

IS CONSUMER A RATIONAL DECISION-MAKER? COMPARATIVE ANALYSIS OF RATIONAL CHOICE THEORY AND BEHAVIORAL APPROACH

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Abstract

In this paper the authors analyse the concept of rationality from an economic and behavioural points of view. Traditional economists describe a rational decision-maker as the one who takes into consideration only feasible alternatives which an individual ranks according to preferences and eventually chooses the best possible alternative within the budget. According to behaviorists the rational choice approach fails to reflect realities in many cases because it ignores such people's psychological peculiarities as self-control problems; limited attention; choice avoidance; etc. Behavioral theories have their own drawbacks though. Many of them are discussed in D.K. Levine's article "Is behavioral economics doomed? the ordinary versus extraordinary". In general the author criticizes behaviorists on the grounds of wrong conclusions derived from experiments and "blindness" to obvious reasons for certain individual behavior. Closer look at the flaws in behaviorist approach found by D.K. Levine is given in this paper; arguments in support of rational choice theory are based, among other things, on neuroscience findings.

Key words: rational choice, behavioural economics, consumer

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Introduction

We decided to investigate consumer behaviour because Homo Economicus is considered to be more controversial topic compared to rational firm behaviour. The reason for that lies in differences in criteria of rationality. A rational firm usually strives for profit maximization (what is pretty easy to observe) whereas the goal of a rational individual - maximizing utility - is quite vague. In the first part of the paper fundamental aspects of rational choice theory including its modified versions will be analyzed. In the second part experimental evidence against rational choice approach will be presented. In the third part the

arguments in favor of rationality will be discussed and reasonable explanations of nonstandard behavior will be provided.

1. Main characteristics of rational choice theory: standard and extended versions

1.1 Evolution of traditional rational choice theory

Although the idea of a rational individual can be found in the earlier writings of economists other than F.Y. Edgeworth we would like to start the analysis of rationality concept with his essay „Mathematical Psychics“ (1881) which is considered to be the cornerstone of modern rational choice theory. In this work the author applies the Economic and Utilitarian approach to the Calculus of Pleasure which according to him differ in goals the economic agents pursue to achieve the equilibrium: whereas the first one implies that people tend to maximize their individual utility, the second one says that their real intention is to maximize universal utility. The author himself supports Egoistic Hedonism emphasizing that „The first principle of Economics is that every agent is actuated only by self-interest“ (Edgeworth, 1881, p. 16). Interestingly, the author mentions that an „economic man“ can ask others for approval of his actions in case his behavior has an effect on them anticipating thereby criticism of behaviorists who like to accuse rational choice adherents of poor understanding of human psychology: people are concerned with other people’s opinions while making their decisions. In addition to this we can derive other useful conclusions from F.Y. Edgeworth’s essay which partially reflect modern rational choice theory: e.g. an individual experiences higher utility in the situation when the pleasure has more time-intensity-number units (in other words he/she never reaches satiation) or an individual cannot count the pleasure-units but he/she is able to decide which option will bring him/her more or less happiness and choose the higher-value alternative (what is close to ordinal utility approach).

Another work worth mentioning in our discussion is the book “The Economic Approach to Human Behavior” written by G.S. Becker. In introduction the author gives detailed economic analysis of human behavior emphasizing such features as utility maximization and stable preferences. Despite hardly realistic assumptions the author makes (cultural or social class affiliation has no significant influence on individual preferences) some of his ideas can be effectively used in defence of consistent preferences. G.S. Becker explains why a changed consumption bundle should not be considered as a result of irrational behavior. We will show that this idea is not outdated by applying it to the recent situation. When organic products had entered international markets everybody started to talk about

preference shift. Indeed, the preferences haven't changed as they are related not to goods and services but rather to decisions which determine fundamental aspects of our lives. As a consequence of new market situation a new consumption bundle started to be purchased but the preference – taking care of one's health - remained the same.

