GREATEST HAPPINESS PRINCIPLE IN A COMPLEX SYSTEM APPROACH

Katalin Martinás*

Department of Atomic Physics, Eötvös Loránd University
Budapest, Hungary

ABSTRACT

The principle of greatest happiness was the basis of ethics in Plato's and Aristotle's work, it served as the basis of utility principle in economics, and the happiness research has become a hot topic in social sciences in Western countries in particular in economics recently. Nevertheless there is a considerable scientific pessimism over whether it is even possible to affect sustainable increases in happiness.

In this paper we outline an economic theory of decision based on the greatest happiness principle (GHP). Modern equilibrium economics is a simple system simplification of the GHP, the complex approach outlines a non-equilibrium economic theory. The comparison of the approaches reveals the fact that the part of the results – laws of modern economics – follow from the simplifications and they are against the economic nature. The most important consequence is that within the free market economy one cannot be sure that the path found by it leads to a beneficial economic system.

KEY WORDS

greatest happiness principle, complex systems, non-equilibrium economic theory

CLASSIFICATION

JEL: C61, D50, I19
PACS: 89.65.Gh, 89.75.-k

*Corresponding author, η: martinas@elte.hu; +36 1 2090 555 Ext 6360;
 Atomfizikai tanszek, ELTE, Pazmany Peter setany 1, H – 1117 Budapest, Hungary

INTRODUCTION

Our civilization is a complex system of individuals interacting with each other and interacting with the environment. Societal dynamics is via human actions, which are governed by decisions. The action of individuals is always a choice among the possibilities recognized as allowed by the circumstances. The choice is a decision. The understanding and modelling of human decisions is the key issue for economics. The basic criteria for decisions is simple, the best is selected, as that can be the definition of best. There is no reason to select the second best one. It is not a normative statement. Others may think that the decision was wrong. Further, it is valid only in the moment of decision. Later the agent may regret it. So the best is subjective, depends on the past experiences and as well as on the future expectations of the agent. Nevertheless for a theory of decisions we need to exploit the properties of the best.

In a simple system approach "the best" has a well-defined form in the rational decision theory. The best is which maximizes the utility. Nevertheless there are theoretical and empirical studies, which show that the present utility theory does not describe the decisions. There are two approaches to overcome these difficulties. The first approach, which includes happiness economics – generalizes the utility concept, they include further variables in the utility. The other possibility is to generalize the decision rule. Instead of utility maximization principle, it looks for a more reliable mathematical model.

In this paper we follow the second line. The theory of human decisions will be discussed with emphasize on the difference of simple system and complex system approaches. In the first part outline the history of the greatest happiness principle. In the second part we summarize the way in which the greatest happiness principle was reduced to utility maximization in the simple system (equilibrium) approach.

In the third part the basic flaw of the standard theory is discussed. The greatest happiness principle implies the utility maximization principle only in a hedonistic approach. To apply this principle further we need the assumption of a human being not interested in the past, not interested in the future, but only the instantaneous consumption matters. The consequence of this simplification is the Homo Economicus, the basic model of human beings in economic theory. The myopic, greedy and perfectly rational one.

A complex system approach was outlined [1] and discussed in the book "On the Reappraisal of Microeconomics" [2]. The economic activity here is modelled as transformation and transport of commodities (materials) owned by the agents. Rate of transformations (production intensity), and the rate of transport are given by decisions. The decision rule is in the form of force law, where the expected gain drives the processes, but the expected gain is not maximized. The result is a complex, dynamic macroeconomics.

Finally, in the fourth part some cornerstones of neoclassical economics will be challenged. The driving force approach leads the maximization in the hypothetic equilibrium case. So, neoclassical economics is a timeless (equilibrium) limiting case in the complex approach. Already "lots of theoretical and empirical works have called into question the core tenants of the neo-classical doctrine – that markets are stable, are driven by rational actors responding solely to price signals." [3]. Our results also confirm that the markets are stable only; if it is assumed that there exists a stable equilibrium. Without that hypothesis, the simplest models of an economic system manifest a chaotic behaviour.

THE GREATEST HAPPINESS PRINCIPLE

The first objection against GHP is that it is not right, as sometimes we are unhappy; we are not in the state of greatest happiness, and there are so many unhappy people around us. Yes, the pursuit of happiness is a governing law of human actions; it is the governing principle of the actions, and not the result of them. Maybe the principle is better formulated in the form that our decisions satisfy the pursuit of happiness principle.

