# Alternative Risk Transfer:
# The Convergence of The Insurance and Capital Markets A Three Part Series

*By: Christopher Kampa, Director of Research ISI | July 28th, 2010*

## *Part II* Non-Life Utilization of Insurance-Linked Securities

*Insurance-linked securities, once considered to be an alternative form of risk transfer, have become a mainstream method of transferring risk from insurers to the capital markets. With greater attention being paid to risk at the institutional level and the search for portfolio diversification at the investment level, insurance-linked securities seem poised to further facilitate the convergence between the capital and insurance markets*

### Part II Contents:



### Abstract

This is Part II in a three-part series on the Convergence of the Insurance and the Capital Markets ("I/C Convergence Series"). Part I in the I/C Convergence Series discussed the maturation of insurance-linked securities as an asset class and the history surrounding their emergence. Insurance-linked securities are a type of alternative risk transfers, which refers to the use of capital market techniques other than insurance or reinsurance to provide risk-bearing entities with risk protection. Insurers turned to alternative risk transfer strategies following several catastrophic events in the 1990s when reinsurance capacity shrunk and prices became more volatile, and the market has since grown to include many forms of securitization on both non-life and life insurance assets. Issuances of insurance-linked securities have grown at a strong pace of 40-50% a year since 1997 with $50 billion in risk capital outstanding in 2008.[1]

Part II of the I/C Convergence Series provides an overview of the non-life insurance-linked security sector. The first insurance-linked security issued was in the form of a catastrophe bond, which served as the foundation for all other insurance-linked securities to follow. Catastrophe bonds serve as a check against rising reinsurance costs and have weathered the effects of the global financial crisis quite well. After the asset-based market was established, derivative and other synthetic securities soon emerged. This opened up a wide avenue of risk management techniques and allowed for hedging of risks that were previously thought to be uninsurable.

Part III of the I/C Convergence Series discusses developments in the market for life insurance-linked securities.

## 1 Overview of Non-Life Utilization of Insurance-Linked Securities

Trading in non-life risks, i.e., catastrophes, is unlike other financial and commodity markets. The chief distinguisher is that there is no tradable underlying instrument. Trades are referenced to notional indices or losses stemming from natural disasters or events such as hurricanes, earthquakes, and tornadoes, which are infrequent events that can cause substantial financial loss but are difficult to predict.[2] Natural disasters have a low probability of occurrence but a high degree of severity when they occur, prompting insurers to limit the amount of catastrophic risk held on their books. Insurers that hold policies concentrated in certain geographical areas seek to diversify their risks through reinsurance or the capital

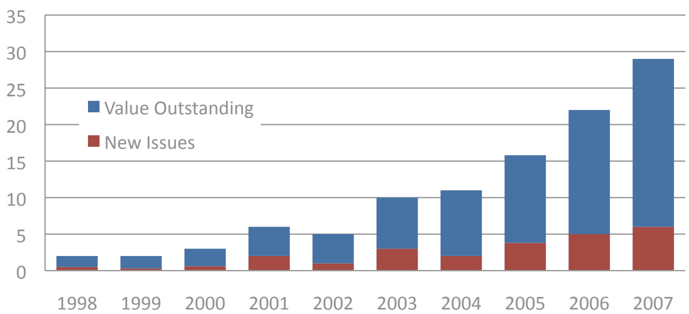
## 2 Catastrophe Bonds Give Rise to Insurance-Linked Securitization

The first catastrophe bond was completed in the mid 1990s and the market for such bonds has experience steady growth ever since. After the 9-11 attacks, the market expanded to over $2 billion per year and following Hurricane Katrina, the market increased to $4 billion per year in new issuances.[5] Catastrophe bonds serve as an important check against increasing reinsurance prices following catastrophe events. These financial instruments not only reduce insurer risks, but also lower the overall risk profile of the entire insurance industry. Catastrophe bonds have little or no credit risk because funds are deposited and held in a trust account managed by an SPV (Special Purpose Vehicle).

