

INSURANCE COVERAGE AGAINST THE RISK OF NATURAL DISASTERS

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Abstract

The phenomena of natural origin are part of life on Earth, but their effects can become destructive interacting with a man-made territory and often unprepared. There are different definitions of a natural disaster on the basis of different approaches; consider specifically that of Turner (1976): the impact of an extreme event concentrated in space and time, which greatly exceeds human expectations in terms of magnitude and frequency and that has a profound impact on the socio-economic system.

Key words: Insurance, Risk Management, Natural Disaster

INTRODUCTION

The analysis and comparison of databases shows that in future disasters will be more frequent and disastrous in the world (figs. 1). Their trend appears to be in strong growth since the early 60's mainly due to the increase of the concentration of population in metropolitan areas or the most vulnerable and because of global climate change (the main cause the greenhouse effect). The data confirm us as especially in the last decade, the trend of extreme events has grown both as a high number of natural disasters, such as damage to both populations (number of victims).

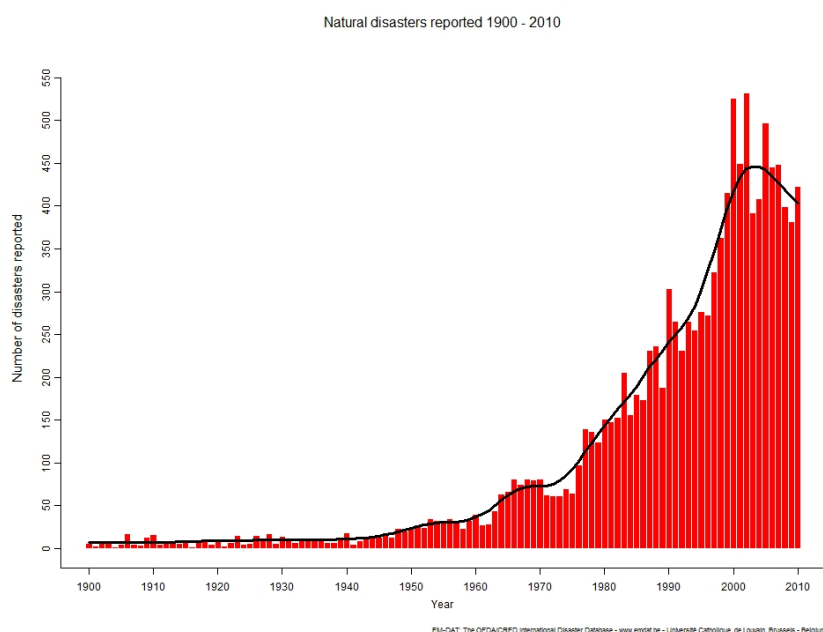


*Fig.1 Temporal distribution of natural disasters since 1900
(EM-DAT, 2011).*

Recent research conducted result is evident the increase in recent decades, the costs and therefore the economic value of the damage caused by natural disasters; this phenomenology that can only be attributed also to the increased concentration of populations residing in the city, which become larger and larger and that have developed in areas characterized by a territory too often exposed to strong catastrophe risks.

The various natural disasters in the literature (Migliorini, 1981; De Alexander, 1990) are generally divided and classified according to the following classification:

- Events due to natural causes;
- Technological risks;
- Epidemics or pandemics;
- Terrorism

Within this classification, we will examine mainly the risks related to catastrophic events caused by natural phenomena characterized by events. These phenomena can, in turn, be divided into six different types that occur at work, and no single intervention of Nature and in which, as mentioned, the work of man has no direct impact. Natural events such as a taxonomy or overseas uses defined King "*No Man Made Events*" can be classified into:

- Earthquake;
- Tsunami / Tsunami;
- Volcanic Eruptions;
- Floods;
- Floods;
- Storms
- Weathering;
- Hurricanes;
- Storms;
- Storms;
- Tornadoes.

The management of catastrophic risks involves an assessment of the role, duties and responsibilities of public and private entities that are involved in the governance of the various activities to be carried out. Experience has shown that for the success of any initiative complex human need to limit the risk of *governance*.