The greatest happiness as a social goal – as opposed to being a personal matter – opens the way to authoritarian policies is a usual counter argument. Aldous Huxley's Brave New World has come to serve as the symbol for universal happiness. He described a society, which ensures the happiness of the citizens, in the most rational way. It forms the citizens to be happy, to wish that what is given by the society.

It is easy to summarize why they do not like BNW, no freedom, no independence. Happiness can be achieved in two different ways, you are satisfied with the actual situation because of the lack of freedom is such, that there is no way to see the lack of freedom. The only possibility is to obey. In the same time a Hungarian poet, Attila József wrote in his poem "Consciousness"

> "Once I saw happiness, contentment:
> four hundred pounds of rotund pink fat.
> Over the harsh grass of the farmyard
> its curly smile swayed and tottered."

(translator:John Bátki)

In case of freedom the state must not and cannot give happiness to the citizens, it can only ensure the possibilities for the individuals to find the actions which give them satisfaction and happiness. Nevertheless the preferences are subjective, so there is no way to satisfy them in an authoritarian way.

In economics the concept of happiness appeared in the technical term, "utility". Modern economics did lose the happiness problems, as it was assumed that the role of economy to ensure the maximum utility. In the second part of the last century the happiness appeared as the Easterlin's Paradox. Esterlin showed that individuals self-reported happiness do not increase with the GDP. Nowadays the happiness economics is one of the most rapidly increasing branches of economics. See for instance the work of Richard Layard, Happiness: Lessons from a New Science [4], or the work of Veenhoven, Measures of Gross National Happiness [5], Luigino Bruni and Pier Luigi Porta published the Handbook on the economics of happiness. A critical overview is in the paper of Helen Johns and Paul Ormerod [6].

In our time there is a significant movement to replace the traditional, consumption based utility, with a broader concept. Happiness economics is a very active part of modern economic researches. It uses the basic concepts of neoclassical economics. The income-based measures of well-being are complemented with further measures of well-being.

Carol Graham gave the following definition: "Happiness economics relies on more expansive notions of utility and welfare, including interdependent utility functions, procedural utility, and the interaction between rational and non-rational influences in determining economic behaviour." [7].

The study of the nature of happiness involves the questions: What is happiness? How can we measure it? Which is the scientific discipline responsible for study of happiness? Philosophy, psychology, sociology, politics, ethics or economics? To underline the principle a short summary of the history and emergence of the concept of happiness is presented together with the results of present empirical surveys.

One of the first analysis of the problem of happiness is in the Histoires, where via Croesus and Solon discussion Herodotus insisted on that we can judge the happiness only for the whole life [8]. Here is his description of the happy life:

> "Croesus: 'Stranger of Athens, we have heard much of thy wisdom and of thy travels through many lands, from love of knowledge and a wish to see the world. I am curious therefore to inquire of thee, whom, of all the men that thou hast seen, thou deemest the most happy?'
>
> Solon: 'Tellus of Athens, sire.'"

First, because his country was flourishing in his days, he himself had sons both beautiful and good, he lived to see children born to each of them, and these children all grew up; after a life spent in what our people look upon as comfort, his end was surpassingly glorious. In a battle between the Athenians and their neighbours near Eleusis, he came to the assistance of his countrymen, routed the foe, and died upon the field most gallantly. The Athenians gave him a public funeral on the spot where he fell, and paid him the highest honours.

Herotodotos stated that we can speak only about a happy life only after the end. In the real life case we can speak only about the pursuit of happiness.

Aristotle in the Nicomachian Ethics (350 BC) investigated the question of happiness [9]. He said that happiness is desirable in itself and never for the sake of something else. But honor, pleasure, reason, and every virtue we choose indeed for themselves, but we choose them also for the sake of happiness, judging that by means of them we shall be happy. Happiness, on the other hand, no one chooses for the sake of these, nor, in general, for anything other than itself. Happiness, then, is something final and self-sufficient.

Already Aristotle stated that happiness is the good towards which every human action is directed [10]: "… all knowledge and every pursuit aims at some good, what it is that we say political science aims at and what is the highest of all goods achievable by action. Verbally there is very general agreement; for both the general run of men and people of superior refinement say that it is happiness, and identify living well and doing well with being happy."

