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The Consequences of the Complex Nature of Paradoxes in Economics

Abstract -The aim of this paper is to focus on theoretical considerations related to the nature of economic paradoxes. The economic paradoxes are then juxtaposed and compared with those of natural sciences. Physics, as the fundamental science concerned with the observation, understanding and prediction of natural phenomena has been chosen by the author as a representative of the natural sciences. The results of the present study show that the nature of economic paradoxes influences and limits the universalism of economic laws. As it was observed the limitation of the universality of economic laws brings about the limitation of their utilitarianism.

Keywords - paradox, economic law, utilitarianism of scientific laws, forecasting, methodology of economic sciences

Introduction

Contemporary science can be divided in accordance with a dichotomous pattern into formal and empirical sciences. As formal sciences, mathematics and logic work out research tools used in empirical studies. Natural and social sciences make up empirical sciences, meaning that the knowledge must be based on observable phenomena. Thus, economics with its focus put on observation, analysis and explanation of human behaviors is regarded as a social science. However, economics, in the course of its development adopted strong mathematical tools¹. This fact supports a strong relation between economics and natural sciences. Physics is one of the natural sciences and other natural sciences use and obey the principles and laws set down by this field. And, it is the physics that is juxtaposed and compared with economics in this study.

There are a number of research papers on similarities and differences between economic laws and laws that govern natural sciences. Some of them, (e.g. Nowak, 2012) attempted to reveal the existence of a common group (like ‘a super-group’) for both economic and natural sciences. Others, emphasized fundamental differences between natural sciences

¹In economics, the range of mathematical tools, their application and sophistication increases steadily. Other areas of research like history or ethnography lack this kind of apparatus sophistication.

and economics by showing imperfections in universal economic laws. The reason for this imperfect nature of economic laws lies mainly in the existence of the so-called ‘human factor’ in social sciences (e.g. Hardt, 2014). Although up until now source literature lacks profound reflection as well as comparative studies on the nature of paradoxes in both fields, attempts are made to catch up. The present study has the objective to contribute to the research in this field. The author makes an argument to show and support the imperfect nature of economic paradoxes. The detection of imperfections requires the selection of a reference frame and indicating the template. While the impact of paradoxes on the universal properties of economic laws constitutes the main focus of this study, the universalism of natural sciences and more precisely the universal properties of physical laws creates the aforementioned template.

Specifically, the aim of the present study is two-fold. Firstly, to compare paradoxes which can be found in economics and natural sciences. Next, to draw pragmatic inferences on the basis of this comparison. The paper is structured into four main parts and the conclusion. The first section presents the discrepancies related to the possibility of the universalism of economic laws. This analysis is necessary due to the fact that in economics paradox means contradiction of the universalism of its laws. The second section develops the theme of the interrelation between universalism and utilitarianism of scientific laws. In the third section the author analyses the phenomena of paradoxes in economic and natural sciences. The influence of the characteristic features of economic paradoxes on their utilitarianism is presented in section four. Finally, the paper concludes with a presentation of the results of theoretical considerations as well as guidance for further research.

1. The problem of the existence of universal economic laws

According to Krajewski, scientific law is a constant relationship between things, and more precisely, between the qualities possessed by the objects or between events in which the objects participate (Krajewski, 1982, p. 14). Scientists have a unanimous view on the fact that scientific laws, and especially physical ones, just due to the methodology used by scientists, are perceived as the most universalistic of laws. One may say that they can be regarded as an epitome of universalism. A scientific theory may be recognized as a scientific law when it not only posits a mechanism or explanation of phenomena, but also applies under the same conditions and implies a causal relationship between its elements. Scientists remain unwavering in their belief about the recurrence of laws unless something denying a law happens.

Economics is a social science. Not only does it involve production and distribution of goods and services, but also the human factor. Also, its laws show themselves in social processes. The fact that economics deals with human behaviors makes it different from natural sciences. Unpredictability is a fundamental part of human nature. As human behaviors are not just the movements in space they differ from other motions and phenomena by being determined by unique elements, namely free will and purposeful human actions. Furthermore, these elements vary depending on religious, ethical, legal and scientific views every single human has. And, also, for that reason the aforementioned elements are strongly prone to unpredictability. Determinism admits no free will and free choice, thus, human behaviors cannot be fully explained in terms of determinism. What is more, humans are able to gain awareness of the processes they take part in. This makes economic laws entirely different from physical ones. The latter express the phenomena of inanimate matter. Also, the laws of biology, genetics and other natural sciences are related to the phenomena cut off from free will and/or conscious perception.