The global financial crisis INITIATIVES in 2007 has increased the focus on the weaknesses of the system of corporate governance that have emerged in cases of failures of prestigious banks and insurance companies, to understand the risks they had taken.

Insurance companies during the crisis have highlighted critical in the management of the business but also solutions, which have emerged as international experience, the evolution towards a new governance.

The insurer after the crisis is asked to consider the ongoing causes of different risks undertaken and their impact in terms of potential losses, assessing the relationship between exposure to risk and the adequacy of its assets to the risk profile of the . In doing so, the insurer is required to identify the strengths and weaknesses of its business, its *governance*, control functions and should develop and use

appropriate policies and *risk management* techniques (risk management) by changing its organizational structure to make improvements where necessary. In the assessment, management and control of risks by insurance companies require suitable methods of risk modelling, *stresstesting*, scenario analysis and *contingency plans*, in order to take appropriate and timely policies to mitigate risk, and use innovative instruments offered by the financial markets, such as to enable the firm to take risks to an extent as not to cause the crisis. The insurer has to search in the time of the limitations of the models used to manage risk, the potential impact they may have in the management of the business and must therefore adapt its system of *risk management*.

DISASTER RISK 'OF NATURE IN INSURANCE SYSTEM

Needs, then, have recourse to models of insurance can cover natural disasters that hit the people especially in the more densely populated areas of the planet.

Most of the insurance companies in Europe and the world enter into insurance policies which cover risks related to events of natural disasters. In the past, this type of insurance was considered too difficult for the extreme randomness of the phenomena, but especially for the size of the damage and the close interdependence between the various claims. The risks related to natural disasters are unpredictable and extreme events are the fundamental characteristics: they have a low temporal frequency, involving a considerable number of people and things, and especially of produce significant damage.

All these features make impossible their statistical evaluation. To discourage insurance companies to invest in this field has not been so, as you might expect, the magnitude of the catastrophe phenomenon affecting an entire geographic area, and damages everything, but the fact that the events which take place in a manner so casual that is almost impossible to make an accurate prediction.

The prediction is possible when you know simultaneously the parameters of the event: the place (where), time (when) and the relative intensity (magnitude). It appears therefore, any wrong prediction if less is also only one of these parameters

Insurance companies in the assessment of conventional risk premium are based on the statistics of the claims in the case of catastrophic risks caused by natural phenomena and / or human statistical data taken into account are not considered reliable. As for these types of risk, in absolute terms, does not apply the law of large numbers (Bernoulli's theorem), according to which the increase of the number of units insured the balance of the portfolio improves. This often happens because the area affected by the same event are the size of claims tends to increase gradually with the increase in the number of insured risks (Miani, 2004). In the case of Japan, the insurance companies will provide compensation for damage considering the high-resolution satellite images or aerial photographs, no site investigation, because of the difficulty of access to the damaged areas, and especially contaminated.

The main problem supported by insurance in the risk assessment of natural disasters is related to their low temporal frequency. The companies typically have a set of data is not significant and, therefore, not representative of extreme events. This happens for two main reasons: it has a small window of time and risk a limited frequency relative to the data of the parameters governing disasters (instrumental measures of frequency of occurrence, magnitude, time, etc..).

These difficulties have been used in the past, through the reconstruction of data bases that could guarantee in any way the data gaps, creating since the 70s of the first banks risk data. Domestically, the first systematic search for large extreme events has been carried out by ENEA with the SGA (Society of Environmental Geophysics) in 1990 with the creation of the database GIANO (unpublished work). From the synergy of the SGA, a research company specializing in the historical study of geodynamic phenomena (earthquakes, tsunamis, volcanic eruptions) and other extreme events of natural origin (landslides, floods, climate change, desertification, eutrophication in pre-industrial times, etc..) and the experience gained by ENEA (corporate body together with ENEL, the identification of sites for the construction of nuclear power plants in Italy), this research was

undertaken with the goal of building a history of extreme natural events. The analysis of the effects of earthquakes and other extreme natural events in the long term, in two thousand years of Italian history, allowed us to build a history specific to the various phenomena of natural origin, which is a first criterion for the evaluation of environmental risks to envision scenarios of recurring disasters or possible.

