CEIOPS-DOC-17/09

June 2009

Insurance Linked Securities Report

Executive Summary

Securitisation and the 'originate-to-distribute' model in banking had been identified as a major cause of the current financial crisis. Securitisation also exists in insurance; to date it has been limited in scope, and not necessarily similar to securitisation in other financial sectors. This report explores insurance linked securities (ILS) as one part of the wider spectrum of alternative risk transfers (ART).

ILS consists of two main classes; catastrophe bonds (cat bonds) and life bonds. Cat bonds transfer long tail risks from an insurance or reinsurance undertaking to an investor. They offer protection against extreme risks, such as earthquakes or wind storms. Life bonds transfer the risks arising from the insurance portfolio of a life insurer, which could be longevity and mortality risk, or can be used to fulfil financing functions.

ILS have gained in importance over the last few years and are an important tool for insurance undertakings to effectively transfer risks and tap new sources of capital market funding. This report explores the prospects of ILS and the challenges associated with it. ILS should have the positive effect to increase the potential for absorption of massive losses. They could also reduce the costs of reinsurance as well as long-term costs of capital. For investors, the limited correlation with ordinary capital markets could be an important reason in favour of ILS.

However, there are also problems associated with ILS. Information asymmetries are one factor to be taken into account with these very complex and non-standardised transactions. It is difficult to adequately assess and analyse the underlying risks. Market size and the pool of investors are still rather limited as well.

The report also explores similarities of ILS with other types of securitisation, especially structured credit products.[1] Some of the techniques used are quite similar as well as

[1] Also see the Report on issues regarding the valuation of structured credit products (see CEIOPS-DOC-30/08 published in August 2008).

the structure, but the underlying risks are not comparable. However, it is useful to build upon the experience gained in the application of structured credit products.

This report gives an overview of the ILS market, its development and the investor structure. The market has grown, especially over the last few years. However, the market for ILS has been affected by the financial turmoil. Over the last months the market activity more or less stopped. Also, the bankruptcy of Lehman Brothers and the difficulties in the monoline insurance market had consequences for the ILS market. This is why the future of the market is quite difficult to predict, at least in the short to medium term. In the long term, however, there is a good chance of the ILS' market growth to pick up again.

While the present supervisory regime (Solvency I) is relatively restrictive in its recognition of ILS, the future regime (Solvency II) is likely to give more recognition to ILS as effective tools of risk mitigation. Nevertheless, supervisory authorities need to be satisfied by the insurance undertakings that the intended risk mitigation from the use of ILS is indeed present. From a regulatory perspective a minimum retention of risk by the originator is desirable and would be in line with the proposed CRD requirements on securitisation for the banking sector.

Table of Contents

1 Introduction

This report explores the origins and use of insurance linked securities (ILS) as well as their potential impact on the insurance industry and supervision. ILS represent a method of financial innovation in the insurance market and present it with new possibilities of alternative risk transfers (ART).

Insurance securitisation offers the possibility to insurance and reinsurance undertakings to spread their risks and to tap new sources of funding. They enable them to pass parts of their underwriting risks on towards capital markets and investors that are in general not related with the insurance industry. Capital markets are well suited for the absorption of losses arising from natural catastrophes, which has led some insurance undertakings to turn to them. Insurance undertakings are also able to reduce their regulatory capital requirements by the use of some of these ILS-products. With reduced risk exposure they could also underwrite new business. However, insurance and reinsurance undertakings might in some cases also be investors in ILS and take new forms of risks into their portfolios.

The market for ILS has its origins in the early to mid 1990's following several major natural disasters. In recent years, this market has gained in importance, although it is still very small in comparison with other markets, including the securitisation of financial products in other sectors. ILS seems to be established as an alternative to traditional types of financing and risk mitigation for insurance undertakings. They can also be seen as a potential alternative for primary insurers to traditional reinsurance. Reinsurance undertakings also use insurance securitisation to spread their risks and although some of their underwriting business has to compete with securitisation, reinsurance undertakings are also structuring and managing securitisations for primary insurers and thereby generating fee income. These instruments seem to be of special interest to investors due to their low correlation with equity and credit markets and the possibilities for diversification of risks. Furthermore, ILS offer comparatively high yields but also potentially large losses.

There are several issues this report explores. What are generally the pros and cons concerning the use of ILS? What similarities, if any, do exist between ILS and structured credit products? Furthermore, how has the market been affected by the financial market turmoil, which started in mid 2007?

Furthermore, this report aims to give an overview over the structures, the products and possible parallels with recent market developments.

Section 2 provides the main aspects for the establishment of ART in the context of limitations of traditional methods of reinsurance and accentuates insurance linked securities as one important class within the group of ART.

Section 3 gives an overview of the basic ILS structure; and cat bonds and life bonds in particular. Risks and parallels with structured credit products are addressed in section 3.

Section 4 focuses on the size and the structure of the ILS market as a whole and also specific sub markets and their importance to the whole market. Investors are also dealt with in this section.

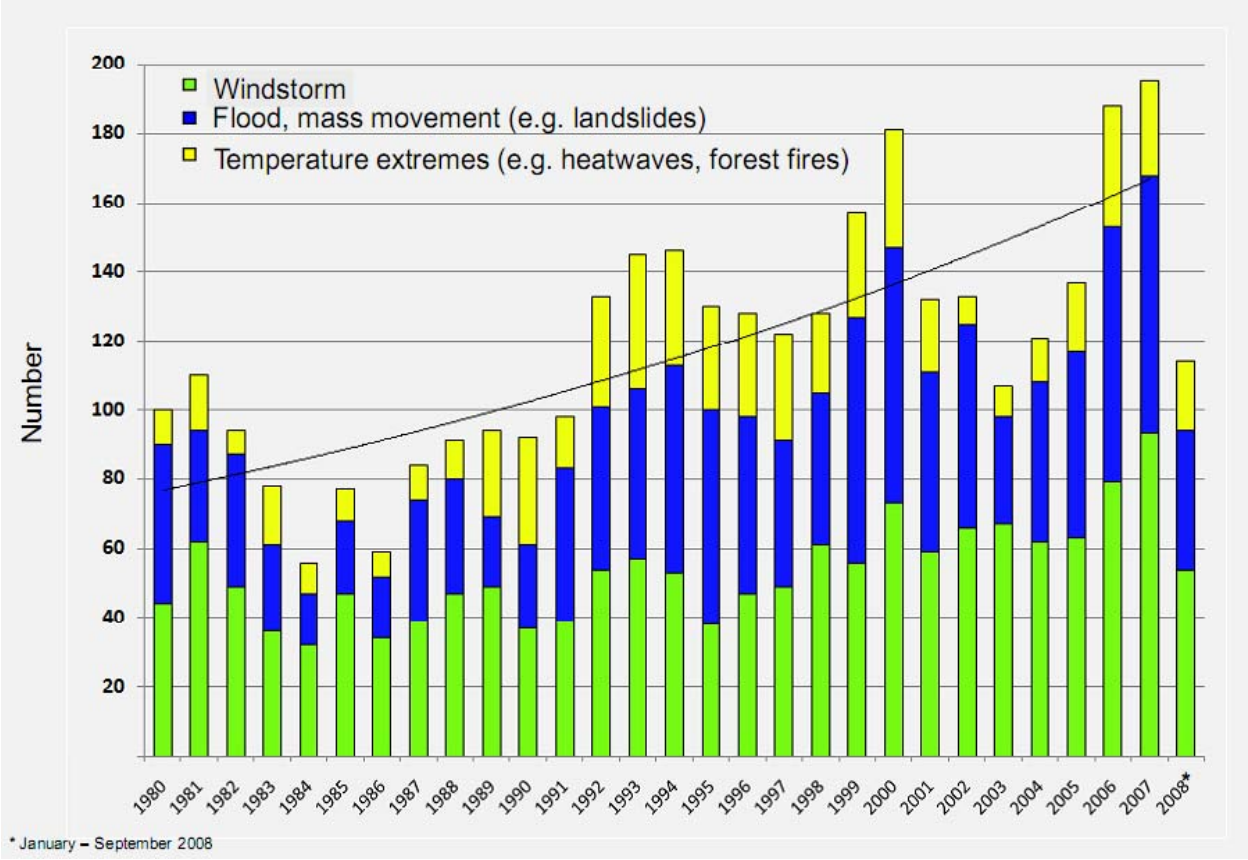
The potential impact of Solvency II and the current regulation of ILS are dealt with in section 5, while the conclusions and an outlook are given in the final section.

2 Origins of ILS in the context of traditional reinsurance and ART

2.1 Origins of ART instruments

One of the main reasons for the increasing demand for ART instruments is the growing number and amount of losses due to natural and man-made catastrophes in the last decades. Figure 1 shows the general trend in the number of weather catastrophes in Europe over the last 28 years.

Figure 1: Weather catastrophes in Europe, 1980 – September 2008[2]



Source: Arnoldussen.

In the early 1990's, the traditional reinsurance market reached its capacity limit because of catastrophes like Hurricane Andrew in Florida (1992) and severe earthquakes in California. As a consequence reinsurance premiums went up dramatically. In 2007, catastrophes caused financial losses of USD 70.6b, of which USD 63.7b were affiliated to natural catastrophes (including USD 10b from European winter storm Kyrill). Only 40% of these damages were covered by insurance, the rest was financed by the private sector, companies or public institutions.[3] This development led to an increasing demand for alternative instruments to traditional reinsurance, to enhance capacities and lower costs of collateralisation. The capital market is well qualified to absorb losses from catastrophe events because of its high capacity and large number of market participants.

[2] Arnoldussen (2008:7).

[3] See Klusemann and Nelles (2008:566).

