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Accumulation control of natural hazards from the reinsurance point of view ¹

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The practice of controlling cumulative commitments due to the existence of earthquake, storm, flooding, riot and civil commotion extended coverage, has definitely gained momentum over the last 25 years. Measures adopted in Latin America for the earthquake hazard under the impetus of professional reinsurers and, more recently, the R.O.A., are an example of this.

It is worth taking a look, first of all, at the reasons behind such a development, before proceeding to analyse how this control is actually carried out and what the repercussions are on both direct insurance and reinsurance. In a final stage, it will be interesting to ponder on the factors that will have emerged and to try to decide whether this development is likely to pursue its course and what the attitude of private insurance and reinsurance firms, as well as of the supervisory authorities, will be.

¹ This paper was delivered by Mr. Bourthoumieux at the *Rendez-vous de septembre*, held in Monte Carlo in September 1979.

I — Development of catastrophic risk accumulation control

At the beginning of the century, reinsurers exercised absolute control over their cumulative liabilities, catastrophic or otherwise. Ceding Companies sent off their monthly bordereaux, giving the amounts per location and the information was subsequently recorded on the Reinsurer's maps of populated areas but

- the need to rationalize administrative tasks,
- and the facilities of excess of loss treaties,

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led to the eventual decline of this system. The problem was not exactly ignored, but just did not seem to worry Reinsurers to the same extent as in the early years. In the meantime, of course, reinsurance had evolved considerably.

Over the last 20 years, the situation has been exposed to a new kind of development, resembling a sort of leap back into the past and important changes have undeniably made their mark.

- An increasingly sophisticated economy, a concentration of values, the occupation and exploitation of vast expanses of land have increased the possible consequences of hazards in areas which, until then, had not worried the insurance market unduly.

Who was concerned 20 years ago by the height of waves or by the probability of earthquakes in the North Sea ?

The dramatic expansion of urbanization has entailed for Insurers commitments for amounts quite disproportionate to their premium income: the total insured value of the Mexico Valley in 1977 was assessed, after deducting the 25% coinsurance, at Dls. 6,000,000,000, while the overall income from the Mexican Market, both for Life and Non-life, amounted to only Dls. 660,000,000.

- Thus, Insurance, which until then had been considered only as an individual precautionary measure, has gradually become an essential factor of economic life. New obligations have been imposed upon the insurance industry which, if not fulfilled, would lead to intervention by the authorities.
- Scientific progress finally has enabled a better assessment of the potentiality of natural hazards. This progress has not always resulted

in a restriction of capacity. A better knowledge of the frequency of certain types of catastrophe and of possible maximum losses has led to a better appraisal of the risk by Insurers and to a more rational use of their capacity.

In spite of this development, direct Insurers were not sufficiently aware of the problem of the accumulation of catastrophic risks, no doubt because the support of their Reinsurers, both proportional and non-proportional, was always forthcoming.

Why were Reinsurers themselves so long in awakening to the danger of their cumulative commitments? For a long time, profits derived from reinsurance, particularly in developing countries, justified a certain optimism; but once competition forced reinsurers to pay commission of 50% and even 52,50% plus heavy contingent commission, profit margins plummeted to such an extent as to oblige them to reconsider the importance of their liabilities, all the more so since, in addition to reduced profit margins, ceded premiums tended to decrease due to:

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- the development of markets leading Insurers to increase gradually their retention on the best risks,
- the growing governmental intervention limiting the amount of premium ceded abroad.

The imbalance between premium ceded on the International Reinsurance Market and the liabilities assumed by the latter became greater.

The major catastrophes of the last 15 years, particularly Hurricane Tracy in 1974, costing 15% of the Australian Market's entire premium, and the earthquakes in Guatemala and Nicaragua, have shown progressively the extent to which the market mechanisms were in jeopardy.

This is why we are now witnessing a continuous effort towards a more efficient control of catastrophic exposure.

II — The situation today

- a) The level of awareness as to the importance of cumulative liabilities on extended coverage varies according to the market and the type of risk involved. The earthquake risk is un-

doubtedly the most closely monitored risk. The Japanese took the lead in this field a long time ago; they were followed by Latin America and, more recently, by the United States, particularly California. Projects undertaken by the R.O.A. and certain professional Reinsurers have made a great contribution to this development, although there is yet much to be done. One cannot but note that, with respect to other risks, the situation is even less satisfactory.

