



THE PRINCIPLE OF RISK PARTNERSHIP AND THE ROLE OF INSURANCE IN RISK MITIGATION

A. Smolka¹, A. Allmann¹, D. Hollnack¹ and H. Thrainsson²

Keywords: Earthquake insurance, earthquake mitigation, risk financing

SUMMARY

The growing loss burden from natural disasters requires a cooperative effort from all parties involved in order to finance, mitigate and reduce the losses from future catastrophic events. The affected stakeholder groups encompass the private sector, i.e. property owners, the financial sector and public authorities, i.e. government bodies on all administrative levels, but also non-governmental institutions and supra- or international organizations. Most important within the financial sector are the insurance and specifically the reinsurance industries, but also banks and the capital market as a whole can play a supportive role in risk financing. Under the heading of “risk partnership” the responsibilities of the persons and entities affected, of the financial sector and the state are described from an international perspective based on actual business practice. It is a challenging task to develop solutions which combine efficient incentives for property owners to undertake risk reduction measures with acceptable and affordable insurance conditions. A close and well-conceived cooperation especially between the state and the insurance sector is indispensable to achieve this goal. Various solutions have been designed and even implemented, but so far none of these have succeeded to a satisfactory degree. The potential role of the insurance sector in risk mitigation is addressed, and some examples of private/public partnerships working in the direction of risk reduction are presented.

Growing losses – need for action

INTRODUCTION

The loss data on great natural disasters since 1950 show a dramatic increase in catastrophe losses over the last few decades. Actual loss figures and trend curves are shown in the figure below. The reasons for this development are manifold and encompass

- the increase of world population, and related effects
 - . increasing values
 - . concentration in large conurbations
- social and economic factors
 - . development of highly exposed regions
 - . high vulnerability of modern societies and technologies
- changes of the natural environment (e.g. global warming and the related regional effects).

As the underlying factors for the observed loss trend remain unchanged, a further increase of losses from natural disasters is inevitable.

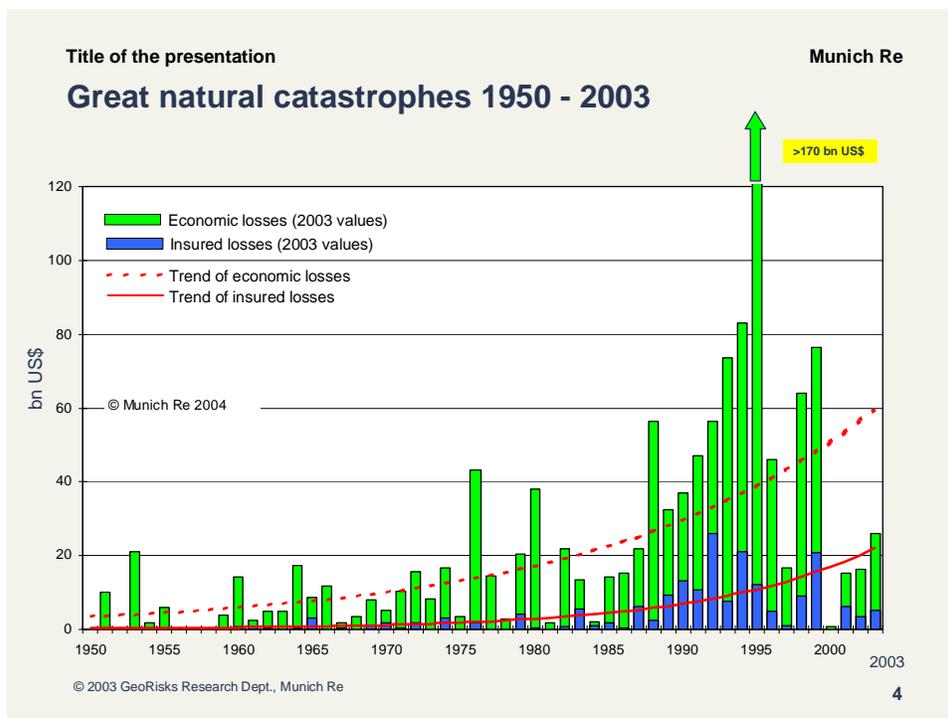


Fig. 1: Losses from Great Natural Disasters (far exceeding 100 deaths or 100 mio US\$ in losses), 1950-2003. Figures are adjusted for inflation.

The principle of risk partnership

Coping with future loss burdens represents a formidable challenge which requires the cooperation of all parties involved, i.e. the potentially affected private persons and industries, by

the financial sector and by the state. More specifically, and introducing the role to be played by insurance within the context of natural disaster relief, we can distinguish between

- the insured persons or entities
- primary insurers
- reinsurers
- capital markets
- governments/public authorities.

Each of these parties has its own tasks and responsibilities in managing the risk arising from natural disasters. Beyond the pure financing of future losses, which is a reaction after the event, much more effort than hitherto has to be invested in a pro-active strategy, i.e. in reducing and preventing future losses. Such a strategy is not only a matter of financial resources, but also, and maybe even more so, a result of good and foresighted planning and of coordination at all levels, from households and industrial companies to public institutions and authorities. What precisely are the tasks of these parties?