Instruments of ART contain the main elements of traditional reinsurance and partially substitute reinsurance products. The remainder of this section looks in greater detail at the main characteristics of traditional reinsurance and the different alternative instruments.[4]

2.2 Traditional reinsurance[5]

Reinsurance companies take on risks from primary insurers (and are paid a premium because of this risk mitigation) and thus increase the capacity of primary insurers who can then underwrite additional new business. Reinsurance undertakings are writing business worldwide and can therefore use the potential risk diversification which is important regarding high damage risk profiles in case of natural or man-made catastrophes. Reinsurance contracts can be divided into proportional and non-proportional contracts.

In the first case there is proportional sharing of the premiums collected by the primary insurer from its customers and also in the distribution of costs and payments in case of damage. There are three forms of proportional reinsurance:

- *Quota-reinsurance contracts:* The primary insurer retains a percentage amount of the business; all residual business is reinsured by the cessionary according to the defined quota; i.e. all payments are distributed proportionally. This form of reinsurance contract is cost-efficient because of its simple structure and low administrative costs. It is used mostly in third party liability insurance and automotive liability insurance, as well as to create supportive capacity for new or growing insurance undertakings.
- *Surplus-reinsurance contracts*: The primary insurer retains an absolute amount defined as 'maximum'. All excess damages above this maximum are divided as described above. The reinsurer often limits the liability by setting a surplus limit. All damages above this limit are again assumed by the primary insurer. This form is used in fire, accident and life insurance where the amount insured varies heavily.
- *Quota-surplus contracts*: A combination of the above mentioned contracts with two sub-types. Either a quota is defined at first followed by the application of the maximum (often used by developing companies to finance initial business) or the maximum is predefined and a net quota is fixed for the remaining amount below the maximum. Both forms provide individual reinsurance contracts but are also costly to administer.

In the second case of non-proportional reinsurance the risk and premiums are not equally divided between the two contract partners. The payments of the reinsurer in case of damage are calculated according to the extent of the effective damage. A priority is predefined in the contract above which level the reinsurer's liability comes into effect. Non-proportional reinsurance is by definition cheaper than proportional

[4] See Klusemann and Nelles (2008:566).

[5] See Klusemann and Nelles (2008:567-568) and Liebwein (2000:62-76, 151-181).

reinsurance because the insured bears a disproportionate share of losses. The following contracts can be distinguished:

- Excess-of-loss reinsurance (or XL): This is the typical form of non-proportional reinsurance. Above a 'priority' the reinsurer incurs the risks. A so called 'exposure' or 'layer' which constitutes a maximum level of risk mitigation limits the reinsurer's losses in case of damage. Losses above are also taken by the primary insurer or covered by another reinsurer.
- Stop-loss reinsurance: The reinsurer assumes all risks, which cumulated, exceed a predefined priority in a predefined period (usually one year). Generally, there is no fixed layer and thus this contract is very risky for reinsurers, because, in case of a catastrophic event they have to cover high losses and there is no possibility to influence the primary insurer's business policy.[6] Therefore, this contract is rarely used in practice.

As can be seen, in practice, there is no form of maximum loss reinsurance, in which the reinsurer covers all extreme risks of a predefined portfolio of primary contracts during a certain period (a whole risk transfer of extreme catastrophic events to the reinsurer)[7].

ART instruments are an additional tool for the insurance sector, especially for extreme risks.[8] They create further risk management and mitigation options as will be demonstrated in section 2.3.

2.3 Classification of ART instruments

ART instruments combine the traditional insurance business with capital markets and partially substitute traditional reinsurance. Reinsurance companies are important participants in the ILS market. It allows them to provide a wider range of products widens the market for retrocessional reinsurance and makes enhanced returns. For reinsurance undertakings there is a huge potential for enlarging business capacities even in 'hard markets'.[9]

ART instruments can be divided into three main groups:

a) insurance derivatives

b) equity-like instruments

c) insurance linked securities (ILS)

To complete the general overview, insurance derivatives and equity-like solutions are briefly described in the following paragraphs, before ILS are defined and outlined in detail.[10]

---

[6] The overall risk can be reduced by interposing further reinsurance contracts.

[7] Even if a reinsurer took over extreme risks, the premium would be very high and there would be capacity constraints for the reinsurer leading to high contract and administrative costs for the primary insurer.

[8] See also Anders (2004:21).

[9] For a further discussion of market participants in the ILS market see section 4.

[10] See Klusemann and Nelles (2008:568-569) for an overview of ART instruments.

a) Derivatives:

This group can be divided into two sub-groups, 'over the counter derivatives' and 'exchange traded derivatives'. They can be further subdivided into swaps or futures and options. A main characteristic for insurance derivatives is that the supply of capital does not occur in advance but only after a catastrophe or another predefined event occurred. Derivatives aid market development via increased liquidity and price efficiency. A catastrophic event is the underlying for these derivatives, which are measured via an index and not as single events[11]. *Weather derivatives*, for example, use the weather as underlying parameter instead of the stock price of a company or other more traditional parameters. Variables of the weather could be rainfall, temperature or snow. Usually indexes for the weather are designed for which it is possible to measure developments. *Catastrophe swaps* (or cat swaps) transfer, just like cat bonds, long tail risks arising from natural disasters. Swaps, however, transfer the previously determined payments and substitute them with a series of payments, which are subject to the occurrence of the insured event.[12]

b) Equity-like instruments:

The category of equity-like instruments may include 'sidecars', industry loss warranties or contingent capital.

A *sidecar* construction features the insurance or reinsurance undertaking transferring a portfolio of risks to a sidecar. Investors place sufficient funds in this sidecar, which is a precondition for the insurer or reinsurer to cede parts of its portfolio to the sidecar and the payment of premiums to the investors. *Industry loss warranties* (ILW) are coupled to industry loss indexes which are the basis for indemnification.[13] ILWs can also be offered by non-insurance undertakings. *Contingent capital* includes several different forms of transactions, such as catastrophe equity puts, contingent surplus notes or a standby line of credit. An insurer receives payments after the occurrence of previously agreed, based on parameters. These allow the insurer to extend its capital base to predefined conditions in case of a catastrophe. In a *cat equity put* transaction the insurer receives the right to sell stocks to the investor at a fixed price in case a predefined event occurs and the insurer is able to strengthen its capital base. *Contingent surplus notes* give the insurer the right to change this security into a profit certificate. This form of ART is already closer to a kind of subordinated capital. A s*tandby line of credit* allows the insurer to use a reserved line of credit from a bank to predefined conditions in case of a catastrophe.[14]

c) ILS:

ILS defines a new asset class and can be characterised as a pooling of insurance related cash flows which are transformed into tradable securities, in general by utilisation of securitisation techniques.[15] The underlying assets and associated income streams serve as collateral.[16]

It is important to distinguish between life and non-life insurance risk transfers. In the first case mortality (e.g. increasing mortality rates due to a pandemic) or longevity

[11] See Klusemann and Nelles (2008:568).

[12] Swiss Re (2006:17).

[13] Swiss Re (2006:18).
[14] See Klusemann and Nelles (2008:568).
[15] Ibid.
[16] See Anders (2004:29), referring to Shaw (1991:1).

risks (the possibility of future life expectancies being higher than originally calculated by actuaries) can be securitised and transferred. In the non-life sector catastrophe or frequency risks could be seen as underlying risks. Typical features of securitised catastrophe risks are low probabilities of the events but high losses in case of an event triggered. Frequency risks have high probabilities of a loss event but low payments in case of an event.[17]

In a 'true sale' transaction a complete portfolio of insurance contracts is transferred to a special purpose vehicle (SPV), as will be demonstrated in section 3. 'True sale' means that the SPV must be a legally and economically independent entity (no-recourse sale, especially in case of the insolvency of the originator).[18] The underlying contracts can be characterised as very similar in their payment structure of received consumer premiums. That means that often contracts of one business line with homogenous contractors are pooled and separated. This procedure helps reducing administrative costs of the ILS transaction.

As distinguished from 'true sale' transactions, in 'synthetic' securitisations only the underlying risk is transferred to the SPV and not the complete contract portfolio. In general, the technique of subordination is applied. This means that different tranches of bonds are offered to investors which correspond to their risk appetite. Tranches with higher risks offer higher returns (and are, in general, rated worse) than tranches with lower risks. Often there is a 'first loss' or 'equity tranche' that is taken over by the originator to reduce moral hazard problems.[19]

3 Basic structure, types of ILS

3.1 Basic structure

The risk transfer off the insurance undertakings' balance sheets to the investor takes place as following. In most cases a special purpose vehicle (SPV) serves as intermediary between the cedent (also called sponsor, the protection buyer). The contracts and underlying risks are transferred from the insurer to the SPV (*true-sale*)[20] or the insurer signs a reinsurance contract with the SPV (in that case called an Insurance SPV, ISPV). The SPV is usually established offshore (e.g. the Bahamas or Cayman Islands) for tax saving purposes to the benefit of the investor related to the transaction which lowers the founding costs (lower equity deposits). The SPV acts as intermediary to isolate the investors from the insurer's credit standing. The SPV subsequently issues bonds, in general via private placements, to investors and invests the principal in collateral trusts. Investors receive their initial payments ('the principal') for the bonds in case the bond expires without being triggered. Additionally, they receive coupon payments over the tenor of the bond.[21] This coupon is financed by premiums the insurer pays its SPV for assuming the initial risk and from capital income from the investment of the principal. The coupon is usually LIBOR plus a certain spread. In case of a trigger event, (which has to be defined in the contract), investors' payments are liable for incurred losses. Investors get paid off only part of their capital or suffer a total loss. The sponsor (insurer) is paid a predefined compensatory payment.