*1 Continued*

markets.[3] Capital market investors who invest in catastrophic risks are betting the risk will not happen, in which case they receive high returns. But if the event happens, their investment, or some portion of it, is used to pay losses resulting from the catastrophe and the investors returns are reduced or wiped out. The willingness and required yields of capital market investors to purchase instruments that securitize catastrophe risks depends on investors' capacity to evaluate the risks and the degree of diversification provided in the financial instrument.[4] The outstanding value of non-life insurance-linked securities has grown 10-fold since 1998 with almost $30 billion outstanding, as shown in Graph: Non-Life Securitizations. The market for catastrophe-linked securities includes catastrophe bonds, contingent capital, reinsurance sidecars, industry loss warranties, catastrophe derivatives, weather derivatives, and a variety of swaps, futures, and forward contracts. Table 1: Market Size of Non-Life Securitizations, illustrates the structure and market potential of the various sectors within the non-life insurance-linked security market.

**Non-Life Securitizations**




### A. Catastrophe Bonds Serve as a Check Against Increasing Reinsurance Costs.

Lack of capacity in the reinsurance markets was the catalyst for the emergence of catastrophe bonds .There are only a small number of reinsurers with sufficient financial capacity to provide catastrophe reinsurance, resulting in possible counter-party risk.[6] For example, reinsurers with risks concentrated in certain geographical areas can purchase reinsurance from other reinsurers. However, reinsurers can also issue catastrophe bonds to transfer risk exposure to the capital markets rather than retroceding the risks to other reinsurers.[7]

It's not uncommon for reinsurers to purchase reinsurance protection from other reinsurers. The process, known as retrocession, enables reinsurers to reduce their risk exposure and spread risks more evenly across the reinsurance industry. However, this process can continue indefinitely until the original reinsurer unknowingly reinsures a block of business that it had originally purchased reinsurance protection on. This spiral can have, and has had, severe consequences for the reinsurance industry and insurers purchasing reinsurance protection. Insurance-linked securities can lower the risk profile of the entire insurance industry by transferring risk to the capital markets instead of retroceeding to parties within the industry.

A basic catastrophe bond structure involves an insurance or reinsurance company ("sponsoring company") issuing a bond security through a Special Purpose Vehicle ("SPV"). The sponsoring company enters into a reinsurance contract and

Table 1: Market Size of Non-Life Securitizations

| | Catastrophe Bonds | Industry Loss Warranties | Catastrophe Derivatives | Side Cars | Contingent Capital |
|---|---|---|---|---|---|
| Type | Indemnity, Index, or parametric | Indemnity or index | Index or parametric | Indemnity | Indemnity or Index |
| Est. Market Size (Billions) | $15 – 20 | $5 | $5 – 10 | $5 – 10 | $5 – 10 |
| Liquidity | Medium | Low | Low – Medium | Low | Low |

pays premiums on the reinsurance to the SPV. The SPV issues the bond to investors with a defined trigger that specifies the situations where the investor would lose principal. The SPV holds funds received from the bond offering in a trust that invests the funds into Treasury securities and/or other highly rated assets. Investors, mostly institutions, typically receive a spread over LIBOR.[8] The sponsoring company collects part of or the entire bond principal when the covered catastrophic event occurs, thus reducing or wiping out returns to the investors.[9]

Standard & Poor's, Moody's, and Fitch rate catastrophe bonds. The ratings are based on the probability that the bond will default due to a catastrophic event, triggering payment of the bond to the sponsoring company. Models are used to determine probability of catastrophe events. Originally, most bonds were rated below investment grade, but today many feature credit enhancements that allow for investment grade ratings.[10]

Payment of bond interest and principal revolves around losses stemming from a defined insured event or events. The bond issuer pays an attractive interest rate and repays the principal at the end of the term, providing there is no credit event (catastrophic event) that exceeds the bond's predetermined threshold. Should the credit event exceed the predetermined threshold, the issuer's interest payment or repayment of principal is lessened or not paid at all. Through these structures, new risk capacity is created by transferring defined risk exposures to capital market investors. Insurers benefit from increased capital supply, reserve relief, capacity to write more business, and a moderating effect on reinsurance prices. Investors benefit by purchasing instruments that have low or zero correlation to traditional investment assets.

