A criticism of the paradigm of rational choice in uncertain conditions through the lens of behavioral economics

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Abstract: The authors of the article point out that the classical theory of economics has failed to yield a solid theoretical background for the economic conditions of the world. Theorists cannot look to controversial mathematical modelling for help, especially due to the influence of unfettered randomness. Heuristic economists and empiricists can better anticipate the consequences of chance for the economic conditions of the world and better interpret the behaviour of individuals and economic entities in decision-making in uncertain conditions, which seems to be an altogether different case. The classical utility theory is criticized. The authors emphasize the particularity of the insurance industry and controversial regulatory projects in this context. The fair insurance premium is criticised. Conclusion: The challenge for today’s theoretical economists is to find a new concept for today’s global era in line with behavioural and empirical approaches.

Keywords: paradigm of economics, the utility theory, behavioural and empirical approach, unfettered randomness, particularity of the insurance industry, criticism of the fair insurance premium

1. Introduction

A very topical and widely discussed question in philosophy and the general methodology of science and, by extension, economic science and its paradigms is the level of determinism in today’s complex globalized world. Due to its dynamics, today’s volatile world, changing at a revolutionary speed, is, in reality, outpacing by far the creation of theoretical and methodological paradigms in the social sciences and, especially, the economic sciences. As a result of the increasing complexity of economic interactions, which are, moreover, strongly affected by randomness, there is a pressing need for a better understanding of the processes of human decision-making in uncertain circumstances.
The aim of this contribution is to draw attention to some topical aspects of the problem of the determination of the current complex world from the point of view of possible ways to change the economic paradigms, especially the theory of the rational choice of homo oeconomicus.

2. Is economic science essentially a hard or soft discipline?

In current economic theory we may observe two conflicting approaches which stem from different methodological positions. The first, which is currently somewhat in decline but still has many faithful proponents, and which was at its peak in the 1990s, was characterized by its supporters’ attempt to shift the paradigm of economic science towards an analogy with the causally connected “hard” scientific disciplines with their clear aim: to enable, through greater rigour (maximization or optimization), normative prediction in economics too. In recent decades, economists have begun to regard their field of study as occupying a privileged position among the social sciences and as the most formalized of all the social sciences. Some have voiced the opinion that economics should be regarded as an imperial science [1].

This tendency among theoreticians, especially at the end of the 1990s under the leadership of Samuelson [2], vigorously introduced mathematical modelling techniques in economics without considering that the selected type of mathematics, a non-dialectical method of enquiry, is, in many applications, too restrictive for the problems under consideration, because the complex and hectic economic world can clearly not be conceived as exclusively deterministic and non-dialectic. The intensive implementation of mathematical approaches, which is currently underway in models of market regulation with the aim of maintaining moderate volatility and greater market stability, has stemmed in the last two decades from the concept of the “risk based approach”, which is based on the illusory thesis of the possibility of a priori understanding and mastery of the considerable influence of randomness on global economic conditions.

The attempt by analysts to predict the economic future and its specific data normatively using mathematical models creates the impression that they are dealing with unambiguous facts. In fact, they are dealing only with a certain variant of prolonged quantities which arose under past conditions, and nobody has yet been able to transfer those past conditions to the future on the basis of historic data. Despite this, analysts still have great power in the world of economics. Their evaluation of the value of an economic subject or financial instrument can significantly influence the mood of investors and help to create a virtual situation on the markets, especially the financial markets.

