

Chapter 1: Market overview, background and evolution

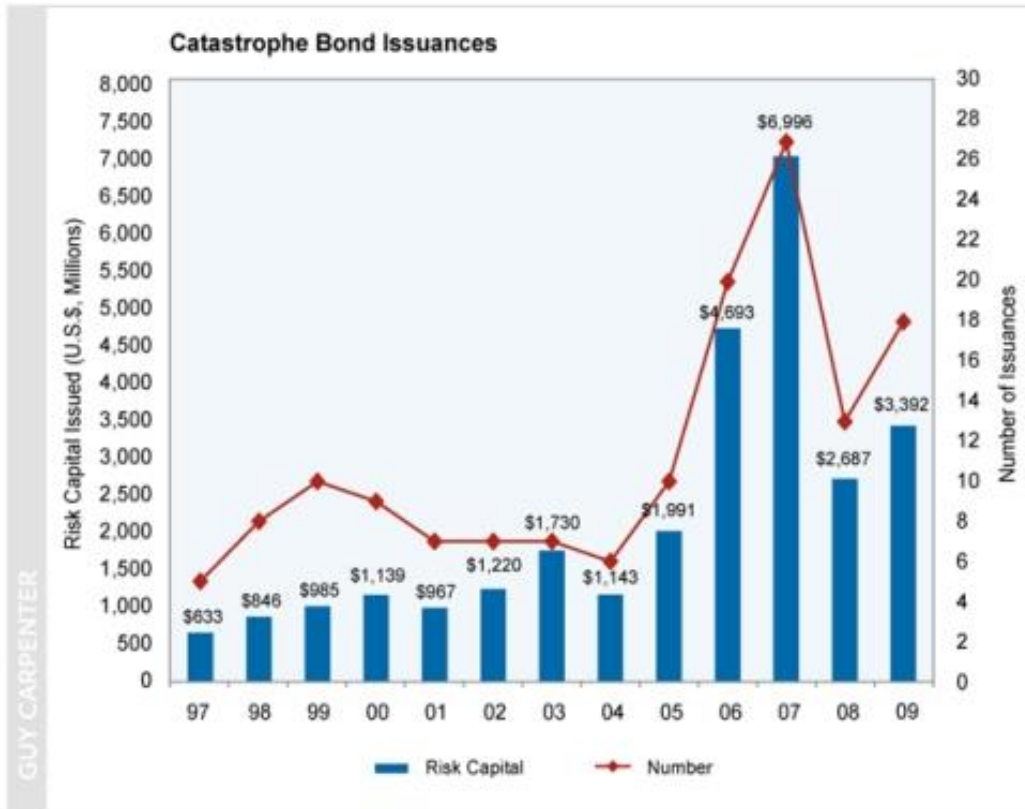
By Jonathan Spry

Guy Carpenter/ GC Securities

I- Market overview

The concept of securitising insurance risks became established in the mid-1990s in the wake of significant pressure on capacity in the non-life reinsurance market and an increased focus on capital management across both the life and non-life insurance sectors. The most prominent form of insurance linked securities (“ILS”) is the catastrophe bond, a structure that was borne out of a desire to broaden reinsurance capacity in the aftermath of Hurricane Andrew in 1992 and the impact this loss had on the availability and price of property reinsurance.

Catastrophe or ‘cat’ bonds were designed to facilitate the direct transfer of catastrophe insurance risk from insurers, reinsurers and corporations (referred to as the cat bonds’ ‘sponsors’) to investors. They were designed to protect sponsoring companies from financial losses caused by large natural catastrophes by complementing traditional reinsurance for certain layers of risk. The first ever cat bond (or ‘Act of God’ bond as it was then termed) was completed in 1994 for the Nationwide Insurance Co. of Columbus, Ohio. The market for cat bonds has grown steadily since the early days of the market to \$1-2 billion of issuance per year for the 1998-2001 period and then to over \$2 billion per year following the attack on the World Trade Centre in New York, which had an effect on available reinsurance capacity across perils. Issuance doubled again to a rate of approximately \$4 billion on an annual basis in 2006 following Hurricane Katrina and then grew further to result in a record annual issuance of \$7 billion in 2007 up 49 percent on the previous year. Issuance volumes in 2008 were down from the previous year partly as a result of a softening reinsurance market but also as financial market contagion limited appetite from investors but was still a fairly healthy \$2.7 billion. In 2009 recovery was strong and investors demand for non-correlating risk enabled issuance to rise to a level of £3.4bn (Figure 2.1).



