

Prospect of Risk-Linked Securitizations in China

중국의 위험연계 증권화 전망

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I. Introduction

Recently, the importance of the Alternative Risk Transfer (ART) instruments, including Risk-Linked Securitizations (RLS), has grown because the exposure to man-made and natural catastrophes such as hurricanes and earthquakes have increased dramatically in the world¹⁾. Following a series of costly catastrophes, including the Asian Tsunami Disaster in 2004, Hurricane Katrina and the Pakistan-India Earthquake in 2005, primary insurers have experienced a difficult time in obtaining catastrophe coverage due to the capacity limits of the worldwide reinsurance market. Furthermore, aggregate catastrophe exposures are too great for the capital of the traditional insurance and reinsurance industry. Many experts expect that the insured losses from catastrophic disasters in the future are beyond any figures previously imagined because the insurers' exposure to natural catastrophes is constantly increasing. However, while

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1) The loss ratio for property insurance for 1992, 1994 and 2001 are very high reflecting catastrophic losses caused by Hurricane Andrew, Northridge Earthquake and Terrorist Attack on WTC, respectively.

\$100 billion represents one-third of the equity capital of US property-liability insurers, such a loss amounts to only about 0.5 percent of the value of US stocks and bonds. Therefore, if a way could be found to access securities markets directly, it would be solve the problem of financing catastrophic risks²⁾. That is the reason why risk-linked securitization has become a major topic of debate in the world.

China has also suffered from serious natural disasters for many years. In addition to these natural disasters, strong economic growth will continue to underpin insurance demand, but the traditional insurance market is not capable of providing economic and smart solutions in China. Experts argue that China is also confronted with serious economic problems such as finance, employment, agriculture and a big gap between rich and poor, and that the financial problem is the most important thing. Furthermore, alternative forms of risk transfer for corporate clients are still in the early stages in China. This slow development compared with other countries can be attributed to the close interdependencies between industrial companies and insurers that are controlled by government, as well as the relatively underdeveloped risk management culture. However, things slowly started changing in China. The Chinese government is aggressively taking a second look at its risk management practice. It is also considering to setting up catastrophe funds and to allow various kinds of capitalization like financialreinsurance, catastrophe bond and insurance derivatives. At the same time, corporates have recognized that better risk management practices have a positive effect on their earnings, so they are eager to import risk management practices from developed countries.

In China the potential for the growth of RLS is considerable. Especially, the ongoing globalization, deregulation of additional industrial and service sectors, and the rapid change in the risk landscape are paving way for the development of the RLS market. At this moment, it is important to analyze the possibility of importing various risk-linked securities that could give a economic positive effect, and suggest some guidelines that can help everyone better understand RLS. This study starts by presenting the most important ART products, and identifies the key features of ART. The

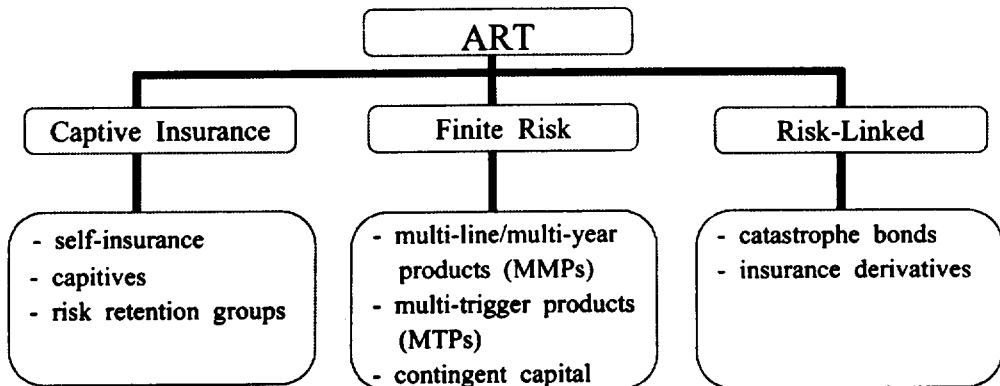
2) Cummins, J. David, Risk Management, August 1999, p. 17.

second section discusses reasons for developing ART and attempts to develop a conceptual framework for the RLS that follows. The third section focuses on the RLS market around the world and the way it has changed over the last two decades. The study ends with the outlook for future development of the RLS market in China.