---

[17] See also Grieger and Ramseier (2008).

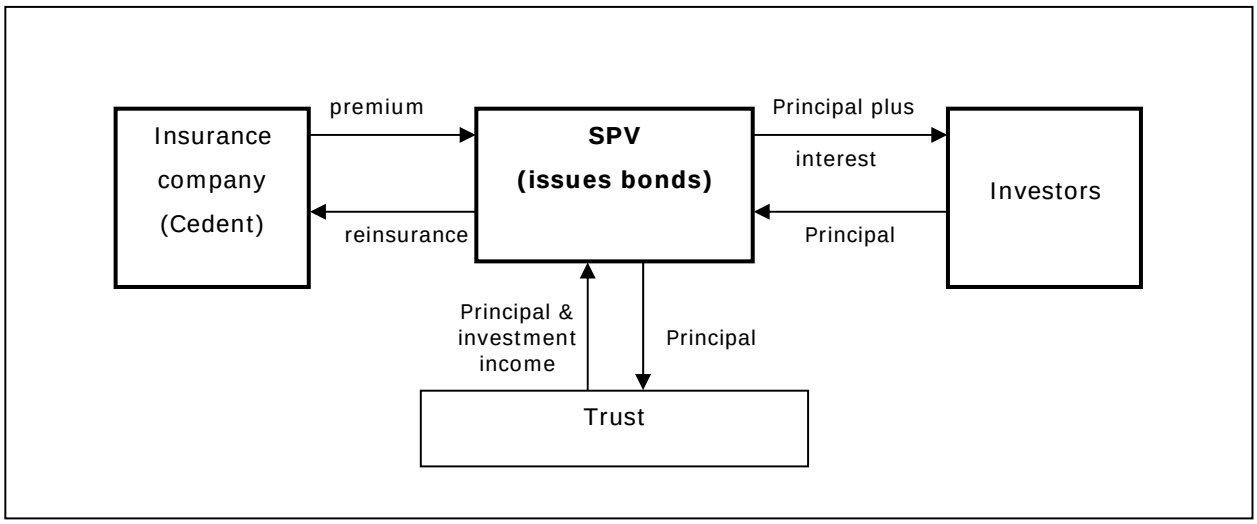
[18] Regarding Basel II and structured credit products this is called "clean break".

[19] For a further discussion for effective and regulatory accepted risk mitigation see section 5.

[20] Another possibility besides true sales are synthetic securitisation transactions as mentioned in the previous section.

[21] See World Economic Forum (2008:10).

Figure 2: Basic structure of an insurance-linked securitisation[22]



One of the main challenges of a risk-transferring securitisation is the choice of the trigger which defines the events when investors face losses to a certain amount. To date, many different solutions have been developed, for example, for cat bond transactions there are indemnity, industry index, (pure) parametric and modelled loss triggers (to be discussed in detail in the following section 3.2). The aim of the originator is to, to the extent possible, exactly identify the individual risk underlying the insured portfolio to reduce its so called basis risk, the difference between applied trigger and the actual book-of-business.[23]

Besides the insurance or reinsurance undertaking, the SPV and investors, there are often other parties involved in an ILS transaction, especially servicers.[24] For example, a trustee, who in general administers the SPV and manages the cash flows in relation to the transaction, or a consultant hired for the crucial task of measuring the underlying technical insurance risks (for cat bond transactions, for example Risk Management Solutions -RMS- or Applied Insurance Research -AIR-; in the case of mortality bonds, for example, Milliman).[25] Rating agencies are employed to rate the bonds and the underlying structure of the transaction and, thus, give investors (and supervisory authorities) an 'external' statement of the related risk-return-structure compared to similar market investments. This is important for investors who, in general, do not have the expertise to correctly validate the risk of the bonds as well as for the insurance or reinsurance undertaking that wants to enlarge its spectrum of possible investors.[26]

Other very important participants, especially in life bond transactions, are monoliners. They provide further guarantees and thereby further enhance the rating of the bonds. However, over the course of the financial crisis monoline insurers themselves suffered rating downgrades and therefore were no longer able to improve the rating of the underlying ILS bonds, as will be also explained in section 4.2 that covers recent market developments.

---

[22] Referring to Klusemann and Nelles (2008:571).

[23] Klusemann and Nelles (2008:569).

[24] See Anders (2004:38).

[25] Klusemann and Nelles (2008:571).

[26] Anders (2004:39).

Two more participants to mention are (investment) banks that help to place the bonds, matching the bonds issued and investors willing to participate in certain tranches, and swap counterparties that transfer irregular (both in time and amount) incoming cash flows from investors, insurance policy holders as well as capital returns into regular cash flows covering the interest payments for investors.

In general, the cedent has, in the first place, to take into account both the risk of default of conventional reinsurance and the primary exposure of the securitisation.[27] Not all risks can be transferred to capital markets. Risks for which losses cannot be predicted over a short period of time are not qualified for being securitised (e.g. liability insurance risks).

3.2 Catastrophe bonds

Catastrophe bonds[28] ('cat bonds'), transfer long tail risks from a insurance or reinsurance undertaking to an investor. They offer protection against extreme risks, such as earthquakes or wind storms. These risk-linked securities usually stretch over a period of several years (typically cat bonds have a 3 year tenor[29]). They can also cover more than just one peril. Cat bonds expand the traditional insurance capacities since most investors typically do not offer insurance protection otherwise. Another advantage of cat bonds is that they usually avoid counterparty risk for the originator vis-à-vis traditional reinsurance programmes.

The basic structure of a cat bond is very similar to the one described in section 3.1. The following illustrates a typical transaction.[30] An insurance undertaking enters a reinsurance agreement with a SPV (which will be often located in an offshore jurisdiction and is especially designed for this transaction) and pay the SPV interest. The reinsurance contract could, for example, cover losses from earthquakes in specified regions of Japan. The SPV issues five year floating rate notes and pays interest on them. These payments would be reduced in case of an earthquake causing damages in these parts of Japan which exceeds predefined amounts of damage. The money yielded by the issuance of the bond is put into a collateral account at a trust. This money would only be invested in very safe forms of investments as the SPV typically has only an extremely thin equity base to absorb losses.

The architecture of a *principal-at-risk* cat bond features that the initially paid principal is forgiven in case a trigger event occurs. A *coupon-at-risk* cat bond means that the coupon is cut or cancelled in case the trigger event occurs. It is also possible to combine these two general bond categories. There are several different possibilities how such a kind of cat bond can be triggered:

- One trigger is *indemnity*. In this case the cat bond is triggered by the realised losses of the cedent. The loss level at which the trigger sets in is determined in advance.
- In case of an *industry index*, the transaction is based on an index of industry-wide losses. Best known is perhaps the Property Claim Services Index in the United States.

---

[27] See Nguyen (2008:3-5).

[28] Also called catastrophe-linked notes (CatLN).

[29] Guy Carpenter (2008:25).

[30] See Anders (2004:101-102).

- *Pure parametric* triggers are solely based on measurable features of the underlying event (for example, the level of an earthquake on the Richter magnitude scale).
- A *parametric index* is very similar to a pure parametric index but uses more refined techniques and mathematical methods to determine the trigger.
- A *modelled loss trigger* is calculated by a model which contains several physical measures of natural catastrophes and estimates losses of the cedent's portfolio.[31]

Parametric triggers are probably the most transparent forms of triggers as investors can easily measure these by looking at publicly available data. This is not the case for indemnity triggers as these are within the domain of the cedent and depend on the amount of disclosure provided to the investor. For the insurance undertaking indemnity triggers have the advantage that they are tailored to its needs and especially its losses (on the same basis as traditional reinsurance). With other triggers losses of an individual insurance undertaking might not always correspond to the industry's loss or set in at a predefined parameter. This means that it is possible that the insurer has to take substantial losses without the protection being triggered because, for example the individual insurer's loss was disproportionately high compared to the industry as a whole.[32]

There is, to a certain extent, a trade-off between the investors' and the originator's demands regarding the applied triggers and used indexes: 'The higher the transparency for the investor, the higher the basis risk for the originator.'[33]

Indemnity was the most used form of trigger in 2007, though it was less prevalent in 2006. Looking at the total amount issued, indemnity was also the largest form of trigger, both in terms of capital and transactions. Parametric triggers were overall second in 2007 and industry indexes were third in 2007, however, almost on the same level as parametric triggers.[34]

Cat bonds can cover many different perils. The two most important ones are earthquakes and hurricanes in the United States. Other important perils include European wind storms, Japanese earthquakes and Japanese typhoons.[35] It is also possible to issue cat bonds dedicated to multiple perils.

It is still relatively unclear how cat bonds should be valued. The existing valuation methods (e.g. cat-simulation-models provided by RMS, AIR, etc. – see section 3.1; peak over threshold–method, derived from the extremum theory)[36]. All valuation methods have certain drawbacks associated with them.[37] For example, stochastic models are used which comprise a hazard module, applied to derive the probability function of a catastrophic event, a damage module, to estimate the damage caused by the catastrophic event, and an insurance module, to calculate the estimated insured losses after an event (after consideration of retentions and other limits fixed

[31] See Swiss Re (2006:6) and Klusemann and Nelles (2008:569).

[32] Based on diagram in Klusemann and Nelles (2008:571).

[33] Klusemann and Nelles (2008:569).

[34] Guy Carpenter (2008:23).

[35] Guy Carpenter (2008:22).

[36] See Anders (2004:89-92).

[37] See Berge (2005).

in the underlying contracts).[38] However, it is an imperfect market with illiquid, underlying information asymmetries and asymmetric profit-loss profiles (low frequency of events but at the same time huge potential losses). For this reason, market liquidity could be limited also in future times.

