

## NEW TRENDS IN (UN) INSURABILITY OF RISKS

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**Abstract:** *In the insurance market have been seen over the last two decades the significant changes in view of (un)insurability of risks, not only in the context of the impact of the recent global economic crisis. To these changes in the insurability of risks can be viewed from two main perspectives. The first is that these changes in the insurability of risks were mainly due to the implementation of the risk of catastrophic dimensions, which were mainly floods. Part of the implementation of flood risk and flood gave rise to a new perspective on one of the sixth criteria of insurability of risks – the randomness. The impacts of these changes in the insurability of risks have economically affect not only to the individual (household), but also to the whole economy. With the last year's floods even increased uninsurable areas in the Czech Republic, hence it's household from 8 % to over 11 %. The second look is at the changes in the insurability of risks – especially the criterion of randomness – is very broad. In the context of the impact of the recent financial crisis on the world arose in the scientific community economic questions about the role played by scientific and economic theory (including general philosophical and methodological), the current problem of global conditions. In the research, scientific methods were particular used: analysis and synthesis, method of deduction, induction, review of professional literature and legislative documents, comparative analysis and synthesis of partial knowledge, elementary statistical analysis.*

**Keywords:** *(un)insurability, risks, natural disasters, unknown unknowns.*

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### 1. INTRODUCTION

According Ducháčková [1] defined six basic criteria for the limit of risk insurability, among which advises and randomness, which examines the insurer, as one of the three aspects of insurability of risks. It is obvious that randomness is one of the key criteria that are considered in the insurability of risks.

If the risk is implemented several times, even in different period of time, it means that this criterion was not fulfilled insurability of risks and the insurer has the right on it, put this risk into exclusions from insurance. This usually happens in the implementation of risk "catastrophic" impact, with their classification is different. When are not fulfilling the criteria of randomness, the insurer may not only put this risk into exclusions, as already mentioned, but also with this fact can cope and insurance surcharges. Now in the Czech Republic, due to frequent realization of "catastrophic" risks of floods and flood arose flood maps that use Czech insurers in the (un)insurance of property and homes. In the next part of the article we will look at this issue in more detail.

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In previous articles, with my colleagues, I engaged in various aspects of speech (not)responsibility in the current economic processes and its (dis)connection with decision-making and the level at which they take place, see e. g. publication [2] – [9].

However, with regard to the considerations in these articles, it is necessary to realize that understanding the problem of (not) responsibility in the current economic processes is a manifestation of a much deeper and, in my view, much more dangerous tendencies, whose effects are indeed global, but its origins are in developed countries. This process therefore can be easily called globalization.

The term globalization can be understood as an abstract phenomenon, involving various changes in society that led to greater interconnectedness of political, socio-cultural and economic events on the global (mondial) level. Globalization can be seen as an uneven process; as a result, some parts of the world relatively closer, while other relatively delaying all regardless of geographic distance.

Already this definition generally admits unequal impact of globalization on different parts of the world. But this is only part of the truth concerning the unequal consequences of this phenomenon, not only because of the disparity among the different "parts of the world", but also among members of such integration groupings, municipalities within states, but also among people – individuals.

Following the impact of the recent global financial, economic and in the end, the financial crisis that emerged in the scientific community new questions about the role of scientific economic theory, including philosophy and general scientific methodology in the current highly problematic global conditions. This issue is in the Czech Republic recently most discussed by the following authors Daňhel & Ducháčková [10] – [12]. As writes Daňhel & Ducháčková & Radová [11] - "*It is necessary to find new approaches and solutions paradigms of economic theory and problem solving economic policy and practice in general.*" This article should contribute to this discussion.

The paper aims to explain the changes in (un)insurability of risks in the Czech Republic over the last decade – over the period 2006 to 2015. For Understanding (un)insurability of risks article first focuses on risks and their uninsurability and then the focus will be on analysis of natural disasters in the Czech Republic.

In the following part will be characterized research methods and data for analysis.

## **2. METHODOLOGY AND DATA**

In the research, particular scientific methods were used: analysis and synthesis, method of deduction, induction, review of professional literature and legislative documents, comparative analysis and synthesis of partial knowledge, elementary statistical analysis. Due to the nature of the article secondary data taken from Czech Insurance Association [14] – [27] and SwissRe [28] – [34] was used.

For understanding of natural disasters is very important definition of this term. Natural catastrophes/disasters are caused by natural forces, the definition by SwissRe [34] is: "The term 'natural catastrophe' refers to an event caused by natural forces. Such an event generally results in a large number of individual losses involving many insurance policies. The scale of the losses

resulting from a catastrophe depends not only on the severity of the natural forces concerned, but also on man-made factors, such as building design or the efficiency of disaster control in the afflicted region. In this sigma study, natural catastrophes are subdivided into the following categories: floods, storms, earthquakes, droughts/forest fires/heat waves, cold waves/frost, hail, tsunamis, and other natural catastrophes.”