This mindset is based on the illusory premise that what has been mathematised and works in equations can be squeezed into a postulate of rational choice, ie. that homo oeconomicus always strives to achieve maximum economic benefit. This too strongly held assumption is increasingly becoming the limit of enquiry within that tendency, and consequently, with ever greater urgency, one question arises: Is economics able adequately to investigate those phenomena which clearly arise from the core subject of that discipline of social science – human behavior on the markets? Moreover, it is, we believe, highly significant that, in line with that approach, the ethical dimension of economic interactions, including its legal framework, has been consigned to the margin of the theoreticians’ field of interest. However much the dealings of economic subjects may be regarded as being driven by the participants’ own interest, it is still necessary to respect one’s partner in an exchange or similar interaction as an equal and, at the same time, to respect the laws and rules (including the unwritten ones) which regulate mutual interaction.
These ethical principles will inevitably go beyond the limits of individual interest. At the same time, it is the factors of moral hazard and negative selection in human economic decision-making which have been one of the main problems in economic practice in recent times. The current increase in the speculative behaviour of economic subjects combined with a drive for short-term profit expressed in terms of money, a thing which originally, practically since the time of Aristotle, had a “merely” instrumental purpose but which now for the majority of the participants of economic interactions represents the final goal of their economic efforts, suggests that an economic theory which tolerates such a development, or even supports it, is heading in the wrong direction. Perhaps the most eloquent comment on further progress in the quest for a new economic paradigm which includes an ethical approach was made by Mlčoch [6]: “Economic theory and the theory of social behaviour in the future should, therefore, be a new synthesis integrating all the positive things that consideration of the ‘lot of humanity on earth’ has produced over the centuries and millennia. Every economic decision—in line with a concept of the internal model of the world.....of a (multi-criteria) decision-maker, who is a far more interesting genotype than the standard homo oeconomicus” should be calculated and booked both in the dimension of the cash flow of real money and according to its impact on invisible assets. For generations our ancestors believed that such account books – the only just ones – were kept in heaven. The new economics faces the challenge of bringing those books down to earth.

Although it may seem hardly possible to implement such ideas in today’s world, the antagonistic dimension of this dichotomy is, to a significant extent, becoming ever more obvious. The world will have to make a decision about the future: either the “just account books”, which include invisible assets too, will be “brought down to earth”, allowing the laws of economics to function better, or ethics will remain a fringe interest among economists, and, consequently, strong regulation will be necessary, which will significantly weaken the effectiveness of financial institutions, partly due to the inappropriate influence of politicians on the economy, with the possible scenario of the gradual abandonment of democratic principles. The other, softer yet increasingly widespread approach to the tools of economic science is represented by the heuristic and empirical economists including Kahneman, Tversky [8], Taleb [9], Ariely [10] and others who, unlike the classical theory, start from the basic fact that the economic conditions of the world are fundamentally unpredictable. According to Taleb [12], the most eloquent proponent of that tendency and one of the most significant representatives of modern unconventional thinking of our time, the social sciences, markets, politics and, by extension, the whole of society are fundamentally unpredictable.

In these empirical, cognitively psychological and heuristic approaches, people are viewed as unique multi-criteria decision-makers who emphasise subjective
viewpoints including the ethical framework of economic interactions or even emotions, and in reality they make decisions based on factors other than the criteria of rational selection (the maximisation of utility). These facts are better understood and experimentally demonstrated by scientists involved in fields completely different from economics who focus on researching situations in which people are not endowed with a mode of thinking based exclusively on rationality and probability or with optimal behaviour based on that mode of thinking in conditions where the result of their decision is strongly influenced by a lack of knowledge of the effect of random influences.

Classic economics based on the utility theory proclaims that when homo oeconomicus makes an irrational decision, Adam Smith's "unseen hand" swiftly sets him back on the correct, rational track. This is the assumption on which the complex construction of relationships and laws which describe all economic interactions is based, including the role of economic policy etc. Everyday reality, however, unambiguously convinces us that people are systemically irrational and that that characteristic is, indeed, a predictable phenomenon. Cognitive psychologists therefore pose the burning question: With such conclusive circumstances, is it not necessary to change the economic paradigms from the viewpoint of real psychology? Svoboda [13] has an unambiguous opinion on this, believing that what economists consider to be the core of the economic method – the theory of rational selection – is simply a primitive version of far richer invariant structures. We may add that a significant generator of invariance is randomness, a category which significantly influences the economic conditions of the world, which is why we, in this context, consider it so important to discuss the possibilities, or impossibilities, of studying and mastering the category of randomness a priori.