II. Alternative Risk Transfer

The term Alternative Risk Transfer was first used in the US at the beginning of the 1990s to describe various forms of self-insurance like Captive and Risk Retention Groups that were formed by corporates to deal with risk exposures. But over years the concept of ART has become the mainstream of corporate risk management practices with the active participation of both the insurers and corporates. Risk-Linked Security is one of financing instruments used as part of ART. Types of ART are summarized on Figure 1.

[Figure 1. Types of ART]



Source: Swiss Re, sigma No.2/1999

ART is a blend of the use of insurance and capital market instruments and typically consists of the use of one or a combination of the following products: captive insurance, finite risk, risk-linked security.

2.1 Captive Insurance

Until recently, the term ART was mainly used to describe various forms of self-insurance, including captives and risk-retention groups. The self-insurances were formed by corporates to circumvent the accepted methods of dealing with risk exposures buying insurance policies. A captive is an (re)insurance vehicle that belongs to a company or group of companies that is not active in the insurance industry itself. It mainly takes the risks of its parent company. Captives perform two main roles. First, they are a formalized vehicle of self-insurance for high-frequency risks that can be carried by the company itself in an efficient way. Second, they are used as a financing instrument for very specific low-frequency and high-severity risks for which no cover is available on the conventional insurance market³⁾. Risk Retention Group (RRG) is another kind of captive. RRG is a cooperative insurance entity or association captive made up for owners engaged in similar business practices and facing similar liability exposures. RRG has proven especially useful to professional firms, organizations with significant environmental impairment liability exposures and transportation companies as an alternative source of stable and reasonably priced commercial liability coverage.

Around 4,000 of the 5,000 captives worldwide are single-parent captives. That is, they belong to a single company. With group captives, several companies get together to form a collective captive. Group captives experienced strong growth during phases of sharp price increases in the United States in the mid-1980s because the liability problem affected companies across entire industries⁴⁾. More recently so-called "rent-a-captive" or "protected-cell-captive" have become more popular. Instead of setting up its own captive, a company can rent a captive. The advantage of this compared with its own captive is that a company does not have to provide any capital. At present there are around 5,000 captives worldwide, generate a premium volume of approximately USD 21 billion. This is equivalent to a share of roughly 6% of the global

3) Kim, Du-Chel etc., *Insurance and Risk Management*, Moon Young Press, 1999, pp. 516-520.

4) Tillinghast Towers Perrin, *Captive Insurance Company Directory*, 2003.

commercial insurance market. Global growth in the founding of new captives is still very strong with a rate of 5% or more recently⁵⁾. The US, UK, Canada and Sweden are leading countries in captive markets. Bermuda is the most important domicile for captives in the world. Around a third of all captives are located there. For US parent companies, Bermuda and the Cayman Islands are still the favorite choice because of a favorable regulatory environment and tax regime. For European countries the preferred locations are Guernsey and Luxembourg, and Ireland has also experienced dynamic growth recently.

2.2 Finite Risk

Finite risk concepts are based on the spreading of individual risks over time. Traditional insurance is based on the law of large numbers. Risk transfer is achieved through spreading the losses that occur in a large grouping of similar risks in which only part of these risks actually incur losses. In contrast to this, the finite risk solutions spread the risks for an individual policyholder over time. The key features of finite risk products are four. First of all, the risk transfer from policyholder to the insurer is limited (finite). In addition to insurance risks, providers of finite risk products also assume non insurance risks such as interest rate risk, credit risk and exchange risk. The second feature is that the policy term usually extends over several years (multi-year). Thirdly, the effective costs of a finite policy depend on the individual claims experiences and a part of the premiums that are not required to settle claims is paid back to policyholders by the finite provider at the end of the contract period. Finally, any interest income earned during the policy term is explicitly taken into account when calculating the premiums⁶⁾.

There are two types of finite risk contracts: retrospective contracts and prospective contracts. Retrospective contracts concern losses already incurred but not yet settled while prospective contracts assume claims not yet incurred but anticipated in the future. There are also three important

5) Coffin, Bill, *The Captives Migration*, Risk Management Magazine August 2003.