Another significant database at national level on the hydrogeological risks (floods and landslides) was built in the years 1991-1992 by the CNR-GNDCI (Group National Defense Hydrogeological Disasters). The database AVI (Areas Vulnerate Italian) reported a survey of historical floods and landslides that occurred in the last century (1918-1990). Later it was updated from 1991 to 1994, constituting the first data-base for the mitigation of flood risk in Italy (17,000 landslides and floods 7,000). The bank indicates areas susceptible to landslide risk, in a non-quantitative, and represents the most complete and updated information on historical landslides and floods in Italy (Ubertini, 2009).

Have developed other European databases and global risks that have also included an economic evaluation of disasters, providing a starting point to which insurance companies and security companies can tap into the data for the study of the policies, and thus simulate possible risk scenarios. Should be noted that catastrophic risks are considerable difficulties in their estimation preventive and their monetary quantification after the occurrence of the event, as you have to take into account the impact of the drought produces immediate (damage to civilian infrastructure and industrial), but also in the long run, overrossia in the reconstruction phase, both at the level of potential output, the economy of the country, both on the domestic capital market and external, that the foreign trade and the country risk (eg. social unrest). The world's most authoritative database on natural risks have been realized by the major European insurance companies such as Munich Re and Swiss Re, the international institutions such as the UN EM-DAT CRED (Centre for Research on the epidemiology of disasters) of 'University of Lovain in Belgium and CATNAT, the site of the French-speaking information on natural hazards. The most comprehensive data base on natural disasters is of Munich Re and has been operating since 1974, allows the study of the natural disasters that occurred in the world since the Plinian eruption of Vesuvius in 79 AD.

Other useful information can be obtained if we analyze the feedback of insurance companies for damages caused by catastrophic events over the last forty years. If we compare the magnitude of the left with its nature, it follows that the more extreme events are of meteorological (1983 to present natural disasters of atmospheric origin with losses of over a billion dollars have been 32 out of a total of 34 events), the greatest damages are due to the hurricanes that hit the United States in 2005 (Katrina, Rita and Wilma), with total damages estimated at 173 billion dollars.

The disasters related to earthquakes in number sharp lower mind (Fi fig.2). In particular, we consider four earthquakes of particular intensity of damage: one of Kobe in Japan (1995), which is among the most expensive natural disasters in terms of economic losses (\$ 143 billion, of which only 3 policyholders), the earthquake Sichuan in China in 2008 with \$ 86 billion, that's Northridge (1994) in California amounted to \$ 44 billion and, finally, the Chilean earthquake of 2010, with \$ 30 billion. In terms of insurance costs, however, the most expensive ever was to Northridge (California) in 1994 amounted to 21 million dollars. In this graph also shows the earthquake that struck the Irpinia in 1980 with \$ 53 billion (Fig.3).

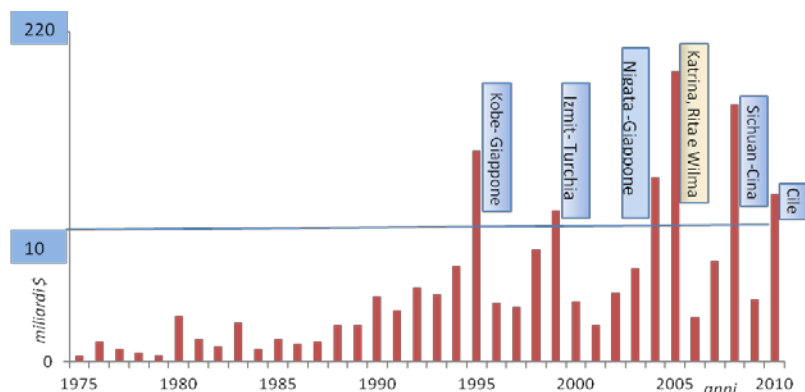


Fig.2 - The estimated damage from natural disasters since 1975
(Source: EM-DAT CRED).