In the Aristotelian-Platonic tradition happiness is the good, meaningful life, contentment, satisfaction. The happiness has a special time dependence, which distinguishes it from the concepts of natural sciences; it concerns the whole life span. Happiness means living a good life, or flourishing – as the word eudaimonia in Aristotelian formulation, rather than simply an emotion.

"Eudaimonia is not an emotional state; it is more about being all that you can, fulfilling your potential. The idea is that by living in a way that reaches your full potential you bloom or flourish and so display the best version of you that you can be." [11]. Aristotle's philosophy is loudly echoed in the movement of Positive Psychology [12].

Modern economics was formed on the Epicurean tradition. Epicurus (341-270 BC) was born in Samos. For Epicurus, the purpose of philosophy was to attain the happy, tranquil life.

"Let no one be slow to seek wisdom when he is young nor weary in the search of it when he has grown old. For no age is too early or too late for the health of the soul. And to say that the season for studying philosophy has not yet come, or that it is past and gone, is like saying that the season for happiness is not yet or that it is now no more. Therefore, both old and young alike ought to seek wisdom, the former in order that, as age comes over him, he may be young in good things because of the grace of what has been, and the latter in order that, while he is young, he may at the same time be old, because he has no fear of the things which are to come. So we must exercise ourselves in the things which bring happiness, since, if that be

present, we have everything, and, if that be absent, all our actions are directed towards attaining it." (Epicurus, Letter to Menoeceus, [13]).

His basic theory is that all good and bad things come from sensations. All pleasure is good, and all pain is bad. Therefore, in order to achieve happiness, we should try to maximize the amount of pleasure we experience.

Happiness is present in the historical roots of modern economics. Nevertheless they transformed it to two simplified formulations. Mainstream economic theory assumes people are insatiably acquisitive, and that the greatest social good comes from the greatest utility (from the greatest consumption). Mainstream economic theory views people as highly individualistic, and the expression of this individualism in the market as the most certain and efficient way to achieving the greatest good for the greatest number.

Bentham's added to hedonism the ethical doctrine that human conduct should be directed to maximize the happiness of the greatest number of people. Bentham's elements are simple pleasures and pains. Every human act is, and should be, based on a calculation of probable pleasant and painful outcomes. Bentham defined his principle in the following fashion: "Nature has placed mankind under the government of two sovereign masters, pain and pleasure ... they govern us in all we do, in all we say, in all we think: every effort we can make to throw off our subjection, will serve but to demonstrate and confirm it."

"By the principle of utility is meant that principle which approves or disapproves of every action whatsoever, according to the tendency which it appears to have to augment or diminish the happiness of the party whose interest is in question... not only of every action of a private individual, but of every measure of government" (Principles of Morals and Legislation, p. 17).

Utility is that property in any object, whereby it tends to produce benefit, advantage, pleasure, good, or happiness ... or ... to prevent the happening of mischief, pain, evil, or unhappiness". [14].

Bentham made the theory of morals and legislation scientific in the Newtonian sense. As Newton's revolutionary physics hinged on the universal principle of attraction (i.e., gravity), Bentham's theory of morals swung on the principle of utility. Further, with the approach that pleasure and pain could be measured in some objective sense, and then every legislative act could be judged on welfare considerations.

The greatest happiness of most people has obtained a constitutional value already in the US declaration of independence of 1776 in the form: "We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed."

Jevons transformed the utility to an economic concept. He referred to Bentham's calculus but made it much simpler to enable the mathematical instrument to be introduced. Jevons redirected the focus of analysis away from collective welfare considerations toward the level of individual decisions. He did not give up moral matters, but he opened the way for the modern utility, which is already free of ethics [15]. Jevons introduced the distinction between total utility, and he established the equimarginal principle, as the rule for choices between commodities. Vilfredo Pareto did the final step in the economic theory to get rid off subjectivity and happiness. He focused on "revealed preferences" rather than "happiness." To Pareto, economists should focus on consumer preferences and choices. Pareto's theories eventually were adopted by other economists, primarily because it allowed economics to become an objective science not dealing with such intangible concepts as human happiness.

The utility maximization lead to the rational decisions, where rationality implies that the driving force of actions is the utility maximization, that is the desire to obtain more money, more wealth, more material possessions.