Matysiak claimed that economic laws are universal. However, it does not refer to all economic theorems and historical generalizations as they are limited in terms of time and space (Matysiak, 2015, p.1). Giddens went even further on his objections to universal economic laws. He claimed that in social conditions, no theorem related to human behavior can be perceived as a universal law (Giddens, 2003, p. 396). Hardt accompanies this claim and says: „Economics is producing believes not laws” (Hardt, 2014, p.322).

The aforementioned claims reveal significant differences in views on the possibility of the existence of universal economic laws. According to one of the opinions on universal economic laws, economy cannot be based on universal laws. This is undoubtedly an orthodox view. Economics, as a science of dynamic, unpredictable and sometimes even controlled social processes, cannot meet the requirement of being universal. Thus, orthodox economists claim that the fact of being universal in terms of both time and space is the sine qua non condition for recognizing a given phenomenon as a scientific law. By juxtaposing ideally universal phenomena of the natural sciences with economic laws, they show the imperfect universal character of the latter. The other view on this matter may be called pragmatic. According to this view, although the acceptance of lack of regularities means indirect approbation of chaos and disorder, it admits the existence of economic laws. Thus, the recognition of certain phenomena as laws is the result of acknowledging their universal character, not, however, absolute, but in a relation to other economic processes. So pragmatics claim that highly predictable phenomena should be viewed as economic laws. They claim,

however, that economics cannot be limited to isolated phenomena. The thought of the inevitable economic process has its roots in the 19th century. Karl Marks, as one of the principal architects of economic and social sciences, claimed that it is possible to analyze and, what is even more important, to predict various socio-economic phenomena.

2. The universal character of scientific laws and their utilitarian applicability

For laws, the fact of possessing utilitarian character stems from being more or less universal. There are three levels at which utilitarianism can be analyzed:

The first level refers to the idealized need for exploring the world. It is an immanent human trait. People have been attempting to explore and experience the reality since the dawn of the human race. This need is a fundamental driving force of civilization. Economics, a social science of management and interactions, is one of the areas of interest and study. This level is thus two-faceted: the idealized need is interwoven with the search for its fulfillment and practical application.

The second level is praxeological. Thanks to our knowledge, we can familiarize ourselves with the processes governing human existence. Moreover, we can optimize resources usage and increase our overall effectiveness.

The third level is related to predictability. Because of some science disciplines people are able to make predictions about the reality. The more precise and effective the prediction is, the lesser the uncertainty and smaller the place for esoteric knowledge. On the one hand, predictability allows people to feel safe; on the other hand, it may be used effectively in the process of managing and transforming Earth's resources.

The fundamental issue related to the second, and even more to the third level, is the question of the existence of the natural laws as well as social phenomena and determining the extent of their universalism. The certainty of the existence of universal laws implies the certainty of the repeatability of phenomena. Repeatability is a necessary condition for accuracy and correctness of predictions. Economic management cannot be fully effective without these predictions. Therefore, we can observe a close and inseparable relationship between the universal character of scientific laws, the possibilities of predicting related to these laws and their practical application in the management of Earth's resources.

3. Paradoxes in economy and natural sciences

In economic thought we can encounter the word 'paradox' meaning some economic phenomena observed now and in the past. The most famous paradoxes were given names after

the economists who observed them and/or explained their origins. Giffen's paradox, Veblen's paradox, Leontief's paradox, Gibson's paradox, the Allais paradox and Puślecki's paradox in Poland, are among those most commonly referred to. In economics, the term 'paradox' concerns the phenomenon where the variables fail to follow the generally laid assumptions of the theory. To exemplify, the law of supply and demand says that the higher the price of bread, the lower the quantity demanded. However, in the 19th century, Robert Giffen observed that people in England and Ireland reacted in a totally opposite way. Thorstein Veblen showed that this phenomenon might also refer to the consumption of luxury goods. The rise in prices may, paradoxically, entail an increase not, more practically predicted, decrease in demand.

