HORUS

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Risk Transfer to the Capital Market - Using the capital markets in Insurance Risk Management

Insurance Derivatives - Convergence of Capital Markets & Insurance Markets

Two Publications of Munich Re

ART has succeeded in establishing itself as a viable source of innovative solutions, complementing traditional risk transfer and financing techniques. Furthermore, the following global trends apparent in the insurance industry will continue to favor alternative reinsurance concepts with respect to acceptability, market share and product innovations:

1. Focus on shareholder value
2. Deregulation and consolidation of insurance markets
3. Higher risk retention and restructuring of reinsurance programmes
4. Innovative risk management
5. Desire to get away from cyclical pricing
6. Shortage of capacity for certain types of risk
7. Transparent accounting and disclosure of earnings volatility
8. Convergence of insurance and capital markets

Alternative risk transfer and financing techniques, as we see them today, basically fall into the following categories:

Risk financing instruments

- Contingent capital ((contingent liquidity))

Risk transfer instruments

- Securitization of insurance risks by way of bond issue
- Insurance derivatives

Although there is no generally accepted definition of ART, alternative risk transfer and financing concepts and techniques can be differentiated as per the following criteria or (dimensions):

1. Goal - risk financing vs. risk transfer
2. Market - insurance markets vs. capital markets
3. Products - reinsurance and financial structures
4. Risk type - insurance vs. holistic risk

Based on this solution-oriented rather than product-oriented approach, the various concepts and techniques can also be embedded in the overall spectrum of traditional and alternative risk transfer tools that access insurance as well as capital markets and deploy reinsurance as well as

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HORUS Newsletter been prepared and Edited By

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financial structures.

Natural catastrophes reached new record levels in the 90s both in terms of loss amounts and intensity. The discrepancy that this brought to light between economic and insured values, capacity and price fluctuations on international reinsurance markets, as well as doubts regarding the ability of certain catastrophe (re)insurers to pay claims following a major natural catastrophe are making it important to look for alternative methods of risk transfer and to take advantage of the nearly inexhaustible capacity offered by the global capital markets. A broad spectrum of new financial market instruments such as risk bonds, futures, swaps and options are proving to be suitable instruments for risk transfer to the capital market. The volatility of available reinsurance capacity and reinsurance prices make capital market solutions appear to be attractive hedging alternatives for insurance risks.

In the wake of and in response to Hurricane Andrew in 1992 and to the Northridge earthquake in California in 1994, which caused insured losses amounting to US$ 18bn and 11bn respectively, the first attempts were made to transfer catastrophe risks to the capital market.

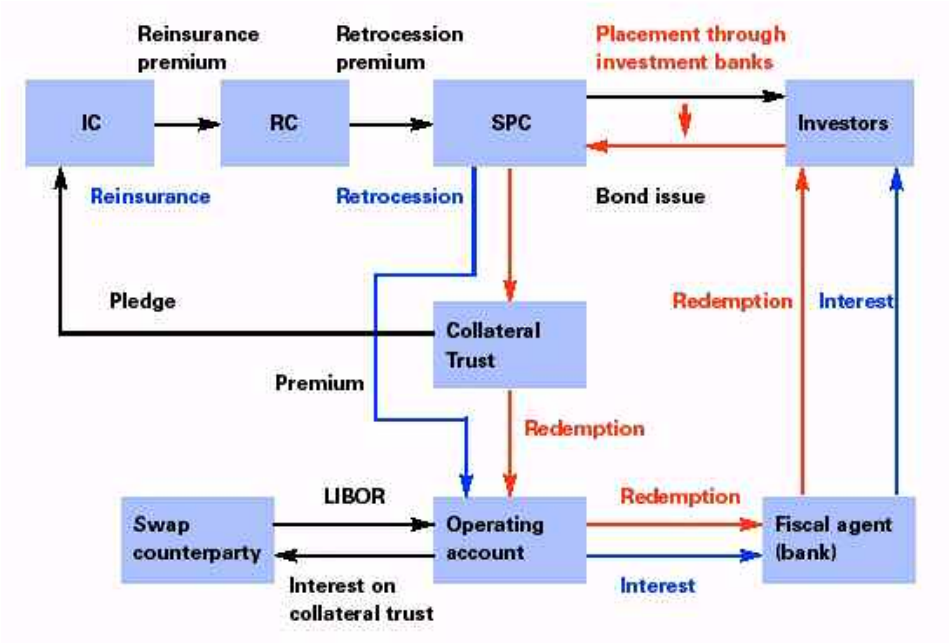
One of the first steps in implementing financial markets as supplementary instruments for dealing with insurance risks was taken on the Chicago Board of Trade (CBOT) with the development of insurance derivatives such as futures and options for natural catastrophe risks in the USA. At the same time, the first bonds securitizing insurance risks came onto the market. After early attempts were made with smaller volumes issued, it became possible to also place larger volumes, i.e. from US$ 100m to US$ 500m, on the capital market as from 1997/98.

For several years now capital markets have been providing insurance companies with limited capital via so-called contingent capital programmes for the event of a natural catastrophe and loss of equity. This process merely involves providing capital which is repaid to the creditors or investors after expiry of the contingent capital transaction (no transfer of the insurance risk, just pure financing). Insurance securitization, i.e. the securitization of insurance risks and the transfer of risks to the capital market via bonds and derivatives has only been widely used as an instrument for covering insurance risks since 1997.
Insurance securitization is giving insurers access to the capital market as a new additional source of capacity to supplement traditional reinsurance.
As insurance risks do not correlate with other investment classes, insurance risk bonds as well as insurance derivatives and contingent capital programmes provide investors with means for diversifying their investments.

First - Insurance securitization by means of bond issues

With the most common insurance securitization model via an insurance risk bond, the insurer, acting as the sponsor of the transaction, concludes a reinsurance agreement with the reinsurer, who then cedes the risk to a special purpose reinsurance company (SPC) under a retrocession agreement. This SPC covers any liabilities from the retrocession agreement by issuing a bond.
The proceeds from the bond issue are invested in top-quality bonds through a collateral trust. Management of the collateral trust is in the hands of a trustee whose task is to ensure the proper administration and use of the trust assets. The assets of the collateral trusts serve as a guarantee for any liabilities on the part of the SPC arising from the retro-cession agreement and thus allow top security rating (AAA) of the cover for the insured.
The investment income from the collateral trust should be based on a reference interest rate, such as the London Interbank Offering Rate (LIBOR). This is made possible by means of an interest rate swap between the trust and a swap counterparty, which swaps the investment income rate from the collateral trust for the LIBOR rate and thus ensures a fixed interest rate for the investors. The reinsurance and retrocession premium rate is passed on to the investors as a spread over LIBOR and offers the investors an incentive to invest in this bond (the below figure shows the flow chart of such a securitization transaction).
Insurance risk bonds can have different structures:
In the case of principle-at-risk bonds, the entire nominal value serves as liability. Liability can, however, also be restricted to the interest payment, as is the case with principle-protected bonds. In such a case, the nominal value of the bond is repaid to the investor five to ten years after a loss event. If a loss occurs, only a portion of the bond serves as liability.
The other portion is invested in discounted (zero-coupon) bonds, which are paid back at par after five to ten years, thus securitizing repayment of the bond at nominal value.
The basis for cover can be the actual loss sustained by the cedant (insurance portfolio), a loss index or a parametric trigger.