Source: Guy Carpenter & Company, LLC

Figure 2.1 ILS Market Volume

Source: Guy Carpenter/ GC Securities

Cat bond risk capital outstanding was \$12.5 billion at the end of 2009 down on the figure of \$13.8 billion reached at the end of the record breaking 2007, a year which saw outstanding capital 63 percent higher than the \$8.5 billion in 2006 and nearly three times the \$4.9 billion outstanding at the end of 2005. Cat bond risk principal now composes an estimated 8 percent of the estimated property limits globally and 12 percent on a U.S.-only basis. The capital markets weight in reinsurance is even larger when adding investments in sidecars of natural catastrophe risk (see chapter 11) and Industry Loss Warranties (ILWs) many of which are written by capital markets participants.

Unlike traditional corporate bonds or other fixed income instruments, the primary risk embedded in ILS is the occurrence of one or a number of adverse insurance related events. The main risk to investors in cat bonds is that a natural disaster such as an earthquake or hurricane will "trigger" the bond, wiping out some or the entire principal, which is used to pay claims. Cat bonds are often said to represent a form of a 'pure play' risk in as much as they offer investors the chance to be rewarded for gaining exposure to natural catastrophe risk without assuming risks such as investment risk or credit risk that are likely to be more heavily correlated with other investments in their portfolio.

Investors choose to invest in cat bonds because their return is largely uncorrelated with the return on other investments and often pay higher interest rates than comparably rated corporate instruments.

Cat bond investors in general do not face the risk of default by the ceding insurance company because they are usually backed by cash collateral although in some cases, there is also some credit risk relating to the continuing payment of premiums; that said risks other than pure insurance risk cannot be ignored when evaluating ILS. The risk of a 'credit cliff' in cat bonds is apparent when an investor can rapidly lose most or their entire principal and –in some cases- unpaid interest if a triggering events occur. The art and science of computer modelling is crucial to assessing and managing the risk in cat bonds and also drives the pricing, yields and ratings, these models are in

turn extremely sensitive to the data used (See Chapter 6 on modelling risk and rating methodology). The quality and quantity of data vary depending on the peril or other type of risk being securitised. Further potential risks for investors include liquidity risk due largely to the fact that most ILS are sold as unregistered investments, available only to large institutional investors and not subject to the SEC's full registration and disclosure requirements, although it should be noted that in 2008 for the first time key trading houses have estimated that the volumes of secondary market trading have been larger than the volumes of primary issuance, and the mark-to-market losses in the most challenging months for the general markets have been on average below double digit figures, thus showing a comparatively healthier market in the ILS sector. An additional risk that ILS investors need to consider is that of counterparty risk, ILS issuers commonly enter into swap or deposit arrangements with third parties that guarantee interest and principal payments to investors, as long as the triggering event does not occur; counterparty risk exists on these collateral arrangements and this risk along with the risks inherent in the underlying collateral itself is one that has been highlighted during the credit crunch of 2007/2008 and the demise of Lehman Brothers. For more on the investor's perspective, please see Chapter 9.

Cat bonds are usually issued by a Special Purpose Vehicle ('SPV') which typically invests the proceeds from the bond issuance in generally low-risk securities (the collateral). The earnings on these securities, as well as insurance premiums paid to the sponsor, are used to make periodic, variable rate interest payments to investors. The interest rate is typically based on LIBOR plus a promised margin, or 'spread' above that.

As long as the natural disaster covered by the bond does not occur during the time investors own the bond, investors will receive their interest payments and, when the bond matures, their principal back from the collateral. Most cat bonds generally mature in three years although life securitisations typically have longer tenors to reflect the nature of the risks being securitised.

The basic structure of the cat bond is shown below, the transaction being very similar to a traditional reinsurance contract for the Sponsor/Cedant albeit it here engaging with an SPV reinsurer which in turn then securitises the contract by issuing notes to investors and collateralising the proceeds.