3.3 Life bonds

As mentioned in section 2.3, there are two main functions of ART instruments, and ILS transactions. First, the risk transfer function which is the main reason for cat bond transactions, as described in section 3.2. Secondly, and also the main reason for most life bond transactions, the financing function; (i.e. to monetise current insurance contracts and future cash flows from these contracts by embedded value financing and thus enhance the capital structure of an insurance or reinsurance undertaking). New business is usually costly in terms of agent or other mediators' fees that amortise very slowly over time (usually over five years) by monthly to annual 'redemption' payments from policyholder premiums. These costs of capital or immaterial assets are well qualified for ILS refinancing. The 'dead' capital can be liquidised and used to underwrite new business or be invested into more flexible assets.

In mortality or longevity life bond transactions the risk transfer function is of great importance as described for cat bonds. The risk transfer also helps to release economic capital as well as regulatory capital when an effective risk transfer is approved by supervisory authorities.[39]

Extreme risks of increasing mortality rates can be transferred to capital markets (the trigger can be local mortality rate indexes, for example, Life Metrics by JP Morgan)[40] as well as longevity risks. Longevity bonds often provide variable yields which depend on a predefined survival rate of a certain population.[41] The transaction usually is structured as a coupon-at-risk bond (also called principal-protected bond).

In XXX/AXXX[42] securitisations the difference between regulatory and economic capital is transferred to capital markets which stresses the financing function of these transactions.[43] XXX/AXXX securitisations are predominantly applied in the US, but have suffered from recent market downturns and rating difficulties of monoliners.

Embedded value financing also contains the motivation for risk transfer. The originator can reduce his investment risk, the risk of fixed minimum yields towards policyholders, and the risk of withdrawals of contracts, administrative costs uncertainty, liquidity and other related risks. As mentioned, activated acquisition costs and the present value of future cash flows are monetised.[44] The embedded value can be defined as economic value of the life insurance contracts calculated by actuaries. It is the sum of the 'net asset value', the financial equity capital adjusted by hidden reserves / losses, and the 'value in force', the net present value of future life insurance contracts cash flows. At this, a run-off scenario is postulated, i.e. no new

[38] See Anders (2004:92-100).

[39] See Klusemann and Nelles (2008:571).

[40] See Klusemann and Nelles (2008:573).

[41] See Klusemann and Nelles (2008:572).

[42] XXX equals term insurance, AXXX are endowment contracts.

[43] See Klusemann and Nelles (2008:568).

[44] See Klusemann and Nelles (2008:572).

business is taken into account. The investor bears all imminent risks of the deviation from this calculation because of different future cash flows and changed market conditions (interest rates, etc).

All these bonds offer high yields and low correlations with other investment assets for investors. For the originator the advantage is the elimination of counterparty risk, the bankruptcy or rating downgrade of a traditional reinsurer. All shown types of life bonds, except for mortality bonds, have been affected by the recent market developments and especially the missing credit enhancement possibilities formerly presented by monoliners, as their rating downgrades directly affected the ratings of the life bond transactions. This will be further discussed in section 4.

3.4 Others

Apart from the aforementioned forms of insurance-linked securities there exist other important variations of the instruments. The foundations of the ILS-market were laid in the United States. However, the most recent innovations have come from Europe. For example, a German primary insurer, who securitised the risk of cancellation of the 2006 FIFA World Cup in Germany and offered it as a terrorism risk bond to capital markets. Also, AXA securitised motor insurance risks in 2005 and 2007. In 2006, first collateralised debt obligations (CDOs) based on cat bonds were issued. Such cat-risk-CDOs bundle several catastrophe risks and are sold in different tranches. Furthermore, CDOs have been issued in the area of embedded-value securitisations.

3.5 Advantages and disadvantages of ILS

ILS are newly developed alternatives for a risk transfer to capital markets and thus enhance the set of instruments for insurance and reinsurance companies to strengthen their risk management and refinancing options. But also new risks emerge that should be regarded by insurance and reinsurance undertakings as well as by investors of ILS products. The following shortly maps the main advantages and disadvantages of ILS transactions. The advantages are usually also in the interest of the supervisory authority as long as they aid the financial strength and sustainability of the insurance or reinsurance undertaking.

Advantages:

For insurance and reinsurance undertakings:

- **+** ILS are alternatives to traditional reinsurance and can raise capacities of primary insurers but also for reinsurers who have a long term expertise regarding catastrophe risks and life insurance related risks[45]
- **+** a set of new instruments alters the options for insurance undertakings' business policies (even in 'hard market') and as a result, complete the market
- **+** ILS can reduce the costs for reinsurance as well as long term costs of capital
- **+** ILS are a new product segment for reinsurance undertakings and can improve their margin (new source of fee income) because of economies of scale and lower costs

[45] Reinsurance companies can further spread their risks taking advantage of additional possibilities for diversification.

+ ILS can reduce regulatory capital requirements in a risk based capital system, depending on the risk transfer
+ ILS introduce the possibility of risk transfers to capital markets (effective risk transfer tool) and smoothing annual results by reducing negative effects from extreme risks
+ ILS reduce the sensitivity towards insurance business cycles and further decrease the volatility of annual profits and losses -> optimise RORAC[46] results
+ No counterparty risk, if designed appropriately

For investors:

+ ILS have a low correlation (if any) with capital markets and other investments
+ ILS have a comparably high yield in contrast to equally rated corporate bonds even during the financial crisis
+ ILS enlarges investors' investment universe and leads to a superior risk - return – allocation, thus, leading to a more efficient capital allocation
+ In general, short time-to-maturity of cat bonds

For others:

+ ILS are a unique instrument for investors not related to the insurance market that wish to widen their business alternatives

Disadvantages:

For insurance or reinsurance undertakings:

- ILS are cost-intensive for small insurance companies who cannot afford the high administrative burden of ILS-transactions, therefore affecting their competitiveness
- ILS enhance competition for reinsurance undertakings, in first place for small reinsurance undertakings
- ILS highly depend on capital market's demand and liquidity
- In case SPV's assets are not risk free, counterparty risk has to be taken on board in the calculation of regulatory capital

For investors:

- historic correlations of ILS can be misleading (positive correlation of man-made catastrophes with capital markets on September 11th 2001)
- investors assuming high risks[47] (worst case: total losses) due to the possibility of high losses from catastrophic events; partially investors also bear the investment risks and counterparty risks of the investment trusts when these fail under extreme circumstances (see section 4.1)
- ILS are very complex transactions, partly lack of transparency / knowledge of investors (asymmetric information and adverse selection problems resulting in

[46] RORAC stands for Return On Risk Adjusted Capital and thereby combines traditional return ratios and risk figures.
[47] Cat bonds usually have non-investment grade ratings.

monitoring and possibly legal costs); standardised products required to strengthen transparency

- Liquidity effects for investors as well as for financial markets are to be considered when the ILS market grows rapidly
- ILS also depend on the expertise of rating agencies to assess the complex and partly non-transparent deals especially regarding monoline insurance of transactions
- ILS has a residual risk for investors if collateral arrangements are not risk-free

For others (including supervisors):

- ILS can affect system stability when financial institutions are not limited in investing into ILS products
- ILS increase the possibilities of regulatory arbitrage; e.g. originate to distribute model seen during the financial crisis regarding structured credit products; repackaging of transferred portfolios further weakens market transparency
- ILS increase the possibility of transferring risks from the liability side onto the asset side of the balance sheet might lead to a lower solvency buffer when markets go down or asset volatility goes up
- ILS soften and transcending traditional product constraints and therefore leading to more complex supervision (deepening of cooperation between different supervisory bodies and demands for integrated supervision)

3.6 Risks and parallels with structured credit products

As the financial turmoil led to huge uncertainty amongst financial market participants (banks, investment trusts, hedge funds, etc. were affected heavily on the asset side and as a result limited in their ability to take any further risks) one outcome was that banks were increasingly unwilling to lend each other short term liquidity facilities. With other participants also being more risk-averse, because of the deteriorating economic conditions, financial markets have undergone a tremendous flight of capital. Also, the ILS market cannot isolate itself from these macroeconomic distortions. Although it should be stressed that structured credit product transactions and insurance linked securities transactions differ in many aspects, there are some similarities.

At a first glance ILS and structured credit products seem to have an identical structure. There are true sale transactions as well as synthetic deals in which different tranches are passed on to capital market investors. Structured credit products combine risk transfer and finance as well. This is generally similar to life bond transactions, especially mortality and longevity bonds, but the underlying risks as well as securitised assets cannot be compared. Regarding ABS, for example, collaterals and ratings are crucial factors, because of a strong dependency on future cash flows.[48] When a large number of debtors default at the same time, as seen during the crisis, there is a substantial lack of liquidity. Concerning ILS, cash flows have already been received and can be considered as collateral, because in case of defaults (policyholders unable to continue to pay the premiums), there are early-withdrawal

[48] Cat bonds are typically lower rated than structured credit products, because of higher underlying potential losses.

penalties for the policyholder, especially in life insurance, which make these kind of outcomes less likely.[49]

Other similarities are the credit enhancement tools: different tranches and subordination; first loss absorption and incorporated trusts' cash flow management.