The result is the governing rule for human actions in the scientific models of the society, which is not the GHP, but the greed. Greed is not the same as self-interest, which means a concern for one's own advantage and well-being. Greed means an insatiable desire for wealth, a selfish and excessive desire for more of something (as money) than is needed.

In modern economic theory greed (not the self-interest!) is a code word for purposeful behaviour. Historically it is a new phenomenon. Greedy individuals were considered to be harmful to society, as their motives often appear to disregard the welfare of others. In Dante's Inferno, the greedy are condemned to an eternity of performing useless labour. Other authors suggested that one would be slowly boiled in oil for all time [16]. Further, greed was the synonym of avarice. So they were considered as hopeless people, who are not able to enjoy the richness of the life, they love only the money. Greed is listed as one of the Christian seven deadly sins, nevertheless desire to increase one's material wealth in a greedy way has become acceptable in Western culture. The desire to acquire wealth has been understood as indispensable for economic prosperity. Nowadays many economic rationalists agree that greed is the only consistent human motivation. As Walter E. Williams stated in his paper, titled "The virtue of greed": "Free markets, private property rights, voluntary exchange and greed produce preferable outcomes most times and under most conditions." [17].

Max Weber summarized the effect of acceptance of greed on our present societies, as: "The pursuit of riches is fully stripped of all pleasurable, and surely all hedonistic aspects. Accordingly, this striving becomes understood completely as an end in itself − to such an extent that it appears as fully outside the normal course of affairs and simply irrational, at least when viewed from the perspective of the "happiness" or "utility" of the single individual. Here, people are oriented to acquisition as the purpose of life: acquisition is no longer viewed as a means to the end of satisfying the substantive needs of life. Those people in possession of spontaneous (unbefangene) dispositions experience this situation as an absolutely meaningless reversal of "natural" conditions (as we would say today). Yet, this reversal constitutes just as surely a guiding principle of [modern] capitalism as incomprehension of this new situation characterizes all who remain untouched by [modern] capitalism's tentacles." [18].

HAPPINESS IN ECONOMICS

Optimal choice is a basic principle of decisions and also for most systems of morality. We follow Jeremy Bentham, who formulated the law following his predecessors: "[Joseph] Priestley was the first (unless it was Beccaria) who taught my lips to pronounce this sacred truth: That the greatest happiness of the greatest number is the foundation of morals and legislation."

The greatest happiness principle can serve as a basis of mathematical theory if there is a measure for happiness. Modern results underline the assumption that everybody is able to evaluate his/her own happiness. It means that everybody has a measure of it.

Layard argued that there is consistency in results from different methods used to measure happiness, and so happiness is measurable: "Happiness is an objective dimension of all our experience. … We can ask people how they feel. We can ask their friends or observers for an independent assessment … Also, remarkably, we can now take measurements of the electrical activity in the relevant parts of a person's brain. All of these different measurements give consistent answers about a person's happiness. With them we can trace

the ups and downs of a person's experience and we can also compare the happiness of different people ... happiness is a real objective phenomenon ... happiness is a single dimension of all our waking experience, running from the utmost pain and misery at one extreme to sublime joy and contentment at the other." [19].

Nevertheless already Bentham believed that people's experiences were unique and by that very fact considered it unworkable to attempt to sum them. We do not need the direct measurement of happiness; it is sufficient that the subjective measure exists. It is similar to the problem of physics, where there is no direct measurement of entropy, the central concept of thermodynamics.

Based on these arguments we assume that everybody has a subjective measure for his/her own happiness, H (Happiness). For the modelling, that is for mathematical theory one has to define the factors or variables of this happiness measure. Simone Borghesi and Alessandro Vercelli (2008) collected the main determinants of subjective happiness in the light of the recent empirical evidence accumulated by economists, psychologists and sociologists [20]. They suggest the following function of self-reported happiness:

$$H = H(Y, Y_R, Y - Y^*, G, R, E, I, U, He),$$

where Y is absolute income, Y^* aspirations of income, Y_R relative income, R relational goods, E environment, I education, U working conditions, He health and G psycho-genetic factors.