In addition to stable preferences the author touches on some other aspects of rational choice theory which are frequently criticized by behaviorists. G.S. Becker admits the existence of incomplete information and he emphasizes that individuals invest different amounts of resources in search of additional information depending on the importance of decision. In case of low-involvement purchases (e.g. bread) consumers are willing to accumulate less information than in case of high-involvement purchases (e.g. car) because the costs of its further accumulation (e.g. hours spent in front of computer) exceed its benefits more quickly (finding a cheaper loaf of bread vs. finding a cheaper car)¹. From the author's point of view cost-benefit analysis cannot be always easily observed by „outsider“, therefore an individual who misses „an apparently profitable opportunity“ (Becker, 1976, p. 7) is not necessarily irrational. He/she is rather aware of „hidden“ costs which deteriorate the profitability of this option. However according to the author an individual is not always conscious of his utility maximizing goal what is only partially supported by neuroscience findings².

Despite the fact that some of G.S. Becker's conclusions can be questioned by modern scientists his contribution to rational choice theory is substantial and most of his ideas can be found in contemporary educational literature. For example H. Gravelle and R. Rees in their book „Microeconomics“ (2004) describe a rational decision-maker as an individual who considers only feasible alternatives, orders them in accordance with preferences and chooses the highest one in ranking. Mathematically it can be interpreted as a simultaneous fulfillment of the following conditions:

$$\max u(x_1, x_2, \dots, x_n) \quad \sum x_i p_i \leq I, \quad x_i \geq 0, \quad i = 1, \dots, n$$

$$x^0 \succ x^1 \text{ or } x^1 \succ x^0 \quad \text{OR} \quad x^0 \succ x^1 \text{ and } x^1 \succ x^0 \quad (1)$$

$$\text{if } x^1 \succeq x^2 \text{ and } x^2 \succeq x^3 \Rightarrow x^1 \succeq x^3 \quad (2)$$

In other words, a rational consumer constrained by his income³ and constant prices of all goods strives to maximize utility by choosing the best consumption bundle, which can

¹ We will continue the discussion about information in the further part of this paper.

² Unconsciousness can lead to inconsistent choice. For further details please see the third section of our paper.

³ Although G.S. Becker assumes that families make a decision about the number of children on the basis of utility maximization „from stable preferences subject to a constraint on their resources and prices“ (Becker, 1976, p. 13), he never

contain only non-negative quantities of any good. In addition the authors point out that rationality implies complete and consistent preferences. Completeness (1) means that while comparing a pair of consumption bundles a consumer either prefers the first bundle to the second one, the second bundle to the first one or he/she is indifferent between them. Ability to express preferences is an obligatory condition in rational choice theory. Transitivity or consistency (2) means that if a consumer prefers the first consumption bundle to the second one and simultaneously he finds the second bundle more satisfactory than the third one, the first bundle will be preferred to the third bundle. The similar conclusion can be made in case of indifference. For further purposes of our discussion one more assumption, namely non-satiation, should be mentioned. Rational choice theorists assume that a consumer prefers the bundle which „contains more of at least one good and no less of any other“ (Gravelle &Rees, 2004, p. 13) what simply means that a consumer is guided by the principle: „the more the better“.

The authors also repeat such G.S. Becker’s ideas as imperfect information whose accumulation demands costs which are often neglected by or „invisible“ to an observer. Therefore a person who makes a worse choice from a monetary perspective doesn’t necessarily behaves in an irrational way, in fact he considers the effort and time required for the search or visit of other supermarkets as not worth spending. As a follow-up to our discussion about information and rationality the extended versions of rational choice theory are presented below.

1.2 Extensions

We have not mentioned above the assumption which was held by economists for a long time that full information is available for a decision-maker. Instead, we included in characteristics of rational choice approach the assertion that information is incomplete. Now we would like to pay attention to authors who called „perfect information“ assumption under question and thus thoroughly contributed to theory refinement.

