NatCat*SERVICE* information

Economic losses resulting from natural catastrophes – background information

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For more than 25 years, Munich Re's Geoscience Research Group has systematically gathered and analysed information on natural catastrophes throughout the world and incorporated these data in its NatCat*SERVICE* database. The core data on each catastrophe are the economic and insured losses incurred and the number of persons affected (fatalities, persons injured, homeless, or evacuated, etc), but the records also include a brief description with all the relevant information that provides a quick overview of the specific event's scope, severity, and consequences.

NatCat*SERVICE* event reports are based on a wide variety of sources, the chief ones being

- Online databases and information services (e g news agencies, bulletins issued by the United Nations or the International Red Cross)
- Reports in the media
- Contacts to scientists, government authorities, and universities
- Trade press, expert opinions, etc.
- Information from our clients in more than 150 countries
- Information from our business units and subsidiaries around the globe

As a rule, reliable and trustworthy information on the number of persons affected by a catastrophe becomes available relatively soon after the event. Our data on insured losses are also generally quite reliable because we receive precise loss reports from the affected primary insurers, that is to say by our clients

Gauging economic losses proves to be substantially more difficult, despite the fact that the media often publish a rough indication of the economic losses immediately after a catastrophic event. But can figures published so soon after an event by public authorities, aid organizations, and the media be considered reliable? What factors do their loss estimates take into account? It is obvious that governments, public authorities, and aid organizations often initially underestimate, and not infrequently overestimate, the extent of losses. Prudence is also advised regarding the widespread "political" practice of exaggerating loss figures in order to obtain aid. Generally, precise loss analyses and reports are prepared only after especially severe natural catastrophes. When a natural hazard causes moderate or relatively minor loss events, the first figures published by the media are held to be valid for years or even forever, even if they were merely rough estimates.

What information on economic losses forms the basis for NatCat*SERVICE* event reports?

First, we rely on information from governments, public authorities and other official sources. As soon as new, trustworthy evidence becomes available – as a rule after a period of a few weeks – the NatCat figures are updated. In certain cases, such as the Northridge earthquake (California, 1994), years may pass before the figures can be considered final (the last updates regarding insured losses arrived in 1999).

- Once the insured losses are known, the extent of the economic losses can be estimated based on the insurance density in the affected country.

Economic losses in the NatCat*SERVICE* database

As a rule, the NatCat*SERVICE* database includes information on direct and – where reliable information is available – also indirect economic losses, but does not usually consider secondary costs.

- Direct losses are immediately visible, countable losses, such as damage to and/or loss of residential buildings, stocks, schools, hospitals, vehicles, agricultural assets (affected acreage, buildings, machines, and livestock). The losses are always assessed on the basis of the new replacement values, including the costs of repairing damage. One of the difficulties here, for example, is the assessment of historic buildings.
- Indirect losses are those resulting from the physical destruction of assets, such as increased transport costs necessitated by the destruction of infrastructure, the loss of jobs or of rental income. Indirect losses also occur in the industrial sphere, where high costs may result from problems in production or supply, which may be covered by business interruption insurance.
- Secondary costs are costs that weaken the affected country's economy through, for example, the loss of tax income, declines in production, diminished gross domestic product (GDP)/gross national product (GNP), and currency losses.

Only seldom do reports on economic losses describe all the criteria that play a role in the cataloguing of catastrophes in the NatCat*SERVICE* database. Generally, we consider ourselves fortunate if reports provide adequate quantitative information even on individual aspects.

Theoretical observations

Just what is meant – from an economics perspective – by the sometimes quite imprecisely used term "economic losses" is elucidated in the sections below.

A glance at the various loss aspects indicates first that calculations of economic loss are in fact frequently distorted because they take certain factors into account two or more times. Also, it is evident that the private insurance industry represents a substantial element in limiting economic losses resulting from natural catastrophes.

When considering the effects more precisely, we distinguish between stock variable and flow variable effects, domestic and foreign economic effects, capital market effects, and short-term and long-term effects.

Effects on production potential (stock variables):

- The most obvious effect that a natural catastrophe can have is to destroy infrastructure and production factors of all kinds (not just buildings and industrial plants in the technical sense, but also livestock, plantations, etc.). The resultant losses can be quantified quite precisely as the current reinvestment needed to replace them. Here, too, however, careful attention must be paid to the actual reinvestment costs, e.g the cost of reconstructing a villa in Malibu, California, taking into account the villa's previous condition but not the value of the plot, which may be much higher.