An increase in per capita income Y appears to increase significantly subjective happiness H only for very low classes of income; the impact of absolute income on happiness tends to diminish for higher income classes and to fade away after a relatively low threshold estimated to be at around \$ 10 000 to \$ 15 000. Above the poverty level unhappiness increases if the relative personal income of the individual diminishes relatively to the (average) per capita income of a reference group and vice versa.

Economics primarily is concerned with the production and distribution of material goods. It is investigating decisions concerning resource changes. The income is important as it ensures the material goods, and also opens the way for different activities. The aim of all primary economic activity is to ensure material goods for consumption directed toward the satisfaction of human needs. Even in the modern service-oriented economy, material products provide most services. The role of stocks (commodities, goods, capital, money) is to satisfy both immediate and future consumption desires. There is a direct link between subjective happiness and economics, as happiness depends on the resources of the individuals.

Assumption: Happiness depends on the stock of resources.

Naturally the stock of resources do not determine the happiness, the statement only tells that we are not indifferent concerning the quantities of stocks. In economics, commodities play almost as fundamental a role as firms and consumers, notwithstanding the importance of services. 'Commodity fetishism', despite its loud denunciation by Karl Marx, is indispensable to economics. The aim of all primary economic activity is to ensure material goods for consumption directed toward the satisfaction of human needs. Even in the modern service-oriented economy, material products provide most services. The role of stocks (commodities, goods, capital, money) is to satisfy both immediate and future consumption desires. But not only the material goods are resources, as for instance knowledge is also an important resource, which affects the happiness. It is worthwhile to generalize the concept of stocks. A resource is any physical or virtual entity with the following characteristics:

1) usefulness (with the change of the quantity the happiness may change)
2) quantity (they can be measured),
3) there is a balance equation for the change.

Balance means here that the resource changes by production/consumption/trade/dissipation.

Let X be the symbol for the stock. The agent is defined by the capital letters A, B, ... X_{Ai} is the quantity of resource i owned by the agent A,

$$\Delta X_{Ai} = X_{Ai} + S_{Ai} + D_{Ai},$$

where $J_{AB,i}$ is the flow of the i-th resource between agents A and B, S_{Ai} is the source/sink which describes the effect of production and consumption. Finally, D_{Ai} is dissipation.

In human actions decisions select J, and S, but generally we do not select dissipation, D, that is why we separated it from the source/sink term. It decreases the quantity of the resource, similarly to the consumption, but the consumption is via a decision, while dissipation is a natural law. The law of nature (The Second Law of Thermodynamics) demands that $D < 0$, in economic terms – there is no free lunch. The dissipation term resolves an apparent paradox. The greatest happiness principle states that in our decisions we select actions, which increase the happiness, but it does not mean that our happiness is always increasing. The dissipation terms generally mean a decrease of the happiness, and there are cases, when the greatest happiness choice means the least decrease, as for instance in the case of tax payment. Ironically we can state that we have to fight always to increase our happiness to ensure that it does not decrease.

The list, possibly incomplete, of resources affecting our happiness:

N – material goods
M – Money
T – Time
R – Relational goods
P – Physiological factors
K – Knowledge

From the list standard economics deals with the material goods and money. A short description is about some of the resources.

TIME

Time is a special resource which can be formally incorporated in the resource description as we have decisions how to use the time, which type of activity to select. Time use [21] on an average workday in USA for employed persons ages 25 to 54 with children is shown in Table 1.

Table 1. Time use on an average workday in USA for employed persons ages 25 to 54 with children.

Activity	Hours
Working and work related activities	8,7
Sleeping	7,6
Leisure and sports	2,6
Other	1,7
Caring for others	1,2
Eating and drinking	1,1
Household activities	1,1
All activities	24,0

The working time is the period, when the agent has no right to make his decisions based on his/her happiness, but he has to fulfil the contract. In the labour contract the agent sells his time. The specialty of time, as a resource that there is no stock of time, but time can be traded.

RELATIONAL GOODS

Relational goods capture the affective and communicative components of interpersonal relations. These goods have characteristics quite different from those of ordinary goods as they are end in themselves, cannot be produced or consumed by a single individual but only simultaneously by at least two of them, while their value depends on the interaction between individuals under conditions of reciprocity. Examples are love, friendship, and more generally direct personal social relations, i.e. not mediated by economic or political exchanges.

Bruni is probably correct in asserting that an "economic theory more open to genuine sociality could better understand not only the 'Esterlin paradox' but also those interactions (that are growing more and more in postmodern market societies) characterized by the presence of relational goods" [22; p.123].