### B. Selection of Trigger Events Influences Issuer and Investor Risk and Return

Catastrophe bonds and other insurance-linked securities contain "triggers" – insured events that determine when the issuer can suspend interest and/or principal payments either temporarily or permanently. A trigger may be based on a single event or multiple credit events. The amount of risk, return, and the ability to hedge vary substantially among the different triggers.

Triggers can be structured as an indemnity, index, or parametric trigger. Indemnity triggers are based on an insurer's actual losses to a predefined event. Index triggers are based on industry losses tracked by recognized indices. Parametric triggers are based on parameters related to a defined event and are based primarily on event location and intensity rather than the amount of damage caused. Examples include earthquake magnitude or wind speed of a hurricane. The insurance-linked security market has been shifting towards parametric and index triggers.

Indemnity versus indexed/parametric triggers provides insurers and investors with choices.[11] Securities based on insurer-specific losses have little or no basis risk[12] for the sponsor, but expose investors to moral hazard risk[13] because insurers have less incentive to properly manage the catastrophe risk they underwrite. This increases risk to investors because they cannot accurately monitor whether insurers are ideally managing their catastrophic risk exposure. Thus, adverse risk selection exists because only the insurance company knows the true risk of its underlying policies. Alternatively, index or parametric triggers that introduce basis risk to the insurer, but limit moral hazard risk to the investor, are more standardized and result in lower transaction costs and greater liquidity. The use of an industry index also limits investor exposure to adverse selection risk.

Indemnity-based triggers appeal to risk transferors because of reduced or eliminated basis risk, i.e., the payout is based on the risk transferor's specific losses. Securities based on specific losses of an insurer force investors to be more diligent in analyzing the insurer's business practices. Investors must also take care to avoid adverse selection risk, where the insurer might be incentivized to securitize only the low profit risks in its portfolio while retaining the more profitable risks. On the other hand, index or parametric triggers may be more attractive to investors seeking to minimize moral hazard costs. Variations among the different triggers is illustrated in Table 2: Cross-Comparison of ILS Triggers.

Table 2: Cross-Comparison of ILS Triggers

| | Indemnity | Index | Parametric |
|---|---|---|---|
| Trigger | Based on Insurer's actual losses | Based on industry loss estimates | Based on defined parameters of catastrophic event |
| Advantages | Eliminate Basis Risk | More transparent; eliminates moral hazard risk. | More transparent; quicker settlement period leading to increased liquidity. |
| Disadvantages | Long recovery period to calculate loss claims, leading to less liquidity for investors; potential for moral hazard risk. | Exposes risk transferor to basis risk | Exposes risk transferor to basis risk |

## C. Catastrophe Bonds are in a Position of Strength Despite Weaknesses in the Global Financial Markets

The catastrophe bond market has followed a path of steady growth over the last decade, reaching its peak in 2007 when total risk capital outstanding stood at $14.0 billion. This was a 65% increase of the $8.5 billion outstanding at the end of 2006.[14] The total value of new issuances amounted to $7.0 billion in 2007; a 49% increase of 2006 when new issuances totaled $4.69 billion. Five to six billion dollars of new issuances are expected for 2010.[15]

After the catastrophe bond market reached its pinnacle in 2007, the global credit crisis spread across all financial markets and hit individual insurance-linked securities with varying degrees of veracity. In the second half of 2008, many planned catastrophe bond transactions were postponed, due in part to the financial crisis on secondary market spreads and partly due to the uncertainty of credit mechanisms embedded in the catastrophe bond structures.[16]

The collapse of Lehman Brothers triggered substantial credit-related losses due to the underlying swap arrangements that had been designed to protect investors against counterparty risk. Prior to the credit crisis, catastrophe bonds were structured with a total return swap ("TRS") counterparty, which was usually an investment bank, to guarantee the collateral pool backing the bonds. TRSs enabled issuers to earn an investment grade rating because the rating was based on the collateral guarantor. Swaps removed all of the investment risk, leaving investors exposed to only the credit risk of the investment bank guaranteeing the security, which was previously thought to be negligible. In the wake of the financial crisis, investors lost faith in the credit worthiness of the underlying guarantees, which temporarily impaired the market for catastrophe bonds.