In his paper „Economics of Information“ G.J. Stigler shows that even under a condition of imperfect information an individual is a rational decision-maker who is aimed at search optimization. In order to do so a consumer compares the expected returns from an additional unit of search ($q \left| \frac{\partial P}{\partial n} \right|$, where q – desirable quantity of a good; $\left| \frac{\partial P}{\partial n} \right|$ – „the expected reduction in price as a result of the search“ (Stigler, 1961, p. 215)) with incremental costs

mentions these constraints in the conclusion about human behavior what makes a reader think that such behavior is typical not of all human beings but rather of some individuals.

related to search. Optimum amount of search is found when both these marginal values are equal to each other. Whereas marginal savings from search depend on the dispersion of prices and expenditure on the good in question, marginal costs of search are composed primarily of the time spent on the identification of potential sellers. Thanks to author's findings consumer behavior in many real-life situations can be explained: unexperienced buyers (including tourists) tend to pay higher prices because they lack knowledge on price variation and therefore cannot determine the rational amount of search; buyers who make repetitive purchases have to spend more time on search in case of volatile market conditions (distribution of asking prices changes with time) than in case of perfect positive „correlation of asking prices . . . in successive time periods“ (Stigler, 1961, p. 218) (in fact they conduct only initial search in this situation); buyers resort to pooling (gathering information of prices from other customers), use of advertising and specialized traders (who enable them to meet with potential sellers) to reduce the cost of search.

Another economist whose role in refining rational choice theory should not be ignored is H. A. Simon. By introducing the concept of bounded rationality he has shown that certain human behavior is not only a result of influence of external forces but is also determined by individual's cognitive abilities. The way people process the information, anticipate the consequences of their actions, choose „among their many competitive wants“ (Simon, 2000, p. 25), etc. limits their ability to make decisions. Although we will not give a deeper insight into theory of bounded rationality because going into details requires opening the discussion about uncertainty which is beyond the scope of this paper, brief mention of it was important for our further analysis.

To create complete overview of extended versions of rational choice theory it's necessary to include into our analysis the P.A. Samuelson's article „A note of Measurement of Utility“ in which the author enriches utility-maximizing model with time concept. According to him individuals tend to maximize both their present utility and sum of their future utilities which they discount at a fixed rate¹. To develop marginal utility function P. A. Samuelson makes a series of additional assumptions such as utility measurability; invariant tastes and constant prices and determines experimental conditions. Through the use of rich mathematical knowledge the author arrives at the conclusion that function of marginal utility of money income can be written as follows:

$$U'(x) = \lambda e^{(\pi-r)t}, \text{ where}$$

¹ This model is called exponential discounting.

λ – a constant dependent on initial sum of money and „actual unit in which utility is“ denominated (Samuelson, 1937, p. 157)

π – fixed rate of discount

r – given interest rate

Considering this model in infinite time horizon we can derive the following useful implications: if his / her discount rate is higher than the interest rate an individual will always spend money, otherwise saving will be a preferred option.

2. Criticism of rational choice approach: behavioral theories

This section will be devoted to several experiments which provide empirical evidence against such features of Homo Economicus as reasoning-based decision-making, non-satiation, rational use of available information and time-consistent preferences.

We will start with the most popular argument for irrationality which is *emotions*. Behaviorists argue that emotional state rather than logic (comparison of benefits and costs) determines the individual choice. In his well-known work „Psychology and Economics: Evidence from the Field“ S. DellaVigna presents outcomes of several experiments showing the influence of mood on decision-making. From the perspective of consumer behavior B. Rind’s study conducted to investigate the influence of weather conditions on tipping is worth mentioning. Findings from the above mentioned study joint with findings from research carried out by N. Schwarz & G.L. Clore show that sunshine effects people in a positive way: they feel happier and as a result are willing to leave higher tips in the restaurants (as cited in DellaVigna, 2009).