6) Skipper, Harold D., *International Risk and Insurance*, Irwin McGraw-Hill, 1998.

finite risk products: Multi line/Multi year products (MMPs), Multi-trigger products (MTPs) and contingent capital. MMPs are another important ART innovation. Several lines of insurance are bundled within the same insurance programs in MMP. Traditional insurance risks can be combined such as fire, business interruption and liability. It is also feasible for an MMP to include special risks currently only covered by banks for the most part as well as risks traditionally considered to be uninsurable. MMPs are also designed to spread risk over time. Usually limits and deductibles are set for each year and for the duration of the policy. The most important feature of MTPs is that claims are only paid if in addition to an insurance event (first trigger) during the term of policy, a non-insurance event (second trigger) must also occur. MTPs provide protection from disasters such as devastating earthquakes and price falls in equity and bond markets during the same financial year. Meanwhile, Contingent capital is designed more to sustain business operations after a major loss. The aim is to prevent insolvency or a threat to planned investment projects due to a lack of disposal funds. These types of products are especially suitable for hedging against extremely rare but severe loss events.

The popularity of finite risk products varies from one region to the next and depends on tax regimes and regulatory conditions. In most countries the accounting principles to take account for finite transactions is still not clearly formulated. The United States is one of the few countries where the general accounting principles applicable to finite solutions have already been formulated⁷⁾. Recently there has been strong demand for innovative products that combine finite and traditional (re)insurance.

2.3 Risk-Linked Security (RLS)

The term RLS was first used in US in the 1990s. The United States takes a leading role in the area of the RLS market with many innovative products and has spread through out the world. Following the major losses from Hurricane Andrew and Iniki in 1992 in the US, many experts realize

7) Korea Insurance Development Institute, The Prospect of Finite Reinsurance in Korea, CEO Report 2002, p. 6.

that the potential loss from a greater catastrophe could severely challenge the entire (re)insurance industry. Furthermore, the capacity for natural catastrophe covers available on the insurance market only constitutes a fraction of the maximum exposure. In an attempt to obtain additional capacity from future mega-catastrophe risks, direct insurers, reinsurers and investment banks have started to securitise catastrophe risk portfolios in order to place them directly with investors in the form of securities such as catastrophe bonds and insurance derivatives.

The risk-linked securities are a kind of financial derivatives. Financial derivatives are financial instruments whose values are derived from another "underlying" financial security. In recently years, derivatives have become increasingly important in the world of finance. Futures, options, swaps, swaptions, structured notes are all examples of derivative securities. Derivatives can be used hedging, protecting against financial risk, or can be used to speculate on the movement of commodity or security prices, interest rates or the levels of financial indices⁸⁾. With development of financial engineering that refers to the development of pricing methodologies and hedging techniques underlying financial derivative products, various financial derivatives have been emerged in the financial markets until now and the trends have expanded to the insurance markets.

There are two principle types of risk-linked securities: over-the-counter catastrophe bonds issued by special purpose reinsurance vehicles (SPV) with the assistance of reinsurance banks, and exchange-traded catastrophe derivatives offered by Chicago Board of Trade in 1992 and the Bermuda Commodities Exchange in 1997. To use catastrophe bonds, a ceding company will work with a special purpose reinsurance vehicle that both assumes the ceding company's catastrophe exposure and issues the bonds to fund losses arising from this exposure. The ceding company obtains coverage equivalent to a traditional reinsurance contract. Investors gain or loss according to the catastrophe's underwriting results. Catastrophe bonds can offer the ceding company a perfect hedge against catastrophe losses. But investors unfamiliar with insurance underwriting and claim settlement practices prefer to separate catastrophe risks from company specific risks.

8) Hull, John C., *Options, Futures, and Other Derivatives* (6th Edition), Prentice Hall, 2004, p. 10.

Thus, they seek investments based on total industry underwriting results rather than individual company results. To satisfy this need, the catastrophe indexes of the Chicago board of Trade (CBOT), the Bermudaexchange and Risk Management Solutions (RMS) have been developed in the US and have actively used in worldwide⁹⁾. Recently, the active participation of capital market investors has provided the emergence of new risk-linked securities and boosted the availability of a wide range of innovative financial instruments in the RLS market.

As a whole, ART products aim at increasing the efficiency of the risk transfer, broadening the possibility of insurable risks and accepting the capital markets for additional capacity. The key features of ART products are summarized on table 1.