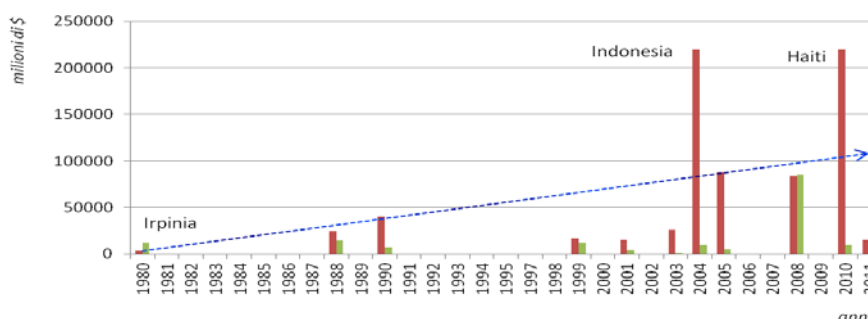


Fig.3 - Time scale the last forty years of the most violent earthquakes in the world based on the damage and deaths (linear trend)

For a first estimate of economic catastrophes, we must consider that the data are the result of the product of the number of events for the mean value of the claims. This consideration must be done because the frequency of claims and the value (average) are influenced by several factors. The frequency depends on the density and the amplitude of the insurance, as well as any cyclical trends in the number and intensity of natural events. The average value of the claims, however, depends on the most catastrophic events and is influenced by the insured values (Miani, 2004). To quantitatively assess the damage caused by various risks can be significant relate primarily to the more serious damage, which can be summarized in the number of deaths observed over a given period of time. In 1997 Houghon presented a collection of meaningful data related to damage caused by natural hazards in the world, by number of victims, in the period 1947-1980 (Table 1).

N °	Natural Disaster	Number of victims
1	Tropical cyclones, typhoons	499,000
2	Earthquakes	450,000
3	Floods	194,000
4	Tornadoes and storms	29,000
5	Snowstorms	10,000
6	Volcanoes	9,000
7	Waves of heat	7,000
8	Avalanches	5,000
9	Landslides	5,000
10	Tsunami	5,000

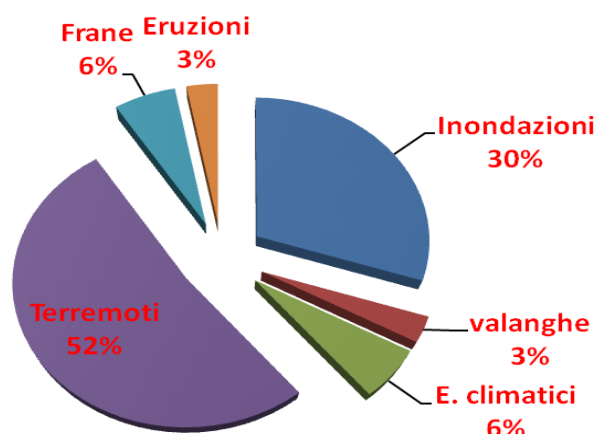


Fig.4 - Number of victims in Italy on the basis of the types of extreme events in the twentieth century (Source: Munich Re, mod.).

Italy is characterized by the highest seismic risk in the European Community and, globally, one of the most industrialized countries in seismic risk (Martelli, 2009). The seismic risk in Italy covers most of the territory (56.8%), where about 23 million people and very common on 4610 8112, are in a seismic zone (National Seismic Service, 2009). Unlike other natural hazards, the earthquake itself does not cause any danger if you are outdoors or if the houses are built to withstand earthquakes. In Italy 65% of the houses may collapse because they are built with standard anti-seismic (earthquake is not to kill, but the collapse of the houses). In the politics of the seismic safety of the territory prevention is a goal to be achieved by intervening with earthquake-resistant construction techniques appropriate to the geological characteristics of the site, not only static but dynamic. The defense against earthquakes, at present, is only effective in the areas of seismic resentment and not in the epicentral area, seismogenic. The areas corresponding to potential seismic sources in our country, who are exposed to damage gra there are: the Apennines, the Alps, the North-East, Gargano and Sicily. A deep seismicity characterizes the southern Tyrrhenian Sea and earthquakes of low magnitude have been recorded in the northern Tyrrhenian and Adriatic, these situations do not favor the generation of tsunami, although exceptions are always possible (eg. Tsunami following the earthquake of Messina).

