on what is considered priority needs at home for his country than the Magnitude needs which external actors consider as more important than what the American President is currently focused upon. There are no cognitive worries regarding this even though observers visualize weight or stress being put on what might be considered as non-profitable ventures (according to their thinking) due to the sentimental affection or motive being expressed about these priorities.

DISCUSSION

Preferences, Values, Choice, and Welfare

Psychologists with interests in economic behavior involving value choices and preferences have of late attacked mainstream economic analyses which advocate choices that are purely based on rationality (Kahneman & Tversky, 1972: 430-454). These advocates of the former believe that individuals make decisions about economic matters not only on a rational basis but also on social-psychological factors such as positive human affection. They cite, for example, that when confronted with a personal tragedy that an individual could have dealt coolly with himself alone, the case becomes automatically shifted to other persons whom the individual has a sentimental affection for. Such predictions which occur in private as well as in the public domain have been noted to be occurring in the real world where goods, services, and investments are involved. The problem is that people take it for granted that these things happen and that they concern peoples' value choices with regards to priority value choices as against magnitude value choices. Investors, businessmen as well as ordinary individuals do not feel disturbed in a cognitive way for making priority value needs the currency instead of the magnitude value needs in the economic world, where rational decision making and profit orientation tasks are appraised more than sentimental ones.

These theorems above which originally appeared as a result of analyses concerning Shipman theory, throw light on the three concepts argued frequently in behavioral economics (Kahneman & Tversky, 1973: 237-251). Together with preferences and values, these concepts are also treated well in Welfare economics. Behavioral economics has unearthed the novel three concepts which the theorems presented above have an affinity with (Kahneman & Tversky, 1972: 1ff.). They talk of heuristic that indicates that people often make decisions based on approximate rules of thumb and not strict logic. Secondly, the concepts include the idea of framing, which is the collection of anecdotes and stereotypes that make up the mental-emotional filters that individuals rely on to understand and respond to events. The market inefficiencies, which is the third notion concerns the mispricing and non-rational decision making that occur in the market during the day to day business activities. The theorems, together with behavioral concepts point out that investors and consumers' behaviors in economics do not inhere in the rational domain alone, but also on emotional factors, cognitive, and social psychological factors that powerfully influence players in the business world.

CONCLUDING REMARKS

Behavioral economics has made important contributions toward economic analyses since it emerged by employing psychological tools to enhance the comprehension of economic behaviors in the market and financial institutions as a whole. The theorems discussed in this article, together with behavioral concepts, direct our attention to the fact that investors and consumers' behaviors in economics do not inhere in the rational domain alone, but also on emotional factors, cognitive, and social psychological factors that powerfully exert pressure in the business world. There are no cognitive apprehensions regarding the manner in which people make priority needs the choice over magnitude needs in an economic world where profit orientation tasks and rationality are appraised as superior to sentimental affections. Again, though observers visualize weight or stress being put on what might be considered as non-profitable ventures due to the sentimental affection or motive being expressed about these priorities (investments, commodities, bond, etc.), they do not present cognitive worries to consumers or investors.

REFERENCES

- Aggarwal, Raj (2014). Animal Spirits in Financial Economics: A Review of Deviations from Economic Rationality. *International Review of Financial Analysis* 32 (1): 179-187.
- Aronson, E., Wilson, T. D. & Akert, R. M. (2006). *Social Psychology* (5th Ed.). New York: Longman.

- Arrow, Kenneth J., 1953. Hurwitz's optimality criterion for decision making under ignorance, Technical Report 6, Stanford University.
- Arrow, Kenneth J. 1963. *Social Choice and Individual Values*. Yale, New Haven: Yale University Press.**
- Ayim-Aboagye, D. 2016. Shipman theory in Behavioral Economics: a review of theory and empirical work. *Journal of Emerging Trends in Economics and Management Sciences* (JETEMS) 7 (1): 50-56.
- Kahneman, D.; Tversky, A. (1972). Subjective probability: A judgment of representativeness. *Cognitive Psychology* 3 (3): 430–454
- Kahneman, D.; Tversky, A. (1973). On the psychology of prediction. *Psychological Review* 80 (4): 237–251.
- Kahneman, D., & Tversky, A. (Eds.) (2000) *Choices, values, and frames*. New York: Cambridge University Press.