In 2009, new catastrophe bond structures featured tighter collateral requirements. In place of total return swaps, more recent transactions impose stricter rules on how the collateral is invested and feature daily mark-to-market accounting for the collateral. The new structures also feature improved transparency to the underlying assets as well as contractual mechanisms to unwind the transaction in case of default. Following strong market inactivity in the second half of 2008, newer catastrophe bond structures emerged in 2009 in response to strong investor demand. In 2009, $3.4 billion worth of catastrophe bonds were issued, taking the total amount of risk capital outstanding to $12.5 billion.

Because of price instability in the reinsurance market, demand for additional risk transfer capacity should continue to fuel growth of catastrophe bonds as insurers look to become more efficient at managing their risk positions. Investors should also increase demand as they look to further diversify their portfolios with non-correlated assets that pay above-average returns. However, the newer catastrophe bond structures have been primarily rated B to BBB[17] due to the absence of total return swaps. This may shut out some institutional investors in search of investment-grade securities.

Even though spreads of catastrophe bonds have recently narrowed along with similarly rated corporate debt, catastrophe-linked securities have historically yielded above-average returns. Therefore, the risk-return profile of catastrophe bonds, along with the portfolio diversification benefits, should continue to drive investor participation in this asset class.

Historically, catastrophe risk securitizations were issued only by insurance and reinsurance companies. But more recently, corporate issuers have implemented their own alternative risk transfer strategies and have issued catastrophe bonds for protection of their corporately-owned assets. Capital market investors have purchased catastrophe bonds from amusement parks such as Tokyo Disney and Universal Studio. However, government participation in catastrophe-linked securities has remained limited.[18]

Increased issues of catastrophe bonds by corporations will likely lead to further growth of the catastrophe bond market. But there are some challenges that insurers and investors must overcome to further facilitate convergence between the insurance and capital markets. For example, market fragmentation and lack of standardized transactions may allow only the most sophisticated investors to participate in this asset class and limit market liquidity. Further, the lack of standardized data regarding some peril types and geographical areas may limit the ability to create non-indemnity instruments and quantify actual losses. Also, the lack of transparency in the underlying risk and valuation methodologies limits participation to the most sophisticated of investors.

## 3 A Market Emerges for Catastrophe-Linked Derivatives

The greatest benefit of a vibrant derivative market is that it allows for the hedging of otherwise not hedgeable risks.[19] Derivatives can provide protection against a single risk, add diversification to a portfolio, and provide capacity to write more business. However, despite the usefulness of derivatives, they are complicated financial instruments that can lead to large losses. Some allege they can be abused to artificially influence price movements of the underlying securities. The chief distinguisher between derivatives and insurance contracts is that derivatives can be used to generate a speculative profit and do not require insurable interest.

### A. Derivatives Garner Value from Other Financial Instruments, Events or Conditions

"Derivative" is a broad term describing a financial instrument that obtains its value from other financial instruments, events, or conditions. Derivatives are used to provide leverage, hedge risk, gain exposure to illiquid risks, or speculate on price movements. Insurance derivatives can be classified into two categories: exchange-traded or over-the-counter (OTC). Exchange-traded derivatives are standardized contracts traded through an authorized exchange with a clearinghouse operating as an intermediary on every contract. These contracts are subject to margin requirements and are comprised of futures, options, or futures options.[20] Over-the-counter derivatives, also known as bespoke derivatives, are customized and traded between two parties. This arrangement makes them more flexible than contracts traded on a formal exchange. Examples include swaps, forwards, options, and credit derivatives. The ability to trade derivatives on the OTC has enabled derivatives designed to fit a particular need to enjoy liquidity while custom managing risk.[21] Either type of derivative can be used for hedging, speculation, or arbitrage.