The main differences between structured credit products and ILS:

On the one hand, the ILS market is still emerging, compared to credit securitisations the transaction capacity of insurance securitisation only constitutes a small fraction of total market volume with a higher investor demand than supply (at least before the financial crisis peaked). Credit risks turned out to have a higher correlation than expected among several credit risk securitisations, especially when risk limits were exceeded and credit events took place with low geographical diversification (U.S. housing market). This was presumably also due to systemic correlations. In general, catastrophe risks have low correlations (if any) among each other when regions and / or underlying catastrophe risks fall apart and thus the accumulation of losses is avoided (many policyholders in the same region, but also correlated losses like fire damages or other property damages after a hurricane, etc.). Although continental drifts theory can explain connections between earthquakes in neighbouring regions, the evidence for a connection of two catastrophes happening in far-away regions in the world is less clear, especially in cases where catastrophes have different direct causes (hurricane, earthquakes, flood, etc.).

While investors thought that credit risks were nearly uncorrelated with financial markets and therefore with all major asset classes traded on that market, the financial crisis pointed out the weaknesses of mass credit risk transactions. Initially contagion effects were neglected. Banks which cleared their bad risks (in terms of borrowers not able to pay back their debts) repurchased these risks and reincorporated them on the asset side of the balance sheet. Using possibilities for regulatory arbitrage, market participants artificially extended their ability of mitigating risks and created a credit risk bubble that burst when payments by borrowers with no financial guarantees and low financial standing did not suffice to repay this debt. Therefore, the market was flooded by bad risks causing substantial losses. Besides contagion effects, also second round liquidity supply shortfalls were ignored. The final result turned out to be distrust among financial institutions and other financial market participants damaging the system's reliability. Also, non-transparent risks of asset-backed securitisation were often not disclosed properly.

Regarding the ILS market all market participants can learn from recent mistakes. The transparency of a market should be assured by the legislator and overseen by supervisory authorities including the oversight of rating agencies. A flooding of a market with non-transparent assets has to be avoided. Under Solvency II risk weightings for investments into insurance linked securities have to be assessed adequately. Liquidity risks must be integrated into the analysis. Regulatory arbitrage must be prevented. Financial markets may have the ability to absorb a high volume of risky assets but banking and insurance companies as participants of these markets should be careful to take on major parts of the traded risks because of their importance for a well functioning financial system. However, a transition from major risk carriers to financial servicers and risk specialists trading risks should be supported.

[49] See Pan European Insurance Forum (2009:2).

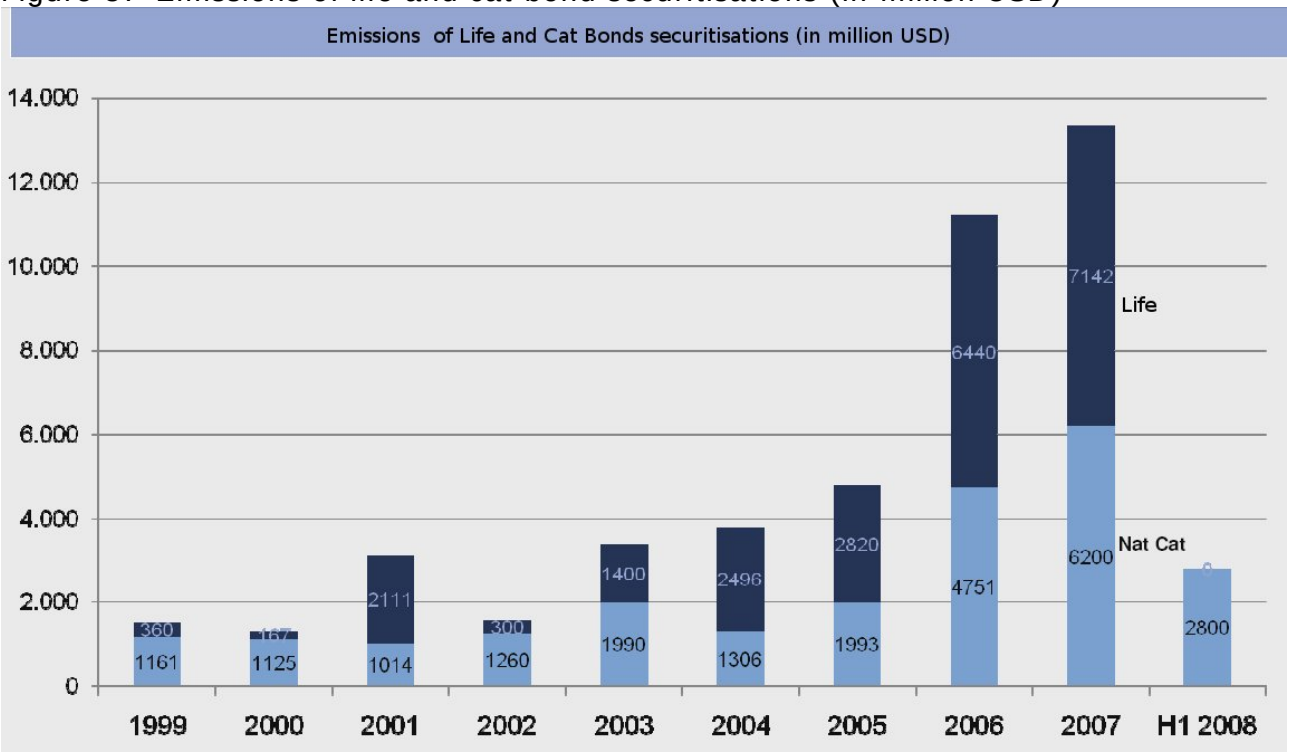
4 Size and structure of the market

4.1 Market overview

The market for insurance-linked securities is compared to the worldwide securitisation markets still very small and only makes up about 1% of all securitisation business. However, the ILS market has been growing at very large rates in the last few years since its development in the 1990s, but especially since 2004/05 until the middle of 2008. One of the main reasons may be the huge losses for insurance undertakings due to natural catastrophes during that time, which caused price increases and a 'capital shortfall of USD 142 billion'[50]. Furthermore, there has been increased investor interest which was fuelled by the search for yield, new possibilities for diversification and uncorrelated asset classes as well as new investment funds and hedge funds.

In 2007, ILS of a total value about USD 13.3b were issued, which was even higher than the USD 11.2b in 2006.[51] The outstanding notional value was USD 39b compared with USD 26b at the end of 2006.[52] By mid 2008, the value of ILS bonds outstanding was USD 40b.[53] As a comparison, the size of the traditional reinsurance market in 2007 was USD 195b. For the total ILS market, life XXX emissions were, with 22% of the total value of the ILS market, the largest investment class in the accumulated period between 1997 and September 2007. Other important classes of investments were multiperil bonds (18%), hurricane USA (14%) and embedded value (13%).[54]

Figure 3: Emissions of life and cat bond securitisations (in million USD)[55]



Source: Munich Re.

[50] Guy Carpenter (2008:13).

[51] Herde (2008:80).

[52] World Economic Forum (2008:9).

[53] Ibid.

[54] Helaba Volkswirtschaft/Research (2007:22).

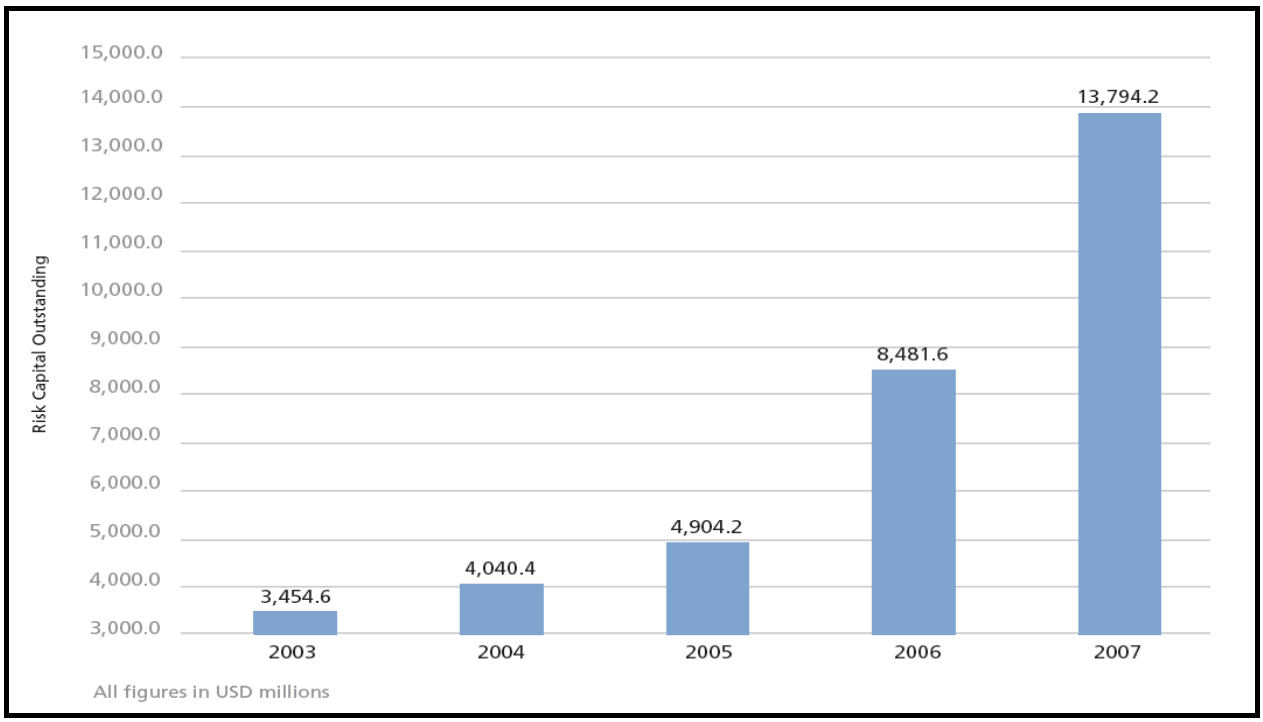
[55] Herde (2008:80).