Insurance securitization by means of bond issues



Second - Insurance derivatives

Insurance derivatives, which transfer insurance risks to the capital market and which, in contrast to insurance risk bonds, do not provide prior liquidity to safeguard the maximum liability, can be structured as swaps or options. The basis for such a transaction may be a market loss index (e.g. the PCS index of the Property Claims Service in the USA) or a parametric trigger. A market loss index reflects the losses incurred in the insurance industry after a natural catastrophe. A parametric trigger links the trigger of cover to a natural catastrophe, which must comply with precisely defined and transparent criteria in terms of severity (magnitude of earthquakes, wind velocity or air pressure for windstorm).
The Chicago Board of Trade has for several years now been trading in standardized option contracts on the basis of market loss indices for nine regions in the USA with coverage periods of up to one year. Through the option contracts, participants can buy or sell covers against natural catastrophes in the USA (hurricanes, earthquake). The option premium here corresponds to the reinsurance premium. In addition to insurers and reinsurers,
other financial institutions such as investment banks or unregulated funds can also be active in this sector. As the volume traded is still relatively low, this market cannot really be described as being particularly liquid at this stage.
Outside commodity exchanges, derivatives are negotiated and agreed upon between the parties on a case-by-case basis. These are referred to as over-the-counter (OTC) derivatives.
With an OTC insurance swap or an option, the cedant pays the investors a premium and receives indemnification in the event of a loss. From a purely technical point of view, this construction is comparable to a standard (re)insurance contract. The cedant acts as the option buyer, the investor as the option seller. The option seller receives an option premium (fixed-rate payment) in advance from the cedant (option buyer), which is comparable to an insurance premium. The option can be exercised when an agreed market loss index level is exceeded or a parametric trigger occurs. The option buyer receives the fixed nominal amount as (compensation) or (indemnification) (floating-rate payment).
The option buyer does not require proof of an insured interest or the occurrence of a loss event for payment from the derivative. The deciding factor is merely the point at which the agreed market loss index level is exceeded or a parametric trigger comes into effect.
The option can also take the form of a second-event cover under which the option buyer receives coverage at a previously fixed price if an agreed market loss index level is exceeded or a parametric trigger comes into play and the option is exercised.
Similar risks can be swapped without payment of a floating rate or option premium on the basis of a risk swap. In this way, the over-exposure of one party in a risk class can be ceded or swapped for another risk class that is underrepresented in the insurance port-folio.
This allows a multi-dimensional diversification effect (risk-class, region) and produces a more efficient risk portfolio. For example, it would be possible to swap the US windstorm risk for the Japan windstorm risk or the Californian earthquake risk for the Tokyo earthquake risk, assuming that these have the same probability of loss and identical exposure (nominal value). Existing insurance risk bonds provide a perfect basis (underlying index) for risk swaps.
The legal basis of insurance derivatives are standard specimen agreements developed by the international Swap and Derivatives Association (ISDA), which are in general use for financial derivatives.

Insurancer derivatives: OTC swap/option

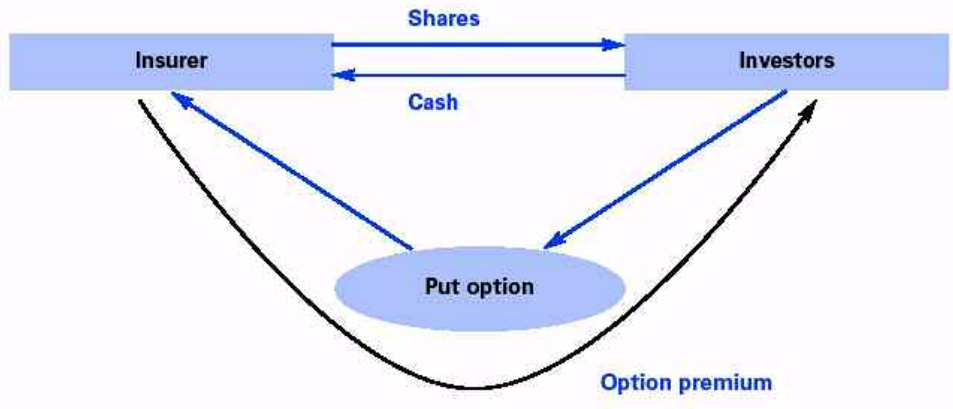
Insurance derivatives versus insurance risk bonds

A fundamental advantage of insurance derivatives is that they are much quicker and easier to structure and realize than securitization by way of a bond issue.
The transaction costs are well below those involved in a bond issue.

On the other hand, a bond can cover greater volumes than a derivative.
However, insurance derivatives harbor a partner risk (counterparty risk), which manifests itself when the investors cannot meet the indemnification payment. The options or swap premium is paid in advance as with an insurance premium; the counter payment or indemnification payment is made only after the occurrence of a given event. With a bond securitization, on the other hand, the proceeds from the bond issue are available in advance in the collateral trust as a liability mass and thus enable best solvency (top security AAA) for the risk-ceding primary insurer.

Third - Contingent capital (liquidity) programmes
Following the occurrence of major losses, e.g. a natural catastrophe accompanied by a loss of equity capital, contingent capital (liquidity) programmes offer insurance companies capital support in the form of surplus notes or preference shares. Within this structure, which incorporates an equity put or surplus put option, the cedant (option buyer) pays a premium to acquire the right to sell surplus notes or preference shares to investors in the event of a specifically pre-defined natural catastrophe and the loss of equity capital. The option can be exercised after the occurrence of a natural catas-trophe. Investors purchase the shares or the surplus notes with a cash payment. In many cases, reinsurers also act as investors and, in this way, make additional and alternative capital available.

Contingent capital/liquidity
Catastrophe equity put arrangement = equity put

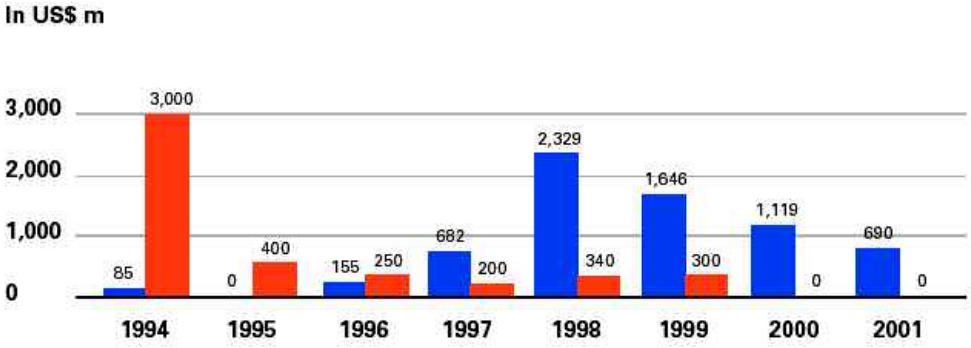


- The insurer buys the right to issue preference shares to investors in the event of a catastrophe (put option).
- The option to purchase shares can be exercised with a cash payment.

In contrast to insurance risk bonds, investors in contingent capital programmes provide their capital only after a loss event. This capital is repaid when the term of the transaction expires.
In the case of insurance risk bonds, the capital is made available by the investors before the loss event, the capital is managed in the collateral trust during the term of the transaction and, in the event of a loss, it serves as a liability mass which is completely lost in the worst case.