The current extreme complexity of globalising trends in the world creates greater fragility and, therefore, greater vulnerability of the markets and, especially the financial institutions [14], which poses the danger of rapid contagion and a domino effect. Faced with the complicated problem of default caused by randomness, the empiricists and cognitive psychologists, with their far more empathetic approach, try to change fundamentally our ingrained view of today's world and point out the crucial role played by randomness in human life and society as a whole. Within the framework of this approach, they reject the methods of statistical extrapolation and statistical modelling of the future using a Gaussian curve based on the conservation of past conditions and historical data, and they indicate the possibility of new global conditions which are completely beyond our ability to predict and, therefore, outside the framework of mathematical definition. The irregular occurrence of new global conditions is generated by a random mechanism, and we have no idea how big the "supply" of various development scenarios and variants is that the generator of possible conditions has in store for us. This is also true for new global economic conditions, and scientists, let alone mathematicians, can do nothing about it, because any meaningful response must be based on observation of the characteristics of the random generator, about whose mode of operation we know nothing.

3. Randomness in human thought and methods to support decision-making in uncertain conditions

The debate about how, in general, to analyse decision-making problems in uncertain conditions, which is still far from finished, was greatly influenced in the 18th century by Thomas Bayes. Two strands of opinion developed in reaction to his theorems - The so-called Bayesians, or subjectivists, who held that it was
appropriate to integrate the subjective aspect of human decision-making in the process of analysis, and the so-called objectivists, or “non-Bayesians”, who believed that it was better to omit the subjective aspects from the formal analysis of a decision-making problem. The ambition of the objectivists was to produce an exact normative recommendation how to make a decision optimally according to the concept of homo oeconomicus. The ambition of the “Bayesians” was to investigate the specific decision-making of a subject in a specific situation, which is a descriptive standpoint, and to attempt to clarify the basic characteristics of real behaviour in uncertain conditions.

The fact that people living in uncertain conditions resembling a lottery do not make decisions normatively was demonstrated by Bayes’ contemporary Daniel Bernoulli in his famous St.Petersburg paradox (people offered participation in a gambling game with a payoff of infinite median value are prepared to pay only a tiny sum to enter the game). This basic approach to the evaluation of games of chance was significantly expanded by the prospect theory of Kahneman and Tversky [8]. Their work perfects Bernoulli’s psychological approach. Before Bernoulli the predominant opinion was that games are evaluated according to the mathematical expected median value of the win. Bernoulli demonstrated that people making a decision about the problem are not guided by the value of the win, because they are very poorly equipped to deal with that type of prediction. Moreover, the components of decision-making are elements from the soft scientific disciplines: psychology, sociology etc. This means that every person, as a decision-maker and, at the same time, a unique individual, has his own usually highly individual relationship to lottery-type situations and his own utility function. Experimental investigation of individual preferences for or aversion to risk has demonstrated that most people are risk-averse.

From the viewpoint of the standard theory of rational selection, economists have regarded, and many still do regard the subjectivist heuristic approach to individual choice, dependent on the context in which the economic subject makes that choice, as a clear breach of the doctrine of coherence and, therefore, despite the conclusive evidence of experiments carried out by psychologists, the revision of the preference theory has come up against, and still comes up against the persistent inertia of the mind-set of a broad spectrum of experts$^3$.

Kahneman and Tversky’s prospect theory differs from the classic utility theory in several fundamental ways. The most important difference is that their model is descriptive, documenting and describing the systematic surpassing of the axioms of rationality in choices between risky alternatives. The prospect theory, which is the most quoted work of both authors, perfects Bernoulli’s approach, primarily due to its reference point principle, which presents the previous, or, more accurately, the initial state by which people measure their losses and gains, and its principle of aversion to loss. The reference point represents the quantity to which the relative change in utility is related. The relative change may arise, for example, from a change in the size of the wealth of the economic subject. According to the authors of the theory, deviation from the reference point then becomes the fundamental factor which determines a person’s utility, not the current level of his wealth.