Cat bonds

According to numbers from Munich Re, cat bond issuances amounted to around USD 6.2b in 2007 (around USD 4.7b in 2006), which so far has been the largest issuance ever. The number of transactions has also been higher than ever before with 27 (compared with 20 in 2006). In 2005, the number of transactions was only around 10.[56]

The value of outstanding cat bonds is high as well (see figure 4). Around USD 13.8b were outstanding by the end of 2007, compared with USD 8.5b in 2006. Again, the market has been growing over the last years until very recently.[57]

Figure 4: Outstanding risk capital of cat bonds[58]



Source: Guy Carpenter.

Reinsurance undertakings are known as the leading sponsors of cat bonds, especially Swiss Re. Also German reinsurance undertakings have issued such bonds or have founded special subsidiaries for this kind of business (for example, Munich Re Capital Markets GmbH).[59] But there are still many first time sponsors as well.

Concerning perils, USA Hurricanes were the most common peril covered by cat bonds outstanding. In 2007, they accounted for 33.6% of all outstanding bonds. Overall they accounted for 31.8% of all cat bonds issued since 1997. In second place is USA earthquake with 26.3% in 2007 and 29.6% since 1997. Europe windstorm is in third place with 12.2% in 2007 and 15.1% overall. The share of other risks (not including Japan earthquake and typhoon) seems to have increased. In 2007, that figure was at 13.8%, well above the overall share of 8.5% for the whole period 1997-2007. One can conclude that risks have been diversified.[60]

[56] Guy Carpenter (2008:5).
[57] Ibid.
[58] Guy Carpenter (2008:6).
[59] Compare Horst and Tokakuna (2008:729).
[60] Guy Carpenter (2008:22).

One would expect that demand for cat bonds rises in a hard market with high prices for reinsurance. Since the surge in cat bonds in 2007 took place under reinsurance market conditions that were relatively relaxed (soft market phase), this could be an indication that capital market solutions are no longer a tactical instrument in a hard market phase but also part of a more strategic solution for the widening of risk transfer capacities.[61]

Some expect that the issuance of P&C bonds is likely to grow to USD 25-50b yearly by 2011.[62] However, it is not yet clear how the financial crisis has affected these estimations.

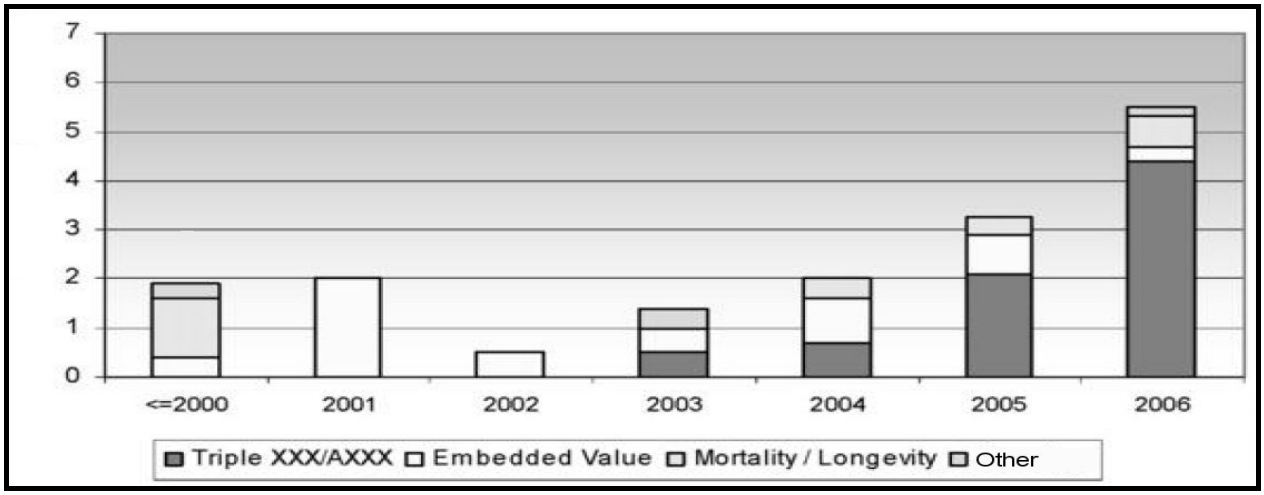
Life bonds

In 2007, life bonds were issued with a total value of more than USD 7b, compared with about USD 6.4b in 2006 (see figure 3 above). The outstanding value of life bonds added to about USD 20b at the end of 2007.[63] Overall, the trend over the past years has been very favourable for the life bond sector, at least until the very recent past. If one looks at the market size around 1997, it is obvious that the market was extremely small in size. Over the past years it has grown substantially.

This segment of the ILS market, especially embedded value and XXX/AXXX securitisations, seems to be particularly affected by the financial turmoil as we will see in section 4.2. These have often been guaranteed by monoline insurers which came under very severe stress over the course of the crisis. Also market illiquidity had additional unfavourable effects.

Figure 5 shows the distribution of life bond by type. Embedded value life bonds were very important in the early part of this decade. XXX/AXXX bonds have since then gained in market share and were by far the most important life bond segment in 2006.

Figure 5: Distribution of life bonds by type[64]



Source: Klusemann and Nelles.

[61] Guy Carpenter (2008:37).

[62] See World Economic Forum (2008:9).

[63] Klusemann and Nelles (2008:576).

[64] Klusemann and Nelles (2008:578).

Others

Cat swaps and ILWs have currently around USD 10b in outstanding notional value.[65]

Weather derivatives' notional value of trades was at a level of USD 32b in 2007-08, more than the circa USD 20b in 2006-07 but less than the USD 45b in 2005-06. However, the market is expected to grow strongly over the next years.[66]

4.2 Most recent market developments

First indicators for 2008 point towards a distinct cooling down of market growth. 2007 was the best year yet for ILS as a whole as 2008 seems to be weaker. According to some sources, cat bond issuance in the first half of 2008 was only half as high as in the first half of 2007.[67] It is possible that they fell to USD 2.7b for the whole of 2008, which is a lot less than the USD 7b in 2007.[68] This might be seen as a sign for how strong a year 2007 was but it could also point out that ILS are not absolutely isolated from overall developments on international capital markets and the financial turmoil as such. The World Economic Forum writes: "Although long-term prospects for the market are robust, ILS issuance slowed in the first half of 2008 due to the turmoil in the credit markets, which particularly affected investment-grade life and non-life bonds."[69]

Also, since August 2008, the cat bond market seems to be under further stress and some describe it as being dried out.[70] The life bond market seems to have experienced this already earlier in 2008 and has 'slowed to a standstill'[71]. The troubles many monoliners experienced since the start of the financial crisis have also affected the ILS market, especially life bonds.

Some cat bonds were directly affected by the bankruptcy of Lehman Brothers. Lehman Brothers was the guarantor (e.g. as swap counterparty) of several cat bonds. These had to be downgraded to CC or CCC (junk status) subsequently. These bonds account for about 5% of overall outstanding cat bonds.[72] In February 2009, it was reported that a cat bond issued by Allstate Corp faced 'imminent default'[73]. This was one of the bonds that used Lehman Brothers as a guarantor on returns from the collateral that backed the note as well as to make interest payments.[74] Eventually, only 91% of the scheduled interest on the bond was paid.[75] The bond was downgraded from CC to D. Such events are very likely to have an impact on the future of the ILS market, at least on a short term, by weakening the confidence in these kinds of securities. Normally, there should not be any counterparty risk involved

[65] World Economic Forum (2008:10).

[66] World Economic Forum (2008:13-14).

[67] See Aon Capital Markets (2008:6).

[68] Suess and Unmack (2008).

[69] World Economic Forum (2008:9-10).

[70] Kullrich (2008).

[71] World Economic Forum (2008:10).

[72] Kullrich (2008)

[73] Suess and Unmack (2009a).

[74] Ibid.

[75] Suess and Unmack (2009b).

in a cat bond transaction for investors. In this case the principal was held in a trust account at an institution which turned out not to be safe.

Another factor that might influence the near term future of ILS is market liquidity. Low liquidity within capital markets makes competition for investors' funds even stiffer than normal. As this is one of the key problems within today's capital markets, ILS find themselves in competition with many other financial instruments and are, thus, affected by the current financial turmoil. That makes it difficult for new issuances to obtain the necessary capital.

Future weather events will also have an impact on the fortunes of the ILS market. The American hurricane season was one factor that may have contributed towards the 2008 results.

Also, the current state of the hedge fund industry and other investment funds has contributed towards the recent state of the ILS industry. Hedge funds are probably not going to play the same role they have previously played (see the numbers provided in section 4.3).

In overall, the short term prospects of ILS seem to be quite unclear. One cannot argue that ILS are completely unaffected by the financial market crisis. However, this might change again in the medium to long run. In fact, there are first signs that the market is catching up again. The French reinsurer Scor issued the first cat bond in 2009 in February and sold bonds worth USD 200m.[76] However, in the near term, it remains to be seen whether the market can get back to where it once was.[77]

4.3 Investors

Dedicated cat funds are the largest investors in cat bonds at the moment (according to data by the World Economic Forum/Swiss Re they currently make up 44% of all investors). Dedicated cat funds are funds that are specialised in investing in cat bonds and other similar instruments. Only a few very large investors are willing and able to invest in ILS directly. Most investors opt for these specialised funds. One advantage of this form of investment is the built-in diversification of this approach besides the one ILS provide as such in combination with other investments. Worldwide there are about 20 dedicated ILS funds.[78]

Other major investors are money managers (22%), banks (13%), hedge funds (14%), reinsurance undertakings (4%) and insurance undertakings (3%).[79] This can be seen from figure 6. It should be noted that insurance undertakings are in some countries (for example, Germany) restricted to invest in ILS. It remains to be seen how far this investor structure can be maintained. Especially in the light of recent market developments, it is unclear whether hedge funds can maintain their role. Also dedicated cat funds and others may be affected by this. It is also noteworthy that the current profile of investors has changed. In 1999, 25% of the investors were reinsurance undertakings and another 30% insurance undertakings. This has changed considerably. In the beginning mainly insurance and reinsurance undertakings tried to spread their risks. Now the investor profile has become wider. At the same time,

[76] Suess and Unmack (2009c).