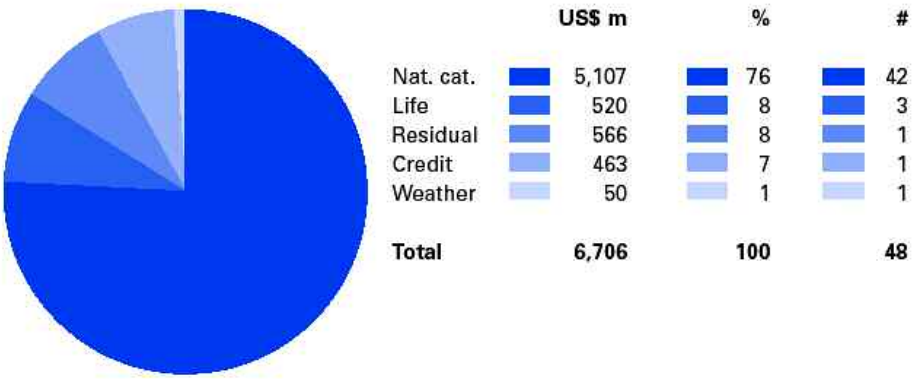
The transfer of insurance risks to the capital market and the financing of insurance risks through the capital market is still a very young field of business. The volume of all capital market transactions carried out since 1994 exceeds US$ 13bn.
The initial focus was on risk financing through the capital market (contingent capital/ liquidity), whereas, risk transfer to the capital market began growing in significance as from 1997. Within the framework of more than 50 bond transactions, an insurance capacity of more than US$ 6.5bn has been generated on the capital market.

Capital markets - Risk financing and transfer



In the securitized risk classes, there is a clear focus on natural catastrophes (placement volume exceeds US$ 5bn). In other risk classes such as life, credit, weather or residual value insurances, individual, large-volume transactions dominate.

Risk securitization - Total volume and number of deals



	US$ m	%	#
Nat. cat.	5,107	76	42
Life	520	8	3
Residual	566	8	1
Credit	463	7	1
Weather	50	1	1
Total	**6,706**	**100**	**48**

In the past, it has essentially been risks with a low probability of occurrence and a high loss potential that have been transferred to the capital market. The probability of loss occurrence is, as a rule, less than 1% for such transactions, the rating between BB and BBB.
Natural catastrophes will continue to be the focus of securitization of insurance risks in future as well. Due to their relatively short run-off periods and the possibility of illustrating the risks within the framework of a transparent parametric trigger or market loss index structure, natural catastrophe risks are perfectly suited for securitization. In addition to this, it is the domain of natural catastrophes that is most strongly affected by capacity and price fluctuations.
In the face of a hardening reinsurance market and an increase in capacity shortages, the capital market will have to prove that it can effectively generate additional and alternative capacity in the long run.

The Role of Reinsurers

Reinsurers support their clients in the transfer of insurance risks to the capital market, functioning as a structurer and project manager, drafting and putting capital market solutions into practice.
As a reinsurer, Reinsurers can assume important functions in insurance securitization and insurance derivative transactions that have a decisive effect on whether the transaction is a success or not.

Structurer and project manager
As a professional reinsurer, Reinsurers act as a consultant to its clients for all products, from traditional reinsurance to complex capital market solutions. It is from this position that Reinsurers provide client support in securitization transactions as a structurer and project manager. Reinsurers thus assure their clients direct access to the capital market.

Fronter and transformer
A reinsurer is needed as a fronter and transformer in insurance securitization transactions to ensure that the reinsurance premium is tax deductible and that supervisory regulations are adhered to.

Risk evaluation
For each insurance securitization transaction, an insurance risk must be written by a specialist risk carrier before it can be transferred to the capital market. The underwriting process embraces the analysis and evaluation of the underlying risk or risk portfolio. It is most advantageous to have the reinsurer involved in the transaction perform the under-writing function here.

Risk assumption
The aim of insurance securitization is to have institutional investors assume a risk. In some cases however, reinsurers involved in the transaction must also assume a part of the risk in order to guarantee the viability of the transaction and hence its success.
The reinsurer can thus assume the basis risk in a securitization transaction, as well as the currency risk.
The basis risk can always be assumed in cases in which the bond issue has an index or a parametric trigger as a basis for indemnification and the reinsurer concludes the reinsurance agreement on the basis of the actual loss.
In addition to this, the reinsurer can also assume the currency risk if the bond issue and the reinsurance agreement are based on different currencies.

Reinstatement
In contrast to conventional reinsurance, securitization transactions do not provide for any reinstatement or continuation of the cover following the occurrence of a loss event. The cover is exhausted with the depletion of the available assets in the collateral trust.
A reinsurer, however, may extend the scope of cover by means of a reinstatement.

Loss adjustment
The reinsurers experience in the loss adjustment process can prove to be another important factor in a securitization transaction.

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Natural Catastrophes and Man-made disasters in 2001: Man made losses take on a new dimension

Sigma Publications by Swiss Re

Summary

Man-made losses take on a new dimension

At USD 34.4bn. the burden on property insurance due to catastrophe losses was extremely high in 2001 , with an estimated USD 1 9bn incurred by property and business interruption losses arising from the terrorist attack of 11 September. Furthermore, the insurance industry is having to cover liability and life insurance losses related to the attack which are estimated at USD 1 6.5-39bn.
As regards property and business interruption losses, which we deal with on the following pages. 2001 was only just surpassed as the worst in insurance history by 1992 (Andrew) and 1999 (winter storms in Europe, eg Lothar) While in 1992 and 1999 the record losses were due to natural catastrophes. in 2001 it was the man-made losses that weighed heaviest on the insurers books.

Of the USD 34.4bn in insured losses. USD 24.4bn was attributable to manmade and USD 1 bn to natural events. Without the 11 September terrorists attack, 2001 would have been just an average loss year: the storm-related losses amounted to about USD 7.2bn. Those caused by earthquakes lay around USD 0.6bn. While losses due to flooding totaled a mere USD 0.O7bn. Not counting the terrorist attack, fire and explosion losses amounted to USD 3.7 bn, aerospace losses to USD 1.1 bn.

In the 315 events recorded by *sigma.* More than 33 000 people lost their lives; the earthquake in Gujarat (India) in January alone accounted for at least 1 5 000 fatalities, the terrorist attack of 11 September over 3000. Apart from the 11 September attack, the total financial loss from which is difficult to quantify. further events caused economic losses in the billions - among them tropical storm Allison (USD 5.Obn), the Gujarat earthquake (USD 4.Sbn) and the Code Red computer worm (USD 2.6bn).

In the long term, it is especially storms, floods and earthquakes that impact the insurance industry - for this reason, it is crucially important for reinsurers and investors alike to be able to diversify the natural catastrophe risk. An analysis oi historical sigma data indicates that geographic diversification significantly reduces the risk, but that diversification with investment portfolios can help to diminish the risk still further.

In the light of the risk factors in evidence worldwide - increasing population densities, higher concentrations of values especially in exposed regions - the trend towards higher losses continues unabated. Add to this the new dimension of large-scale terrorist attacks with their high and complex loss potentials. Direct insurers and reinsurers have taken up the challenge and have developed new approaches: re-assessing insurability and offering special terrorism covers with initial government involvement.