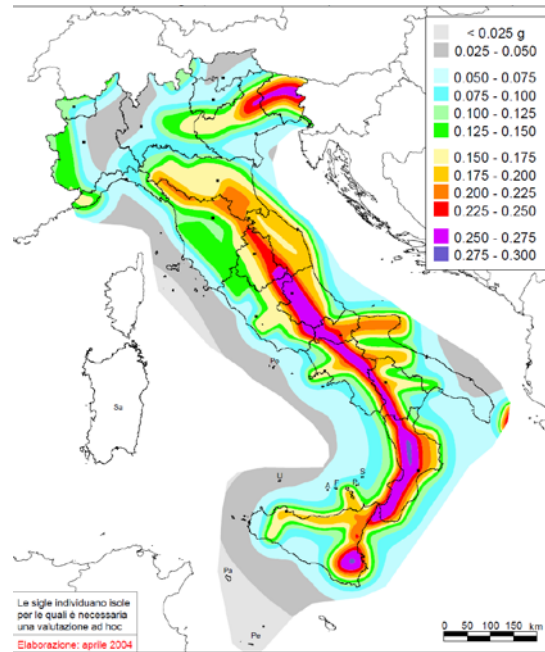


Figure 5: Map of seismic hazard of the national territory

Source: (INGV, 2004) ref. Ordinance PCM 28/04/2006 n. 3519

Support and strengthen long-term research and services, integrated and multi-disciplinary study of the seismic source and the soil scuotibilità governance actions are due and unavoidable, national and supranational

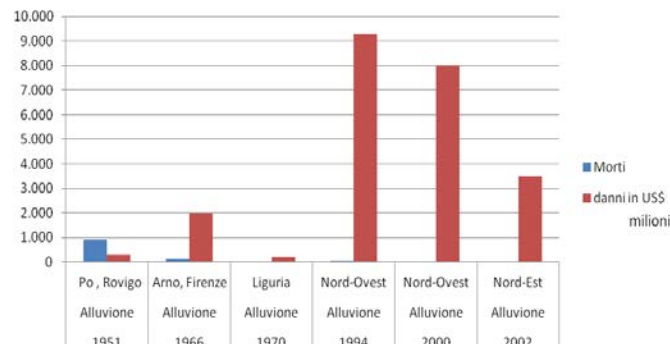


Fig.6 - Number of casualties and damage in Italy on the basis of earthquakes and floods (Source: Munich Re).

By the evidence of the commitment and sustainability of the costs of natural disasters, a local and global level, we can assume the introduction of an insurance scheme on natural hazards, based on sound and solid technical assessments, legislative, economic and behavioral targeting to:

- sensitize and empower citizens to environmental protection and homeland security;
- mitigate and make sustainable public expenditure;
- discourage pollution and illegal;
- improve the quality in the construction of private and public works and professional services involved in the development and management in homeland security;

- promote in-depth studies and surveys on the identification, qualification, mitigation of natural hazards and their impact on social and economic factors.

The main forms of coverage risk approach between ex-ante and ex-post to catastrophic events.

It 'widely shared in the literature that the choices on the different types of policies to be adopted in order to obtain an adequate prevention about catastrophic risks, move along two main lines: the first, in which the intervention of the institutions is mainly centralized, and is defined *ex -post* - that is next to the occurrence of the disaster - and a second time mainly *ex ante* to avoid the possibility of compensation for damages through the adoption of prevention tools virtuous. The assessment of the conditions and the possible ways in which insurance companies carry out the transfer of risks subsequent catastrophic events is at the center of the analysis conducted in this part of the work. To this end, we proceeded to identify in advance of the main forms and instruments for hedging risks; among many possible methods we focused mainly on the types of coverage they see the presence of a possible public-private partnership. A partnership, then, that not only contemplates the action of the national government or smaller regional institutions, but see also involved major players in the insurance industry working not only at national level but also locally.