Derivatives, such as call or put options, provide investors with the right to buy or sell at a predetermined price. The option's value depends on the current price of the asset relative to the strike price. However, because there is typically no tradable underlying asset with insurance derivatives, indices are often used as a measure to take the place of the asset price. The future of the derivative market is uncertain given recent turmoil in the financial markets. Derivatives have come under regulatory scrutiny and future regulation is unclear. Opponents of derivatives argue that derivatives allow speculators to take large positions that create market disparities and distort prices. Further, derivatives are complex instruments that create the potential for substantial losses when used by inexperienced investors. Derivatives can also create systemic risks when market participants take excessively large positions.

### B. Industry Loss Warranties ("ILWs") and Catastrophe Derivatives Reemerge After a Period of Inactivity

Industry loss warranties are an index-based type of reinsurance or derivative contract through which one party purchases protection based on the total loss arising from a trigger event affecting the entire industry. They are a hybrid transaction that combines features of reinsurance and a derivative contract. The payoff depends on both the insured loss of the buyer and on an industry loss index. The threshold for the insured-specific loss is often set low enough so that if an industry loss is triggered, the insured will receive a payout. Therefore, the price for industry loss warranties are typically based on the risk associated with the industry as a whole. This makes the warranties easier to underwrite and price. Hedge funds and other non-insurance entities have been the primary issuers of industry loss warranties. The most commonly used indices for industry loss warranties are PCS, Swiss Re's Sigma, and Munich Re's NatCat Service.[22]

Catastrophe derivatives are customized over-the-counter contracts structured similarly to industry loss warranties. Catastrophe derivatives are structured with a binary trigger based on a single-event loss; meaning that the payout is based both on the loss of the buyer and on an industry loss index. A typical transaction involves a series of fixed, pre-defined payments in exchange for a series of variable payments dependent on the occurrence of an insurance event.

The advantages of catastrophe derivatives over catastrophe bonds is that they are simpler to implement, have lower fixed costs, and buyers can purchase protection for smaller loss events. Unlike catastrophe bonds and most forms of industry loss warranties, catastrophe derivatives are not always collateralized and they contain credit risk exposure. The majority of catastrophe derivatives thus far have been issued on property risks in the United States.[23]

Early efforts by the Chicago Board of Trade (CBOT) to establish a market for exchange-traded catastrophe derivatives failed, due to a lack of market participants. But before the collapse of the financial markets in 2008, catastrophe-linked derivatives emerged. Demand was fueled by insurers seeking less expensive alternatives to catastrophe bonds. More recently, however, the New York Mercantile Exchange (NYMEX), the Chicago Mercantile Exchange (CME) and the Insurance Futures Exchange Services (IFEX), introduced exchange-traded catastrophe-linked futures and options contracts.[24]

Use of industry loss warranties and catastrophe derivatives has grown at a strong pace, and according to some estimates, they provided additional risk capacity of over $10 billion in 2009.[25] These contracts are increasingly traded by reinsurance companies, investment banks, and hedge funds. The total market size remains relatively small, but with the increased activity of exchange-traded derivatives on NYMEX and the Chicago Mercantile Exchange, the market should be expected to grow and provide more liquidity to market participants.[26]

### C. OTC Catastrophe Swaps Exchange Fixed Payments for Variable Payments

Catastrophe swaps are financial instruments that allow insurers and reinsurers to offload catastrophe risk to the capital markets by agreeing to make fixed payments to another party in return for variable payments based upon the occurrence of catastrophe losses. OTC transactions typically involve an insurer or reinsurer that makes an upfront payment to investors, such as investment banks or hedge funds, to assume the risk of a catastrophic event. These transactions are usually scheduled for duration of one calendar year, and if the trigger event occurs during this timeframe, the investor provides the insurer or reinsurer with the agreed amount of compensation.[27] If the trigger event does not occur, the insurer's or reinsurer's portfolio remains unchanged, and the investor keeps the upfront premium. Essentially, the swap is the financial equivalent of a reinsurance contract less cost and structural complexities, and the counterparty is now a capital market investor instead of a reinsurer.