- Substantially more difficult to determine are economic losses attributable to the effects of natural catastrophes on workforce potential. Thoroughly plausible estimates can be made, however, of the effects on overall economic productivity.

- Another cost factor is environmental impairment, but it is hardly possible to quantify the loss of natural habitat caused, for example, by a forest fire.

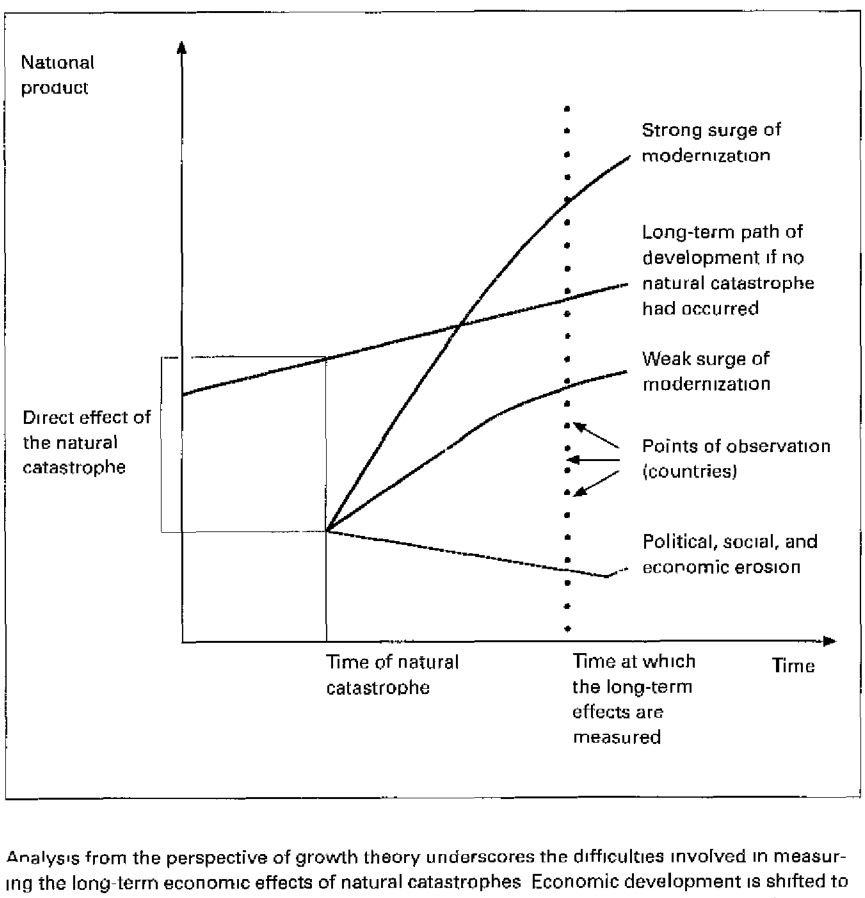
Effects on the domestic economy (flow variables):

Natural catastrophes can affect an economy's level of activity both directly and indirectly.

- Since they are merely a reflection of the effects on the production potential, direct effects should not be included when calculating economic loss. These can be quantified both in terms of income and in terms of supply and demand. For example, the loss of a workplace resulting from the destruction of a factory shows itself in the income of the person who was employed there, in the demand for goods, and in the government's finances (loss of tax income, perhaps unemployment payments from governmental and/or semi-governmental institutions).

- The indirect effects, on the other hand, have to be quantified separately, first, the natural catastrophe's consequential effects on supply and demand in regions and sectors which were not directly affected (e.g. production bottlenecks due to non-delivery by suppliers, problems with the power and/or water supply, or the failure of communications installations), second, for example, the weakening of bank balances resulting from extensive credit exposure vis-à-vis the affected region or sector Also to be added separately are the effects or costs of immediate repairs.

These indirect effects are not necessarily negative for every sector and every region, for example, heightened demand for relief supplies may trigger a short-term increase in activity (e.g. in the health sector) and downstream income effects (multiplicator processes). Distributional effects come to bear when a production failure in one sector or



Analysis from the perspective of growth theory underscores the difficulties involved in measuring the long-term economic effects of natural catastrophes Economic development is shifted to a new starting point by the natural catastrophe, subsequently, numerous scenarios – a further decline or even accelerated growth – are feasible region gives rise to additional demand in another sector or region or when, for instance, increased government spending for the repair of damage in one area leads to cuts in government activity or general tax increases in other areas.