The study has outlined, through the analysis of literature on the subject albeit limited, on the one hand the possible opportunities that these forms of collaboration can trigger and other obstacles or gaps still exist in *practice* regarding the insurance coverage in case of catastrophic events. In the course of the study activities, in fact, were examined possible tools that can bridge these very critical issues from time to time by identifying the practices and methodologies as possible; The underlying hypothesis is that it will be the Government of the Regions, the vanguard for the proper management of catastrophe risks.

The identification of a systematic approach to identify, assess and reduce the risks of natural disasters, is suspected to be, however, the basis for the realization of a fully sustainable development precisely for those countries exposed to natural occurrences such an extent that they can be easily united to disasters and / or natural disasters. From the analysis conducted, it is clear identification of a detailed platform of commitment to the regions that can not be substantiated in a coordination action that can exploit the resources and experience accumulated so far and at the same time represent a useful tool to encourage the interest and commitment of individuals in order to encourage as appropriate and possible stimulating investment management "split" of risks arising from natural events.

Finally, in the present work we took to represent the possible instruments to bridge the gap of knowledge, and more generally, the experience so far identified in the scientific literature that today still represent a substantial obstacle to the proper construction of a possible range of instruments fully supported and able to provide full coverage of catastrophic risks. The analysis, therefore, of these possible mechanisms adopted to insurance against catastrophic risk has as its main goal the construction of a new awareness not only among the representatives of the insurance industry but also in the diverse world of political and institutional. The goal is the search for innovative forms of coverage of risks arising from catastrophic events in nature; the central theme of the analysis referred to the full understanding of the mechanisms of insurance to guarantee full coverage of risks; these instruments refer to those ascribed to the category of *ex-ante* risk coverage. As evidenced by the adoption of the possible public-private partnerships can fulfil the onerous task of transfer, with Pareto efficiency, the risks arising from catastrophic events that can not be an optimal solution.

It 'just from the foregoing reasoning that the need to offer a very large picture of possible changes and revisions steps for a new vision of Risk Management and consequently to an innovative approach of DRM (F Sperling, F Szekeley - 2005); that can not undergo significant changes and consequently deep and that it refers to the new needs of:

- Drafting of innovative projects are able to offer specific solutions drawn up on a case by case basis;

- Creation of ad hoc institutions (committees, etc. Coordinators.) With the specific aim to anticipate and absorb the costs resulting from natural disasters;
- Launching formalities systemic planning times so far as possible of natural events.

In relation to the changes in the methodological approaches aimed at the achievement of a desirable status quo and in any case prior to the occurrence of the events just further hypotheses can be advanced. We refer to the innovative guidelines that do not include the mere coverage of disaster losses, but at the same time identify the possible actions for planning interventions to reduce upstream impacts caused by catastrophic events.

The proposal, therefore, it is suggested that it is adopting a new approach to management about the management of natural hazards; or through the adoption of strategic plans for the transfer of risk and proper planning of the so-called "pre-event". These changes are believed to be substantial and reformed behind the traditional approach that is likely to shed light on the possible inability, on the part of the insurance system, to deal in economic terms to the task which would be called upon the occurrence of an event or disaster natural. Incapacity, this just highlighted, which takes form and substance by the knowledge that an excessive reliance on ex-post hedging of risks that can not be avoided by planning strategies of its Risk Management.

And 'now widely accepted by the scientific literature, that the action, on the part of public bodies and institutions, sources of financing ex-post to catastrophic natural events, have the immediate effect to absorb almost all the sources of economic livelihood aside in periods earlier. The adoption of such practices is likely to dry up so that these sources of financing, although they have been set aside in the process of economic planning and then for activities to attend and support the growth and full and sustainable development of the Territory, would be seen to occur at zero of a tragic natural event.

The transfer of catastrophe risk and the main mechanisms of insurance coverage.