PHYSIOLOGICAL FACTORS

These factors characterise the state of the body or bodily functions. To maintain them we must consume. The physiological needs are requirements for human survival. Physiological needs include breathing, food.

The quantity of goods effect the happiness, but they do not define it. Ljubormirsky summarized the empirical results that for individuals, psychogenetic factors gives 50 % of the happiness; 40 % is from the voluntary actions and 10 % all the others [23].

Nevertheless the resources solely do not define our decisions. Past experiences and expectations on future have an important impact Antonio Damasio, formulated what is now known as the "somatic marker hypothesis" which can be seen as a biological theory of choice [24]. The theory proposes that signalling the prospective consequences of options for action can assist in selection of an advantageous response option. According to the theory, patients with ventromedial prefrontal lesions do not make advantageous real-life decisions because they have lost the ability to incorporate predictions regarding the emotional consequence of an action into the decision process.

The expectations on future mean a serious problem, any investigation, or any measurement to define them may change the expectations themselves. A situation similar to the quantum-mechanics, probably a new quantum economics is needed. The other solution is that the expectations on future and the past experiences are handled as external parameters. The foundation of modern mathematical economics simply ignores this problem. In economics the production and trade and consumption of resources are investigated, so we can introduce the reduced happiness, called wealth, which contains only the resources as variables– and the expectations and activities are considered as external parameters.

THEORETICAL ECONOMICS

In modern microeconomics decisions of consumers and other entities are modelled with preference relations, which incorporate the concept of happiness. The Webster on-line dictionary gave the following definition for the preference [25]: "Preference (also called 'taste' or 'penchant') is a concept, used in the social sciences, particularly economics. It assumes a real or imagined 'choice' between alternatives and the possibility of rank ordering of these alternatives, based on happiness, satisfaction, gratification, enjoyment, utility they provide."

In microeconomics, preferences of consumers and other entities are modelled with preference relations. The introduction of preference relations on one hand allowed the introduction of the simple mathematics, the optimization formulation of the decision theory, on the other hand it

lead to a mathematical economic theory, which is flawless mathematics, but is not about the nature of economic reality.

The usual definition of preference relation we copy from Stefano Lucarelli [26]: "Let S be the set of all 'packages' of goods and services (or more generally "possible worlds"). Then $\leq$ is a preference relation on S if it is a binary relation on S such that $a \leq b$ if and only if b is at least as preferable as a. It is conventional to say 'b is weakly preferred to a', or just 'b is preferred to a'. If $a \leq b$ but not $b \leq a$, then the consumer strictly prefers b to a, which is written $a < b$. If $a \leq b$ and $b \leq a$ then the consumer is indifferent between a and b."

The following assumptions are commonly made:

- the relation is transitive: $a \leq b$ and $b \leq c$ then $a \leq c$.
- the relation is complete: for all a and b in S we have $a \leq b$ or $b \leq a$ or both. This means the consumer is able to form an opinion about the relative merit of any pair of bundles.
- the relation is continuous.

These assumptions are sufficient to ensure the existence of a utility function, and the decision problem is translated to find the package of maximal utility.

The utility function for the actor A is not in the form

$$u^A = u^A(a),$$

but there are properties of actor A, which change, and with their changes the preference ordering changes, and so the utility function also changes. The real utility function is in the form

$$u^A = u^A(a, X).$$

It depends on the past experiences, on the future expectations, and it depends on the resources owned by the actor. Traditionally, economic theory solved the problem with eliminating the changes, with equilibrium hypothesis.

Neoclassical theory investigates, what behaviour can be expected in equilibrium? The question of whether there exists equilibrium is never raised in a neoclassical project. In spite of the fact, that already ... "When A.A. Cournot constructed the first model of (oligopolistic) competition in 1838, he immediately noticed a lacuna in his explanation regarding the emergence of an equilibrium. Rather cunningly, instead of discussing this difficulty, he studied what happens when we begin from that equilibrium. Would the system have a tendency to move away from it or was the equilibrium stable? The proof of its stability secured his place in the pantheon of economic theory."

In the textbooks the canonical hypotheses, as Robert Solow has characterized them are greed, rationality, and equilibrium-became the maintained hypotheses in almost all branches of the subject.

