# Financial Crisis Affected the Options of Solutions to the Financial Impacts of Natural Disasters[1]

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## Abstract:

The impacts of natural events with disastrous effects have been rising recently. More natural disasters have been happening lately and consequently damages caused by them have been increasing. At the same time natural disasters have begun to occur in the regions which did not experience them in the past. The increase in impact of natural disasters means problems for insurance markets. The capacity of insurance markets is not sufficient to cover fully the damage caused by natural disasters. Accordingly, regulatory projects which aim to make insurance companies accept homogeneous events for the cover have been applied to insurance markets, especially in Europe. Therefore insurance companies have determined limits of cover and increased loss participation in their insurance products. So called "alternative instruments" have begun to be used for disaster damage cover to a large extent. Most of all, it means the use of capital market instruments.



## Key words:

natural disaster, natural catastrophe, reinsurance, capacity of reinsurance markets, alternative instruments of reinsurance markets, limit of cover, loss participation


## INTRODUCTION

There has been a worldwide escalation of life and economic losses due to a massive increase in the frequency of occurrence of natural disasters in the world in the last decades. The consequences of these catastrophes have affected not only the areas hit by the disaster, but also the global economy as a whole. In connection with that, the question – how to solve financial impacts caused by disasters - has become very important. In other words, the question of different forms of providing financial continuity for subjects which are hit by disasters. The implementation of these trends, which have begun to prevail recently, has been hampered to a certain extent by the last financial crisis.

## THE ROLE OF COMMERCIAL INSURANCE IN COVER OF DAMAGE CAUSED BY DISASTERS

The negative impacts of unpredictable natural occurrences were historically the main domain of commercial insurance and reinsurance and until recently they were definitely the most efficient tool for financial solutions to disasters. The exclusion of politically motivated aims to privilege some risk groups was considered as one of the main advantages of this way how to solve the financial impacts of natural disasters. The others were for instance the continuous providing of cover, the compensation to those who suffered losses and the transparency of financial compensations which were stipulated beforehand. The competition among insurers could be seen as another advantage since it guaranteed "fair" business

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practices, the expertise in creating appropriate insurance products, and the ability to deal with insurance claims.

On the other hand, the commercial way of running insurance business which forces insurance and reinsurance companies to maintain balance between their income and expenses has become amid rising compensation costs for disasters an obstacle to efficient solutions to natural catastrophes. According to the data of the reinsurance company Swiss Re, the number of natural catastrophes almost tripled over the last four decades; disaster insurance payouts increased by more than fourteen times. One of the reasons for the permanent increase in financial extent of damage caused by natural disasters is the growth of wealth in the society. The wealth is concentrated in small areas, however, very unevenly around the world. It implies that periodically occurring disasters in developed countries (e.g. American hurricanes or Central European floods) always destroy, even if their intensity remains the same, more economic assets of higher value. An analogy can be seen with the last natural catastrophe in Japan. The total amount of losses caused by this disaster to insurance and reinsurance companies has not been counted yet. Nevertheless, the impact on the share price of the most involved insurance institutions has been significant. When the potential financial impact of disasters is being discussed, one more thing must be taken into consideration – for instance the major catastrophe of the last decade, tsunami in Indonesia with more than 150,000 victims, occurred in a poor part of the world with a low level of national wealth and a low level of insurance penetration. Yet, this tragedy should not be outshone by that at all.

Another reason for the increase in economic and financial impacts of disasters may also be the change in the very nature of disasters themselves. Meteorologists have formulated (so far not confirmed) a hypothesis that a permanent change of climate is happening in the world. This change may relate particularly to the rainfall distribution, which will mean frequent floods caused by torrential rains in Central Europe and severe droughts, heat waves and probably even more typhoons and hurricanes in other parts of the world.

## IMPACTS OF NATURAL DISASTERS ON THE INSURANCE SECTOR

Commercial insurance and reinsurance companies have a reduced possibility of prior catastrophe risk identification and quantification. Insurance companies do not like to insure elementary catastrophes as earthquakes, tsunami, volcanic eruptions etc. because they are concerned about severe impacts of these disasters on insurance sector in general. Problems connected with an effective solution to financial elimination of losses caused by disasters manifested themselves in the last decade which was in this point of view very dramatic. Payouts by insurance and reinsurance companies covered only a part of total economic losses caused by catastrophes. Despite that, these disasters meant in connection with other factors a significant decrease in financial power of global insurance industry. Particularly reinsurance companies as “insurance companies in the last instance” have registered weakening of their economic strength.

Above all, the possible qualitative changes in the very nature of disasters cause that the neuralgic point of current state of the financial solution to the damage caused by natural disasters with insurance is the permanent methodological problem which is gaining more influence. The question is – how to transfer the existing statistical data and consequent probabilities to the future when they are based on previous conditions for natural disasters? Otherwise stated: how to make the future the object of exact scientific research if it does not exist as an object yet? Here is a very current example: Floods occurred in Central Europe in 1997 as a 100-year-flood and continued in 2002 as another 100-year flood and flash floods due to unexpected overflow of small regional rivers in following years. It implies in the context of meteorological prognosis an increase in frequency of flood occurrence. It may mean a significant jump in statistical rows with serious impact on the whole society, including insurance companies and their clients.

## REACTION OF INSURANCE MARKET TO ALTERED CONDITIONS

New regulatory projects have been implemented in financial sector in connection with current attempts to limit the possibility of another financial crisis development and to increase the stability of financial markets in general. The projects Solvency deals with the insurance industry. Capital requirements are set for insurance companies as a result of attempts to determine a safe percentage between risk exposure and financial sources. These requirements proceed from the relation to the risks which are accepted as a part of insurance and which force insurance companies to homogenize their insurance portfolio. Therefore the most feasible way is to determine the limits of cover and stipulate exclusions from insurance cover.