- The insureds: householders and business owners can do a lot in order to reduce the risk to their property by proper maintenance and securing sensitive items like equipment, electronic installations and machinery. In industrial businesses emergency planning can help to prevent or minimize losses from future disasters. Finally, a certain portion of the financial risk has to be borne by the insureds in order to keep the interest in loss reduction awake. Typical forms of self-participation are deductibles, preferably expressed as a percentage of the sum insured, and/or coinsurance, i.e. a percentage participation in each and every loss, see section 4.
- Primary insurers: primary insurers have to provide and secure capacity by
 - . charging technically adequate rates
 - . applying appropriate underwriting guidelines
 - . accumulation control and portfolio management
 - . establishing reserves for natural perils
 - . limiting their liability according to their financial strength => reinsurance protection.
- Reinsurers: reinsurers are often the main risk carriers in the field of natural disaster losses, making proper risk management all the more a primary task which includes
 - . balancing the risk over time and regions
 - . technical support to the clients in rating considerations and assessments of probable maximum losses (PMLs)
 - . controlling and limiting liabilities (setting cession/occurrence limits, budgeting, retrocession).
- Capital markets: they have entered the scene only recently. This type of alternative risk transfer (ART) must be seen as a supplement to rather than in competition with reinsurance. Their potential function is mainly to provide additional capacity for top-rank losses.
- The state: in the insurance context the state has to act as a reinsurer of last resort for very rare, extraordinary losses and/or uninsurable risks. The main task of the state lies, however, in the field of risk management and risk reduction by
 - . designing and enforcing land use and building regulations
 - . securing the serviceability of critical facilities and infrastructure

- . developing emergency plans defining precisely the responsibilities and the coordination of the authorities involved.
- . granting tax exemption for catastrophe reserves

Within this context, the role of the insurance sector has been rather well established and tested. In contrast, the capital markets have still to prove whether they are willing to provide reliable and continuous capacity when investors may have lost their money after large disasters. Furthermore it is worth mentioning that the entirety of ART programs have been placed so far for highly developed countries. Complexity of the programs, investor attitudes and also the usually high price require mature insurance markets. The state should create an environment where the greatest possible use is made of private resources for disaster recovery, combined with the availability of protection for as many people as possible. Linking the availability of such protection to the observance of building regulations can provide an efficient mechanism for code enforcement, especially for new construction. Notwithstanding, mechanisms aiming at code compliance may serve to encourage rehabilitation measures as well. Another important role in the “mitigation cycle” could be, but seldom is, played by mortgage banks requiring natural disaster insurance as a precondition of the loan, see section 4.

Earthquake insurance – a tool for risk mitigation?

The use of earthquake insurance as a motivating tool within the framework of loss mitigation programs has been discussed to an increasing extent in recent years. So far, however, actual implementation of this concept lags far behind its potential. The reasons are manifold. Among the public at large there is often a lack of knowledge about insurance mechanisms or an idealistic perception of the function of insurance. In the insurance sector, competition and a short-term financial perspective do not create a favourable environment for actively promoting prevention and mitigation measures as the time scale for a possible positive outcome tends to be too long. A project like the community classification scheme of the insurance-sponsored Institute of Home and Business Safety (IHBS) in the US where communities are classified according to code compliance with the final aim to promote loss prevention is unique so far.

The classic example of successful loss prevention in property insurance is the inspection of insured objects by fire engineers employed by insurance companies with the aim of giving recommendations on enhanced fire protection. The level of fire protection is a well-established criterion for rating and PML assessment. As far as the earthquake risk is concerned, similar initiatives were taken by private firms as a consequence of the shrinkage of insurance capacity after the Northridge earthquake in California. On the basis of risk management surveys, earthquake protection was improved and the insurance coverage bought was adjusted to the minimum demand or given up altogether in favour of direct investment in loss prevention.

Nevertheless in natural hazards insurance, and especially in earthquake insurance, other features that foster loss reduction are widely used, see section 2. These features are risk-adjusted premiums and self-participation on the part of the insured party:

- Risk-adjusted premiums: Tariff schemes reflecting the actual risk level commensurate with the location and the constructional characteristics of the insured object are increasingly

being used on a global scale. But the correct application of such schemes presents a problem, and in actual practice rates are still dictated by pure competition. Sometimes, for instance, rebates are given for alleged compliance with anti-seismic building regulations. Often, however, code compliance has not been checked and - although stated - does not exist in reality. Therefore, in practice, this element can be counter-productive and even unjustified for old generation codes whose principal goal is avoiding loss of life rather than reducing monetary loss.