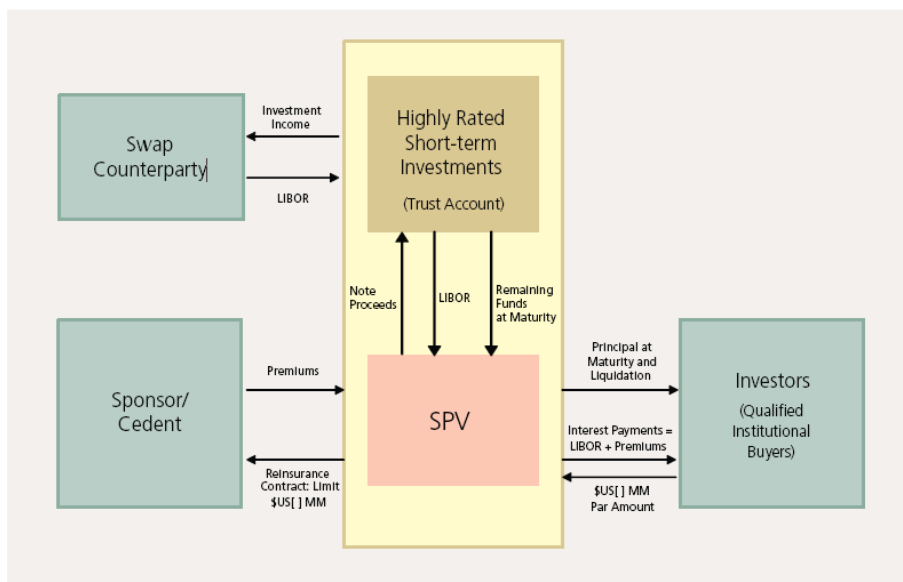


Figure 2.2 General non-life ILS structure

Source: Guy Carpenter/ GC Securities

Risk Capital by Trigger Type

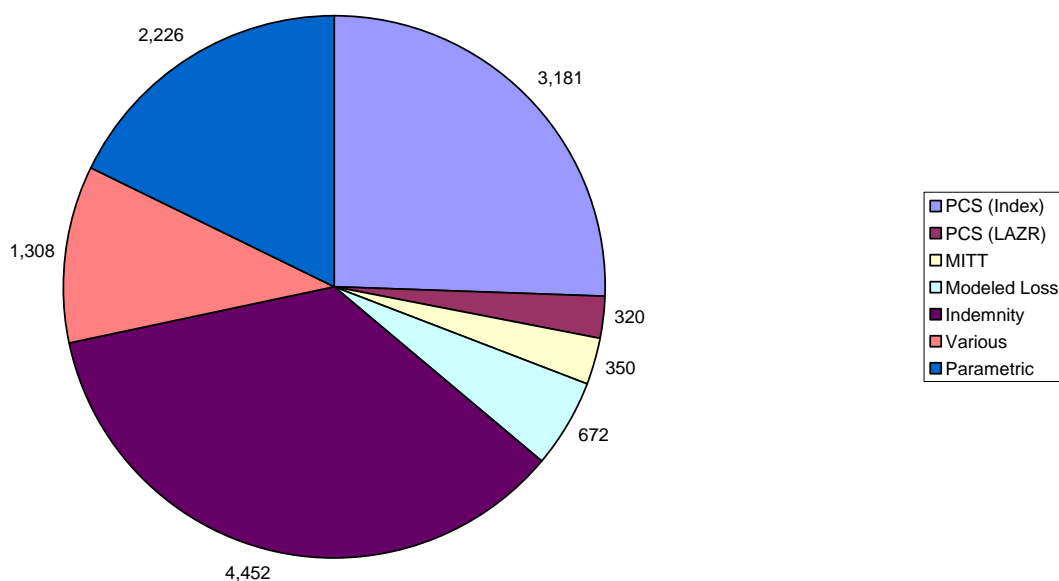


Figure 2.3 Risk Capital Outstanding by Trigger Type.

As at 31 December 2009.

Source: Guy Carpenter/ GC Securities

The sponsor of a cat bond must choose the type of trigger that will be used to signify that a ‘catastrophe’ has occurred. There are four basic trigger types.

- Indemnity: triggered by the issuer's actual losses, so the sponsor is indemnified in much the same way as if they had purchased traditional catastrophe reinsurance.
- Modelled loss: sponsor’s expected loss is calculated by catastrophe models using objective data, the bond is triggered if the sponsor’s modelled loss post an event is above a specified threshold.
- Indexed to industry loss: the bond is triggered when the amount of the overall industry loss from an event, usually determined by an independent third party such as PCS, exceeds a certain amount.
- Parametric: instead of being based on claim size (the insurer's actual claims, the modelled claims, or the industry's claims), the bond is triggered by some objective parameter of the natural hazard (e.g. wind speed for a hurricane bond).