Another drawback of rational choice approach behaviorists see in non-satiation („more is preferred to less“) and they provide compelling empirical evidence of *choice avoidance* to show that the above mentioned assumption by no means always reflects reality. In this connection the paper „When choice is demotivating: Can one desire too much of a good thing?“ should be mentioned. Its authors S. S. Iyengar and M. R. Lepper conducted a series of experiments to show how people behave when they face excessive choice. In the first study consumers were offered to choose from either six flavors of jam or twenty four flavors of jam, whereas in another study participants sampled the chocolate which they previously had selected from a limited (six choices) or extensive collection (thirty choices) or which was chosen for them (no-choice condition). Findings from both experiments show that although consumers initially find excessive choice more tempting, it may have negative effect on their

subsequent satisfaction and purchasing behavior. Due to the fact that individuals in extensive-choice conditions are more excited during choice-making process they become too emotionally involved with it, feel too responsible for their decisions what eventually leads to frustration, regret and dissatisfaction with their choice. People tend to overestimate their abilities, “make available to themselves many more choices than they can possibly handle” (Iyengar & Lepper, 2000, p. 1004) ignoring the simple reality: the more options you have the more challenging it will be to find the right one. As it was mentioned above consumers are less motivated to buy a good if they face choice overload: according to results of the first (second) study only about 3% (12%) of participants in extensive-choice condition have subsequently purchased jam (preferred chocolate to money¹) whereas in limited-choice condition 30% (48%) have acted this way.

Economic reality implies that individuals face unlimited opportunities but their resources are scarce. From behaviorist perspective human *attention* is *limited*², therefore consumers' perceived value of a good ($\tilde{V} = v + (1-\theta)*o$, where θ - degree of inattention) whose price includes “a visible component v and an opaque o component” (DellaVigna, 2009, p. 349) is different from that in reality ($V = v + o$). Findings of various experiments support the idea that limited attention leads to decision-maker's irrational behavior. In their study Hossain and Morgan (as cited in DellaVigna, 2009) compared the effect of increased shipping costs (in the first treatment CD reserve price was 4 dollars and shipping costs were zero; in the second treatment their values were 0.01 dollars and 3.99 dollars respectively) on consumer choice. As shipping costs were less salient for consumers their average expenditures in the second treatment were 20% higher in comparison to the first treatment. Another study conducted by Chetty, Looney and Kroft (as cited in DellaVigna, 2009) showed the effect of increased transparency of indirect taxes on consumer willingness to purchase a good. As a result of more visible after-tax price (which was indicated on the price tag besides pretax price) nearly 9 percent decrease was observed in the average quantity demanded compared to the previous week.

In addition to limited attention human beings have *self-control problems* what means that their preferences are time-inconsistent. People like to make plans to get rid of bad habits or change their lives in a positive way but the closer the moment of sacrifice is the less

¹ The subjects were compensated for their participation. In case of no-choice condition only 10% of people have chosen chocolate.

² Although in the previous section we have mentioned cognitive abilities among constraints individuals face while making decisions, H.A. Simon's idea doesn't refute rationality but rather restricts its boundaries. On the contrary behaviorists see limited attention as one of the determinants of irrational behavior.

attractive their promise seems to them. The conflict of present and future self is captured by hyperbolic discounting model which implies that „any future period is discounted at a lower rate than the current period“ (Machado & Sinha, 2007, p. 837). In contrast to exponential discounting which we described above ($\pi = \text{const}$) discount rate on the assumption of time-inconsistent preferences decreases over time: $\pi = \beta / (1+\epsilon t)$, where ϵ – bias towards the present. Time inconsistency in preferences leads to *procrastination effect* which can be demonstrated on the intertemporal consumption of addictive goods. Whereas in the present consumers heavily discount future costs from addiction in relation to its present benefits, as self-imposed “deadline” approaches they start to postpone it persuading themselves that the detrimental effect of smoking, alcohol or drugs on their health is a myth rather than reality. The difference between the planned and actual quitting age is proven by Machado and Sinha (2007) who as a result of conducting 500 face-to-face interviews to get an insight into planned duration of smoking and 347 face-to-face interviews to analyse actual (ex-) smokers’ behavior predicted that 80% of respondents would fail to quit smoking till the age of 30, whereas initially only 21% had admitted that they would lose the battle against this bad habit till the above mentioned „deadline“.