The overall impact of these indirect effects on the economy cannot be determined with certainty; in individual cases, it may even be positive – as can be demonstrated, at least theoretically

Effects on the capital market:

- Stock markets are a gauge of enterprises' expected future profits, and exchange rates are a good indicator of the future economic development of an entire economy. To this extent, a natural catastrophe's effects on the capital market are merely a reflection of the market's expectations regarding the effects of a catastrophe as described above.

- However, especially in relatively small, open economies in which the losses caused by a natural catastrophe may represent quite a large proportion of the economy's overall addition of value, natural catastrophes can sometimes cause extensive disruption, as history shows. In such cases, a catastrophic event may trigger exaggerated reactions on the part of the financial market, generally because it is assumed that the event will burden the economy's balances of trade and payments and that the country risk will deteriorate.

Effects on foreign trade and the country risk:

Just what effects a natural catastrophe will have on an economy's balances of trade and payments, however, is not entirely clear.

- First, it may be assumed that a natural catastrophe tends to weaken a country's balance of trade, as the loss of production potential reduces its volume of exports. The demand for replacement equipment necessitates additional imports. The economic environment risk of the plants located in the country increases due to the generally negative effects on domestic economic activity. On the financial markets, this may result in an outflow of capital from the stock or bond market Generally, these factors tend to burden solvency, thus increasing the country risk.

- On the other hand, it is not unusual for a natural catastrophe to have positive effects on a country's capital account. Public transfers after natural catastrophes may improve the balance of capital movements; there may even be a reduction in interest on foreign debts as a result of a debt remission or deferment of payment. Both improve the current account. For example, since 1962, the International Monetary Fund has provided a total of 24 loans in connection with natural catastrophes. The last and thus far the largest loan (US$ 501m) was awarded in 1999 following the earthquake in Turkey.

- Lastly, the insurance industry may also help to improve the current account. Natural catastrophes give rise to claims against insurance policies, producing a wealth-transfer effect when the primary insurers are foreign, but especially when the reinsurance is international, and foreign (re)insurers pay some of the insured losses. Thus, the reinsurance industry makes a not inconsiderable contribution toward stabilizing the balance of payments of countries visited by natural catastrophes. This is a significant argument in favour of opening markets to the international reinsurance industry

Whether a natural catastrophe has a negative impact on an economy's balances of trade and payments, and how strong this negative impact is, depends therefore on the weight of the factors described above.

Distributional effects:

- The disparity of effects on individual sectors and regions has already been pointed out earlier in connection with domestic business activity. Like other external shocks, therefore, natural catastrophes tend to promote personal, regional, and sectoral redistribution within a national economy.

- Here again, however, the insurance industry can attenuate the effects by distributing the costs among the insured community (possibly including the international insurance industry). This is true not only of traditional property insurance, but also of other classes of business ranging from life and health to credit insurance.

Long-term effects:

Thus far, this discussion has been limited to relatively short-term effects and costs. Is it also possible to make general statements regarding the long-term effects of natural catastrophes on growth? In our opinion, it is not.

Considered within the context of growth theory, it is unclear what the long-term effects of a natural catastrophe may be

- In principle, it is possible that reconstruction may begin rapidly and be accompanied by a surge of modernization (use of more modern production technologies), causing the affected national economy to grow more strongly and, in the long term, to produce a greater national product than if the natural catastrophe had not occurred.

- Under certain circumstances, however, the surge of growth brought about through reconstruction may not suffice to compensate for the immediate negative effect of the natural catastrophe. In this case, the economy suffers a lasting setback, lagging at a lower level for an indefinite period.

- If possible political and social consequences of the natural catastrophe (political instability, civil commotion, etc.) are also taken into account, there may in extreme cases even be temporary further erosion of the production potential, causing the national product to decline further, at least initially.