In addition to these four basic trigger types a number of hybrid triggers have been used in structuring cat bonds and innovations such as granular disaggregation of industry triggers in order to minimise basis risk to sponsors can be seen for instance in Allianz Risk Transfer’s 2008 ‘Blue Coast’ transaction. Triggers in non-life ILS are covered in greater detail in Chapter 4.

Catastrophe bonds cover a number of perils and geographic territories with US hurricane and earthquake and European wind being the most prominent, but with Japanese typhoon and earthquake risk and earthquake risk in other territories also being securitised. Less common is the securitisation of flood risk and perils such as volcano and tornadoes but as models develop investors have shown a willingness to evaluate more and more types of risk with future cover for terrorism or aviation/ marine and off-shore energy risks all thought possible. Terrorism risk

has rarely been securitised, with the exception of the Golden Goal transaction for FIFA and –indirectly- the catastrophic mortality programs discussed later; despite clear demand for such cover following the attacks on the World Trade Centre the securitisation of terror risk has been hampered by the lack of faith placed in terrorism models although the acceptability of these models is increasing over time and it is likely therefore that cat bonds covering terrorism risk will become feasible in the future.

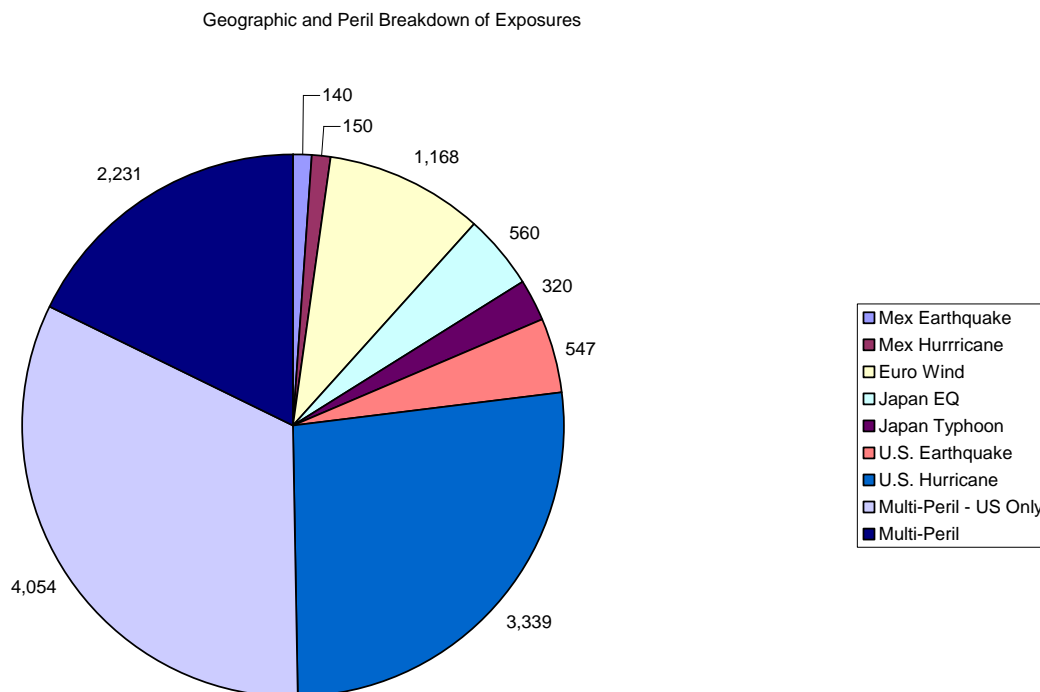


Figure 2.4 Geographical breakdown of exposures

Source: Guy Carpenter/ GC Securities

Some cat bonds are straightforward in offering only one class of securities. Other issuances can offer several classes, or tranches, which vary in payment terms, coupon rates and credit ratings. Different tranches can also cover different perils or territories.

In the early years of the catastrophe bond market, bond terms varied dramatically from one year to as many as 10 years. As the market has matured, one-year and long-term (five years or greater) tenors have become increasingly rare with three year deals becoming by the far the most common.

The market for non –life insurance securitisation has moved beyond cat bonds and the transfer of ‘peak-risk’ in recent years with the arrival of a number of motor securitisations that are designed to transfer non-catastrophe risks to the capital markets with a view to optimise risk adjusted economic, rating agency and regulatory capital requirements.