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$^3$ In this context, Havlíček [15] has some interesting findings: behavioural approaches to the evaluation of assets predominate especially in the USA, Israel and, to some extent, in Great Britain. In continental Europe the theory of effective markets still predominates. The reason for this may be simple: the lecturers in behavioural finance at the top US universities are leading heuristic economists, all of Israeli origin (Kahneman and his students, Ariely, etc.), who have a fundamental influence on the specialist community.
A new category of the prospect theory not found in Bernoulli is so-called aversion to loss, which can explain the behaviour of people in cases where they have a choice between only two decisions both with negative consequences. The certainty of loss, according to the creators of the theory, leads people to try to take a risk with the hope that a random mechanism will generate the variant with the smallest possible loss. This category includes those unfortunate situations in which people facing very unfavourable alternatives take a desperate gamble, while accepting the high probability that, in exchange for a little hope that they will avoid a great loss, their situation will get even worse. This is the case of the victims of loan sharks or companies losing their competitiveness and expending their last resources in a vain attempt to catch up with their competitors. Kahneman demonstrates that taking risks of that kind usually leads to an inevitable catastrophe, but accepting a certain loss is so emotionally painful that a person is unable to take a rational decision and make provision for the loss.

4. The methodological problems of quantifying random factors influencing global economic conditions

From a methodological point of view, the basis of decision-making problems in uncertain conditions is closely linked with the dialectical, philosophical categories of necessity and randomness. In the context under investigation, one should always be aware that randomness is neither a concept nor a category recognised by mathematics. Unlike probability, it does not deal with quantitative aspects but is, rather a qualitative (philosophical) interpretation of a category which contains the entire phenomenal wealth of the world. The relationship between the conflicting aspects of qualitative and quantitative interpretation is contained in concepts connected with randomness such as risk, uncertainty and indefiniteness. Decision-making in a risk situation means a state in which a future situation is, in advance, unambiguously characterised by probability. The objective distribution of the probability of the occurrence of particular values of random quantities is, therefore, known in advance. In this it differs fundamentally from decision-making problems with uncertainty, where that objective distribution of probability is unspecifiable. Our conception of the term also includes future situation characterised by subjective probabilities which may also be interpreted as a possible estimator of objective probabilities (partial uncertainty).

The most complex decision-making problem is decision-making with indefiniteness, as opposed to uncertainty, which has exactly defined quantities whose values are, nevertheless, unknown. In an indefinite situation, the exact definitions of quantities and relationships are unknown and can be characterised only by vague terms such as significant, approximate, inconsiderable etc.

After characterising the typology and structuring of decision-making problems, we note a significant paradox. Although problems characterised by decision-making in uncertain conditions are not very common in economics (in fact they are quite exceptional), in today's globalised and volatile economic world one of the most widely used expressions is the term "risk", which, without any deep methodological basis, is used almost exclusively in cases of the exact investigation of economic processes and activities with ambiguous or uncertain outcomes, without the probability of most of those decision-making situations being characterised in advance.

An example of decision-making in a risk situation is a casino, where probability is known, Gaussian, and almost calculable. Gambling is, therefore, to use Taleb's terminology, "tamed" or "sterilised" indefiniteness, unlike the real economic conditions in the world, where "unfettered" randomness prevails. Nevertheless, to
make the problem more comprehensible for the human mind, these situations are
described as decision-making in a risk situation, although, in reality, the problems
are always much more subtle than that. It is certainly possible to calculate
probability and, therefore, to measure risk in games and situations with clear and
explicitly set rules, but not in the real world.

When we analyse socio-economic decision-making problems in uncertain
conditions, the basic problem usually appears to be non-conflicting, but as we
gradually finesse a problem, the solution requires ever more subtle methodological
approaches, including ones which contradict each other. At the same time, every
special solution of such a contradiction has both pragmatic and philosophical
consequences. In such circumstances, the end result of the analysis tends to be very
unsatisfactory. In situations where the result of a decision depends on unidentifiable
conditions, decision-making analysts, who work on a purely mathematical basis, will
invariably disagree about what recommendation to make to a decision-maker in a
specific case.