〈Table 1. Features of ART〉

Captive Insurance	Captive Insurance	A captive is an (re)insurance vehicle that belongs to a company or group of companies that is not active in insurance industry itself, but mainly created to insure the risks of its parent company
	Risk Retention Group (RRG)	RRG is a cooperative insurance entity or association captive made up for owners engaged in similar business practices and facing similar liability exposures ¹⁰⁾
Finite Risk	Multi line/ Multi year Products (MMP's)	The concepts of combining different categories of risk into one product over several years
	Multi-trigger Products (MTP's)	Claims are only paid if in addition to an insurance event (first trigger) during the term of policy, a non-insurance event (second trigger) must also occur
	Contingent capital	The raising of capital at pre-agreed terms is linked to the occurrence of an insurance event.
Risk-Linked Security	Catastrophe Bonds	A ceding company will work with a special purpose reinsurance vehicle (SPV) that both assumes the ceding company's catastrophe exposure and issues the bonds to fund losses arising from this exposure
	Insurance Derivatives	Instruments such as futures and options for natural catastrophe risks whose value is determined by the performance of an insurance specific index

Source: The Association of Chartered Treasury Managers, Alternative Risk Transfer, 2000

9) Powers, Imelda Yeung and Michael R., Seeking the Perfect Catastrophe Index, A.M. Best's Review P/C December 1997, pp. 101-102.

10) Warfel, William J., Reforming Risk Retention Groups, Risk Management Magazine 2003.

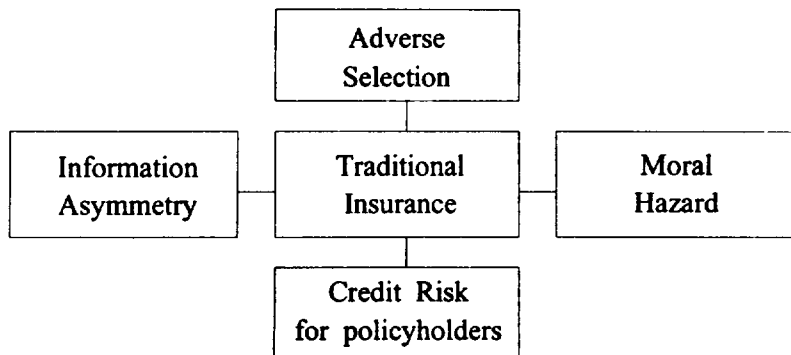
III. Reasons for developing ART

3.1 Improve the Efficiency of Risk Transfer

The primary objective of developing ART is to improve the efficiency of risk transfer. That is, the inefficiencies of traditional insurance have contributed to the development of alternative risk transfer solutions. The structural inefficiencies of traditional insurance are shown on Figure 2.

The primary limitation of the traditional insurance is Information Asymmetry. An analysis of the insurance costs shows that the difference between the premium and the expected loss is high. This result is come from the information differences between insurers and policyholders¹¹⁾. This limitation can be reduced through alternative risk such as captive insurance, finite risk and risk-linked securitization.

[Figure 2. Structural Inefficiencies of Traditional Insurance]



Source: Swiss Re Economic Research & Consulting

The second is Adverse Selection. Traditional insurance prices are calculated on the basis of average risks, and are therefore higher than the risk-adjusted premium rates for good risks. As a result, good risks are becoming increasingly reluctant to subsidize bad risks, and are turning to self-insurance or captive insurance instead.

11) Doherty, Neil A., Financial Innovation in the Management of Catastrophe Risk, Journal of Applied Corporate Finance, Volume 10, No. 3, Fall 1997, pp. 84-95.

The third is Moral Hazard. With insurance there is a danger that the policyholder has little incentive to prevent or contain a loss. In the case of self-insurance, the policyholder has a direct incentive to adopt suitable risk management measures to prevent losses or keep losses to a reasonable level. Various alternative risk transfer products can eliminate the problem of moral hazard by defining the loss event on the basis of a physical event. Moral hazard is also a potential problem in catastrophe securities where the contract payoff based on the losses of the insurer issuing the securities. In most of the catastrophe (CAT) bonds issued so far, moral hazard is dealt with by including a percent coinsurance in which the insurer collects only certain percentage (usually 90 percent) of its CAT losses after the triggering event occurs. The indexed linked products have also been developed because the moral hazard of index linked contracts is very low.