The market for life insurance securitisation has too developed considerably since the early 1990s and is now concentrated around a number of asset classes including Embedded Value (EV) or Value in Force (VIF) securitisation, financing ‘surplus’ statutory reserve requirements (for example US statutory ‘XXX’ reserve securitisations) and types of cat bond where the underlying risk relates to mortality spikes (so called mortality (cat) bonds). The area of much focus for the securitisation market but one where to date few transactions have

been completed is that of longevity risk, where insurers or pension funds would secure hedging against increases in longevity (mortality improvements) on a pool of policyholders using securitisation techniques.

The motivations for insurers in utilising life securitisation are numerous but generally fall into the following categories:

- The desire to find an efficient form of raising capital often in the form of ‘operational’ rather than financial leverage
- A tool for managing capital requirements
- A form of illiquid asset monetisation
- A technique for managing ‘peak risk’ exposure

The details and parties involved in Life securitisations are detailed further in Chapter 14 where we will see that the process of life securitisations and the ongoing administration and dynamics of the deals are far from simple.

For investors in life securitisations the risk profile can be more complicated than for non-life ILS and various combinations of mortality, longevity, investment and expense risks and even policy holder behaviour can come into play, most notably in the Embedded Value and XXX reserve securitisation asset classes. For EV securitisations credit risk too cannot be ignored, the ability to continue to produce surplus to pay noteholders is likely to be contingent on the continued solvency of the sponsor and for this reason these types of securitisations are generally rated below that of the sponsor by the rating agencies. Investors in Mortality and Longevity bonds do however benefit from pure play life insurance risk and in this respect they are more akin to and sometimes classified as a type of cat bond. Data on the growth of the life ILS market are available in Chapter 23 on embedded value and XXX transactions.

Insurance Linked Securities have evolved significantly since the early days of the market. In the beginning, investors were scarce and required substantial education before making a commitment. Today, the ILS marketplace features a solid, expanding core of experienced investors, often with funds dedicated to the sector. Rating agencies and cat modelling firms have also played critical roles increasing the confidence of market participants by working on and providing analysis of nearly all transactions. Issuers too have become far more comfortable with using ILS strategies and their use as hedging instruments has evolved from being somewhat experimental to an integrated part of the risk management tool-kit with benefits ranging from managing earnings volatility to capital management and the ability to monetise illiquid assets.

The role of ILS in the context of traditional reinsurance has evolved from one of a threatened substitute to that of a complementary product and an increasingly symbiotic relationship has developed. This dynamic has been fuelled not only by evolving structures and the convergence in capital markets and traditional reinsurance pricing but also by the evolution of the capital markets players themselves, who armed with increasing levels of sophistication and backed by state of the art modelling are able to play across the ILS, Industry Loss Warranties (“ILWs”, or contracts triggered by a pre-defined level of industry loss) collateralised reinsurance and ‘sidecar’ space.

II- Market Dynamics

Since the 2005 losses of hurricanes Katrina, Rita and Wilma (also defined as “KRW”) the ILS market and the market for cat bonds in particular has witnessed significant growth. The capital markets today represent core providers of risk transfer capacity to insurers and reinsurers alike and the number of large international (re)insurers that have utilised capital markets capacity in the non-life sector now outnumbers the number that have not.