3. Arguments in favour of rational choice theory

In this section we will consider several facts which can explain some of above mentioned “weaknesses” of rational choice theory. We will further develop D. K. Levine’s ideas who in his paper “Is Behavioral Economics doomed? The ordinary versus the extraordinary” views inconsistent behavior as a consequence of lack of consciousness, knowledge or experience rather than a result of irrationality.

According to him people are inclined to procrastinate either they do not realize this or because their previous experience influences them (for instance smokers who didn’t suffer health problems resulting from smoking in the past are likely to postpone a quit date). The idea that consumers cannot often control internal mechanisms which shape their decisions is not new; neuroscience findings show that in case of repeated actions (e.g. repetitive purchases) “goal-oriented structures in the brain have reduced activity and systems linked to stimulus control and automatic responses increase in activity” (Martin & Morich, 2011, p. 493). In other words consumers tend to behave in a more “autopilot” way when the environment is familiar to them. Taking a familiar good off a shelf automatically, not paying attention to other options which may be of the same quality but cheaper – this is one of the

examples of unconscious behavior which behaviorists would love to use as a proof of irrationality. Despite disagreement on the above mentioned conclusion (the opportunity costs should be included into cost-benefit analysis: instead of searching for an item¹ which is the best from financial perspective a consumer will make a habitual choice and spend saved time more efficiently) we admit that sometimes unconscious behavior can lead to inconsistent choice: e.g. in restaurants people tend to imitate their companion's food eating behavior (eat bigger portions or order particular food) even if it doesn't correspond to their real preferences (Martin & Morich, 2011).

As it was mentioned above people violate postulates of rational choice theory when they face unfamiliar situations or interpret situations in a wrong way. D.K. Levine (2010) notes that through gaining experience and training people „converge“ to rationality. Interestingly, behaviorists agree that experience mitigates deviations from standard behavior (e.g. DellaVigna, 2009; Iyengar & Lepper, 2000).

Besides the mentioned factors contributing to unexplainable behavior D.K. Levine (2010) emphasizes that there is no conflict between our rational and impulsive self, instead the former one triggers the actions undertaken by the latter one. Although this idea contradicts to behavioral point of view which strictly differentiates between emotions and rationality, it can be supported by newest neuroscience findings². According to them our behavior is a result of „a complex interconnection of circuits in which emotional signals cannot be separated from the adaptive reasoning and decision making“ (SPEZIO, 2011, p. 352).

In the end we will briefly mention principles of rational choice theory which are consistent (or at least partially consistent) with neuroscience findings. Kable's and Glimcher's neurobiological research (as cited in Levi, Lazzaro, Rutledge & Glimcher, 2011) shows that decision-making consists of two stages: firstly a consumer attributes subjective values to each option and then he/she chooses the highest-valued alternative. In the experiment conducted by Levi, Lazzaro, Rutledge & Glimcher (2011) the participants twice viewed the pictures of pairs of items³ from which they had eventually to choose. The results show that in the majority of cases the individuals demonstrated consistent behavior choosing the same pair repeatedly and showing transitive preferences.

¹ In our example we consider low-involvement purchases.

² This conclusion is made on the basis of novel findings. In the past the scientists were guided by dual process models which not only separated emotions and reasoning but even opposed them to each other (Spezio, 2011). This maybe served as the basis for behaviorist views.

³ There were 20 items which were alternately paired with each other.

Conclusion

The probability of encountering an absolutely rational individual in the real world is the same as the probability of finding a perfectly competitive market. Despite this the rational choice theory is a useful tool to understand how individuals *usually* or *under certain conditions* make decisions what is supported by a number of studies presented in the third section of this paper. Although we are aware of such limitation of our analysis as insufficient provision of empirical evidence (in many cases we refer to one author to back up our point of view) we truly believe that this paper can contribute to the development of rational choice theory: the model can be enriched by new assumptions about consciousness, experience and knowledge what is likely to increase its reliability thereby preventing further criticisms.

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