Catastrophes in 2001: record losses in property insurance, over 33,000 fatalities in all

Number of catastrophes running high since 1 987

Since the late 1 980s. the number of catastrophes has been high at more than 250 natural catastrophes and man-made disasters per year. A major part of these are road and shipping accidents, major fires and aerospace incidents. In the year under review, *sigma* reported 315 major losses; of these, 111 were attributable to natural catastrophes and 204 to man-made disasters.

Were it not for 11 September. The economic losses of the year 2001 would have been below the average of the costly loss years since 1987. (The overall economic loss due to the terrorist attack is not taken into consideration here, as its indirect adverse consequences are extremely difficult to quantify.) Economic losses in the billions were caused by tropical storm Allison in the US (USD 5.0bn), by the earthquake in India (USD 4.Sbn). The drought in Iran (USD 2.5bn) and the earthquakes in El Salvador (USD 1 .5 bn) and in the US (USD 1 .Obn). Manmade events likewise caused economic losses in the billions, for instance, the Code Red computer worm (USD 2.6bn) or the explosion on oil rig (USD 1 bn).

High death toll - the earthquake in Gujarat in January 2001 alone claimed 1 5 000 fatalities

Over 33 000 people lost their lives in the events recorded by *sigma.* The terrorist attack on 11 September claimed over 3000 victims. But as in previous years. natural catastrophes again took a high toll: more than 1 6 000 people died in 1 3 earthquakes. 15000 in the Gujarat (India) quake alone. Almost 4000 people perished in floods and over 2 000 were killed in storms. (Annex. The 20 worst catastrophes in terms of victims in 2001.)

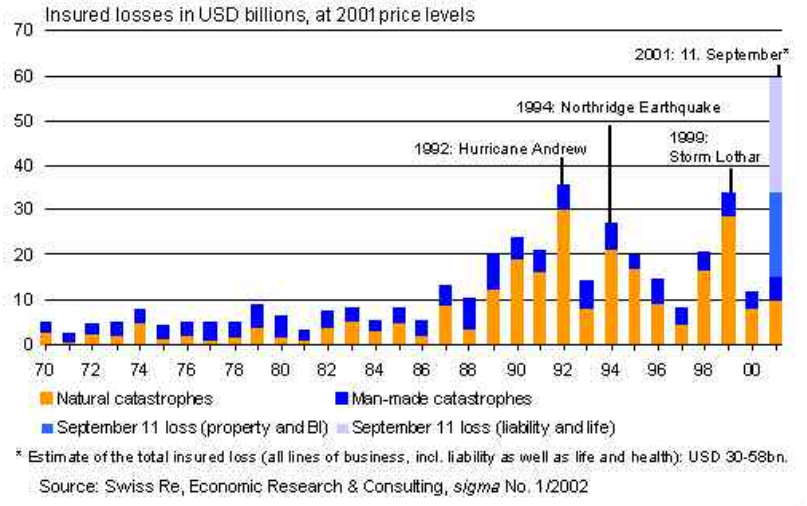
Insured losses in 2001: a new record in man-made disasters

The insured loss caused by large-scale events in 2001 amounted to USD 34.4bn - of which USD 10 bn were due to natural catastrophes and USD 24.4bn to man-made disasters. The property and business interruption losses caused by the terrorist attack of 11 September - not to mention the liability and life insurance losses - are estimated at USD 1 9bn. Which makes the terrorist strike the highest property loss ever in the history of insurance. For the sake of comparison, the previous most costly man-made property losses were: the explosion on the Piper Alpha oil rig in 1 988 (USD 3.0bn) and an explosion in a petrochemicals plant in Texas in 1989 (USD 2.9bn; both figures indexed to 2001). For the first time since the 1990s, when natural catastrophe losses clearly decided the worldwide property insurance balance, the technical losses tipped the scales in 2001 with a share of well on 70%. (Annex, The 20 most costly insurance losses in 2001.)

Regional focus of insured losses in 2 1: Europe and US

The US accounted for four-fifths of all insured losses worldwide, precisely because of 11 September and tropical storm Allison. For Europe the figure was just on 9% - mainly due to an explosion in a fertiliser factory in France. Asia bore about 6% of the insurance burden - especially because of the typhoons Nan and Danas (Taiwan. Japan) but also as a result of a major fire in Taiwan. The Asian region was once again the region with the highest proportion of victims, accounting for approximately 70% of the total; but the US also recorded a large number of disaster victims in the year.

Insured Losses: trends since 1970



Averaging USD 8.9bn per year. Storms have been the most serious cause of loss since 1 987. followed by earthquakes (USD 1 .6bn) and floods (USD 0.8bn). However, the losses of USD 0.O7bn attributed to flooding in the year under review appear to be particularly low. This is because floods often occur in the wake of a storm, so that the losses they cause are attributed to the storm itself - for example, in the case of tropical storm Allison in the US. where the secondary flooding caused about 90% of the insured loss. The absence of further billion-dollar insured losses due to natural catastrophes in 2001 is completely fortuitous.

Outlook

The scale of the natural catastrophes and man-made disasters recorded by *sigma* has been on the increase since 1 970 and reflects the growing loss potential due to

- higher population densities
- more insured assets in exposed areas
- higher concentrations of values worldwide.

Though the rise in insured losses is being curbed by preventive measures and higher deductibles, the *sigma* statistics nevertheless show that these mitigating measures are still being outweighed by loss increasing factors.

Natural catastrophes: risk diversification by reinsurers and investors

Geographic diversification

On average over the years. storms, floods and earthquakes are the most costly catastrophes - this holds true even taking into account the high man-made losses of the year 2001 . Storms, floods and earthquakes are the result of physical causes that are independent of each other: atmospheric pressure differences, uncontrollable masses of water, and geophysical forces, respectively. The only instance in which some limited interdependence can be observed is in the case of floods, which frequently

follow storms that have been accompanied by heavy precipitation. From the geographic aspect, too, natural catastrophes are independent of each other, provided sufficiently broad regional terms of reference are defined. For this reason, natural catastrophe risks can be relatively well diversified on a global scale. This applies to only a limited extent to the insured portion of natural catastrophe losses, as the insured values are spread extremely unevenly by region. International reinsurers are able to balance out a major part of the fluctuation in the loss burden due to natural catastrophes over the years. For example, in a given year the worldwide reinsurance premiums for natural catastrophes may be used to pay for a high loss in the US; in another year these premiums are available to pay for a catastrophe in Japan.

Geographic diversification also pays off in terms of the mean variation of the loss ratios.7 The mean loss ratio due to natural catastrophes has nearly doubled since 1990 compared with the previous period (1970-1989); for this reason, Table 3 shows only the values since 1990. The mean loss ratio due to natural catastrophes is highest in America at 2%. Followed by Asia and Europe. This is related to the higher concentrations of insured values in these regions. But is also a consequence of the greater exposure of these values in high-risk areas.