The fourth is Credit Risk for the policyholders. There is danger that the (re)insurer will not have sufficient funds to cover a claim. In fact, there are many insurers going bankrupt because of large natural catastrophe losses in the 1990s. However, the credit risk of a CAT bond is close to zero because the trust that is held by issuer is funded with safe securities and exists only for the purpose of this single transaction¹²⁾.

3.1 Increase Capacity

The policyholders' exposures to catastrophes are constantly increasing because of demographic trends and rising property values. Many experts expect that the insured losses from catastrophic disasters in the future are tremendous. However, from time to time large companies find that no cover is available for catastrophic risks that threaten their existence due to a lack of capacity on the (re)insurance markets. The top ten insurance losses worldwide are shown on table 2.

Projected catastrophes like a \$75 billion Florida hurricane or a \$100 billion California earth quake would severely stress the capacity of (re)insurance market. However, while \$100 billion represents one-third of

12) Swiss Re, Alternative risk transfer (ART) for corporation: a passing fashion or risk management for the 21st century, sigma No.2/1999, pp 12-13.

the equity capital of US property-liability insurers, such a loss amounts to only about 0.5 percent of the value of US stocks and bonds. Therefore, if a way could be found to access securities markets directly, it would solve the problem of financing catastrophic risk. These securities are bought by investors such as hedge funds and pension plans that receive a premium above usual market yields for bearing the catastrophic risks¹³).

〈Table 2. Top Ten Insurance losses in the World〉

(Unit: USD Millions)

Date	Country	Event	Estimated Losses (USD Millions)
2001. 9. 11	USA	Terrorist Attack on WTC	58,000*
1992. 8. 24	USA	Hurricane Andrew	20,185
1994. 1. 17	USA	Northridge Earthquake	16,720
1991. 9. 27	Japan	Typhoon Mireille	7,338
1990. 1. 25	Europe	Winter Storm Daria	6,221
1999.12. 25	Europe	Winter Storm Lothar	6,164
1989. 9. 15	USA	Hurricane Hugo	5,990
1987. 10. 15	Europe	Autumn Storm	4,674
1990. 2. 26	Europe	Winter Storm Vivian	4,323
1999. 9. 29	Japan	Typhoon Bart	4,293

* Estimated of the total incurred losses

Source: Swiss Re, Sigma No. 1/2002

Tillinghast-Towers Perrin, Status as of 31 January 2002

3.1 Portfolio Diversification

Financial investors may find it is worth investing in risk-linked securities like catastrophe securities because it allows them to diversify their portfolio even further. That is, investors such as hedge funds and pension plans want to buy a security that creates an exposure to a large loss in the event of a hurricane or earthquake because such investments form only a small part of their highly diversified portfolios. In principle,

13) Cummins, J. David, The Insurance Link to Securities, Risk Management, August 1999, pp. 17-20.

CAT securities are valuable to investors because CAT losses are zero-beta events with their financial portfolio. The correlation of CAT losses with capital market security returns is close to zero. Zero-beta securities are valuable for diversification purposes because they make it possible for investors to reduce risk for any given level of expected portfolio returns.

3.2 Market Innovation

Many new and innovative financial instruments have a very tremendous effect on the development of the ART market. Over years, the traditional insurance market has failed to come up with new products and process innovation. Furthermore, the insurance market is slow and adaptability to meet the ever changing risk needs of corporates and risk managers. As a result, corporates started questioning about the value of insurance products and their inability to recoup major catastrophic losses and lack of flexibility in the products of insurers had also fuelled the growth of ART market. ART market continues to grow in volume and new innovative instruments. The market is also being introduced every year with new features to tackle catastrophe risks. In addition, the role of brokers, bankers and reinsurers are commendable because of their interest and eagerness to invest in new products and take additional risks in financing. The increased sophistication of risk managers, the convergence of actuarial sciences, developing financial mathematics, and capital market innovations also paved for the emergence of sophisticated risk reduction products.