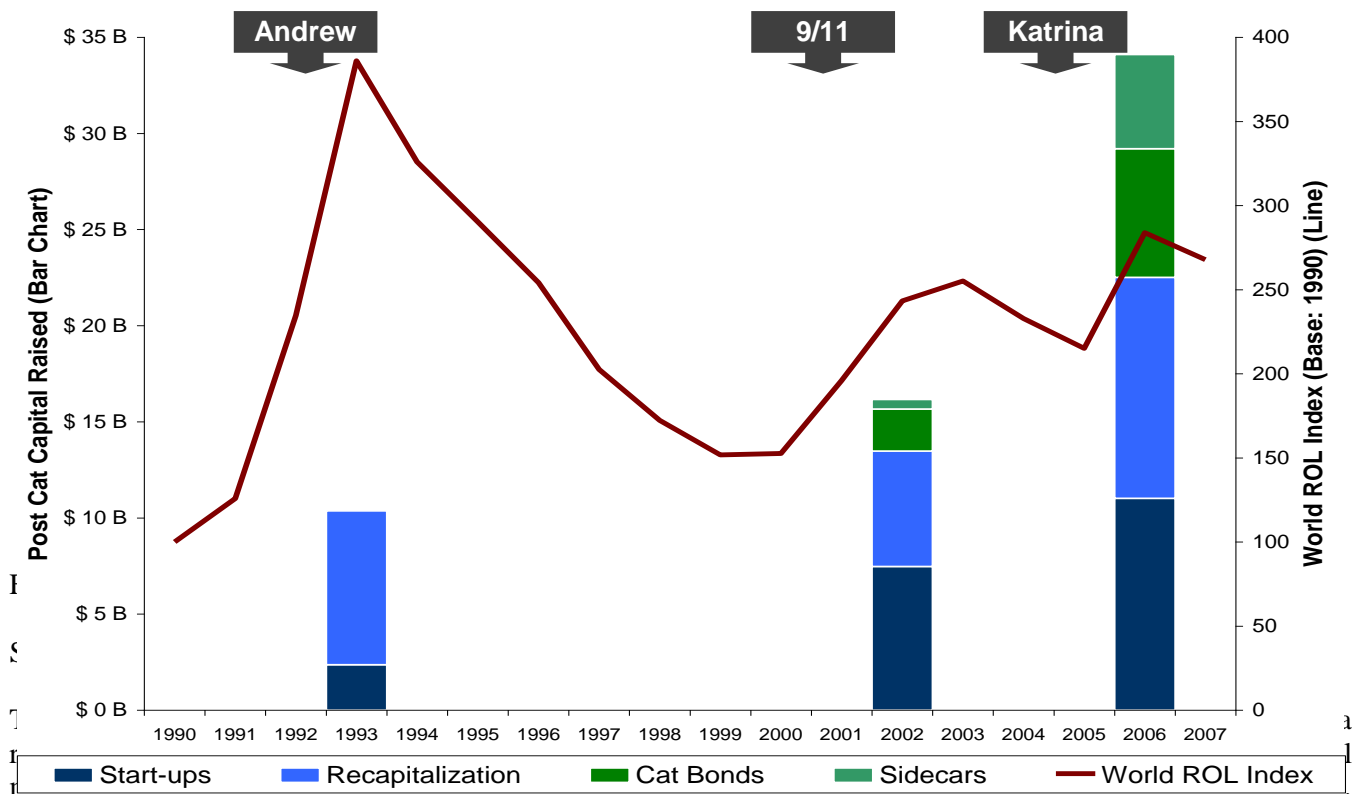
Cat bond market activity levels have ended the argument that these instruments are only a novelty purchased for prestige or used only in times of desperate shortages of traditional capacity. While the cat bond market has been in existence for well over a decade, development has not been smooth over this time span. In a manner consistent with other modern economic innovations such as the growth in derivatives or credit trading, market growth progressed slowly for several years before reaching a critical mass and then accelerating dramatically since 2005 before slowing again during the credit crunch of 2008.

The growth of life ILS has not been stellar although securitisation has become a prominent form of financing for XXX statutory reserves in the US and the notion of mortality cat bonds has grown in importance with increasing focus on the risks for pandemics and more generally life securitisation is seen by issuers as being a potentially useful source of financial flexibility in the future.

One of the key dynamics of the post KRW environment was the increased visibility of non-traditional capacity sources, such as proprietary trading desks within banks, hedge funds, institutional asset managers including pension funds and other non-reinsurer capital providers. To a certain extent, it was clear that not all sponsors were comfortable with these new providers, in part because of a lack of process and personal familiarity among counterparties. Trust levels were lower, because relationships with traditional reinsurance providers often span several decades. Though significant amounts of work remain, great strides have been made to reduce these ‘familiarity barriers’. The results of these efforts are clear. The increased velocity and flexibility of new capital entering the market of 2006 truncated what otherwise would have been an almost certainly more protracted hard market.

The dramatic growth of cat bond issuance post KRW was unsurprising. The losses sustained by the industry from 2004 and 2005 catastrophe activity created a capital shortfall with the underlying storm activity causing risk transfer prices to skyrocket. In an expected reaction to a perceived opportunity, high velocity capital or ‘hot money’ entered the market to address some of this demand overhang. Because of an established investor following, marketing and issuance and documentation protocols, the cat bond market were particularly well-suited to address this need.

The chart below shows the impact that ILS issuance and increased capital markets capacity is having on reducing the amplitude and frequency of the reinsurance pricing cycle:



Rather, they took the view that the capital markets represent a valuable source of significant amounts of high-quality risk transfer capacity, causing them to invest in this area. In fact, several large sponsors that were unwilling to purchase expensive protection during the hard market of 2006 turned to cat bonds during 2007, even with additional traditional capacity available. With the market again hardening in late 2008 and into 2009 issuers are again turning to ILS solutions in order to best utilise available capacity.