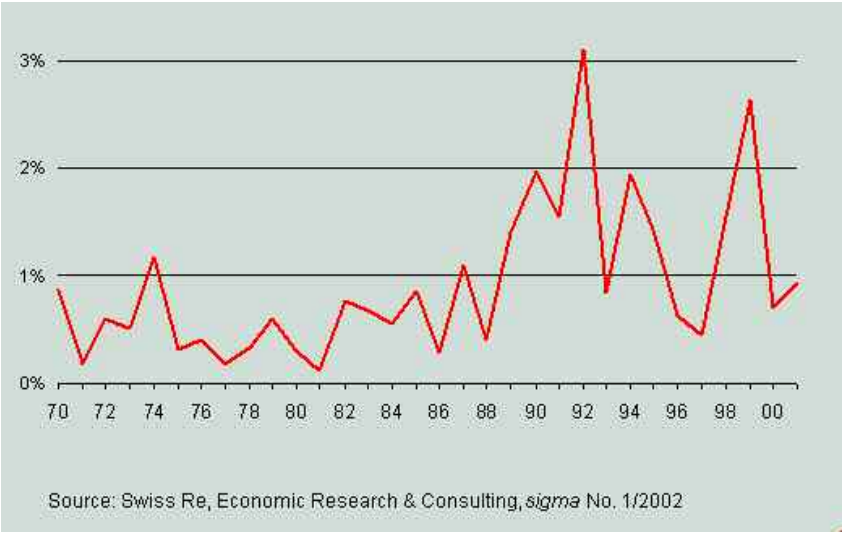
The mean variation of the loss burden due to natural catastrophes is significantly higher in the individual regions than in the case of an insurance portfolio that spans the whole world. While in such a global portfolio the variation of the natural catastrophe loss ratio amounts to only 56% of the mean (a variation coefficient10 of 0.56). In America the relative variation is as much as 87% of the mean, and in the other regions it even exceeds the mean by a clear margin. These statistics show that international diversification of the natural catastrophe risk, as practiced by international reinsurers, can significantly reduce the fluctuation in the loss burden from year to year. As international reinsurance only has to make available as much capital as is required for the global portfolio, its relative capital cost is lower than that for regional or single-country reinsurance solutions.

However, the natural perils harbor an enormous accumulation potential. As the loss peaks in the years 1992 & 1999 impressively show the various insurance markets are too different in size to permit. for example, the risk capital required for the American market to be reduced by diversification with insurance portfolios in Africa or Oceania. Cross-compensation between the larger regions of America. Asia and Europe works better, but still suffers from the fact that average losses in America in the past twelve years were three times higher than in Europe and more than four and a half time as high as in Asia. This indicates that the potential for geographic diversification also has its limits.

Absorption of fluctuation worldwide

Further options for balancing risk in the worldwide portfolio are diversification over time or diversification with investment portfolios which include not only insurance but also other risks. In the case of diversification over time, a few years premiums added together are sufficient to pay for the losses. However, there must be enough capital available to cope with fluctuation from year to year. Diversification with non-insurance risks is based on the fact that there is hardly any correlation between natural catastrophes losses and financial market parameters: whether a natural catastrophe causes a loss has little or nothing to do with a stock exchange index or interest rate levels.
Because this is the case, the variation of a portfolio of stocks and bonds can be reduced by mixing in catastrophe risks. For this reason, cat bonds - and other similar financial instruments - are ideal additions to an investor portfolio and can serve as a complement or a hedge for international reinsurance. At present, however, the cost of such capital market instruments is higher in most cases than that of traditional reinsurance. mainly because investors are not yet very familiar with these instruments and insurance risks appear to be far from transparent enough for the capital market.
For this reason. cat bonds are being increasingly linked to objective (parametrical) indices based on economic values; this makes it easier for the investor to assess the mostly quite minor probability of default.

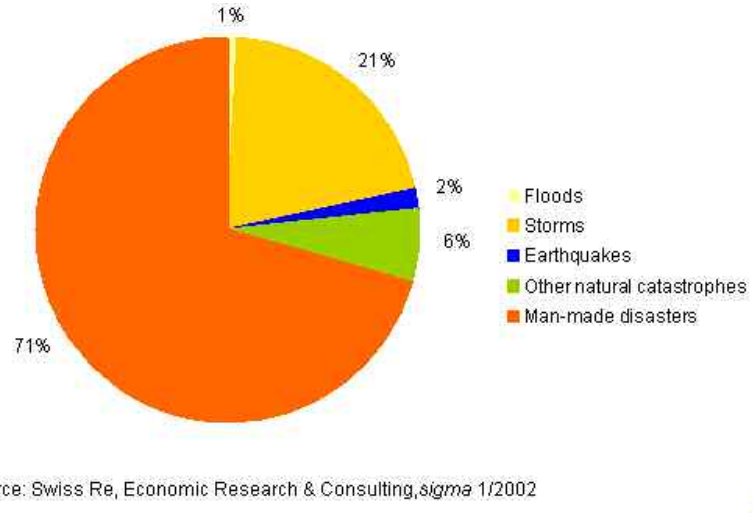
Insured natural catastrophe losses as % of non-life premiums 1970-2001



Annex

Number of victims as a result of natural or man-made catastrophes from 1970 - 2001

Victims by loss category from 1970 - 2001



Source: Swiss Re, Economic Research & Consulting, *sigma* 1/2002

The 20 worst catastrophes in terms of fatalities in 2001

Victims[1]	Insured loss[2] (in USD m)	Date	Event	Country
15 000	100	26/01/2001	Earthquake (moment magnitude 7.7) in Gujarat	India, Pakistan
3 000	19 000	11/09/2001	Terrorist attack on WTC, Pentagon & other buildings	US
886	-	10/11/2001	Torrential rain falls, severe flooding	Algeria
844	180	13/01/2001	Earthquake (moment magnitude 7.7), landslide	El Salvador, Guatemala.
396	-	15/08/2001	Heavy rain causes Mekong river to burst its banks	Vietnam, Cambodia
360	-	25/07/2001	Typhoon Toraji causes landslides and flash floods	Taiwan, China
350	-	20/10/2001	Boat carrying illegal immigrants capsizes	Indonesia
350	-	10/08/2001	Floods; damage to farmland, forests, infrastructure	Iran
320	-	07/11/2001	Tropical typhoon Lingling	Philippines
302	-	27/08/2001	Flash floods in Nigeria	Nigeria

291	-	29/12/2001	Explosion in fireworks shop	Peru
281	-	16/07/2001	Tin mine flooded	China
277	-	31/07/2001	Fierce storm triggers floods and landslides	Indonesia
274	-	13/02/2001	Earthquake (6.1. Richter scale)	El Salvador
265	44	12/11/2001	American Airlines Airbus 300 crash shortly after take-off	US
196	-	04/07/2001	Typhoon Utor with unusually large radius (350 km)	Philippines, Taiwan, China
178	-	18/06/2001	Floods; 2400 buildings damaged	China
177	-	10/08/2001	Typhoon Usagi; floods	China, Vietnam, Thailand
169	100	24/06/2001	Typhoon Chebi; rains, floods, landslides	China, Taiwan, South Korea
146	-	07/09/2001	Floods in Eastern India	India
145	60	23/06/2001	Earthquake (8.3 moment magnitude); tsunami	Peru, Bolivia