IV. The RLS Market around the World

The market for ART currently consists of captive insurance, finite reinsurance, and risk-linked security. Most of these products are in strong demand due to the hardening of insurance market. Over years, corporates are trying to develop various techniques for risk protection and minimization because they are concerned the role of the conventional insurance. Most multinational corporations already have a captive, and

new captive formation will emerge to serve medium-sized corporations. Many alternative risk products are available in a wide variety of forms to meet corporate needs. In 2001, The ART market attracted about 10 percents of insurance premiums¹⁴⁾. However, apart from the comparative popularity of the captive concept in industrialized countries, the ART market is still in its formative stages. Important factors influencing the expansion of ART products include the risk management culture, the importance of corporate financing and the industrial structure. There are significant differences across the globe. The more important a capital market is for corporate financing in a national economy, the more important the shareholder value principle is for a company. The ART market will not replace traditional insurance but rather supplement them in areas where they do not offer efficient solutions.

With development of ART market, attempts to transfer insurance risks directly to capital market investors have received special attention over the past decade. This can be through the securitization of risks in the form of catastrophe bonds or via derivatives transaction. The first attempt to use financial market instruments for controlling insurance risks was the development of catastrophe bonds for natural catastrophe risks at the Chicago Board of Trade (CBOT). Insurance derivatives are not only traded on exchanges, but also can be placed privately. Catex is one of example. Catex is a special exchange for insurance risks where licensed risk carriers can engage in global electronic trading of packages of specific catastrophe risks via the internet. Unlike trading in insurance derivatives on the CBOT, no direct additional capacity is generated by Catex. However, by improving the diversification of individual risk carriers the available risk capital is used more efficiently overall.

In principle, the securitization of insurance risks is not limited just to catastrophe risks. For example, the derivative structure is being increasingly applied to other risks, especially weather risks. But due to the conspicuous lack of capacity, they merely had their beginnings in this area. The RLS market appears to be progressing and the balance of market share between investment bankers and reinsurance intermediaries have

14) Swiss Re, The Picture of ART, *sigma* No.1/2003.

remained steady. Investment bankers controlled two-thirds of the issuance market and Goldman Sachs is the market leader¹⁵⁾. Top ten risk-linked security transactions in the world are shown on Table 3.

〈Table 3. Top Ten Risk-Linked Security Transactions in the World〉

Special Purpose Vehicle	Origin	Issuer	Amount (USD Millions)	Market Share (%)
Residential Re	USAA	Merrill Lynch	200.0	56.8%
PRIME Hurricane	Munich Re	Goldman Sachs	159.0	87.0%
PRIME Earthquake	Munich Re	American Re	129.0	78.7%
Gold Eagle	American Re	Lehman Brothers	116.4	63.6%
Western Capital	Swiss Re	Goldman Sachs	97.0	67.1%
Mediterranean Re	AGF		88.0	78.9%
SR Wind Class A-1	Swiss Re	Swiss Re	58.2	63.6%
SR Wind Class A-2	Swiss Re	Lehman Brothers	58.2	67.3%
Alpha Wind	Arrow Re	Goldman Sachs	52.2	63.6%
NeHi	Vesta Rire Ins.	Aon Capital	41.5	80.5%
Other Transactions				
Assb AB	Assb AB	Marsh & Mclennan	1,170.0	
Tokyo/State Farm Swap			200.0	
California Earthquake			100.0	

* Amount: USD Millions

Source: Risk Management, August 2001.

4.1 North America

The US takes a leading role in the area of RLS market with many innovative products and has spread through out the world. Following the major losses from Hurricane Andrew and Iniki in 1992, experts realize that the potential loss from a greater catastrophe could severely challenge the entire insurance and reinsurance industry. This generated several immediate responses. States with large catastrophe exposures set up catastrophe funds and the demand for catastrophe coverage prompted the capitalization of new insurance companies in Bermuda. In addition, the electronic reinsurance exchange, Catex, was formed to allow subscribers to

15) Lane, Morton N. and Beckwith, Roger, Current Trends in Risk-Linked Securitizations, Risk Management August 2001, pp. 17-23.

cede and assume catastrophe exposures over a secure electronic system. Catex completed its first transaction in 1997. Canada is also an important player in the ART market with active participating in the RLS market since the late of 1990s and takes a cue at the practices being implemented by its neighboring country USA.