5. The characteristics of decision-making problems connected with the
economics of the commercial insurance business

The thesis that decision-making problems in a risk situation, that is, when the
probabilities of the occurrence of random quantities are known a priori, are not very
common in economics can be clearly seen in and applied well to the economy of the
specialised branch of the financial markets which attempts to solve financially the
economic consequences of randomness – in other words the commercial insurance
business, because this branch works with randomness as the basis of its activity:
products offered by an insurance company represent a managed transfer, within the
specific insurance product, of the financial consequences of randomness. If an
economic subject decides to ensure actively its financial continuity in that way, the
further options are either to create special financial reserves for that purpose (self-
insurance), or to ignore the possible impact of randomness completely (which is
known in theory as the principle of total ignorance).

5.1. An analysis of the strategy of taking out insurance against the negative
financial consequences of randomness

The situation in which an individual economic subject has to decide whether to take
out insurance as protection against unidentified, but insurable, conditions with
random negative consequences, in other words, the problem of a potential client of a
commercial insurance company whether or not to insure himself against certain
dangers, but, on the other hand, as we shall demonstrate later, also the problem of
an insurance company deciding what the correct level of the premium should be to
cover the negative consequences of that danger, is not decision-making in a risk
situation, but, rather, decision-making with uncertainty or even indefiniteness.

Let us first look at the decision-making problem of an individual subject, the aim
of the analysis being to produce the recommendation of a decision which is the most
consistent of all the subjective aspects of the choice: the consequences of solving the
problem of whether to take out insurance or not depend, for the reasons stated
above, on the opinions, ideas and preferences of the individual economic subjects in
question.

The dilemmas arising from any given decision-making problem can be
appropriately modelled using applications from the arsenal of game theory. A good
basis for structuring an analysis is the model of a game for two players, in which
one player is indifferent to the value of his win. It is, therefore, a classic decision-making problem of an intelligent player playing against “nature”, which represents the random generator of world conditions. For the analysis one may select the four criteria of Luce and Raiffa [17], which are recommended for solving problems in a state of “total ignorance”. According to these criteria (the criterion based on the minimax principle, the minimax risk criterion, the criterion based on the principle of insufficient reason, and, in the overwhelming majority of cases, also Hurwicz’s criterion), the specific economic subject is recommended to adopt the strategy of insurance [18]. Shifting the sets of strategies of the random mechanism towards greater loss (with insurable risks with possible catastrophic impact) only strengthens the force of the recommendation to get insured. In other words: the application used from the selected model of game theory produces a very strong recommendation that the individual economic subject should cover the risk of a great loss by the certainty of small loss by choosing the strategy of insurance. An exact analysis proves that none of the four criteria used is able to fulfil all the reasonable requirements which were imposed on them in the form of Luce and Raiffa’s axioms.

From the resulting recommendations of the application of game theory it is clearly not possible to deduce normative implications. Descriptively, it is possible to interpret the triple recommendation of the insurance strategy as meaning that if the subject does not know anything about the nature of his “opponent”, then fear of ignorance of the objective probabilities which the random mechanism uses to select its strategy, or fear of ignorance of a list of strategies to select from (in the case of catastrophic damage) will lead him to recommend insurance as protection against the consequences of randomness.

This, of course, leads us to the core of Bernoulli’s dilemma: Taking out insurance as a financial solution to the consequences of randomness is, of course, from a mathematical point of view, irrational, with a negative median value of gain (apart from paying out compensation for damage, an insurance company also has to cover its administrative costs and make a profit for its shareholders). Despite that, economic subjects do take out insurance. The motives for taking out insurance must, therefore, be sought among the subjective human characteristics, that is, in preferences and, above all, aversions, which are clearly outside the realm of mathematics.