Between these three theoretical extremes, there are empirically numerous possible levels that are determined by, for example, the scope of the natural catastrophe and the structure of the economy. Did the plants that were destroyed have relatively low output-capital ratios or were they high-tech operations? How flexibly can the economy deal with the shock? How capable is the bureaucracy? These levels are also determined by the scope of external aid received and, finally, by the maturity of the insurance sector

Conclusions

1 In calculating the economic losses attributable to a natural catastrophe, care must be taken to avoid taking certain factors into account two or more times:
   - Direct losses can be determined from changes in stocks and from the effects on supply, demand, and income.
   - Indirect losses must be added, allowing for their multiplicator effects.
   - Since the financial markets reflect the actual consequences, it is unnecessary to take them into account again. Especially in relatively small economies, however, these markets may overreact due to the effects on the economy's balances of trade and payments, and the country risk.
   - The effects of a natural catastrophe on a country's balances of trade and payments cannot be determined with certainty.
   - It is possible that a natural catastrophe will even bring about an improvement in a country's foreign economic position.

2 Even the theoretical analysis provides some indication of the difficulties involved in empirically establishing the relationship between natural catastrophes and long-term economic development. The best results that may be expected are general statements regarding trends:
   - In relatively poor countries, natural catastrophes generally result in relatively large economic losses (in proportion to the GDP) Here, a substantial role is played by factors such as the efficacy of early-warning systems and the degree of risk exposure.
   - The longer-term consequences of a natural catastrophe are all the more grave, the more it is accompanied by an erosion of the country's political, social, and economic stability, and the less the economy (and especially the national bureaucracy) is capable of responding flexibly and efficiently
   - Well-established insurance markets can soften the impact of natural catastrophes on national economies by facilitating internal redistribution and more rapid reconstruction The participation of the international reinsurance industry can alleviate pressure on the country's balance of payments. Any evaluation of the long-term consequences of natural catastrophes therefore underscores the overall significance of insurance for national economies

IMF Emergency Assistance Related to Natural Disasters

Country	Year	Event	Loan (US$ m)	Economic losses (US$ m)
Egypt	1962	Crop failure	24.00	n.a.
Macedonia	1963	Earthquake	30.00	600
India	1966	Drought	187.50	n.a.
Nicaragua	1972	Earthquake	16.00	800
Chad	1974	Drought	3.80	n.a.
Dominican Republic	1979	Hurricane	31.40	1,000
Dominica	1979	Hurricane	1.35	n.a.
St. Lucia	1980	Hurricane	2.42	235
St. Vincent and the Grenadines	1980	Hurricane	0.54	n.a.
Yemen, P.D.R.	1982	Floods	20.74	90
Yemen, Arab Republic	1983	Earthquake	13.20	n.a.
Mexico	1985	Earthquake	392.51	9,500
Madagascar	1986	Cyclone	21.55	150
Solomon Islands	1986	Cyclone	1.75	20
Ecuador	1987	Earthquake	50.78	1,100
Bangladesh	1988	Floods	96.83	1,200
Jamaica	1988	Hurricane	49.03	n.a.
Pakistan	1992	Floods	255.39	1,000
Bangladesh	1998	Floods	132.14	4,300
Dominican Republic	1998	Hurricane	53.47	1,000
Haiti	1998	Hurricane	20.47	n.a.
Honduras	1998	Hurricane	63.98	3,795
St. Kitts and Nevis	1998	Hurricane	2.15	400
Turkey	1999	Earthquake	501.00	12,000

Countries affected by natural catastrophes are supported by loans from the International Monetary Fund, as in the case of Turkey, which received US$ 501m following the 1999 earthquake.

1999 winter storms Anatol, Lothar, and Martin 05

Lothar caused severe damage particularly in France. Millions of trees were uprooted, antennae and roofs were ripped off by the score. Numerous places were without electricity for several weeks.

Impact on markets and windstorm modelling

About ten years elapsed between the last major series of gales in January/February 1990 and the three major loss events in December 1999, Anatol, Lothar, and Martin. The bills presented to the insurance industry by these two windstorm series were similar: Daria, Herta, Vivian, Wiebke, and four other windstorms in 1990 generated insured losses equivalent to €8,800m (original values); the three gales in 1999 cost the insurance industry €10,400m.

Does this mean that the extent of loss in 1999 was foreseeable in the light of the experience in 1990? And wasn't it in fact the events of 1990 – with a new dimension of loss at the time – that had had such a decisive impact on windstorm modelling developments in Europe and established a better data basis? How has the insurance industry reacted to these developments? This article will throw light upon these three questions.

Were the losses generated by Anatol, Lothar, and Martin unexpected?