[1] Dead or missing

[2] Excluding liability losses

The 20 most costly insurance losses in 2001

Insured loss[1] (in USD m)	Vicitms [2]	Date	Event	Country	Non-life premium volume (in USD m, at 2001 price levels)	Loss as % of NL-premium volume
19 000	3 000	11/09/2001	Terrorist attacks on WTC, Pentagon and other buildings	US	463 481	4.10%
3 150	33	05/06/2001	Tropical storm Allison; rain, floods	US	463 481	0.70%
1 900[3]	-	06/04/2001	Hailstorms, floods, tornadoes	US	463 481	0.40%
1 357	30	21/09/2001	Explosion in fertiliser factory; 4000 homes destroyed	France	38 336	3.50%
600	103	06/09/2001	Typhoon Nari; floods, landslides	Taiwan, Japan	-	-
500	1	03/08/2001	Storm Hartmut, hail; winds of up to 112 km/h	Germany	69 623	0.70%
500	11	15/03/2001	Explosion on board Petrobras drilling platform P-36	Brazil	10 745	4.70%
485	-	30/04/2001	Violent thunderstorms, hail and tornadoes	US	463 481	0.10%
398	20	24/07/2001	Rebels destroy aircraft of Sri Lankan Air	Sri Lanka	-	-
335	-	09/06/2001	Heavy thunderstorms and hail	US	463 481	0.07%
320	-	07/09/2001	Loss of power in Hughes-702 satellite	Space	-	-
305	1	28/02/2001	Earthquake (moment magnitude 6.8)	US	463 481	0.07%
300	5	10/09/2001	Typhoon Danas, winds of up to 108 km/h	Japan	105 800	0.30%
286	-	12/05/2001	Fire in Asia Pacific Design Centre	Taiwan	7 301	3.90%
285	-	06/05/2001	Thunderstorms, floods, hail	US	463 481	0.06%
253	-	06/09/2001	Panamsat PAS-7 loses power capacity	Space	-	-
215	-	23/10/2001	Severe cold front, thunderstorms	US	463 481	0.05%
200	25	06/07/2001	Storms over western Europe	France et al.	-	-
190	5	24/02/2001	Thunderstorms, tornadoes	US	463 481	0.04%
n.a.	-	14/08/2001	Explosion in refinery	US	463 481	n.a.

[1] Excluding liability losses

[2] Dead or missing

The Marine Insurance Market - 2002
Publication of WILLIS

Global View of the Marine Market

After many years of a soft Marine Market, some signs of hardening were evident well before September 11.

Now the signs are everywhere:

- Sharp increases in premium are common and will continue.
- Direct underwriters are being squeezed by reinsurers to increase rates and limit the terms offered.
- Renewal efforts are focussed more on controlling cost of risk and managing reductions in coverage. In some cases, insureds are opting to increase retentions to mitigate rate and premium increases.
- Higher minimum deductibles are being required by underwriters.
- Finding a strong lead underwriter has become much more important and may mean the difference between completing a risk and having less than 100% subscription.

One of the many drivers of the current hardening Marine Market is the reinsurance market. Reinsurance costs have been on the rise due to a cumulative history of losses and tightening of capacity and now reinsurers are retiring from many marine classes of business. Those remaining are covering less with more restrictive terms. Primary underwriters are, in turn, walking away from risks that do not fit new corporate criteria that reflect the increased costs and restrictive terms of reinsurance treaties. As a result some insureds are being forced to increase retentions and seek coverage in non-traditional markets.
Many insurers buy multi-line reinsurance programs, which have been severely tested by the events of 2001, even prior to September 11. With pressure from capital providers and management to produce profitable returns, reinsuring underwriters have been forced to adopt changing attitudes or cease underwriting.

Marine Cargo

There is no doubt that the changes, which were evident at this year renewals, were already being felt in the final quarter of 2001. It would be easy to say that these changes were brought about by the events of September 11, but there were other factors which led to the hardening in the cargo market.
For a number of years, underwriting results were declining and there was recognition within the London market that this situation could not continue. 2001 was already a year of significant losses to the market. The Petrobras loss had significant impact, and in the absence of WTC, the Toulouse refinery loss would have received far greater media coverage.
Rates began to harden and underwriters became more selective in the risks that they chose to write. Additionally, pressure from insurance buyers and their brokers was always evident as each sought the widest terms at the most competitive price. In fact, in many instances the hardening of the market was not as pronounced as some underwriters would have liked.
Poor underwriting results led to some managing agents and financial backers reviewing their activity which resulted in a significant number of departures from the underwriting community. This further enforced the desire of the remaining underwriters to review their underwriting strategy to return to profitability.
The need for the market to harden was combined with an unfortunate trend for late premium payments in recent years.
This was witnessed across the whole of the market and put further pressure on underwriters profitability. Not surprisingly, underwriters looked to avoid risks with poor payment records or imposed warranties to secure timely premium payments. The delay in payment of premium was certainly an influence in the negotiations of renewals.

It is therefore fair to say that the changes in underwriting strategies that we have seen in the last 5 months had started well before September 11. WTC resulted in significant losses for all global markets and has resulted in increased claims costs for both primary insurers and reinsurers. Reinsurance costs have escalated and this had an obvious impact on the costs of primary insurers.
In light of these developments, insurers have had little choice but to impose stricter underwriting disciplines. These changes were easier to impose following September 11 as there has been a general acceptance by insurance buyers that the changes were needed so that the market could begin to return to profitability. Most buyers have taken a philosophical view and appreciate that without the prospect of some profit for underwriters, there may be no market to accept risks.

The Cargo Market at a glance

- Declining results for a number of years
- Stricter underwriting disciplines
- More Underwriters withdrawing from the market
- Move towards first class security
- Rates increased by 15% - 30%

Looking to the future

There can be little doubt that the year ahead will be challenging for both buyers and sellers of insurance alike.
The availability of the required level of cover at a price that satisfies both the buyer and the financial investors will, we expect, be the basis for much discussion between both parties.
Building sustainable relationships between insurers and insureds is a key component for any long-term partnership.
Above all an understanding of each party business environment is vital because without insurance there can no international trade of any significance. In this market, investors and capital providers will be looking for evidence of overall price increases in order to return to a market where premiums are not just sufficient to meet claims but also provide an acceptable profit margin.

Marine Hull

The London Market

Hull underwriters had been talking of the need for higher premiums for several years, but the actual trigger for the direct hull market to bottom out was their reinsurers insistence on higher premiums and retentions accompanied by stricter coverage.
This process continued throughout 2001, but accelerated following the tragic events on September 11. The biggest impact was seen in the market for war risks, particularly since marine war and aviation war tend to be concentrated with the same underwriters. Shipowners, with some justification, found it hard to see why they were required to pay for aviation losses.
During the recent renewal season leading up to January 1, 2002 those shipowners with consistently good loss records were lucky to pay only a 25% to 30% increases in premium. Where rating levels were perceived by underwriters to be severely underpriced or where the record was adverse, renewal terms regularly involved increases of 100% or more.
Again, partly driven by the reinsurance market, policies for periods of more than 12 months are no longer on offer. The other factor at work here is the perception that this hard market will last longer than 2002. If one accepts that the average loss ratio in the hull market had been running at 150%, then logically, underwriters will argue that further premium increases will be necessary before they will return to underwriting profit (the greatly reduced investment return during the last couple of years has been a further spur for a return to profitability(

Thus it can be expected that this hard market has at least another year or two to run before there is sufficient new underwriting capacity to redress the balance between buyers and sellers of hull insurance. We would also anticipate that there will be a greater differentiation between the prices charged to different shipowners.

Other Interests

As mentioned above, it is the war risk market which has seen the most dramatic changes. Following September 11 London underwriters increased the basic annual rate to 0.05% which was a multiple of the previous relatively nominal rates. In addition a number of areas, principally in the Middle East and Eastern Mediterranean, were subject to Additional Premiums.
At the time of writing these APs are softening but the annual rate is holding firm so far.