Let us then go back to Bernoulli. His utility function explained why, to put it simply, poor people pay for insurance, and why richer people sell it to them. His analysis of the approach to a decision in uncertain conditions, in the sense of property preferences, remains relevant even three hundred years later. Generally speaking, subjects prefer a certain small loss which is known in advance, ie. an insurance premium, to the possibility of a loss whose size is not known in advance, but may be much greater – real damage. In such a case, the decision-maker is willing to reduce the expected value of his future utility if, at the same time, he reduces its variance in time, that is its distribution. In these circumstances, he is willing to buy a product with a negative median value of gain, which is, of course, a course of action in conflict with the classic economic theory: homo oeconomicus should buy only products with a positive quantity. Kahneman [18] adds that people are willing to pay more for insurance than corresponds to the expected value of the risky alternatives, which gives rise to the difference from which insurance companies cover their costs and create their profits [18]. The general deduction can be made that people buy more protection against improbable disasters, eliminate their fears and pay for peace of mind. In this respect, from the conclusions of
prospect theory it follows that people give far greater weight to a potential loss than to a potential gain of the same size. Classic utility theory either took no account of this fact, or considered a positive change and a negative change in utility to be equal to each other in absolute value.

This is another form of utility, a fact which a subjective decision-maker takes into account when deciding whether to take out insurance or not. The variant of insurance may, for the decision-making subject, represent a positive expected value, even if the subject maintains rationality in its decision-making process. By taking out an insurance policy, the insured party enjoys the utility that stems from the emotional satisfaction of having limited future uncertainty or having protected himself against the possible negative consequences of chance, which, potentially, represents not only the material damage which the insurance company calculates (in the case of non-life insurance), but above all “emotional damage”, which is caused mainly by catastrophic events such as the loss of the roof over one’s head and the resulting life on the streets etc.

The effective prevention of such fatal scenarios has a very positive effect on the human psyche, whether it eliminates unnecessary stress or simply gives peace of mind. In this context we should recall Kahneman’s latest research, which deals with the distinction between the experiencing self and the remembering self, whose interests are not the same. The difference between them stems from the fact that the way in which “the two selves inside us try to achieve happiness, poses a series of questions both at the individual level and at the level of society, which sees the well-being and feeling of happiness of the population as a political aim”[18, p.21].

According to this mind-set, by taking out insurance, the economic subject gains a certain surplus value in the form of emotional utility, which compensates for the negative expected value of purely economic utility, which, taken as a whole, makes insurance a product with a positive expected value both for the insurer and the insured party, assuming that the increase in emotional utility compensates for the original negative expected value of economic utility. Even though emotional utility is very hard to measure and is, to a certain extent, a highly individual matter, it is probably the most important element in the subjective decision-making process of an economic subject related to insurance. An analogy may be drawn with the emotional utility of someone taking part in a lottery who, simply by buying a potentially winning ticket gains the hope, albeit it highly improbable, of a big win. That hope is the decisive factor that leads most people to take part in lotteries on a regular basis.

From this discussion, we may generalise that most people have a tendency either to systematically over-evaluate or under-evaluate the possibility of an event with very low probability of occurrence, which significantly complicates any exact quantification of emotional utility. The formulation of an economic model which would include emotional utility could be a suitable subject of research for the modern approaches to the human decision-making process in an environment of uncertainty and indefiniteness, especially from the point of view of behavioural economics.

5.2. Setting an insurance premium as a strategy of a commercial insurance company against the choices of the random generator

We shall now look at the problem of setting a balanced premium at a commercial insurance company. There is no doubt that insurance company managers and their mathematicians would love to consign decision-making problems about the correct
level of insurance premiums and the appropriate level of their technical reserves to
the field of risk decision-making, because with a priori knowledge of the distribution
of the probabilities of a random factor – the occurrence of damage over a sufficiently
long period – operating the technical models for calculating insurance premiums
would simply be a scientific discipline – the number of probabilities. However, the
reality of the insurance business is completely different.