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Although storm risk is constantly monitored in the United States and in Australia in particular, no precautions have been taken in other countries where storms, hurricanes and cyclones are just as common.

The anti-selection, which quite naturally characterises flood coverage, and the relative frequency of this phenomenon in the affected areas, undoubtedly explain why this risk is hardly ever insured and why it rarely poses any problem on an international level. The position is not the same, however, regarding strikes, riots and civil commotion etc. and it is quite extraordinary that in spite of the recent serious disturbances in the Lebanon, Nicaragua and Iran, no effort seems to have been made to set up a more effective system of control, while insurance policies, the extents of which are far from being contractually clear, are still being delivered in many countries.

b) *How the control works*

With respect to risks insured, various methods are currently being applied which tend, above all, to limit the Insurers' commitments in absolute terms:

- exclusion of risks located in certain areas, e.g. the United States, the creation of Coastal Pools for flood risks and of Fair Plans for Riot risks, at the instigation of the Authorities,
- limitation of insurable amount per risk as is the case with simple risks in Japan (private and small commercial),
- introduction of compulsory co-insurance:
 - in Japan, industrial risks from Zone 5 cannot be insured for more than 15% of their value,
 - in Mexico, the percentage insured is 75% for the whole country,
- existence of an absolute deductible, generally varying from 2 to 5%.

The Insurers' Position

Various measures have been taken by companies, either following a decision made by a professional organism or acting on instructions received from the supervisory authorities whose awareness of the problem of accumulation control has gradually increased. The Insurance Commissioner for California, when presenting the regulations that would govern earthquake insurance as from 1st January, 1979, stated:

« And while normal regulatory safeguards aimed at the maintenance of sufficient financial surplus to pay large losses appear adequate for other classes of insurance, the potential for an earthquake to produce staggering losses over a wide geographic area at one time makes it important to know the extent and terms of earthquake coverage ».

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These regulations are a good example of measures that could be taken with a view to controlling cumulative earthquake liabilities:

- California is divided into seven seismic zones,
- Tables are drawn up fixing the probable maximum loss for every type of construction per zone,
- Insurers are not authorized to write any one risk for a sum exceeding 10% of their net assets,
- Insurers are required to inform the Insurance Department of their aggregate commitments expressed in terms of probable maximum loss, excluding the absolute deductible retained by the Insured and any proportional reinsurance,
- Insurers are required to forward the above information to their Reinsurers, except in the case of catastrophe treaties.

In many countries, Insurers may have the option, or may even be required, to set up a Disaster Fund. In France, companies have the right to constitute, tax free, an equalization reserve representing up to 75% of profits derived from the classes of insurance covered by this measure. The profits are reintegrated after 10 years provided that none have been used to offset the incurred losses. In principle, this measure can only be applauded, but the 10 year period is far too short, considering not only the low frequency, but also the magnitude of certain natural phenomena.

Generally speaking, it cannot be denied that great progress has been made, although only haphazard measures have been introduced, and have seemingly been applied with the earthquake risk uppermost in mind.

The Reinsurer's Position

312 Before commenting on the situation from a reinsurance point of view, I would like to make the observation that Reinsurance cannot be considered as a single homogeneous entity, applying the same techniques and participating in the same business.

Up until now, it has been common to compare professional Reinsurers, whose operations are confined to Reinsurance alone, with direct Insurers, whose activities are composite. The distinction has also been made between Reinsurers who work directly with Ceding Companies and those who work through an intermediary.

Of course, these differences are real, but for various reasons they seem to have been relegated behind what I consider to be a more important difference, namely, that between the primary and the secondary reinsurance markets:

- Reinsurers belonging to the primary market would be those who accept their business first and foremost from direct Insurers, operate in various types of market and, in fact, reinsure the companies managers as much as their risk portfolios.
- Reinsurers belonging to the secondary market would be those who underwrite primarily through brokers, on such markets as London today and, perhaps, New York tomorrow, whose links with direct Insurers are few and far between, and who participate to a greater degree in retrocession treaties and pools, both proportional and non-proportional.

If this distinction is accepted as such, it is clear that the control of cumulative catastrophe commitments is different on the two markets.