Meteorological aspects:

Winter storm catastrophes are not uncommon in Europe. Each year, in fact, around 150 to 200 low-pressure systems over the North Atlantic have a central pressure of less than 970 hPa (mb), so that winds regularly attain gale force (8 or above on the Beaufort Scale, meaning at least 63 km/h). Only a very small minority of these windstorms actually reach the British Isles and the European continent, however. Particularly in relatively mild winters, when there is only a very slight snow cover over central and eastern Europe, windstorm activity is more pronounced in western and northwestern Europe because the blocking effect of the eastern European cold high-pressure system is missing. With a continued rise in mean global temperatures in the atmosphere (as a result of global warming), the frequency of these weather situations is likely to increase, and windstorms that used to be classed as rare events on the basis of historical meteorological data will have to be reviewed in terms of their "return periods". The practical significance of this for the insurance industry may be formulated in simple terms as follows. A forward-looking, cautious assessment of the windstorm hazard in Europe must in the medium term be based on the assumption of an increase in the probability of windstorm catastrophes.

Windstorm losses:

The loss generated by the 1990 series of windstorms has been the subject of in-depth examinations carried out in and for the insurance industry. These studies produced for the first time a definite correlation between windstorm intensity (wind speed) and insured losses for various risk classes and various European countries. Munich Re received the required data directly from its clients and published the results of these loss analyses in "anonymous" form in its exposé "Winter storms in Europe". In 1999 the gales Lothar and Martin provided further comprehensive and indicative loss data for France and Germany which can be compared

Satellite image of Lothar on 26th December 1999. When this picture was taken the centre of the low-pressure vortex had already reached the southwest of Germany. Source: Deutscher Wetterdienst (DWD)

Preparations for the great millennium festivities had already been completed in many places when Lothar and Martin went on the rampage shortly before the New Year. Festival grounds and tents – as here in Munich – were devastated. Countless events were insured against cancellation.

directly with the 1990 experience. Anatol provided new and very detailed loss data for Denmark, which was only marginally affected in 1990.

This overview already supplies part of the answer to the first question:

- Combining the mentioned loss parameters from 1990 with the insurers' portfolios and the actual wind fields of the 1999 windstorms produces an extent of loss that may on no account be considered "unexpected" on the basis of the loss history to date.

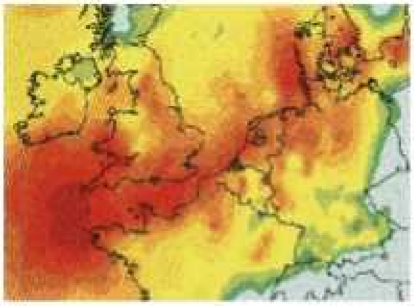
- Only in regions with – for European conditions – high wind speeds (> 140 km/h) were some of the reported losses larger than those derived from extrapolations using historical data.

A complete answer to the question of ranking the 1999 windstorm losses must also include an evaluation of the occurrence probability ("return period") of the loss amounts in the countries affected and an estimate of loss probabilities from Europe-wide accumulation scenarios (which is of great significance to a reinsurer operating on an international scale). As mentioned under "Meteorological aspects", if climatic conditions change, the exclusive use of data from the past may produce assumptions of future windstorm activity in Europe that are quite false and, in particular, much too optimistic.

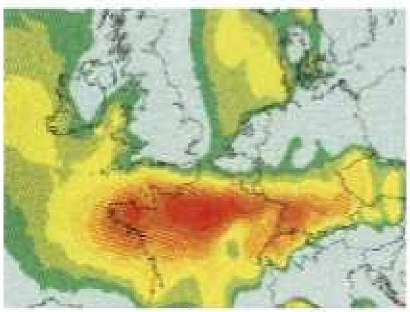
As far as the insurance industry is concerned, this is a typical example of the risk of change and affects two core aspects of underwriting:

- Premium calculation (pricing): A calculation of the risk premium rate (burning cost rating) will lead to the risk premium being too low if the frequency of windstorm losses increases.