Acting in accordance with Popper's methodology² and observing the phenomenon that does not follow a theoretical pattern we could assume that the theory was falsified. We could think that this phenomenon is in contradiction to the theory. Thus, the effect would be consistent with Poppers view (1977). Mayper summarizes this view well: "good theories, according to Popper, are theories which take risks, which run the chance of finding their predictions are wrong" (Mayper, 1980, p. 110). Popper urged scientists to put forward daring hypotheses and then try deliberately to falsify them. In consequence, falsified theories should be replaced by theories that can account for the previously unexplained phenomena. In both natural and formal sciences, researchers choose to follow that path. Thus, when a theory is falsified, scientists can respond by revising the theory, or by rejecting it in favor of the new one. The rejection of the theory which does not explain an observable phenomenon has sound methodological grounds. They form a basis for the scientists' assumptions that a paradox always means an error of reasoning. Since a paradox is a statement that, despite apparently sound reasoning from true premises, because of an error, leads to a logically unacceptable conclusion (Sowiński, 2016). The aforementioned error may have different sources ranging from simple mistakes in the research process to complex faults in making logical inferences. For instance, a paradox in mathematics would occur when the final equation would be $2=3$, and not $2=2$. In physics, for example, physical impossibility of a 'perpetuum mobile' creates a paradox. The attempts to explain inconsistencies between the empirical studies and theoretical predictions have always ended in failure. Every time it turned out that the cause of the failure was a mathematical or logical fallacy, a mistake in the research process (a simple mistake in

² The present study is based on Popper's methodology. Kuhn's, Lakatos's, Feyerabend's research methods have not been included.

the lab) or a deterministic and previously omitted and/or unobserved cause was found.³ A paradox in natural sciences has one important feature – it does not refer to the theory itself but to logical fallacies as well as the to the research process. The existence of paradoxes in the world described by natural sciences is impossible. This kind of paradox, if it really existed in the real world, would cease to be a paradox. It would, on the other hand, become an independently functioning phenomenon. What is more, it would falsify the theory according to which it would be a paradox. And, consequently, this is the theory that would prove to be false.

Generally, a paradox occurs when an apparently correct reasoning leads to the wrong conclusion. However, economic paradoxes emerge because of different mechanisms, having different causes and effects. Thus, in economics, we encounter a paradox when something happens contrary to mainstream economists' theoretical models. An economic model is a simplified framework designed to illustrate the workings of the economy. Since it is based on simplifications, it does not cover the full complexity of phenomena. Modelling requires abstraction and for that reason not all variables can be included and not all processes simulated. In consequence, a model is stripped of a wide spectrum of variables and dynamics. The detection of those variables in the course of empirical studies is qualified as a paradox. A paradox is then a natural consequence of economic modeling and theoretical simplifications.

Although paradoxes remain in total contradiction with theoretical predictions concerned with a specific economic law, it is assumed that they do not contradict this law. They do not falsify it. They are just the exceptions to the rule (a model). Interestingly, paradoxes may be explained⁴, and this explanation, paradoxically, may enrich the theory of economic laws.⁵ Despite this explanation, it would be impossible to determine whether a given phenomenon is just a paradox or, as Popper suggested, a phenomenon that refutes a theory. Because of the nature of paradoxes, Popper's Chopper (Mayper, 1980, p. 110) cannot be fully exploited. It can be said that economic paradoxes do not clear our mind of false theories. They may enrich our knowledge with the description of new phenomena, however, without being

³ In the 30s, there were the attempts to explain the differences between theoretical assumptions concerning the disintegration of an atomic nucleus and data from empirical studies. The explanation was based on the fact that the law of conservation of energy was violated in the aforementioned process of disintegration. However, later, it occurred that in this process one important particle is released. This release of neutrino showed there was no paradox there. On the contrary, the situation was different from faulty theoretical predictions.

⁴ Robert Giffen tried to explain his paradox on the basis of the law of supply and demand.