Christian Arnsperger and Yanis Varoufakis summarized the hidden meta-axioms, which are behind this postulate [27]:

1) Methodological individualism – individual agents who are to be studied are independent of the social whole their actions help bring about. It is just the Newtonian independent particle approach,

2) Methodological instrumentalism – all behaviour is preference-driven or, more precisely, it is to be understood as a means for maximizing preference-satisfaction.

   Preference is given, current, fully determining, and strictly separate from both belief (which simply helps the agent predict uncertain future outcomes) and from the means

employed. In the last time there was apparently a significant change. The endogenous preferences and psychological game theory replaced the simple consumer rationality. Nevertheless, homo economicus is still exclusively motivated by the greed.

3) Methodological equilibration − important limitation of neoclassical economics is the equilibrium hypothesis.

COMPLEX SYSTEM APPROACH

In a complexity approach we will construct a theory without the meta-axioms. We will miss the rationality (maximizing property) axiom, and the result will be that the other is will not be needed.

An important group of the factors is the group of resources. Economics primarily is concerned with the production and distribution of material goods. It is investigating decisions concerning resource changes.

For mathematical modelling of the happiness an important point is that it depends on the stock or the flow of resources, that it we are interested only in the changes − in this case only the flow is important. Or we need the resources, their services, in this approach the stock of resource counts. For non-economists the answer is simple, the total quantity of the goods is important.

The economists are educated that only flow is important. It originates in the mathematical model. In a perfect equilibrium state with constant unchanging stocks, all flows must balance and a representation in terms of flows alone can be justified. This is, essentially, the underlying assumption of neoclassical economic theory, and especially, general equilibrium theory. However, in real accounting systems stock changes must be considered in order to balance the accounts during any period. Moreover, a system of exchange with unchanging stocks cannot grow or expand by any endogenous mechanism. This is one reason for the difficulty of reconciling static general equilibrium theory with economic growth,

$$Z(X) = H(X, Y, A), Y \text{ and } A \text{ are fixed.}$$

Expectations and the past experiences define the form of function Z. For the economic investigations, where only the production and trade of material resources is investigated − a more reduced description is possible, where the list of resources contains only the material goods N, and money M. In the following part we investigate only that economic part of the wealth.

The existence for the wealth function for individuals follows from the greatest happiness principle. Nevertheless, Z exists for all type of economic actors, for firms, companies and other economic actors, as it was proposed based on the irreversible nature of decisions [28].

Nevertheless this reduction has an important mathematical consequence. The optimal choice for Z and H do not coincide. The action, which maximize Z do not necessarily maximize H, as the change of future expectations in the former are not taken into account.

For the mathematical theory we have two possibilities. First, accept the maximization of Z as a good approximation, in that we have to accept the meta-axioms. Assumption − equilibrium − we get back to the equilibrium − and the rational decision. In that approach Z will have a role similar to the utility function.

The other possibility is to accept the law of nature, that Z is not maximized, so we release the rational decision principle for the modelling of economic decisions.

The wealth change caused by the change of the stock of resource expresses the increase of happiness, which coincides with our definition of value. For normal goods the value is positive, but it is a decreasing function of the stock of resource. If the supply of any class of resource is so great that every demand is met, then the increase of the resource does not mean "better

life", so it must not lead to the increase of happiness, then value is zero, or negative if it causes further problems. If, in any class of resource, the supply is not sufficient to meet the demand for satisfaction then the increase of the stock increases the happiness, and value emerges.

Starting from the definition of value given by Menger: "To have value, a good must assure the satisfaction of needs that would not be provided for if we did not have it at our command. But whether it does so in a direct or in an indirect manner is quite irrelevant when the existence of value in the general sense of the term is in question." [29].

With this definition of wealth and value the money has also a subjective value, it is the change of happiness due the increase of money stock. The appearance of the value of money opens a new way for the optimization of economic processes [30-32].

NON-OPTIMIZING THEORY OF DECISIONS

Since Adam Smith's formulation, it is accepted that the driving force for human actions is self-interest. The expected wealth change arising from the actions is which drives us to act. Traditionally economics accepted it in the form of maximal utility and the driving force disappeared.