SwissRe determines each year the lower limit beyond which it is a disaster. SwissRe changes in the amount caused by the fact that each year these criteria adapted to inflation [34]. Below (see in Table 1) is shown the development these criteria over the past five years. Criteria include amount of: insured loss in mil USD (total damage, marine accidents, aviation accidents, other events) and number of damaged people (death or disappearance, injured, homeless).

The statistics on the damage caused by natural disasters in the Czech Republic publishes the Czech Insurance Association (CIA). Its statistics include events that are not in accordance with SwissRe catastrophe, cover all damage caused by natural elements divided according to three criteria:

- damages caused by weight of snow,
- damages caused by floods,
- damages caused by gales and hail storms.

Table 1: Development of criterion of disaster by SwissRe

Insured loss in mil USD	Year					
	2010	2011	2012	2013	2014	2015
Total damage	86.5	89.2	91.1	96.0	97.6	97.7
Marine accidents	17.4	18.0	18.3	19.3	19.6	19.7
Aviation	34.8	35.9	36.7	38.6	39.3	39.3
Other events	43.3	44.6	45.5	48.0	48.8	48.8
Number of damaged people	Year					
	2010	2011	2012	2013	2014	2015
Death or disappearance	20	20	20	20	20	20
Injured	50	50	50	50	50	50
Homeless	2000	2000	2000	2000	2000	2000

Source: own elaboration from [28] – [34]

### 3. RESULTS AND DISCUSSION

Among the risks that the Czech Republic is one of the most endangered risks: floods and flooding, heavy snow and windstorm and hailstorms.

Basic analysis of the number of claims and amount of damages in natural hazard insurance for the last ten years for members of the Czech Insurance Association (CIA) in the Czech Republic is shown in Figure 1.

The above data for the last nine years shows that the greatest damage occurred in 2010, the largest share of these damages should damage from flooding. The most significant natural disaster in the Czech Republic and the associated burden of claims is [14] – [27]:

- 1997 – floods in Moravia (paid CZK 9.7 billion);
- 2002 – floods in Bohemia (paid CZK 33 billion);
- 2006 – heavy snow (shame CZK 2.5 billion), 100-year water (paid CZK 1.1 billion);
- 2007 – hurricane Kyrill (paid CZK 2.25 billion);
- 2008 – windstorm Emma (total damage CZK 1.24 billion);

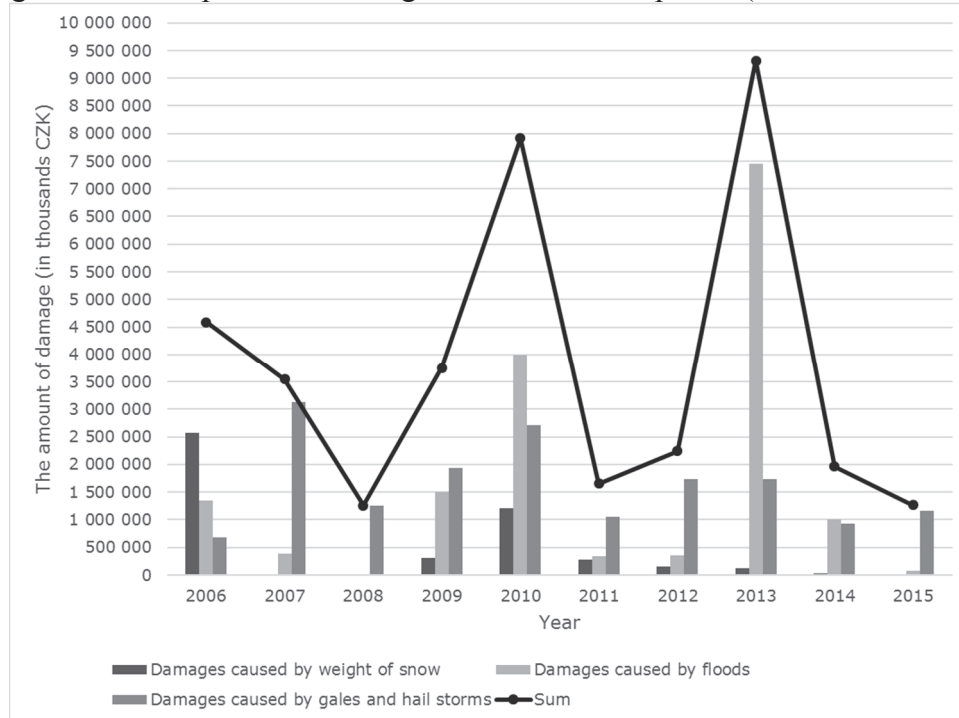
- 2009 – floods in the Opava, Olomouc and South Bohemia (the amount of damage CZK. 1.8 billion);
- 2010 – snow calamity Daisy (the amount of damage CZK 1.1 billion), floods in Moravia and Northern Bohemia (the amount of damage CZK 3.7 billion), hail in Prague (the amount of damage CZK 2.6 billion).
- 2013 – floods (paid CZK 7.4 billion); hurricane Xaver (payout of CZK 8.6 billion).