A relatively recent phenomenon in the cat bond market is the introduction and continued use of shelf-programmes in which a sponsor acquires the option to issue additional bonds (often referred to as takedowns) as it sees fit over the course of a prescribed risk period. Among the advantages of this approach is that the sponsor incurs substantially lower issuance costs for each additional takedown than it does for the initial program. Shelf offerings support both long-term planning and near-term manoeuvring. While they make it easy to access capital quickly in the event of emergency, shelf offerings also signal to capital markets and traditional capacity providers that a sponsor is interested in being a consistent, repeat issuer. Committed catastrophe risk investors tend to reward repeat issuers with progressively tighter execution pricing, provided that the issuer has a strong track record.

The capacity crunch of 2006 left most potential cat bond sponsors concerned that they could be vulnerable to an excessively volatile reinsurance risk transfer market. Companies throughout the industry re-evaluated their approaches to risk management. Most favoured an Enterprise Risk Management (ERM) approach rather than focusing on risk at the operating unit or 'silo' level. The number of cat bond and shelf offering issuances in 2007 suggests that some potential sponsors were wary of relying on a single supplier (i.e., the traditional market) for such a critical component of their business models and that they increasingly saw value in the cycle management benefits of the multi-year protection afforded by ILS solutions.

A global environment in which catastrophe events appear to be increasing and insured values are expanding rapidly in catastrophe exposed areas calls for diversification of risk capacity sources. For certain sponsors, there may be tangible benefits associated with being able to show public equity markets, rating agencies and regulators that, in the event of the next capacity crunch, a cat bond shelf program provides an additional conduit to risk transfer capacity and financial flexibility. The advantages of product consistency (i.e., more reliable year-over-year capacity and pricing) can benefit both insurance and reinsurance companies directly, not to mention

shareholders and policyholders. The ability to curtail post-event volatility through product consistency thus may be the most important attribute of the capital markets as a supplemental risk transfer solution.

Secondary market trading of ILS has often been described as attaining low volumes and is sometimes characterised by rather opaque pricing. As generally private ('144A') transactions that are bought often with the intention to hold to maturity and with demand for ILS often outstripping supply the market has not been deemed to be particularly liquid in terms of two way pricing, whilst sellers of ILS have traditionally met liquid demand within (if not better than) the indicative bid offers published by broker/dealers in ILS. Liquidity has been reduced in the darkest months of the 2008 credit crisis, but still allowed transactions with mark-to-market losses which have been relatively small when compared with other types of fixed income instruments

III- The question of basis risk remains

Evidently basis risk could constrain the further rapid growth of the ILS market; however the industry has shown that the management of basis risk is changing quickly. Perceptions regarding indemnity triggers and basis risk continue to evolve. As the cat bond market has become mainstream, sponsors have spent considerable time and resources understanding their exposures to basis risk. While sponsors generally prefer indemnity protection to non-indemnity protection if all else is equal, the practical utility of this position is waning. With respect to indemnity versus non-indemnity transactions, all else is not equal, and the differences between each type of protection represent important cost-benefit decisions that sponsors are making in an increasingly sophisticated fashion.

Sponsors perceive indemnity transactions as reliable and familiar, largely because they resemble Ultimate Net Loss (UNL) traditional cover and result in minimal basis risk. But, they typically entail three disadvantages relative to non-indemnity triggers: risk spread premium, disclosure requirements and perceived legal exposure and the process, time and cost necessary to issue. In recent years sponsors focused on the interplay of these factors, relative to the potential basis risk, pricing and execution achievable through non-indemnity transactions. There is a growing awareness that specific transaction objectives should trump the perceived superiority of one trigger type over another (see Chapter 5 basis risk').

The cat bond investor community, particularly the core group of longstanding committed investors, is adjusting its perception of potential basis risk. The rejection of indemnity risk on the basis of moral hazard alone has become outdated. Now, many committed cat bond investors tend to recognise indemnity risk as simply another risk component in a transaction, provided that they have sufficiently reliable modelling and are comfortable with the ceding entities. Depending on sponsor-specific judgment, in conjunction with considerations such as the longer post-event loss adjustment and principal payout process, investors will adjust their required spreads or available capacity. As the understanding of sponsor-specific risk increases, investors are not uniformly changing their required spreads upward while reducing capacity allocations (though this is the norm). Judgment as well as understanding of traditional reinsurance is playing a more prominent role than ever before.