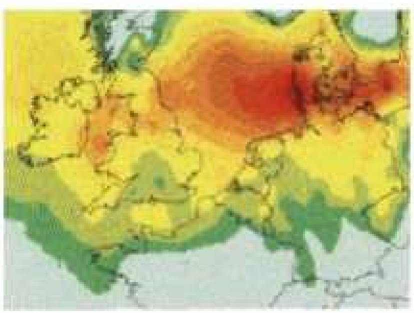
- Accumulation loss potential. Within the short timeframe of a few decades for which there is reliable meteorological data, extreme windstorms over the European continent have only been observed – if at all – on rare occasions in some regions. Consequently it is difficult or even impossible to make a statistical estimate of occurrence probabilities for accumulation losses. Alternatively, however, the accumulation loss potential for insured portfolios may be estimated using the definition of hypothetical wind field scenarios and their "return



Wind field of Daria in 1990. With an insured loss of around €4,400m the costliest windstorm catastrophe in Europe to date at that time.



Wind field of Lothar in 1999. Insured loss throughout Europe of €5,900m, including €4,500m in France alone.



Wind field of Anatol in 1999. With an insured loss totalling €2,000m an "only" moderate loss event in northern Europe. But for the Danish insurance industry (losses amounting to around €1,800m) it was a major catastrophe, for which few market players had sufficient reinsurance protection.

Wind speed in gusts (km/h)

< 70	100–109	140–149
70–79	110–119	150–159
80–89	120–129	160–170
90–99	130–139	> 170 km/h

periods" using meteorological boundary conditions and statistical analyses.

The Geoscience Research Group at Munich Re has applied this method for years as a means of calculating loss probabilities for windstorm events in Europe. The losses generated by Lothar and Martin confirmed these estimates particularly in France and Germany – as did the losses generated by Anatol in the case of Denmark (for more information on this, please refer to our exposé "Winter storms in Europe").

- France:
  A windstorm market loss of €4,500m or more (roughly corresponding to the insured loss from Lothar in France) is to be expected once in 60–80 years

- Germany:
  A windstorm market loss of €700m or more (roughly corresponding to the insured loss from Lothar in Germany) is to be expected once in 6–10 years

- Denmark:
  A windstorm market loss of €1,800m or more (roughly corresponding to the insured loss from Anatol in Denmark) must be expected once in 60–80 years.

Conclusion: None of the three windstorm catastrophes of 1999, Anatol, Lothar, or Martin, produced insured losses that should be considered "unexpected" in terms of the amount involved or their occurrence probability.

The impact on loss modelling

Following the windstorm catastrophes of 1990 the European insurance industry stepped up its use of software (in-house developments and commercial windstorm models) to simulate historical and hypothetical/stochastic windstorm events. A major part of this development took place in the second half of the 1990s, so that the models used largely incorporate the loss experience (loss parameters) from the 1990 winter storms. Nevertheless, there are wide differences in the evaluation of the occurrence probabilities of windstorm fields, which is essential for the calculation of accumulation loss potentials. This is illustrated in exemplary fashion by the losses generated by Lothar in France. The "return periods" produced by commercially available models for an insured windstorm loss in France of €4,500m or above range from about 70 to 400 years (a factor of 5.7!).

There are three main reasons for the large differences between these evaluations:

- a distinct tendency to base stochastic wind fields on historical events,
- little or no consideration of the risk of change in terms of windstorm activity, and
- differences in the estimates of exposed sums insured using alternative parameters like numbers of policies, rooms, or living spaces.

Exposure to windstorm in Europe – Comparison of 1999 data and 1990 loss experience

	Loss ratio[1]	Average loss[2]	Loss frequency[3]
Denmark	Directly comparable data for 1990 only partially available; 1999 loss ratios somewhat lower than 1990 in UK but mostly much higher in Germany or Switzerland.	Average losses within the expected range.	In all risk classes comparable with the 1990 experience in other European countries.
Germany	Very good comparable data on 1990 losses available; Lothar reveals important fact: at high wind speeds loss ratios rise more steeply than extrapolated on the basis of 1990 data.	Average losses considerably higher than in 1990, but within the expected range.	Comparable with the 1990 loss experience/extrapolations.
France	Lack of direct information on sums insured restricts possibility of comparing 1999 and 1990; 1990 loss experience tends to be confirmed, but higher loss ratios observed in 1999 at high wind speeds.	Average losses considerably higher than in 1990, but in the expected range.	At average wind speeds comparable with the 1990 loss experience; at high wind speeds considerably higher loss frequencies than extrapolated using the 1990 data.