The Hull Market at a glance

- Minimum rate increases of 25% - 35% for low loss ratio fleets
- The International Hull Market is currently running at a 150% loss ratio
- Deductibles up 30% in some cases
- Disbursements rates up significantly
- Mortgagees Interest rates up over 100%

Rating levels in respect of Disbursements and Mortgagees Interest have also seen dramatic increases, albeit admittedly from historically low levels. For example Disbursements rates for even the largest fleets are between 0.1% and 0.2% while a year ago they might have been 0.05%.

International Markets

In the eyes of their competitors, London underwriters have always been accused, with some justification, of exaggerating the insurance cycle by leading the market down and then overreacting when the market turns up. It seems that with so many London underwriters employed by American capital providers this is more than ever the case.
During the last year, of the three major international hull markets outside London, Paris and New York have generally sought similar increases from shipowners. The odd one out has been Scandinavia, particularly Norway, where, with the assistance of

benign reinsurers and without any influence of US capital, underwriters have proved rather more friendly particularly to their core account; their appetite for new business also appears encouraging.

Capacity

Market capacity for hull insurance has been relatively stable. 2001 saw the withdrawal of the Independent Insurance Co. while Cotesworth and Newmarket ceased underwriting in Lloyd. However, by the end of the year that missing capacity had been replaced by Martin Reith Ascot (Lloyd) and John Charman Axis (Bermuda).
Tindall Riley and Allianz created a new hull facility similar to Dex called Marianne; targeted initially at members of the Britannia P & I Club, it has had a slow start.
In Norway, Zurich ceased underwriting last October but their account has been acquired by Bluewater, a new Norwegian insurance company.
Recently Gjensidige announced that it is terminating the underwriting of blue water Hull, and Marine Offshore business with immediate effect.

Several specific developments:

- Cruise lines are especially hard hit due to the increase in war risk rates, the shrinking of geographical limits and the waning cruise and tourism markets
- The market is facing the elimination of Loss of Hire coverage
- Terrorism exclusions are commonplace
- War risk coverage, formerly a (throw-in), now commands an explicit premium charge
- US underwriters are not receptive to no n-US brown water fleets, while UK markets are not viable for US brown water fleets, especially for P&I coverage

Protection & Indemnity

The renewal at February 20, was the hardest that the P&I market has seen for at least ten years. A full analysis has yet to be completed however, broadly speaking, the rating increases were in the region of 20% across the market.
Individual Clubs took remarkably similar approaches to the renewal. Over the last five or six years, in spite of relatively narrow variations in general increase levels, the degree of flexibility from the general position varied widely between different Clubs. By contrast at this year renewal the vast majority of Clubs took a very firm line in trying to attain their published general increases and consequently the discrepancies in the market were much less.
September 11 was certainly a catalyst in the speed of the hardening of the market, but it was not the underlying cause. The market as a whole has reported pure underwriting deficits since 1995/1996. Despite this, premium levels fell year on year from 1994/1995 to 2000/ 2001. Over the same period claims remained relatively stable. Investment income was able to compensate for these technical deficits until 1998/1999. However, for the last three years the market has experienced overall losses and resultant deterioration in the asset base.
Clearly in a mutual market this situation is unsustainable. The weaker Clubs have already been forced to resort to charging unbudgeted supplementary calls to maintain their free reserves at an acceptable level. The questions in the mind of many shipowners are whether this is the end of the story for these Clubs and indeed will other Clubs follow with similar problems? Is the mutual P&I market experiencing a repeat of the late 1980, early 1990 when the vast majority of the Clubs had to make excess calls, or are the current Clubs in difficulty isolated incidents?
Are the recent unbudgeted supplementary calls the tip of the iceberg or just three individual Clubs under-performing? In our view it is very unlikely we will see the majority of the market resortin g to unbudgeted supplementary calls as in the late 1980. With so much market-wide pessimism, why do we believe this to be the case? The following graph below plots the average market supplementary call accuracy over the last sixteen years and compares it t o the average market general increases announced over the same period .

The Protection & Indemnity Market at a glance

- renewal hardest for 10 years
- Pure underwriting deficits since 1995 years of investment income deterioration
- Unbudgeted supplementary calls
- More increases predicted in 2003
- Rates increased by 20%

What is different today?
Like most underwriting cycles, the hard market phase in the early 1990 saw a typical over-correction in terms of rating. Rating levels were raised massively and probably out of proportion with the increase in risk. This was due to; a straightforward overreaction to the problems in the previous years, genuine fears about continuing increases in claims levels and a conscious strategy in a number of cases to actually build free reserves.

Premium levels within the market were more than doubled over this period. Following these five years of rapid rate increases, market income peaked in 1994/1995.
This increase in the premium base allowed the Clubs to grow the amount of funds held as reserves. At this point the market philosophy had changed to a prevailing view that reserves were a positive thing, necessary to insulate Members against underwriting results and prevent unbudgeted supplementary calls.
Over roughly the same period (1991 to 1995) individual Club retentions within the International Group pooling arrangement increased from US$1.6 million to US$5 million each loss. This added further potential volatility to claims on individual Clubs and consequently, provided greater necessity to increase reserves.
Significantly there is also a difference in the cause of the deficits experienced by the Clubs. There has been no recent rapid rise in claims levels, as seen in the late 1980. The current deficits are a result of premiums falling due to competition, against the background of relatively stable claims levels.
Against such a background, therefore, our optimism that there will not be a return to the market-wide excess supplementary calls is based on:
•Proportionately higher reserves, which give the Clubs more, time to underwrite out of the current deficits
•The rapidly hardening market should enable viable premium levels to be restored before the deficits become critical This is not to say that all the individual Clubs within the market will not have (continued) problems - we expect further isolated difficulties, however we do not expect the market-wide effects of a decade ago.

The above analysis is also not a foregone conclusion .The renewal just completed will not be enough to bring the market as a whole into balance, at least a further round of increases at renewal next year will be necessary to achieve this.

Liability

The events of September 11 ensured that the hard market arrived in the marine liability sector, as it did in many other sectors of the insurance industry, far more rapidly than anyone had anticipated.
In the immediate period following the tragic events in the United States, many underwriters were thrown into a state of uncertainty. A number of syndicates and companies effectively suspended their underwriting operations awaiting clarification regarding their financial positions.
Six months on, the market situation is rather clearer. There have, so far, been no underwriter failures in the marine liability market as a result of WTC losses. However, this situation may well change during the next 12 months, as more accurate figures regarding overall claim amounts to the market become available. Cashflow will become an increasingly important issue for many underwriters.
Most underwriters have completed the placing of their own excess of loss reinsurance arrangements and it is clear that both premium and retention levels have increased enormously when compared to 2001 amounts. In some instances, the purchase of reinsurance has proved to be prohibitively expensive, leading in certain cases, to underwriters deciding to dispense with reinsurance altogether.
The result of this, inevitably, is that underwriters are insisting upon premium increases for all business that they write. Currently, accounts with clean loss records and unchanged exposures can expect to pay a minimum increase of around 20%, although many accounts are attracting far larger premium rises (i.e. increases of 30% to 100%+).
Underwriters are also looking very carefully at the size of their individual lines on each risk. Many syndicates and companies are unable to write the same line size in 2002 as they were in 2001 (i.e. Hiscox syndicate maximum line on marine liability business has been reduced from US$100m in 2001 to US$25m in 2002). Therefore the participation of an increased number of underwriters is now generally required on each account. The subscription market has returned!
A consequence of this is that underwriters are now attaching far more value, than in the past, to the capacity available to them. They are choosing more carefully the business that they write - and are generally rejecting more accounts than previously. They are also requiring far higher minimum levels of premium for excess liability accounts than they did in 2001. Some underwriters can no longer afford to charge a premium level of one per mille on limit for excess layer business, when some of them are paying at least double that amount for their own excess of loss reinsurances.