### D. Pure Catastrophe Swaps Exchange Risks for Risks

A pure catastrophe swap allows insurers and reinsurers to exchange catastrophic risks with other insurers and reinsurers. For example, it enables parties with over exposure to catastrophic risk in a geographical location to swap a portion of that risk for another risk in a different location. As these risks are uncorrelated with one another, this allows for greater portfolio balance and reduction of risk exposure in relatively easy and low cost transactions. However, these instruments only retrocede the risk to other parties among insurers and reinsurers and do not reduce the overall risk level of the industry.

Although catastrophe bonds and insurance derivatives have been established for almost two decades, the market for catastrophe swaps is still very young; and because these instruments are traded over-the-counter, information quantifying the size of the market is somewhat subjective. It is difficult to accurately gauge the size of the market, but the World Economic Forum estimates that catastrophe swaps and industry loss warranties had an outstanding notional amount of $10 billion in 2008.[28]

### E. Weather Derivatives are an Economic Tool to Hedge Risk

The weather derivative market was born out of the deregulation of the US energy sector during the 1990s. A weather derivative is a financial instrument used by companies or institutions that may be adversely affected by unexpected weather conditions.

Farmers can use weather derivatives to hedge against poor harvests caused by drought or frost, tourist attractions can insure against rainy weekends, and gas and power companies can use them to guard against unseasonably warm or cold temperatures. Even outdoor sport and charitable events can benefit from the Weather Derivative market. Heating degree days (HDD) and cooling degree days (CDD) are the most common types of weather derivatives. Depending on the weather, they are structured as either put or call options. Weather trading combines characteristics of the insurance and derivative markets. However, a secondary market for weather derivatives is yet to fully materialize. Most of the risk is held on insurers' and reinsurers' books or traded with foreign dealers.[29]

The weather market has remained healthy following the 2008-2009 financial crises, with the value of transactions rising to $32 billion in 2007/2008, up from $9.7 billion in 2004/2005.[30] The period in between experienced a surge in the value of weather derivative contracts due to Hurricanes Katrina, Rita, and Wilma. The size of the market during the 2005/2006 period reached $45 billion. Despite the volatility, the market is expected to grow at about 30% for the next few years.[31]

# 4 Insurance-Linked Securities Expand Beyond Traditional Lines of Reinsurance

Along with traditional securitizations and derivatives, insurers have partnered with investors to create hybrid security structures that have further hastened the convergence between the insurance and capital markets.

### A. Reinsurance Sidecars Supplement Reinsurance Needs, but Demand has Waned

A "Sidecar" is a single-purpose reinsurance company that is created and funded by capital market investors to solely provide additional capacity to an insurer or reinsurer to finance catastrophic risks. Sidecars are used to provide capital to insurers when reinsurance prices are high, which typically is the case following a large catastrophic event. Sidecars allow insurers to write more policies and limit their liabilities because the risk is transferred to the capital markets.

A typical sidecar structure involves three principal participants – equity investors, debt investors, and the sponsor. A sidecar is set up as a special purpose vehicle collateralized by the initial investment from debt and equity providers. The sponsor pays premiums to the sidecar, which pays claims as would a typical reinsurer. Interest payments and dividends are paid to the debt and equity holders. A typical sidecar structure lasts for one or two years.

Historically, reinsurance sidecars have provided almost $11 billion in capital outstanding to the insurance market. However, with the emergence of alternative forms of insurance-linked securities and improved capitalization of the property and casualty insurance industry, sidecar capacity has been shrinking. In 2007, only $1.9 billion of capacity was issued compared with $4 billion in 2006. Then following the 2008-2009 financial crises, capital retrenchment and investor demands for increased returns led to almost non-existent reinsurance sidecar capacity. In 2009, many planned sidecar renewals were shelved and only a handful of transactions were successfully completed. However, sidecars may regain their popularity if there is an increase in catastrophic events in the future.[33]