As the above data show the highest claims in the implementation of the risks of natural disasters – floods in this case – paid in 2002 (also in 2003 – when there was some complicated liquidated damage event) in the amount of CZK 33 billion, although estimates were insured damage in the amount of CZK 37 billion. If we take into account that the total insured losses CZK is 33 billion, these insured losses accounted for more than 45% of the total damage. In the world there are different models of the resolution of property damage in the implementation of catastrophic risks – one of them is based on the principle that each property must be insured against natural disasters. It is interesting that despite the high penetration within the property insurance in the Czech Republic, the share of insured losses is relatively low. This fact was also often caused by under-insurance when properties were poorly insured at inappropriately low amount that did not correspond to the market price of the property. It is surprising that this fact also remains in many insurance policies. Clients are not interested in increasing the sum insured, which would correspond to the market price of the property (or the so-called "indexing" insurance), since this change also brings with it an increase in the price of insurance – premiums. Unfortunately, the introduction of compulsory insurance of property is not possible, because it is inconsistent with the existence of the so-called flood maps. Insurance companies that had to pay such claims in a short time, live up to their commitments. In the Annual report for the year 2002 Vladimír Mráz [5], general director of Czech Insurance Association (CIA) wrote *"This catastrophic event, such as flooding undoubtedly were, however, made it clear that it is necessary to change the method of valuation risk, re-evaluate the rate and existing products. Considerable pressure for change came from the reinsurance, which contributed significantly to cover flood damage. From 2003 onwards, the insurance company had progressed to adjust rates on property insurance, determine the indemnity limits and deductible, catastrophic insurance solutions specific risks, stricter appraisal of the risks involved, modeling scenarios of possible contact with the relevant flood and the generation of sufficient reserves to cover future losses. It is noted with satisfaction that the undertakings in this direction was also supported the CIA. Prepared for example, recommendations for further insuring flood risk, insurance companies supplied information on flood plains – the maximum historically known spilling water during floods – contributed to the decision to wider use of geographic information system in the insurance and proceed to towards the realization of the tariff zones."*

They are these so-called "tariff zones" were the basis for the creation of so-called "flood map". The flood risk zones CIA developed in cooperation with Intermap Technologies in 2002–2003 for the purpose of assessing the risk of flooding its member companies. The creation of hazard zones also participated in renowned global reinsurers SwissRe. Map data and data in the data are regularly updated to be consistent with the information used by member insurers of the CIA. The application is available on the web CIA. Taking a flood maps are used to evaluate the likelihood of flooding throughout the Czech Republic. Member insurers CIA used this system for the determination and calculation of hazard insurance premium prices for property insurance in the spot position of the object. The evaluation of whether the property is located in a flood plain, it is possible to obtain information about the real possibility of (no) insurance the object, respectively indicating a possible increase in the price of premiums or exclusions object of insurance.

After the June floods in 2013 tightened the flood maps by extending the floodplains, where the percentage of households uninsurable extended from 8 % to 11 % [35].

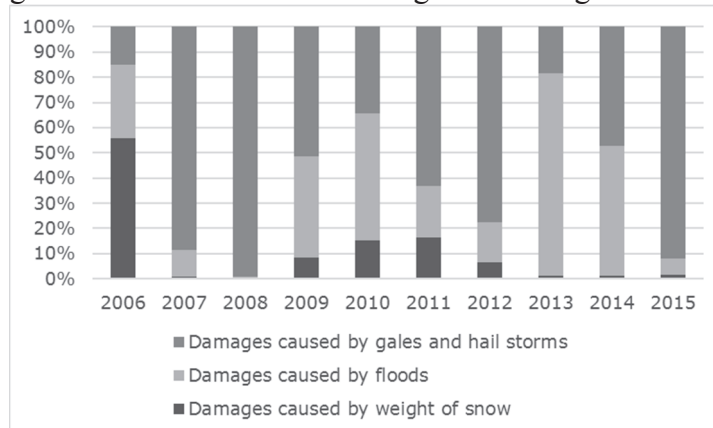
Figure 1: Development of Damages in the Czech Republic (in thousands CZK)