Especially in the current globalised era, the assumption of a priori knowledge of
the distribution of probabilities which the random generator will choose as its “game
strategy” against a premium set by an insurance company, as if it were playing
Russian roulette, is completely unfounded. There has been both a significant change
in the character and enormously increasing financial impact of hitherto insurable
dangers (for example, the risk of flooding in Central Europe, or hurricanes in
America), and the appearance of completely new dangers (for example SARS, large-
scale terrorism, computer piracy, and environmental threats). For these emerging
dangers, some of which have consequences resembling traditionally insured dangers
(an explosion and fire following a terrorist attack), the insurance industry has
adopted the concept of “unknown unknowns”, something insurers fear the most.
These phenomena did not occur in the past and, therefore, have no past probability
which could be put into mathematical models, even if we were to accept their
functionality. From the point of view of categorising a problem according to the
methods for supporting decision-making, this situation is one of decision-making
with uncertainty and can be modelled according to the theory of fuzzy sets (the
insurance interval has a fuzzy upper limit).

Unknown unknowns are future conditions in the world without any historical
data, and, in any case, no (insurance) mathematician has yet succeeded in
transferring the conditions of the past, when damage occurred, to the future. One of
the basic methodological paradoxes applies to the calculation of these as yet
unknown phenomena – how to make the future (the future occurrence of damage)
the object of scientific research when, as an object it does not yet exist. When
integrating the consequences of those dangers into insurance products it is vital for
commercial insurance companies to be cautious and to adopt a conservative
approach.

It is apparent that Gaussian, ordered randomness occurs relatively rarely in the
non-life insurance business. We could include in this category the insurance of
motor vehicle accidents, where the interval of possible damages has the ceiling of the
purchase price of the vehicle and there are probabilities of the level of various types
of damage according to the statistical distribution frequency. We could also include
accident insurance.

On the other hand, insurance against the possible fatal consequences of, for
example, natural disasters, or to cover liability for damage, displays the features of
decision-making with uncertainty or even indefiniteness. Damage caused by an
earthquake or the liability of the driver of a motor vehicle for a train accident at a
level crossing display the symptoms of a right-open insurance event interval. As
Taleb puts it, the consequence of insurance for the insurer and the client depends
on the generator of the conditions of “unfettered” randomness.

In current official microeconomics, within the theory of utility, there is the
postulate of the so-called fair insurance premium, which is defined as a level of
premium commensurate to the expected loss. The guaranteed income is equal to the
expected income, meaning that the insured party has the same guaranteed income
regardless of whether the loss occurs or not. Passages about fair and maximum
premiums in expositions of mathematical elegance tend to be assigned in textbooks
on macroeconomics to sections about decision-making with risk. I have never, however, in connection with that, read a warning that most of the non-life insurance business displays the signs of decision-making with uncertainty and indefiniteness, meaning that postulates about a fair and maximum premium are dealing with a fringe area of the problem with a tamed, sterilized randomness expressed by probability, and that for the greater, and more important part of the insurance business, that postulate does not apply. For the supporters of that theory it will be no easy task to refute Taleb’s arguments and construct an a priori fair insurance premium against, for example, the consequences of a hurricane, perhaps a future version of hurricane Sandy [12].

If we have found a prevailing aversion to risk among economic subjects (with the reservation that the term lacks a precise methodological grounding), then we must also note that a commercial insurance company, as an institution which takes over the consequences of randomness from its clients, should have a neutral relationship to risk, as long as this attitude is not subjectively influenced by the managers or owners of the company. Similarly, emotional utility does not come at the expense of the insurance company, which, unlike the insured party, works only with the measurable economic utility expressed financially and is, therefore, indifferent to the emotional utility of the insured party, or only takes it into account as a marketing factor.

The consequences of Taleb’s unfettered randomness [9], which are manifested in the enormous growth in the financial losses caused by disasters, are, of course, beginning to come up against the barrier of the commercial nature of the insurance business. The combination of natural disasters with ever greater impact on assets, and the fragility of technological progress (eg. the tsunami at the Fukushima nuclear power station) raises a serious dilemma: Should the commercial insurance business continue with its historical mission of trying to eliminate the financial impact of unfettered randomness, or even take on the “new challenges” of resolving the consequences of new threats, such as environmental damage or the cyber threat? Another possibility is to stick to its historical core business, or even to limit the level of insurance cover for hitherto insurable dangers.

As a result of the continuing desire to prevent the excessive volatility or even failure of the financial markets, the state regulators are currently giving priority to the stability of the commercial insurance sector in order to maintain balance on the financial markets, which is, of course, inevitably at the expense of the basic mission of insurance and the insurance business.