[1] Loss ratio = loss divided by sum insured as a function of wind speed
[2] Average loss = total loss amount divided by number of losses as a function of wind speed
[3] Loss frequency = number of losses divided by number of risks or policies as a function of wind speed

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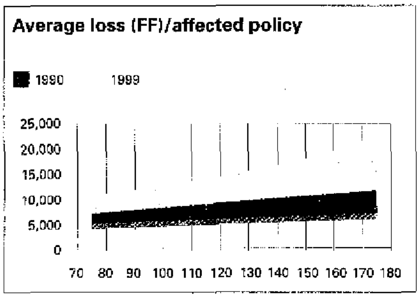
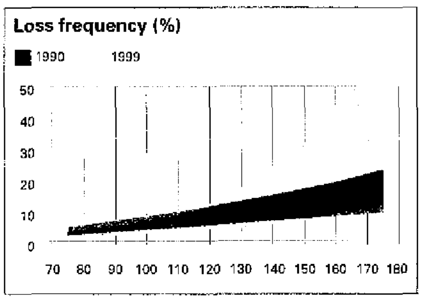
The numerous losses generated in France, Germany, and Switzerland by the winter storm Lothar came to US$ 11.1bn, of which US$ 5.9bn was insured. This is the costliest windstorm catastrophe (single event loss) of all time in Central Europe.



France: Comparison of average losses under "risques particuliers" (residential buildings/contents) from the gales Herta (1990) and Lothar (1999)



France: Comparison of loss frequencies under "risques particuliers" (residential buildings/contents) from the gales Herta (1990) and Lothar (1999)

If we exclude the last named reason (since it only applies to countries in which insurers rate risks and assess accumulation on the basis of factors other than the sums insured), we may identify a central problem in windstorm modelling in Europe: the infancy of scientific investigation into the windstorm hazard in Europe as compared with, for example, earthquake research in the United States. Meteorological institutes and official met offices have been very slow to recognize the need for research and services in the field of windstorm in Europe.

Windstorm models for Europe therefore currently represent the results of the developers' own meteorological analyses and interpretations; and so there is no general scientific consensus by and large. This means that only relatively large windstorm catastrophes provide the chance to modify individual assessments.

Consequently, this often means that in countries with major losses in the recent past an adjustment has been made in the direction of more conservative, i.e. higher accumulation and risk price estimates. This was observed, for example, in the wake of Anatol, Lothar, and Martin in the countries mainly affected by these windstorm catastrophes.

If the reinsurers had used the "old" windstorm models consistently for risk pricing before the catastrophes of December 1999 and if they now priced their risks just as consistently using the revised ("more expensive") versions which involve a more conservative risk assessment, the situation for them in the future would be as follows:

- The risk premiums for the reinsurance protection would increase from a level that is considered technically insufficient to a level that may now be considered on a long-term average commensurate with the risk if the 1999 losses are taken into account.

- Only for newcomers in covering the windstorm risk, e.g. in France or Denmark, would there be a chance – assuming a now technically correct risk premium – of achieving a balanced result in the long term.

The insurance industry's reactions to the 1999 winter storms

For many insurers the 1999 winter storms were more than just an "ordinary" major loss. After settling the losses, there was no way of simply resuming business as usual. The reactions of the market players have essentially focused on two central aspects:

- reassessing reinsurance requirements for accumulation losses and risk premiums to cover the windstorm risk, i.e. examining the accumulations of liability assumed (establishing or improving systems for accumulation control), re-calculating the accumulation PMLs (considering a possible risk of change in the windstorm hazard), and

– developing new quotation tools with prospective risk assessment elements (price calculations incorporating the windstorm risk to be expected in the future).

Also, the dialogue between scientists and risk carriers with regard to the windstorm hazard in Europe has been stepped up. Meteorological and climate data are increasingly being recognized as the technical basis for mathematical and scientific models for risk evaluation.

Whether these positive reactions to the catastrophe events of 1999 on the part of the insurance industry are to be considered lasting, will be revealed by the competitive situation in the years to come. Endeavours to demonstrate to clients the enduring and constantly improving proficiency of the insurance industry, even under the burden of large claims, should not be allowed to become a game of chance.

Loss potentials from winter storms in Europe*
Return period: 100 years

Region/country	Insured market loss in €m
Europe	20,000–25,000
Denmark	2,500–3,000
Germany	4,000–5,000
France	6,000–8,000

*(only the countries mainly affected by the 1999 winter storms)
The stated windstorm loss potentials are based on analyses using the Munich Re's windstorm model "MRStorm" and our own estimates of insured liabilities
Data December 2000 (market liabilities, meteorological data, loss parameters)