In literature it is widely accepted that a competitive market can be considered when the competition between the agents who work there, workers and firms, tends to exhaust all the possibilities of existing gain; the conditions for the competitive balance are also listed so by Paolo Bosi (2003):

- a. consumers and firms act as price takers, or behaviors are competitive;
- b. There is a complete set of markets through which goods are allocated by the agents;
- c. there is perfect information of the agents.

Whenever one of these conditions is not talking about the failure of the market and, in general, it requires state intervention in the economy. The lack of condition a) (Monopolies or oligopolies) invokes the intervention of the state as regulator; the loss of b) indicates situations in which the goods are allocated according to mechanisms that are independent from the true feedback from the individual or there is just the market (externalities and public goods); the absence of the condition c) is when you have difficulty in establishing a complete set of markets for lack of information. May miss future markets or the markets in contingent.

The main types of market failure are therefore linked to the forms of market power for individual operators that may result from legal or technological conditions (natural monopoly): Externalities and Public Goods or Asymmetric information. The conditions that an insurance market functions are related to the probability of the insured event for each individual must be independent of any other individual. Should not be related to each other otherwise it would not be possible to allocate the risk. Another condition refers to the probability that the event is less risky or not very close to unity. The probability equal to one characterizes certain events.

The insurer must have a significant amount of information in order to define the contract of insurance. There are two types of information asymmetry: the '*adverseselection*' and the *moral hazard*.

L. '*adverse selection*' is a situation in which the insurer is unable to meet certain features or information in the possession of the insured, for this reason can be encouraged to look for insurance cover only those at risk resulting in insufficient premiums and probable failure of the insurance. In the case of natural disasters variables to consider in the determination of risk are manifold: the nature of the area, the type and intensity of catastrophic events to which it is subject have been satisfied the standard of construction of the building, distribution of human settlements and urban also the premium rates offered should reflect proportionally the degree of hazard in the area. These variables lead us to subdivide individuals into two sub-sets: "high-risk" and "low risk". People at high risk are those who live in areas exposed to frequent natural disasters, those at low risk are those who live in areas not exposed to frequent natural disasters.

The insurance companies may offer two types of contracts, for areas where the degree of exposure to natural disasters, high, called "risk areas", the prize will be associated with high and areas in which the degree of exposure will be low or zero-called "low risk areas", the prize will be lower than the previous. However, in this way, those at low risk could not be induced to make assigning an incorrect value to their utility functions.

Two other issues are fundamental: the allocation of risk and the Samaritan's Dilemma. In industrialized countries, the risk-sharing is one of the main problems for the insurance of natural disasters since the value of insured property is high and results in a higher value of the prizes. A feasible solution would be to provide an insurance contract with a prize "medium", or calculated based on a probability that is between the average probability at high risk and the low risk. In the case of voluntary insurance, the hypothesis of a contract with an award "average", a full coverage that will satisfy all parties, allowing insurance to achieve a financial balance is to be excluded. The reasons for this exclusion are to be found in the difficulty of the insurer to:

- Evaluate the different probabilities associated with the subject "at risk" and "not at risk"
- Evaluate the amplitude of the two groups of subjects
- Non-adherence to the contract award with the "average" from the "non-risk" they will not accept to pay a higher premium, even if only slightly, than "fair".

Potential losses in the event of natural disasters, can make it difficult risk sharing. Since the cost of many disasters is often relative to national economies affected, insurance need a certain degree of international participation at risk.

The propensity of people to purchase insurance against disasters is often tempered by the rational perception that the losses will be covered by the national government or international donations, this is a moral hazard problem due to the "Samaritan's Dilemma". After a natural disaster has struck a nation and created a lot of damage to people and things, the national government will be under intense pressure from the public and will be led to even pay the damages that are not insured. The "Samaritan's Dilemma" is even more evident in the case they are affected poor countries or in developing countries. One way to overcome this bias can not be the solution for mandatory insurance coverage against natural disasters.

The economic existence of insurance is based on brokerage activities and coordination preferences and choices of individual expectations, so the ultimate aim of insurance can not just attributable to the allocation and reduction of risks. The allocation of risk is to deploy its effect on a different proportion of the population or wider, while the reduction of the risk involves scaling the amount of losses that are realized.