The mathematical modeling established by the Solvency II regulatory project, whose first pillar determines the acceptable ratio between the non-life risks covered by insurance and the insurance company’s capital resources, leads insurance companies to offer disaster insurance with limited validity. Insurance policies formulated in that way mean that randomness is “sterilized”, but they have a serious drawback – damage which exceeds the limit is not dealt with systematically. Once the crisis psychosis has died down, it will be the task of theory to find a balanced position between the original mission and sense of the insurance business and the possibilities of commercial insurance, which works on the principle of equivalence between income and expenditure.

To this principal dilemma we should add the opinion that, Taleb-style, when there is a real possibility of the occurrence of conditions in the world which lie entirely outside the framework of predictability and, therefore, outside mathematically defined definiteness, it is difficult to construct a scalar representing
“non-life risk taken on” by an insurance company. At the same time, this, in our view speculative, quantity is used as a binding capacity criterion for commercial insurance companies. The Solvency II project, despite these obviously illogical factors, continues to lead a life of its own. Nobody now discusses its sense or the limitations of its application, and the hefty volumes of guidelines constantly published by self-important regulators increasingly resemble the content and style of Orwellian writings.

Although in the real financial world it is clearly impossible to measure successfully future manifestations of randomness, or, to use the prevailing terminology, to measure risk, there is still an increasing amount of literature and specific instructions in regulatory projects how, in financial institutions, to measure, in particular, credit risk and the other commercial risks of banks, insurance companies etc.

6. Conclusion

The inability to master the complexity and compression in both time and space of the phenomena of today’s complex globalized world creates a whole new economic environment, has a significant impact on the state of the global economy and is becoming an urgent challenge for the social sciences, in particular in their search for new economic paradigms. One of the most pressing questions in this regard is the level of determinism in the world today and the role of randomness in the life of both society and individuals. The idea that economic science can achieve greater rigour and normative prediction through greater formalisation and mathematisation, an idea that has been widespread for at least the last two decades, increasingly looks like a dead end. More and more people are being won over by representatives of the open, soft scientific disciplines, which can better anticipate the consequences of randomness on global economic conditions and better elucidate the behaviour of people and economic subjects in decision-making problems in uncertain conditions.

In this context, we believe that it is important that most economic problems should have the parameters not of decision-making problems in risk situations where the probabilities of the occurrence of random quantities are known in advance, but of decision-making problems with uncertainty and indefiniteness.

The dilemma of anticipating randomness in economic problems can be seen clearly in the problem which the insurance business is currently trying to solve, when commercial insurance is a historically tried and tested tool for financially eliminating the consequences of randomness. Modern approaches to randomness (risk) call into question, for most of the insurance business, the formulations of classic microeconomics about the so-called fair insurance premium.

The enormous growth in the financial consequences of catastrophic events leads to pressure from state regulators to increase measures such as limits on pay-outs and exceptions from insurance which, on the one hand “sterilise” randomness and protect insurance companies from the danger of insolvency, but, on the other hand, reduce the effectiveness of insurance as a financial solution to the consequences of unfettered randomness. Finding a balanced position between measures increasing the stability of the commercial insurance business and its role in resolving the financial consequences of randomness, which have been diverted towards the reduction of volatility on the financial markets, will be the important task of insurance theory.

The basic idea of the modern thinkers, Kahneman and other heuristic thinkers, Taleb and other empiricists, is to reverse the process of acquiring knowledge: not from reality to a model, but from a picture to reality - in other words, to study
unfettered, unmapped, humbling indefiniteness on the markets and in life as a means to understanding randomness, or, more accurately, its generator. They call for the quest for knowledge to be freed from the style of investigation that has hitherto prevailed and for epistemic arrogance and the Platonic idea of precisely defined categories to be abandoned, as well as all tools which do not take into account the enormous consequences of unfettered randomness on the markets and in life, in other words to rely more on common sense while fully appreciating the role of randomness in the consequences of (not only) our economic decisions.

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