### B. Contingent Capital Is a Form of Post-loss Funding that Could Stem Future Crises

Contingent capital is technically not a securitization. It is a type of loan arrangement structured similarly to a banking facility. Contingent capital can be structured as a prearranged bank facility that allows the insurer to access funds in the event of a predefined loss, or it can be structured in the form of a surplus note issued by a trust. Even though contingent capital structures are not a securitization, they are often considered a part of the alternative risk transfer universe. Contingent capital arrangements are a form of prearranged financing available to a company after it experiences a predefined loss. The insurer pays an upfront fee for the right to access capital in case of a catastrophic event. If no event occurs, the facility remains unused. The debt can be structured with either a fixed or variable rate of interest and can be issued in the form a banking facility or a surplus note. Under the surplus note structure, the insurer establishes a trust to issue promissory notes that pay above-market interest rates to capital market investors. Should a catastrophic event occur, the insurer can access the funds in the trust to cover the loss. Surplus notes, like a loan structure, increase insurance company assets, but unlike the loan structure, they do not increase the insurer's liabilities.

Contingent capital arrangements can be designed on an indemnity basis or related to an index. An indemnity-based contract favors the insurer because it pays according to actual losses incurred, thus eliminating exposure to basis risk. An index-based transaction will favor the capital market investor by limiting exposure to losses of an individual insurer, and the presence of moral hazard and adverse selection risks are reduced.[34]

The benefit of pre-arranged contingent capital structures is that they allow insurers to access less expensive funds following catastrophic events than they otherwise would be able to access from the reinsurance or capital markets. The drawback is that contingent capital arrangements include an upfront, non-refundable fee to secure financing that may never be required. Because contingent capital structures do not have viable trading volumes, they expose investors to liquidity risk. Further, contingent capital structured specifically to an insurer limits investors' ability to get out of their positions, and exposes them to adverse selection risk. Moral hazard risk is also present.

To help weather periods of financial stress, contingent capital can be structured to convert to equity at pre-specified triggers, thus bolstering the firm's capital position. This allows institutions to access funds and to increase their capital during times of crisis when credit markets may be frozen. The attractiveness of this strategy is that it provides a capital market solution to achieve a risk management framework independent of

*4 Continued*

economic cycle fluctuations as opposed to imposing minimum capital requirements.[35]

The notion of contingent capital structures is catching on with other large, systemically important institutions outside of the insurance realm. Top Federal Reserve officials believe contingent capital could address some of the concerns policy makers have about how to ensure large banks have enough capital to withstand sudden pressures on their balance sheets.[36] Contingent capital could very well become a tool to improve Federal government policy responses in future crisis. Federal Reserve officials believe that it may force banks to be more disciplined in taking on risks because of the contingent capital conversion.

## 5 Summary

The practice of reinsurance first appeared in the 14th century. For hundreds of years it stood as a central risk management practice for insurers wishing to reduce their exposure to loss. However, over the last thirty years, weather-related claims have increased fifteen-fold and in 2008 alone reinsurer capital was reduced by 14%.[37] This has created an environment where the demand for reinsurance exceeds the supply and has incentivized insurers to search for alternative forms of risk transfer.

The imbalance between demand and supply has led to volatility in both the cost and capacity for reinsurance coverage. Insurance-linked securities can smooth price instability and increase the supply of reinsurance protection while reducing the potential for retrocession spirals. Although some sectors of non-life insurance-linked securities have suffered due to the global financial crisis, the asset class as a whole has remained relatively strong.

Insurers can transfer their risks to capital market investors through a variety of securitization structures. Catastrophe bonds make up the largest segment of non-life insurance-linked securities, followed by catastrophe derivatives, industry loss warranties, reinsurance side cars, and contingent capital arrangements. These securities can be tied directly to losses of the insurer or tied to industry loss indices or parametric parameters.

Issuances of catastrophe-linked securities receded following the financial crisis, but have since bounced back and have returned to pre-2008 levels. Improved credit structures and strong investor demand have aided in the resurgence, leading to strong growth estimates. Investors, attracted by the low correlation to traditional financial markets and the above average returns, have fueled the growth of non-life insurance-linked securities.