Risk reduction is one of the most important features of insurance and is characterized by four main methods: aggregation, diversification, hedging (hedging), and the control of *moral hazard*. The main

function of the reduction in risk is the aggregation of risks that are not related or statistically independent; in this way the insurance company lowers the overall risk level thus resulting in a compensation of extreme values and ultimately reducing the overall size of the exposure to risk.

The transfer of risk in a market re-insurance has consequences far different from those of a typical financial market. While using the financial markets research the "coverage" of a risk linked to an event with the aim of consolidating - and in some cases increase - expected returns, the use of the insurance market is needed to "cover up" financially from damage and physical deterioration of expectations caused by catastrophic events, in order to secure a loan - based on compensation - the reconstruction of the infrastructure, as well as support to a possible decline in market demand. In particular such a system reported to Catastrophe risk is analyzed in relation to two fundamental principles; first refers to a broader framing of issues concerning the legal aspects and a second, which refers, however, to articulate procedures defining the manner in which the post-disaster compensation must be determined.

CONCLUSION

As well as extensively in the literature, insurance plays a key role in the functioning of our modern economies. The insurance contracts represent the main instrument of transfer of risk "individual" to the broad financial markets through full coverage evidently faced by insurance companies, thus allowing an effective reduction of risks to insurance companies. The tools can be adopted to mitigate the economic impact of the damage caused by the occurrence of disasters. Natural forms are due to diversification. The formulation and the description of the operation of the insurance coverage as well, as mentioned, is obviously reductive; seems so obvious highlight the existence of several reasons why many of the natural events that have the characteristic unpredictability and uncertainty, can not be effectively insured by the insurance markets.

In research carried out as the object of the present work, we are, among others, featuring in the inability of the system to cover the effects of catastrophic events; At the same time, they also highlighted the possible consequences and the main issues related to the difficulties of full solvency and consequently liquidity constraints that has the covers of these costs.

The main macroeconomic effects that follow a catastrophic event do so reference:

- the deterioration of the fiscal position;
- the weakening of the trade balance;
- the reduction in exchange rates;
- increase in inflationary pressure;
- the arrest of economic growth, for the damage to infrastructure and basic services.

These elements are the ones that have the greatest impact on the economic recovery of the areas affected by catastrophic events, and therefore are the ones who need early intervention. Interventions that need to be immediate course of economic conditions sometimes so burdensome as to induce the territories to resort to forms of loans or even in some cases even to "international aid".

In order to face the problems so far highlighted the territories (municipalities, provinces and regions) and, more generally, the state must necessarily take preventive measures with the primary purpose of reducing the causes of the increase of the factors triggered the catastrophic events (eg policies aim at reducing emissions of greenhouse gases in the atmosphere). Other possible forms of intervention refers to the opportunity to adopt appropriate insurance coverage necessary to cope with disasters and especially the economic damage arising therefrom. The use of insurance covers the damage, in order to protect the policyholder from financial loss arising from the risk that a catastrophic event occurs through the reduction and risk sharing, is the extent to which the system considers to be the most

effective to date although present major problems associated with forms of insolvencies of insurance companies.

The problems of insolvency highlighted are influenced by so-called adverse selection; a phenomenon which is embodied in the phenomenon of the apparent demand for insurance coverage only by those persons who have a very high degree of risk. It is believed then that only a supportive risk-sharing can be a possible solution, and may be able to cover the high value of insured property in the area. In order, therefore, to solve the problem of insolvency, there was evidence in the course of this work, the various financial instruments that reduce the economic exposure of insurance companies - for example, the so-called "weather derivatives" that transform the insurance risks in securities and derivatives.

In conclusion, the problems related to insolvency and those resulting from the offer of insurance against disasters can be avoided by implementing a full role of regulator and guarantor of the state; avenues and insurance systems adoptable are numerous, but there is, in literature, a convergence towards systems that have a full coexistence of public and private funding (mixed forms).

For all of the above is necessary to develop a sound and prudent management of the company, whose cornerstone is represented by good *governance* and an effective system of risk management, which must be developed in compliance with the *best practices* and international principles and standards shared by the sector.

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