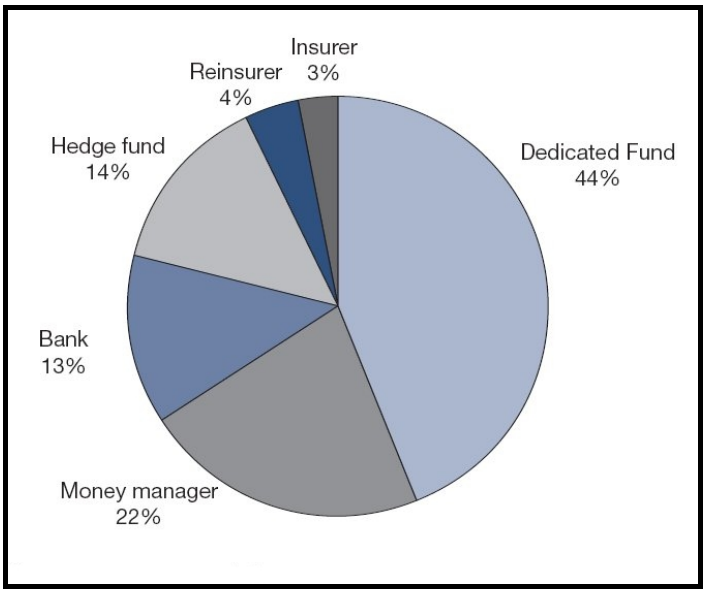
[77] Also see Kullrich (2009).

[78] See Grieger and Ramseier (2008:53).

[79] See World Economic Forum (2008:15).

these investors become more sophisticated and specialise on this market segment. The modelling of cat and other risks is far from easy and requires a substantial amount of specialised knowledge that not every investor has.

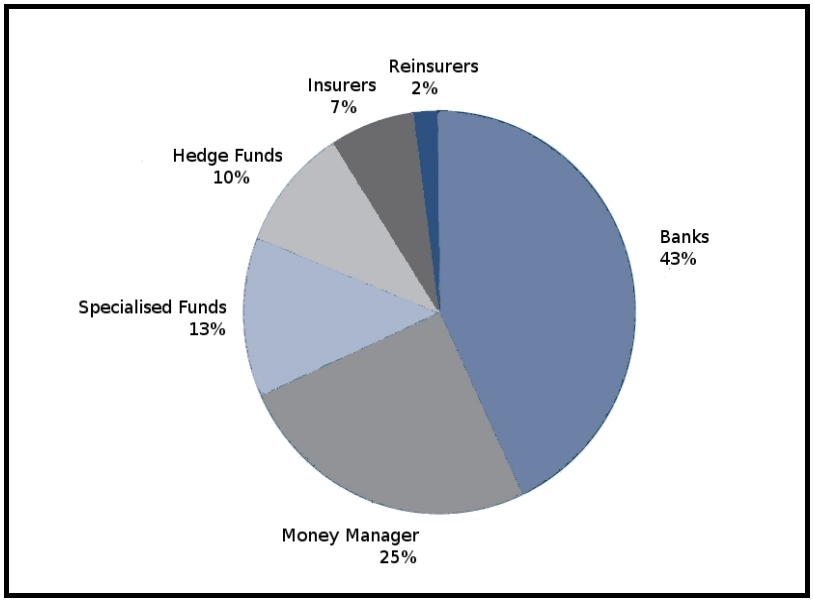
Figure 6: Investors in cat bonds by type (as of end 2007)[80]



Source: Helaba Volkswirtschaft/Research.

Investors in life bonds are somewhat different to investors investing in catastrophe bonds as shown in figure 7. The largest investors are currently banks (43%), followed by money managers (25%), dedicated funds (13%), hedge funds (10%), insurance undertakings (7%) and reinsurance undertakings (2%).[81] Again, it shows that insurance and reinsurance undertakings only hold a small market share compared to other institutional investors.

Figure 7: Investors in life bonds by type (as of September 2007)[82]



Source: Helaba Volkswirtschaft/Research.

[80] Ibid.

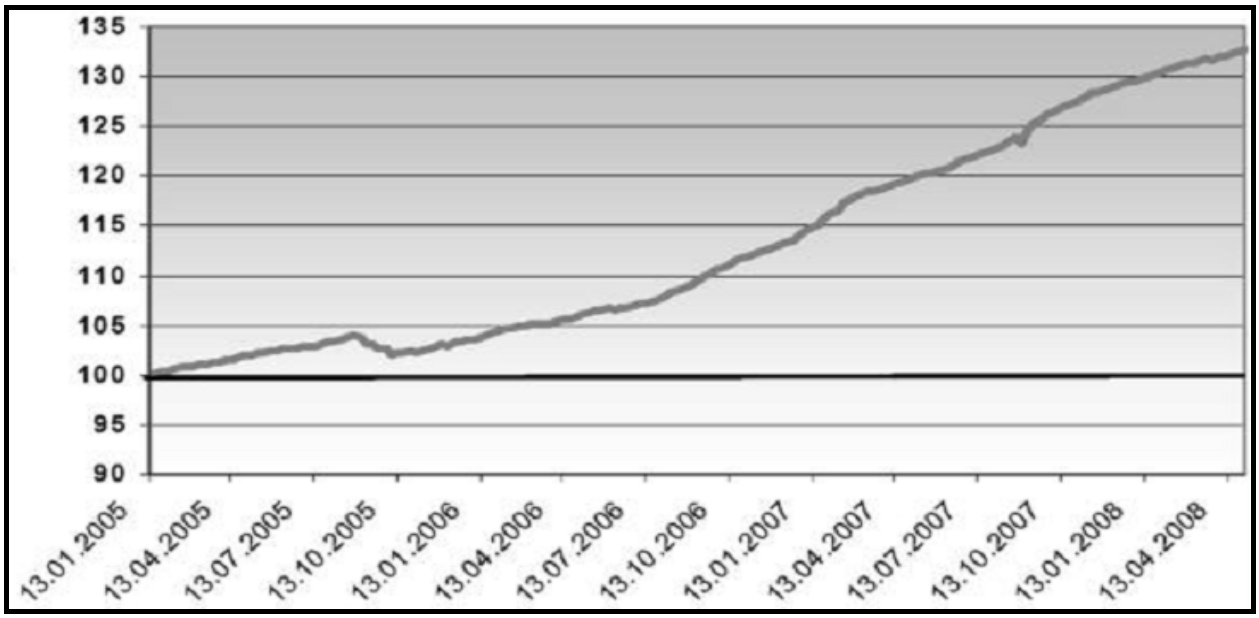
[81] Helaba Volkswirtschaft/Research (2007:22).

[82] Ibid.

The differences between investor's profiles in catastrophe bonds and other ILS may be a result of several factors. This can be due to an appetite among investors to diversify their portfolios since catastrophe risks are uncorrelated with most other available forms of investment instruments. A mixture of cat bonds and other asset classes might thus yield an overall portfolio with very little correlation towards the rest of the capital market (a very low beta coefficient in terms of the Capital Asset Pricing Model[83]). A major argument for these investors might be the possibilities for improved diversification of risks. Furthermore, they offer a comparatively high yield due to the risk of very large losses.

For the cat bond market Swiss Re calculated a Total Return Cat-Bond-Index since 2005.[84] Starting in 2005 at a level of 100 the index reached 132 points in May 2008. This corresponds to an annual return of 9.2% in this period. A BB – rated cat bond investment exceeded the return of a BB – rated portfolio of corporate bonds by 3.8% per year.[85] Remarkable is the positive performance since the beginning of the financial crisis in summer 2007. So far the cat bond segment has shown its resistance towards high market volatility and high losses of stock and traditional bond markets. In October 2008 the Swiss Re Total Return Cat-Bond-index dropped and has been recovering since. But compared to stock market losses during that month the index has performed fairly well. 'Catastrophe bonds returned 2.9 percent since January last year, according to the Swiss Re Cat Bond Total Return Index. Similar-rated corporate bonds handed investors a loss of almost 22 percent in the same period, Merrill Lynch & Co. data show'.[86]

Figure 8: Performance of the Swiss Re Total Return Index 2005 – 2008[87]



Source: Swiss Re.

[83] A model developed by William F. Sharpe, John Lintner and Jan Mossin which is build upon the Portfolio Theory by Markowitz.

[84] See Klusemann and Nelles (2008:575).

[85] The spread of major cat bond transactions exceeded LIBOR by 460 basis points in the period of 1997-2002. In comparison to expected loss spreads, derived from their ratings, cat bonds showed a spread multiple – spread over LIBOR divided by expected loss spreads - of 6.2 on average. See Anders (2004:116-117).

[86] Suess and Unmack (2009c).

[87] Klusemann and Nelles (2008:575).