⁵ For example, Veblen's paradox as well as Giffen's paradox deepened our knowledge by making us aware of both the need for the division of goods into basic and luxury goods and the consequences of this division. Moreover, we gain knowledge about the fact that demand and supply curves may be different for basic and luxury goods. This difference may even refer to goods within one group (e.g. luxury goods). Because of the awareness of the paradoxes we are also more cautious in making hypotheses.

sure that this enrichment is nothing but a clumsy attempt to coordinate observed phenomena and theoretical predictions.⁶

The lack of clear criteria that could be used as a framework to identify paradoxes makes it easier to overuse this term. Therefore, the term ‘paradox’ may be used in order to hide methodological insufficiency and measurement errors or just because of the unwillingness to reject valid theories.⁷ It may also be the case that the empirically supported paradox is just the isolated effect of deterministic chaos (Sobków, 2016). There are no scientific grounds for naming such an isolated situation a paradox as well as for the attempts of its explanation.

4. The imperfect nature of paradoxes and its impact on the utilitarianism of economic laws

In 1953 Friedman stated that scientific theories and mathematical models are the essence of the economic thought. The main objective of these theories and models is to predict economic phenomena (Friedman, 1953).⁸ Theories are pragmatic by nature and they are used by investors for implementing specific, not general economic plans. Thus, for theories pragmatism means action, power and possibilities. For Friedman and the representatives of neoclassical economics focused on econometric techniques, to ‘predict’ means to ‘calculate’.

Economics is a broad and multifaceted scientific subject area and finance plays a key role in economics. Finance is a culmination of human efforts for effective management in terms of households, businesses as well as nations. At present, it is based on analysis and prediction. For that reason, the issue of the existence of economic laws and their universalism has a profound influence on the world economy and human existence. Only by considering universal rules (laws) and sophisticated mathematical tools can we make sound financial projections. Predictability is always an inseparable element of accurate and reliable economic

⁶ Similarly, Ptolemy’s theory of epicycles were to adjust astronomical observations to the geocentric theory. And only after more than thousand years, new Copernican model abolished a previous theory and its all of the explanatory concepts.

⁷ After accepting Leontief’s paradox, the economists were satisfied with the explanation why the theory of abundance does not work in the US economy. Both, the explanation of the paradox and the law of abundance were accepted. The aforementioned theory was not modified in connection with the paradox. It is difficult to say whether this decision was right.

⁸ A hypothesis can’t be tested by its assumptions. What is important is specifying the conditions under which the hypothesis works. What matters is its predictive power, not its conformity to reality. On the 29th of June 1996, in his lecture he said: The validity of a theory depends upon whether its implications are refuted, not upon the reality or unreality of its assumptions (Hetzl, 2007).

forecasting. In the case of economy then, the highest degree of the utility of knowledge is based on the existence or nonexistence of universal laws that can be practically applied.

The nature of economic paradoxes makes them totally different from paradoxes in natural sciences and determines the utility of economic laws:

Firstly, while analyzing the phenomenon related to an economic law we are not able to predict the consequences. It may happen that the phenomena will adjust to a new or already existing paradox.

Secondly, we may not be sure whether this newly observed 'paradox' is real or imaginary (e. g. may be the result of measurement error). Here, in economics, the verification stimulus is significantly smaller than in the case of natural science where a 'paradox' may be a falsifier of the theory.

Thirdly, the development of economic theories encounters methodological problems. Never can we precisely determine the phenomena that deny a scientific theory. Counter-theory phenomena may be called paradoxes which in economics do not oppose the theory. Popper's Chopper appears to be slightly blunt.

Conclusion

There are two approaches to the existence of universal economic laws, namely an orthodox and pragmatic approach. The former rejects the existence of universal laws in economics. For the latter, the term a 'universal law' in economics refers to the regularities with the high degree of occurrence. Discrepancies in opinions on research methodology occur not only in economics. However, the most heated methodological debate seems to take place in economic sciences. Nowadays, economics rules our lives. Therefore, it is the economics that has an important and unique place among other sciences regardless of the ethical assessment of this fact. Finance is the mother science of all economic subjects. It is based on prediction. In natural sciences prediction refers to the universal nature of discovered laws. In economic sciences prediction must be also related to the universal nature of laws

The present analysis of economic paradoxes showed that there is a deep interrelation between the features of those paradoxes and the prediction in economics. To put it more precisely, paradoxes may limit the power of predictability in economic laws. In consequence, the utilitarian value of economic laws dwindles.

The present study is intended to make contributions to the research on paradoxes. As it was presented, faulty predictions stem from the nature of economic paradoxes. This issue is

still open to debate and more studies on paradox analysis are needed to make scientists closer to the elusive nature of paradox.

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