The Liability Market at a glance

•Impact of September 11 still unknown
•Cashflow vitally important to underwriters
•Minimum premium increases of 20%
•Some premium increases of 100%+
•Value of capacity increasing

The WTC loss has also focused underwriters attention on the issue of coverage for war, sabotage and terrorism risks. Many policies now include a full exclusion in respect of these risks, with separate limited buy-back coverage available in certain cases. A number of underwriters are also addressing the level of commission offered to brokers and clients, as they are keen to minimise their business acquisition costs.

They feel that commission levels were increased during the soft market and that these now need to be (pegged back) during the hard market.
Premium payment is also a (hot issue) for underwriters and several new premium payment clauses have appeared during the past six months - all enabling underwriters to cancel coverage if premium is not paid on time.

As this Commentary is going to press there are reports in the market that a new rival to the TT Club is set to be launched shortly, called Wavelength. A consortium of Lloyd underwriters together with Charles Taylor, manager of Standard Steamship Owners(P & I Club, are understood to be behind the new venture which is reported to have up to US$100 million for property, liability and business interruption cover for ports and terminals. Consequently the next twelve months is going to be an extremely interesting period of time in the marine liability market.
Will all of the current participants in the market survive until the end of 2002? Will those who do survive be able to turn around their own financial situations and use the hard market to deliver the level of profits demanded by their corporate backers?

The only certainty is that premium levels are going to continue to increase through 2002 and market capacity, which has been given away relatively cheaply in the past, will become an increasingly valuable commodity.

Reinsurance

2001 was a shocking year for Marine Excess of Loss reinsurers. P-36, Air Lanka, Toulouse refinery, several other refinery losses and September 11. 2001 was supposed to represent the return to profit for
marine reinsurers. Now 2002 is under pressure to produce a profit and to this end, several new exclusion clauses have been drafted or reintroduced. Clauses excluding or limiting Terrorism, Political Risks, Refineries, Non-Marine Cargo (i.e. excluding stock throughput coverages, extended storage, business interruption and limiting real property coverages within so called Cargo policies) have all been broadly applied.
Retentions have increased once again and so have premiums. Retrocessional costs and retentions have also increased.
The renewal season only began in earnest in mid-December, owing in part to the diverse clauses being
requested and to the severity of the increases. There was generally a reluctance to compete with holding markets unless the terms being quoted were clearly unrealistic.
Some Continental European markets were ready to offer terms and in consequence, the London share of many placements has decreased. Whilst leaders were hard on terms, the capacity available from the following markets was often more flexible and many programs were substantially over placed.
In the U.S. the marine reinsurance market has seen significant changes since January 2001. Several factors have caused this dramatic hardening including a prolonged soft market and several major loss occurrences during 2001. While the marine reinsurance market experienced some hardening in terms of rate and available capacity beginning in early 2001, these picked up pace during the course of 2001 as the impact of these factors became manifest in reinsurers(results. By year-end, there was significant pressure on increasing retention levels as well as rate increases.
As always there are exceptions to the trend, but for year-end renewals, retention increases ranged from 50% to 100% and rate increases ranged from 20% to 50%. Technical underwriting, including the utilization of actuarially-driven pricing models, is becoming the norm.

The Reinsurance Market at a glance

- one of the worst years on record
- Exclusion clauses introduced
- Premiums increased 20%-30%
- Retention increased 50%-100%
- Retrocessional costs increased

Other prevalent issues affecting the U.S. market were: (1) terrorism coverage and (2) continuing pressure to narrow the scope of coverage to eliminate stock-throughput-type coverage from cargo and certain non-marine elements of coverage from the marine liability account.
In spite of rising primary rates, there was a further reduction in available proportional capacity. However, for non-proportional business, viewed as adequately priced, there is still adequate capacity available to satisfy most U.S. reinsurance buyers) requirements.
The Proportional Treaty market has contracted again, with a preference for Quota Share over Surplus type treaties. The emphasis is on the quality of the reassured, the balance of the portfolio and for those reinsurers with the good fortune and good positioning to be going forward, the promise of benefiting from the greatly improving market in 2002 and hopefully, beyond. For once, and at last, premiums and retentions are being increased against a background of increasing original rates and volumes, as demonstrated in a brief comment on each component market below. (Please refer to the relevant sections earlier in this Commentary for a more detailed review of development in these areas).

Hull

Marine Hull business was paying rises through 2001. There were few large hull losses in 2001 and some insurers may report reasonable results for 2001. 2002 has seen a sharp increase in premiums, up at least 25% for loss-free renewals and often over 100% for fleets with poor results. The average rise over the hull portfolio is in the region of 50%. Deductibles have remained steady as insurers have concentrated on the premiums. Market capacity has reduced, but is still sufficient for the largest vessels.
There are now very few long-term policies being offered, which do not have a full review provision after 12 months.

Cargo

The Cargo market has generally imposed premium increases of between 15% and 30%. Insurers(line sizes have reduced in general and in London, the subscription slip is frequently replacing the recent tendency of insurers to write 100%. Insurers are being noticeably more selective. The cargo market is benefiting from an influx of business as a result of the unbundling of package policies. The larger market placements are being squeezed by the general reduction in capacity.

Liability

Premium increases vary according to record, type of business and quality of the account between 30% and 100%, with deductibles being increased wherever possible. Individual insurers) participations are reduced, but capacity is available for up to US$200m for marine risks. Insurers are generally not altering the conditions, other than for terrorism, but are concentrating on increased premiums and enforcing premium payments.

P&I

As predicted the P&I market witnessed increases of approximately 20% across the board. The International Group of P&I Clubs reinsurance enters its third and final year this year, for which an increased premium of 20% is payable. The excess placements (over US$1bn) will probably encounter severe capacity restrictions.

War

The events of September 11 stirred the Hull and Cargo War markets into collective action. Shipowners were encouraged to submit to their existing insurers for re-rating and the response, without recou

rse to a blanket notice of cancellation, was immediate. All vessels were charged a large premium increase with passenger vessels, particularly the luxury cruise vessels, being charged substantially higher rates, as the perceived terrorist threat was greater. These amended rates are under pressure, but are generally holding up in 2002.
For the Cargo market the prime concern was to identify the scope of cover afforded, as many cargo policies are extended to include long term or permanent storage coverage. The Termination of Transit Clause (Terrorism) limited the coverage as per the traditional market clauses along with an additional premium applied universally to cargo policies, which included coverage for War and Strikes (the
latter specifically covers Terrorism
Whilst Terrorism exclusion clauses have been applied to almost all reinsurance contracts, reinsurers have agreed to cover terrorist risks in respect of waterborne risks and specified cargo risks. Aviation War, which is substantially written within the marine war market ,has seen some huge increases. Marine reinsurers have generally excluded Aviation War from marine whole accounts. ?