From business point of view, insurance companies are in a rather difficult situation which is also complicated by the impact of the last financial and economic crisis. As a result, insurance companies opt for limits on insurance cover in reaction to the likelihood of catastrophic scenarios. It means particularly the redefinition of insurance conditions. New conditions are stricter and they usually include more precise selection of risks which will be covered by insurance; in the Czech Republic it is mainly the flood risk. Regarding the calculation of insurance premiums, insurance companies followed by reinsurance companies respect more and more the limits of commercial insurance which it can play by the cover of risks if the risks and their changes are very difficult to identify beforehand. Insurance companies choose to tread the path of extreme caution when they sell new insurance and reinsurance policies. The quality of accepted insured risks, not their quantity is emphasized. A big attention is dedicated to the most accurate possible calculation of insurance premium. Insurance companies use effective software GIS to make the quantification of natural disaster risks more accurate and precise. Geographic Information System (GIS) enables more accurate evaluation of the potential risk exposure of each client. Insurance companies also use flood maps based on a digital terrain model. These models are able to determine potential of flood risks in the area. The terrain relief, previous overflow of watercourses, and also anti-flood measures done in the past together with climatic and meteorological preconditions are taken into account to establish the risk zones.

This stricter approach to risk assessment has very serious consequences for insurance clients. More accurate risk assessment of perils which are covered by insurance brings an increase in insurance premiums, imposing limits on cover, and more exclusion for cover. Subsequently, the use of these exact approaches to insurance conditions causes that a part of insured clients will become uninsurable, for instance against the flood risk, or they will be moved into a higher risk category which may increase their insurance premiums. The implementation of limits on cover which are understandable from the economic point of view also means that a certain amount of damage over the limit remains without financial cover. This may result in a dramatic decrease in insurance efficiency for clients. Furthermore, it is in direct contradiction to the conclusion of risk management analysis. It recommends strongly that clients should transfer the financial impact of catastrophic natural events to the insurance company.

If a financial continuity is to be provided for economic subjects endangered by natural catastrophes, it is obvious that dramatic changes regarding the solution to these risks must be achieved. These changes have already started. Instead of until now accepted ad hoc solutions including financing at the expense of economic subjects which suffered the loss, at the expense of state, commercial insurance and reinsurance companies, or even at the expense of international help or charity, under new conditions these issues must be solved systematically with multi-level financing. There are non-system solutions to big media covered disasters with the help of charity and philanthropy. Besides, there are traditional ways of financial solutions to the impacts of natural disasters which include insurance and reinsurance. Reinsurance has become a traditional stabilizer and it is improving steadily in international perspective. The impacts of natural risks are traditionally solved with public finance as well. In addition to all these options, the current global financial world offers another alternative solution. It consists of intra-sector diversification, i.e. to transfer the risks out of insurance sector. In this case it embraces all financial markets including capital markets.

The innovative attempts at searching for alternative forms of risk transfer, particularly risks of disasters, brought the creation and development of financial derivates during the last decades. The most important are insurance futures whose main idea is the transfer of catastrophe damage to global financial markets. Loss development trends in each insurance and reinsurance company which emits these instruments were used as a base asset during the first development stage of these new constructed investment tools. In following stage, the derivatives started to be derived from objective indicators which are independent of economic results of issuing insurance company.

A relatively high frequency of natural disaster during the last decade together with the declining confidence in derivative instruments, which had their share in the last financial crises, had the following effect. Catastrophe bonds (CAT bonds) have found their place in financial markets. CAT bonds are instruments which promise to bring high-yields incase the disaster progress is convenient for the insurance company during the given period (usually short-term) which this bond is issued for. The yields on CAT bonds are above average in comparison with similar instruments. However, in case of negative loss development, they may decrease significantly (even to zero). In any case, rating agencies consider these kinds of CAT bonds as speculative. It means as securities with higher risk of loss. Nevertheless, there has not been a single case of bankruptcy of any CAT bond issuer who guaranteed the return of the principal so far (according to all available sources). Moreover, these securities attract investors with one more thing – they are not closely linked with the overall capital markets development and their market price does not reflect the price volatility of similar investment instruments. This characteristic of CAT bonds represents a very important element of portfolio diversification and increases their appeal to investors. A higher grade of business risk diversification together with a more complex way how to make economic results of commercial insurance less volatile are the main aims why all these innovative instruments have been created.

On the other hand, critics of these instruments claim that the transfer of natural disaster risks to capital markets is an interesting solution how to finance their impacts, but in fact, it is available only to the big companies operating in the market

## CONCLUSIONS

Due to a big increase in losses caused by natural catastrophes, the classical and historically most efficient tool how to finance the impact of these natural disasters – insurance has found the limits comprised in its commercial core. This hindrance is caused by the necessity to respect the equivalence principle in the economy of the commercial insurance company. The situation has been hampered by the financial crisis which was followed by steps to make the regulation of financial markets, including insurance sector, more extensive. The result is a worse situation for clients of insurance companies, who still have a part of damage which exceeds the limit of cover set by the insurance company without any cover. Regarding the fact that natural disasters may have a bigger impact and perhaps even frequency in the future, it is necessary to search for and apply alternative forms of risk transfers connected with the impact of natural disasters. A higher stability for economic subject hit by a catastrophe may bring multi-source or multi-layer financial cover of losses caused by these disasters. This principle has already been used in some countries. Alternative forms of risk transfer which use derivative instruments to transfer the impact of catastrophes to all financial markets have to overcome the skepticisms of investors about these tools. Their distrust is to be related to the role which such derivatives played in triggering the financial crisis.

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