Part Three of the three-part series on the Convergence of the Insurance and the Capital Markets ("I/C Convergence Series") discusses securitization of longevity/mortality risks for life insurance-linked securities

1 A World Economic Forum Report, Convergence of Insurance and Capital Markets, World Economic Forum, 2008.

2 United States Government Accountability Office, Catastrophe Insurance Risk: The Role of Risk-Linked Securities and Factors Affecting their Use, Report to Chairman, Committee on Financial Services, House of Representatives, 2002.

3 Ibid.

4 Ibid.

5 AON Benfield, Insurance-Linked Securities, Adapting to an Evolving Market 2009, reDEFINING, 2009.

6 The risk that the counter-party to a transaction will not be able to honor their side of the obligation due to financial hardship or other forms of financial distress.

7 (25)

8 LIBOR, the London Interbank Offered Rate, is the most widely used benchmark for short-term interest rates in the world. It is the rate which banks borrow funds from other banks in the London interbank market.

9 United States Government Accountability Office, Catastrophe Insurance Risk: The Role of Risk-Linked Securities and Factors Affecting their Use, Report to Chairman, Committee on Financial Services, House of Representatives, 2002.

10 Ibid.

11 Neil Doherty, Financial Innovation in the Management of Catastrophic Risk, Department of Insurance and Risk Management, Wharton School, University of Pennsylvania, Philadelphia, 1997.

12 The risk that investments in a hedging strategy will not experience offsetting price movements resulting in an imperfect hedge.

13 The risk that a party to a transaction will not properly manage their risk level due to the nature of the transaction.

14 Capital Ideas, The Catastrophe Bond Market at Year-End 2007: The Market Goes Mainstream, Guy Caprenter & Company, LLC., 2008.

15 AON Benfield, Insurance-Linked Securities, Adapting to an Evolving Market 2009, reDEFINING, 2009.

16 2nd Conference Organized Under the Auspices of the OECD International Network on Financial Management on Large-Scale Catastrophes, Catastrophe-Linked Securities and Capital Markets, Organization for Economic Co-Operation and Development, 2009.

17 Ibid.

18 Ibid.

19 Allan Hodgson, Derivatives and their Application to Insurance: a Retrospective and Prospective Overview, The Changing Risk Landscape: Implications for Insurance Risk Management, The AON Group Australia, 1999.

20 Drs. Veronique Bruggeman, LL.M. Capital Market Instruments for Catastrophe Risk Financing. American Risk and Insurance Association. 2007

21 Ibid.

22 The Role of Indices in Transferring Insurance Risks to the Capital Markets, Sigma, Swiss Re, 2009.

23 Sigma, The Role of Indices in Transferring Insurance Risks to the Capital Markets, Swiss Re, 2009.

24 2nd Conference Organized Under the Auspices of the OECD International Network on Financial Management on Large-Scale Catastrophes,

25 Ernest Eng and Cormac Bradley, Insurance-Linked Securities Reaching Critical Mass, Emphasis, Towers Perrin, 2009.

26 Ibid.

27 Drs. Veronique Bruggeman, LL.M. Capital Market Instruments for Catastrophe Risk Financing. American Risk and Insurance Association. 2007

28 A World Economic Report, Convergence of Insurance and Capital Markets, World Economic Forum, 2008.

29 Confounding the Forecasts. Environmental Finance. 2008.

30 A World Economic Report, Convergence of Insurance and Capital Markets, World Economic Forum, 2008.

31 Ibid.

32 2nd Conference Organized Under the Auspices of the OECD International Network on Financial Management on Large-Scale Catastrophes, Catastrophe-Linked Securities and Capital Markets, Organization for Economic Co-Operation and Development, 2009.

33 AON Benfield, Insurance-Linked Securities, Adapting to an Evolving Market 2009, reDEFINING, 2009.

34 Drs. Veronique Bruggeman, LL.M. Capital Market Instruments for Catastrophe Risk Financing. American Risk and Insurance Association. 2007

35 Damian Paletta, Contingent Capital Idea Gaining More Steam Within Fed, Wall Street Journal, 2009.

36 Ibid.

37 Reinsurance Market Outlook, Global Prices Firm as Reinsurers Maintain Core Capital Amid Credit Crisis, AON Benfield, 2009.