Source: own elaboration from data of CIA [27]

Percentage share of the amount of damages according to different types of damage is illustrated in Figure 2. This figure show that the largest percentage of the total damage during the reporting period was damages caused by gales and hail storms in years 2007, 2008 and 2015 and damages caused by the floods in year 2013. It is also clear that during the reporting period, there is realized risk of flooding each year, and to a lesser or greater extent. From this analysis it is also obvious, and from the available data of CIA, the incidence of the risk of flooding is in the Czech Republic is not realized in some random areas – it is therefore not fulfilling the condition of randomness. This fact was leading to the tightening of flood maps in year 2011. Very interesting is the situation with realization of damages caused by gales and hail storms, these thus ultimately their frequent realization did not lead to the creation of “gales maps”, gales or “hail storm maps”.

Figure 2: Percentage share of the amount of damages according to different types of damage



Source: own elaboration from data of CIA [14] – [27]

In his work Taleb [36], for the understanding of the concept of randomness, classifies events on a "black swan" – unknown unknowns and "gray swans" – which relate modeled extreme events. Taking the term "unknown unknowns" became common within the non-life insurance, in the context of significant changes in the nature of insurable still dangerous (hurricanes in the USA, the risk of flooding in Central Europe) and in the context of discovering entirely new hazards (SARS disease, environment, cyber attacks, etc.). The term "unknown unknowns" according to Business Dictionary is defined as follows: "Future circumstances, events, or outcomes that are impossible to predict, plan for, or even to know where or when to look for them." This concept has recently been in the calculation of non-life insurance term very frequently [37] as the "unknown unknowns" cannot be a priori probability and thus not included in the previous probabilities, which is just in the calculation of premiums non-life insurance.

There is therefore a clear connection between the term "unknown unknowns" as defined in Business Dictionary and how it also understands and insurance practice and the concept of randomness. We can say that the unknown unknowns are random, if the re-implementation of the "unknown unknowns", so this is a "gray swans" – the risk that we can use mathematical and statistical methods to model and thus predict. There is then the question of whether excessive mathematising of economics is effective. The mathematical-statistical model is reliable only for meeting the basic conditions defined in the model. In today's complex global environment, there are many variables that affect the functioning of the model, making it virtually impossible for the created model in predicting future equaled reality. According Daňhel and Ducháčková [10]: *"The current complex global political-economic systems have problems with its functionality and ability to handle the complexity of phenomena with a high degree of randomness; political elites have to cope with the constraints imposed by democratic principles and characteristics of imperfect people and their difficult modeled subjective behavior."*

As a new paradigm of economic science we can understand the current solutions present a serious dilemma between "good economics and economics of evil" in the sense of holding a solid moral and ethical values. New understanding of the concept of randomness is part thus affected just by adopting the moral and ethical values of individuals whose behavior may affect the company.

It is therefore questionable whether unethical behavior of strong regulation restricts or encourages the natural economic environment, which itself has a tendency to self-regulation. It should be noted that the financial markets have been and will always need to have a certain minimum regulatory measures to ensure the financial health of the players in the financial market. Conversely, an unhealthy degree of regulation may have rather the opposite effect.

#### **4. CONCLUSIONS**

The insurability of risks has mainly the effect of randomness, which is one of the six criteria of insurability of risks and one of the three criteria by which the insurer decides whether to assume the risk insurance. Thanks to the risk of catastrophic consequences occurred in the insurance market to reduce the risk insurability nature of natural hazards – risk of flooding due to non-fulfillment of randomness (for frequent that risk). So far this year was increased the number of uninsurable homes from 8 % to over 11 %. There is a certain moral dilemma – on the one hand, it is necessary that people have the opportunity to insure the property and on the other hand, insurance companies do this for them at a disadvantage synallagmatic legal relationship, do not want to enter a due understanding of the concept of randomness, or may not. It is then a question of whether it would be appropriate to change the model of voluntary negotiation of property

insurance – especially the legal estate, whether directly altering the whole model of this type of life insurance. It should be emphasized that the influence of the changes of the concept of randomness and that worldwide global problems were caused by the impact of the recent financial crisis. Just complexity of the current complicated "global" world, with strong elements of "unknown unknowns" causes the current global economic challenges, even in the context of vacant solid moral and ethical values. Here it is questionable whether this unethical behavior to limit the strict regulation of the state or encourage the natural economic environment. Certainly, it is necessary to have a certain minimum regulatory measures in order to ensure the financial health of the players in the financial market.

## ACKNOWLEDGMENTS

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