Savvy investors (including several reinsurers) are recognising that basis risk typically cuts both ways. If one believes that catastrophe models provide reasonably accurate loss estimates on an industry-wide basis, its reasonable to expect some insurers to outperform (pay less than expected) while others underperform (pay more than expected). Over a large enough portfolio of individual sponsors, basis risk should net out in the aggregate. For this theory to manifest itself in practice there must be a sufficiently sized pool of indemnity transactions to include in a diversified portfolio. The market's desire for a larger pool of indemnity transactions on this basis may also be contributing to an increased appetite for indemnity trigger deals, although dedicated ILS investors able to understand underwriting risk make an effort to focus on outperforming insurers and to stay clear from the underperforming ones.

Flexibility rather than the desire for a single trigger type appears to be the prevailing force in the cat bond market. The ability of all market participants to understand, evaluate, price and ultimately transact efficiently using

various triggers indicates the cat bond market's continued maturation. Over time, the size of the risk spread premium (if any) should reflect the market's perception of a sponsor's internal processes, as long as there are no shocks. To the extent that a sponsor feels that the market misunderstands its true risk profile, it can elect to purchase non-indemnity cover. With the continued development of improved index and parametric tools (still an area of considerable focus for modelling firms and the industry in general), these covers should become more reliable and widely accepted by sponsors.

IV- ILS and the Credit Crunch

The credit crisis of 2007/2008 and following periods of recession throughout the world has provided an opportunity to evaluate how ILS asset classes have performed in a tightening credit market. Since the inception of the ILS market, participants have believed the theoretical claim that ILS returns are not correlated with other asset classes. Because cat bond values are principally linked to the occurrence of physical phenomena, it was claimed, fluctuations in value should bear little relation to changes in general financial markets.

Evidence to support this theory has been limited but was supplied to some extent during the financial crisis of 1998 (the 'Russian Crisis') the decline in stock markets in the years 2000 and 2001 driven by the collapse of the 'dot com' boom, the World Trade Centre disaster and the demise of Enron and most importantly through the credit crisis of 2007 and 2008. Credit spreads in general widened by unprecedented amounts during the credit crisis whereas ILS spreads in general performed robustly in 2007. In 2008 the picture became more complicated with the performance of certain cat bonds being adversely affected by credit crisis contagion notably the impact of the insolvency of Lehman Brothers (who acted as TRS counterparty to a number of transactions) and the impairment of the collateral behind some of the vehicles in the cat bond universe.

The impact of the credit crisis on the ILS market and the future prospects for both issuers and investors is mixed. The impact on investors is likely to be positive over the long run as generally ILS have been validated as a diversifying non-correlated asset class and as investors have become increasingly sensitive to credit markets risk, desire for the non-correlated, more stable returns will benefit the ILS sector. The short term impact has been less positive and has caused a source of distraction for some of the non-dedicated 'multi-strategy' funds, increased volatility and attractive spreads in other asset classes have caused temporary outflows of funds to other strategies or to meet redemptions. Furthermore some apprehension over the security of TRS swap counterparties and collateral funds exists whilst structures adapt to the changing perceptions of investors to this risk and the likelihood that collateral arrangements for cat bonds and collateralised reinsurance in general will be tightened going forward, this has been demonstrated by the use of US Treasury backed collateral in many of the bonds issued in 2009.

The outlook for the life securitisation market is also mixed, issuance has fallen significantly during the credit crisis and the demise of the 'monoline' bond insurers that were prevalent in many life securitisations has led to a number of downgrades and areas of the market becoming tainted (See chapter x 'Life securitisation'). The credit crunch has had a direct impact on life securitisations with assets backing a number of the transactions becoming impaired and with sponsors themselves suffering weakened solvency positions and ratings downgrades. Whilst the short term impact has been negative for life securitisation the longer term need for capital and the desire to bolster balance sheets might once again cause issuers to turn to securitisation techniques as an attractive alternative to expensive equity or debt capital raising.

For non-life and life insurance issuers alike the immediate impact of the credit crunch is to highlight the strategic imperative of sophisticated ERM and diversification of funding sources, particularly as traditional capital raising sources are affected by credit market conditions. The longer term impact of the credit crunch on ILS issuance is also likely to be positive with the collapse of a number of major financial institutions and the strain on reinsurers' balance sheets highlighting counterparty credit risk and value of stable collateralised capacity.