Alternative approach is that driving force for an action is the expected wealth gain, dZ. More precisely, the driving force is the expected gain associated with a unit process. The force law defines the actual decision, which is an empirical relation. The force law is subjective, depends on the expectations on the future possibilities, so it has to be observed. The force law together the balance equations give the differential equations of an economic system. This system describes the quantitative changes in real time.

Each economic actor is characterized by the stock of resources N_{ai}, and money M_a, where index i is for the resource type and index a identifies the agent. Wealth function of the actors, $Z_a = Z_a(N_{a1}, ..., M_a)$. The change of the resource is given by the balance equation. Now, we investigate the case, when two agents (agent *a* and agent *b*) trade the good i for money.

The driving force for action is the value – price difference. For the sake of simplicity we assume the force law in linear approximation, that is the traded quantity is proportional to the value – price difference.

Let $q_{ab,i}$ be for the quantity traded with the actor *b*, then

$$q_{ab,i} = L_{abi}(v_{ai} - p_i),$$

and for the agent *b*

$$q_{ba,i} = L_{bi}(v_{bi} - p_i).$$

It gives a relation for the prices. For exchange of normal economic goods and money there is a natural conservation rule, which states

$$q_{ab,i} + q_{ba,i} = 0.$$

The price equation is

$$p_i = \frac{L_{abi}v_{ai} + L_{bai}v_{bi}}{L_{abi} + L_{bai}}.$$

The traded quantity will be

$$q_{ab,i} = \frac{L_{abi}L_{bai}}{L_{abi} + L_{bai}}(v_{ai} - v_{bi}).$$

After introducing the effective willingness to trade, L^*,

$$L^* = \frac{L_{abi}L_{bai}}{L_{abi} + L_{bai}},$$

the traded quantity becomes

$$q_{ab,i} = L^*(v_{ai} - v_{bi}).$$

It is now very similar to the physical transport equations, and it can be interpreted as the driving force of exchange is the value difference. Apparently it seems to be the definition of market forces. Nevertheless the real force is the self interest, the expected increase of the wealth. The market force is only the consequence of the mathematical manipulations.

Force law can be applied for the production decisions too, the dissipation and the consumption is an externally defined quantity, details and limitations are discussed elsewhere [2].

The linear force law here does not mean linear approach, as the values have a non-linear dependence on the stocks. So this system is capable to simulate the complex response of an economy for interventions.

The robust result is that the equilibrium hypothesis is non-tenable. There are several equilibrium solutions, but the overwhelming part of them is unstable.

CONCLUSIONS

Based on the greatest happiness principle we outlined a non-equilibrium economic framework, which contains as a special case of the neoclassical economic approach. Our preliminary results underline the critics that the results of GE economics come from the unnatural meta-axioms but not from the economic nature.

The fallacy of modern economics really can be understood. The macroeconomy, which tries to describe with basically linear relations, the working of the economic system in the best case is similar to the engineer who wants to understand the working of a computer based on the Ohm's law.

ACKNOWLEDGMENT

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PRINCIP NAJVEĆE SREĆE U PRISTUPU KOMPLEKSNIH SUSTAVA

K. Martinás

Odsjek za atomsku fiziku – Sveučilište Eötvös Loránd
Budimpešta, Madžarska

SAŽETAK

Princip najveće sreće bio je temelj Platonove i Aristotelove etike, služio je kao temelj principa korisnosti u ekonomiji. Istraživanja sreće postala su u novije vrijeme značajna tema društvenih znanosti na Zapadu, posebno u ekonomiji. Ipak, znatan je znanstveni pesimizam oko toga je li uopće moguće utjecati na održivi rast sreće.

U ovom radu naznačuje se ekonomska teorija odlučivanja temeljena na principu najveće sreće. Moderna ravnotežna ekonomija je pojednostavljenje, u okviru znanosti o sustavima, principa najveće sreće. Pristup kompleksnih sustava naznačuje neravnotežnu ekonomsku teoriju.

Usporedba pristupa pokazuje kako dio rezultata – zakoni moderne ekonomije – slijedi iz pojednostavljenja te su kao takvi protivni ekonomskoj prirodi. Najznačajnija posljedica je da se u pristupu slobodnog tržišta ne može biti siguran da li neki bliski put vodi do pogodnog ekonomskog sustava.

KLJUČNE RIJEČI

princip najveće sreće, kompleksni sustavi, neravnotežna ekonomska teorija