- Self-participation: There are three types:
 - . Deductibles, expressed as a percentage of the sum insured or as a flat amount. Typical deductibles in earthquake-prone countries start at 2% and go up to 15% in highly exposed regions like California. Insurance payments start only in excess of the deductible.
 - . (Proportional) coinsurance, again expressed as a percentage of the sum insured. Under this arrangement, the insured party carries a fixed proportion of each and every loss. Typical values range from 10 to 25% and reach a level of 70-85% in Tokyo Bay.
 - . First loss coinsurance/liability limits, expressed as a percentage or a flat amount. Here, the insurer pays from the ground up or after a deductible up to a certain limit.

All of these elements can be combined and are accompanied by corresponding premium rebates. The greatest incentive to take loss prevention and reduction measures is given by proportional coinsurance of at least 10% or by deductibles of 5% or more, as the insured party has to carry a substantial portion of any loss on its own.

The effectiveness of the above-mentioned elements depends to a critical degree on the actual spread of insurance. In this sense a distinction can be made between 'free' insurance markets and countries where earthquake coverage is obligatory or semi-obligatory:

- In an unregulated market that is completely exposed to competition it is a delicate task to find the right balance between tariff elements geared to loss prevention and acceptability for the consumer with the result that a sufficient spread of insurance is achieved or maintained. A common reaction in such cases is the 'zero option', i.e. no insurance and no loss reduction. This option is neither in the interest of the public, which at the very end has to pay the forthcoming losses without having set aside reserves beforehand, nor of the insurance industry, which wants to generate business. As a matter of fact, insurance conditions that are unattractive or in extreme cases completely unaffordable result in a situation where on a global scale typically less than 10% of the people have any earthquake insurance at all. Such a low market penetration makes attempts to foster loss prevention by means of insurance almost futile.
- A much better environment for using insurance as a direct incentive or as an indirect contributor to loss reduction programs is provided by insurance markets where the coverage is either mandatory or at least widespread. Attempts to educate and raise the awareness of the consumer by means of brochures and videos reach many more people and consequently have a greater chance of success than in free markets with low insurance penetration. In this context mortgage banks can play an efficient role in fostering high market penetration without the support of legal measures by requiring disaster insurance as a precondition for the loan.

In addition, and even more important, all of the above cited direct measures like deductibles, e.g., can be brought to real fruition without leaving room for the ‘zero option’ - if they are used, of course. If, instead, full coverage without substantial deductibles is granted under mandatory schemes, the goal of loss prevention is missed again. A portion of the premiums collected under such schemes can be invested in loss reduction programs or in relevant research. The governmental Earthquake Commission in New Zealand or the Swiss Earthquake Insurance Pool provide examples of such a policy.

Discussion and conclusions

The foregoing discussion has identified several levers for mitigating losses from natural disasters. The components are there, the challenge is to knit them together into a secure and tight network of risk reduction measures.

At present, various solutions are in use regarding the splitting of responsibilities between the parties involved. In New Zealand, for instance, the “Earthquake Commission” (EQC) provides basic insurance coverage for every household, up to an annually adjusted, actual building value. Additional coverage for the replacement cost can be obtained in the private market, as well as insurance for commercial and industrial risks, and for business interruption. In Japan too residential risks are covered to a large extent by the state-run Japan Reinsurance Company, whereas large businesses buy insurance in the private market, and the corresponding reinsurance is supplemented to a small extent by ART instruments like CAT bonds. The concept of “basic coverage” was also introduced by the California Earthquake Authority (CEA) in the aftermath of the Northridge earthquake in 1994 when earthquake insurance was difficult to obtain for homeowners. An often-used concept in natural disaster insurance schemes is the insurance pool, which involves every company participating in disaster losses in proportion to its market share in premiums. This concept ensures that companies avoid being too badly hit or even going bankrupt because of a disproportionately high loss burden from specific events. Such pools exist now, e.g. in Switzerland, France and Spain, partially supported by state reinsurance. They are also being considered in several other countries in Europe and overseas. Losses exceeding the capacity of the above-mentioned programs usually fall under the responsibility of governments.

The involvement of capital markets in natural disaster coverage is still minor and limited to very few, well-developed markets. This may have to do with a very cautious attitude on the part of potential investors, the reasons for this being a lack of confidence in risk modelling tools for regions outside the US and Japan on the one hand, and the general socio-economic stability of developing and emerging markets on the other hand. On the buyer’s, i.e. the insurer’s, side the high price for such transactions as compared to conventional reinsurance must not be forgotten either.

What is almost completely missing so far are efficient incentives for code enforcement. The Turkish Catastrophe Insurance Pool (TCIP) starting operations in late 2000 represents an innovative concept for a less developed marketplace where code enforcement is to be linked to the availability of insurance protection and/or governmental disaster assistance. This project also

illustrates the potential role of international organizations like the World Bank in designing and backing new, proactive strategies for risk prevention and reduction.

¹, GeoRisks Research, Munich Reinsurance Company, 80791 München, e-mail: asmolka@munichre.com
aallmann@munichre.com, dhollnack@munichre.com

² Senior Research Scientist, Corporate Underwriting, URM - Exposure Management, American Reinsurance, Princeton NJ 08543, e-mail: hthrainsson@amre.com