However catastrophe risks might in some rare cases be correlated with other capital markets like equity markets. Very extreme natural disasters as, for example, the Kobe earthquake in 1995 can have an economic impact and also an effect on equity markets. Another example could be pandemic risks, as a widespread pandemic would surely have an impact on the economic development of a country or a region. Still, in most cases there does not seem to be a correlation between equity markets and catastrophes.[88]

5 Current regulation and potential impact of Solvency II

Current and future regulation in the European Union imposes capital requirements upon insurance undertakings. Very important in this respect is the accounting treatment of ILS. The IFRS[89] differentiate ILS as reinsurance contracts or not. Only contracts with a sufficient risk transfer can be considered as reinsurance contracts. In case they are recognised as reinsurance contracts, they can be part of the technical provisions of the insurer. In case they are only recognised as derivatives (and not as reinsurance contracts), they are considered as non-insurance business and cannot be part of the technical provisions. As financial derivatives, ILS are not part of the insurance result. Furthermore, they would be valued at fair value. Under the IFRS only ILS with an indemnity-based trigger are considered as reinsurance contracts. The accounting treatment of ILS affects the capital requirements of the insurer.[90]

Under Solvency I, claims against an SPV with its head-office in the EU/EEA can be considered by the calculation of the solvency margin and can be treated as assets covering technical provisions as long as the transfer is recognised as a reinsurance contract. Another factor which might have an impact on this, is, whether the SPV, employed in a particular transaction, is considered as sufficiently supervised. This might be important as SPVs are often located outside the EU and it depends whether the European supervisor considers this third-party supervision as equivalent, assuming that the SPV is subject to a licensing procedure and on-going supervision. Overall, supervision must be equivalent to that of one within the European Union and provide the same level of safety.

The new principles-based Solvency II framework is very likely to be a major development for the ILS market. Solvency II will recognise securitisation and derivatives as effective risk mitigation techniques. The insurance undertaking will need to satisfy supervisors that the intended risk mitigation is indeed present. The framework acknowledges the economic substance of insurance activity and focuses on risk and the management of risk. As seen above, the current Solvency I framework is much more restrictive concerning ILS than Solvency II is going to be in this respect. Specific treatment of ILS is still under discussion and will be specified in Level 2 measures.

CEIOPS laid down several principles in its Quantitative Impact Study 4 (QIS 4) with respect to the recognition of alternative risk mitigation tools. Concerning solvency capital requirement purposes these tools should generally be 'recognised and treated equally, regardless of their legal form or accounting treatment, provided that their economic or legal features do not oppose the principles and rules required for such

[88] Grieger and Ramseier (2008:50-52).

[89] International Financial Reporting Standards.

[90] See World Economic Forum (2008:19).

recognition.'[91] Furthermore, these instruments need to be 'legally effective and enforceable in all relevant jurisdictions'. The value of the instruments needs to be steady enough to reliably cover the risk. The credit quality of the counterparty should also be of sufficient quality. Additionally, the claims of the sponsor should provide a direct claim and be sufficiently explicit as to what pool of risks they refer to. Also, they need to be irrevocable and should not allow the protection provider to unilaterally cancel the contract and are unconditional upon any clauses the insurer cannot control, which could allow the protection provider to be exempted from paying claims.[92]

Under the new Solvency II framework, European insurance and reinsurance undertakings can use securitisation in the same way as they use reinsurance to meet their capital requirements which should have a positive effect on supply and facilitate the development of the insurance securitisation market. These techniques can be used to obtain commensurate solvency capital relief, provided that insurance undertakings can demonstrate that they understand the nature and limitations of such techniques, and provided that there is a real transfer of risk. As a result of this, insurance undertakings are probably going to use these instruments even more widely than at the moment. It could, thus, be argued that future regulation of these instruments, especially in the EU, is likely to have a direct impact on market development.

The increased transparency and quantification of risk generated by the Solvency II process should provide a foundation for the growth of securitisation as an effective risk transfer tool. But it has to be stressed that supervisory authorities will have a pivotal role in monitoring the insurance undertakings' general risk model and internal risk control measures to prevent an uncontrollable originate-to-distribute model that led to the current crisis in the banking sector and the recent credit crunch intensively affecting the worldwide economic situation.

6 Conclusions and outlook

Overall, there are positive and negative aspects to ILS that must be considered. Besides beneficial and wanted effects, like the increased potential for absorption of massive losses resulting from natural catastrophes and new sources of funding in general, they can also reduce the costs for reinsurance as well as long-term costs of capital. Furthermore, the limited correlation with ordinary capital market investments makes a strong case for ILS' diversification effects. This should, in normal times, attract more investors and increase investor's diligence with improved risk management and could speed up the progress in achieving more standardised and transparent insurance securitisation deals. It will also be interesting to see whether hardening conditions in the reinsurance market could, in fact, contribute to new growth of the ILS market.

There are also disadvantages that need to be addressed properly. Information asymmetries are possible with these very complex, non-standardised transactions. It is difficult to adequately assess and analyse the risk of a natural disaster to occur at some point. This, in particular, is one factor that might hinder market growth. Capital market illiquidity is for ILS just as much a factor as for other parts of global financial markets. Market size is still rather limited, which could affect investor confidence.

[91] CEIOPS (2008:121).

[92] CEIOPS (2008:121-123).

Improvements are being made constantly, and the market could, therefore, have the potential for further growth in the future.

Overall ILS and ART, in general, are likely to become a relevant factor in the future conduct of insurance undertakings and need to be addressed properly by regulators as well as supervisors. We have seen that the market has grown substantially over the past years, both in catastrophe bonds and life bonds. However, the market has not proven to be fully immune to the ongoing financial turmoil that started in other sectors of the capital market but caused spillover effects that also impacted upon ILS market. For example, the bankruptcy of Lehman Brothers and the deteriorating state of many hedge funds caused considerable distortions. It is very difficult to predict how the market will develop in the short to medium term. However, there is a chance that ILS will catch up again in the long run. This is also due to regulatory developments, like Solvency II, that are likely to recognise this risk mitigation technique in a way which is different from the current one.

References

Anders, S. (2004): "*Insurance-Linked Securities: Eine Analyse der Einsatzmöglichkeiten als Finanzierungsinstrumente für Sach- und Lebensversicherungsunternehmen*", Wiesbaden.

Aon Capital Markets (2008): "*Insurance-Linked Securities 2008: Innovation and Investor Demand Set the Stage for Continued Growth"*, Chicago.

Arnoldussen, L. (2008): "*Renewals at 1 January 2009 – The Market Has Turned*", http://www.munichre.com/app_resources/pdf/press/press_releases/2008/2008_10_27_app1_en.pdf, 23/06/2009.

Berge, K. (2005): "*Katastrophenanleihen: Anwendung, Bewertung, Gestaltungsempfehlungen"*, Lohmar/Köln.

CEIOPS (2008): "Technical Specifications QIS4", http://www.ceiops.eu/media/docman/Technical%20Specifications%20QIS4.doc, 23/06/2009.

Grieger, D./ Ramseier, U. (2008): "*Insurance-Linked Securities als neue Anlageklasse*", in: Absolutreport, No. 42, p. 46-53.

Guy Carpenter (2008): "*The Catastrophe Bond Market at Year-End 2007: The Market Goes Mainstream"*.

Helaba Volkswirtschaft/Research (2007): "*Verbriefung von Versicherungsrisiken: Eine Assetklasse auf Wachstumskurs*", Frankfurt am Main.

Herde, R. (2008): "*Insurance Linked Securitization*", presentation at the Fitch Insurance Roadshow, Frankfurt, 20/10/2008.

Horst, C./ Tokakuna, T. (2008): "*Strategische Alternativen zur Absicherung von Desasterrisiken unter besonderer Berücksichtigung von Rückversicherung und Katastrophenanleihen*", in: Zeitschrift für das Versicherungswesen, No. 21/2008, p. 723-734.

Klusemann, M./ Nelles, M. (2008): "*Insurance Linked Securities – Alternative Risikofinanzierung von Versicherungsunternehmen"*, in: Finanzbetrieb, No. 9, p. 565-578.

Kullrich, A. (2008): "*Markt für Cat Bonds liegt danieder"*, in: Boersenzeitung, 18/10/2008, p. 4.

Kullrich, A. (2009): "*Markt für Cat Bonds erwacht*", in: Boersenzeitung, 05/02/2009, p. 4.

Liebwein, P. (2000): "Klassische und moderne Formen der Rückversicherung", Karlsruhe.

Nguyen, T. (2008): "*Vorteilhaftigkeitsanalyse von Katastrophenbonds versus traditionelle Rückversicherung"*, http://www.tristan-nguyen.de/pdf/A13.pdf, 15/01/2009.

Pan European Insurance Forum (2009): "*Insurance View, Regulatory consequences of financial crisis*", http://www.cea.eu/uploads/DocumentsLibrary/documents/1234432162_final-booklet-peif.pdf 24/02/2009.

Swiss Re (2006): "*Securitization – new opportunities for insurers and investors"*, in: Sigma Report, No. 7/2006.

Suess, O./ Unmack, N.(2008): "*Cat Bonds Survive Earthquakes, Decline After Lehman's Collapse*", http://www.bloomberg.com/apps/news?pid=20601203&sid=aRYFLKElf8bY, 23/06/2009.

Suess, O./ Unmack, N. (2009a): "*Allstate's Catastrophe Bonds Face 'Imminent' Default*", http://www.bloomberg.com/apps/news?pid=20601087&sid=aDeH.Tlf.VW4, 23/06/2009.

Suess, O./ Unmack, N. (2009b): "*Allstate's Willow Re Cat Bond Pays 91% of Coupon*", http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aeqBQ9WlgTPY, 23/06/2009.

Suess, O./ Unmack, N. (2009b): "*Scor Sells First Catastrophe Bond Since Lehman Demise*", http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aXEQqFHe6r30, 23/06/2009.

World Economic Forum (2008): "*Convergence of Insurance and Capital Markets"*, Geneva.