- On the primary market, any progress that may take place in the field of direct insurance will obviously enable improvement on accumulation control. Measures introduced by the Mexican Market as from 1st January, 1976, led to a withdrawal of reinsurers belonging to this category, hitherto, active on that market.

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A clear-cut relationship between direct underwriters and reinsurers means that any progress is wholly dependent on developments in direct insurance.

Reinsurers are fully aware of the absolute necessity of sustaining efforts made over the last few years to co-ordinate information with direct Insurers, as the control of their liabilities is still very complex, and this is rendered all the more so by the combination of two phenomena:

- on the one hand, we are witnessing an unrelenting interpenetration of markets particularly in Europe with the advent of the Common Market, which means that, in the future, it will no longer be possible to consider treaties from one country as totally distinct from those of another,
- on the other hand, there is a constant trend towards the extension of the notion of « occurrence » in Excess of Loss treaties, which, of course, increases the Reinsurer's exposure to the dangers of catastrophic accumulation. It is significant that during the last few months, on the occasion of the sinking of the « München », and the water damage claims in Great Britain due to the freeze, the problem of defining the term « occurrence » in Excess of Loss Treaties became increasingly difficult.

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In spite of these imperfections, it is not unduly worrying. The same cannot be said of the secondary market.

At this stage, it is difficult to evaluate the possibility of catastrophic risk accumulation, particularly as retrocession treaties, very often, do not provide for a limit per zone, but only for each ceding company's programme, or even for each treaty. This obviously unclear situation will undoubtedly prove hard to correct, as, to a great extent, it accounts for the present-day market capacity.

How, then, can Reinsurers on this market deal with their underwriting in a satisfactory manner, if they cannot control their cumulative commitments? The answer is, by subscribing to Catastrophe Excess of Loss cover which, in the absence of any major event over the last few years, has been all the more easily placed, as it has been re-absorbed by the secondary market.

Here we are observing a phenomenon which is most unexpected — the indefinite multiplication of capacity — a phenomenon we would compare to the creation of the Eurodollar on the International Monetary Market.

This brings us to the question of how this enormous capacity would be put into operation in the event of a major catastrophe? Would reinsurance and retrocession schemes move from one collapse to another, leading to the bankruptcy of certain companies?

314 The situation, however, does not seem to be a cause for concern, as this increase in capacity lies mainly in the resources of the numerous direct insurers who have opted to accept reinsurance business, imagining that this would produce better results than direct insurance.

Only time will tell whether this is not an over-optimistic view. But it seems, however, that there is another often overlooked drawback, i.e. the lack of information which is characteristic of this secondary market.

Reinsurance has always been based on good faith, and rightly so. If this good faith is to continue, an honest relationship between the insurer and the reinsurer must be preserved and this « rapport » must also be close and legally well defined.

In practice, however, a new market has developed from which this kind of relationship is absent and which accepts considerable liabilities without being able to evaluate them or to assess their true nature and exact importance, leaving the legal relationship between the various parties throughout the world to defy description.

In the event of difficulty, how could the liabilities of those involved, i.e. direct brokers, underwriting agents, direct insurers, reinsurance brokers and underwriters, reinsurance pools and retrocessions etc. be evaluated?

In which branch of activity can one imagine any industrialist or trader willing to accept commitments for such considerable sums in such vague and legally imprecise contracts as the increasingly common retrocession treaties today? It is, therefore, not surprising that a new breed of reinsurer is appearing who will not blindly agree to pay without supporting documents and without undertaking a strictly legal analysis of his commitments.

This can perhaps be considered as a normal and even welcome development in the reinsurance market, provided that one is aware of its existence. Can one be sure that should a catastrophe take place, re-insurers would not be tempted to avoid fulfilling their commitments by pleading ignorance of the exact nature of the risks involved and to make use of, before their country's law courts, a legal loophole in the complex relationship between them and the primary policy-holders?

Some recent examples lead one to wonder whether, in the final analysis, it is often the responsibility of the intermediary, i.e. broker and agent, which is to be questioned.

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The effects of these changes are beginning to be felt, as was noted in the « World Insurance Report » of 12th December 1978:

« There appears to be a growing world-wide tendency among re-insurers to insist on information regarding the primary policy-holder and the quality of the risk, even in the event of a claim on a treaty.

« In general terms, this desire for grass-roots information about primary risks and those who insure them is contrary to the Lloyds reinsurance underwriting tradition of writing on the basis of figures supplied by brokers and in accordance with the class or sub-class of business being handled, rather than on a detailed appraisal of the facts ».

The situation regarding the secondary market is therefore all the more unfortunate, in that the enormous capacity available to direct insurers has the effect of hindering efforts made elsewhere towards a better control of catastrophic risk accumulation.

III — Looking towards the future

The commitments of the direct insurer are becoming more and more important, even in the face of the economic crisis, and therefore the need for information regarding catastrophic risk accumulation can only become increasingly acute, in spite of the current laxity of the reinsurance market and excessive competition.

For this reason, more active research into catastrophe determination should number amongst the industry's priorities. Some progress has been made in the field of earthquake insurance, but, as previously stated,

this is not the case regarding other forms of perils, with the exception of storm and flood in certain areas.

In Europe, however, no progress has been made towards a systematic accumulation control, in spite of the storms of 1967 and 1976, when several reinsurers were severely affected, not having imagined that one single event could lead them to assume such liabilities.

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Furthermore, a study of most catastrophes will show an important difference between the total amount of damage and the sum assumed by the insurance industry. This was the case for the storms of 1976 in Europe, which cost insurers U.S. \$500,000,000, whereas the total cost of the damage was estimated at U.S. \$1,000,000,000. Thus, there is every possibility of a substantial increase in the losses borne by insurers, even though the non-insurance is partly due to the destruction of public-owned property.

It is to be feared that if the insurance industry does not take appropriate measures, then the authorities will intervene, their aim being to see that the public is adequately protected, while allowing the insurers to play their part and even supporting them in various instances: in Japan, the retention by direct insurers in the insurance of simple risks is proportionally insignificant, in the United States, where Coastal Pools and Fair Plans have been introduced, and in France, although to a much lesser degree, temporary tax exemption is allowed on the equalization reserves.

If the general idea behind the intervention on the part of various supervisory authorities is to make sure that insurers are in a position to fulfill their obligations, it seems that they are never in doubt as to the capacity of the international reinsurance market. To my knowledge, Californian insurance legislation is the first to make provision for the control of earthquake accumulation by reinsurers.

The confidence enjoyed by reinsurers must be preserved at all costs so as to justify continued co-operation with the Authorities, but this would no longer be the case if this confidence were to be endangered by an ineffective control of their cumulative commitments.

This is all the more crucial in the current monetary crisis. While there is a growing tendency for governmental authorities to regulate the export of foreign currency due to reinsurance cessions, one of the main justifications for an important outflow of reinsurance abroad is

the obligation for countries, particularly developing nations, to resort to the international market for protection against major catastrophes.

Casting doubt over the role of reinsurance would lead to various kinds of governmental interventions, none of which would be satisfactory:

- Setting up strict controls, not only on the reinsurer's solvency, but also on the size of his eventual commitments. In view of the infinite complexity of such a control, this could possibly give rise to direct intervention by the authorities with relation to the coverage of extended perils; this intervention could hardly be confined to these risks alone and could, therefore, in the long run, challenge the international role of reinsurance if one is not careful.

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For these reasons, one of the priorities for the insurance industry, particularly reinsurance, should be to continue, to the best of its ability, to direct its efforts towards a better knowledge of catastrophe accumulation.¹ The credibility of the whole profession is at stake.

¹ Il faut rapprocher la conférence de M. Bourthoumieux et un numéro spécial de l'*Argus International* de juillet-août 1979, consacré aux risques catastrophiques. En voici la table des matières: L'assurance face aux risques catastrophiques (François Négrier); Le contrôle des cumuls provenant des risques à caractère catastrophique (B. Porro); Les pertes immobilières dues aux catastrophes naturelles aux Etats-Unis: hier, aujourd'hui et demain (J. H. Wiggins); Quelques réflexions sur l'assurance du risque de tremblement de terre dans le monde (P. C. Perrenoud); Le risque « tremblement de terre » au Japon (A. Loubière); Three mile Island (A. Melly); DC-10 (A. Melly); The reinsurance of extraneous perils (J. Neave); L'avenir de l'assurance incendie en Europe (U. Haasen); Sinistres et catastrophes dans le monde en 1978.