There are two principle types of risk-linked securities in US: catastrophe (CAT) bonds and insurance derivatives. CAT bonds are issued by special purpose reinsurance vehicles with the assistance of investment banks, while insurance derivatives offered by exchanges such as Chicago Board of Trade in 1992, the Bermuda Commodities Exchange and Risk Management Solutions in 1997. USAA has played an important role in the CAT bonds market since its early days. Residential Re usually issued CAT bonds by insurer USAA. USAA is the sixth-largest homeowner and auto insurer in the United States and Residential Re is a special purpose reinsurer licensed under the laws of the Cayman Islands. The Chicago board offered the first catastrophe derivatives in 1992. These catastrophe futures and options were based upon indexes of total industry loss ratios provided by Property Claim Services (PCS). The Bermuda exchange began trading options based upon the Guy Carpenter Catastrophe Index in 1997. Another catastrophe indexes were offered by Risk Management Solutions (RMS) in 1997. The catastrophe Indexes traded in US are summarized on table 4.

<Table 4. Catastrophe Indexes in US>

Classification	PCS index	Guy Carpenter Index	RMS Index
Area covered	U.S.A.	U.S.A.	Worldwide
Perils	Hurricanes, Tornadoes, Hail, Windstorms, Winter freezes, Earthquakes, Riots, Fires, Floods, Explosions	Atmospheric perils only	Hurricanes, Typhoons, Cyclones, Earthquakes
Event thresholds	\$25 million insured property loss	No threshold	Richter scales, Category 1 or above

Classification	PCS Index	Classification	Classification
Reporting units	Individual states	ZIP codes	ZIP codes
Exchanges	Chicago Board of Trade	Bermuda	n/a
Contract types	Aggregate loss	Single and second Loss option contract	n/a
Exposure period	Quarterly and annual periods	Semi-annual	Various periods
Updates	Daily from start of exposure period	Quarterly, Beginning a month	28 days after occurrence

Source: A.M. Best's Review P/C December 1997

It is not easy to create a sufficiently attractive index for insurers, reinsurers and investors. For example, Catastrophe bonds can offer the ceding company a perfect hedge against catastrophe losses, but investors prefer to index based catastrophe derivatives. But these indexes fail to provide ceding companies with the perfect hedging of their individual losses. Therefore, extensive research and development have been devoted to develop effective catastrophe derivatives in US.

4.1 Europe

Catastrophe bonds of risk-linked securitizations are generally developed in Europe. In Europe, the role of capital market in the RLS market is still in its developmental stages, and is less sophisticated as compared to the US market. But experts say that with the introduction of single European currency euro, a more proactive role of capital market is expected in the RLS market. The introduction of the euro has created a single capital market in Europe whose size is second only to that of the US. The European capital market is therefore to become more transparent and more liquid with greater product diversity and a much more important role for corporate financing. The introduction of the euro will intensify the competitive pressure that has already been unleashed by the deregulation of many markets. Further liberalization is expected in business sectors

that have been heavily regulated. The Association of Chartered Treasury Managers, *Alternative Risk Transfer*, 2000.

The importance of the RLS products in the European market varies considerably. In the UK their development is relatively advanced while in the continental Europe they are still in their early stages. The world's biggest industrial and service companies in the continental Europe are also confronted with comparable risk management demands because they face intense global competitive pressure. Therefore, Europe is likely to experience significant growth potential for the RLS products. In general the overall conditions for the innovative RLS products are more favorable than in the US as regards the regulatory and tax environment, and the accounting principles.

Swiss Re is one of the frontrunners in catastrophe bonds. It set up its two programs of CAT bond, Pioneer and Arbor. Pioneer was set up in 2002 and Arbor in 2003. Swiss Re is issuing up to USD 8 billion worth of CAT bonds (Arbor USD 6 billion and Pioneer USD 2 billion) covering five peak perils. Pylon, the French utility provider, became the first European corporate to issue a CAT bond. The deal is made to protect the company against transmission and distribution risks caused by windstorm damage in France. Both companies get over 30 percents market share in Europe. Munich Re has also been a quite consistent player in the RLS market.

4.2 Asia

Entire alternative forms of risk transfer for corporates are still in the early stages in Asia. This slow development compared with other regions is attributed to the close interdependencies between industrial companies and insurers as well as the relatively underdeveloped risk management culture. One reason is the close interdependencies that exist in many Asian countries between industrial companies and (re)insurers. For example, in Japan the four biggest non-life insurers whose market share comes to almost 50% belong to what are known as "Keiretsu" association. A large portion of commercial insurance is arranged within these groups of companies, so that the competitive pressure and the prospects of success

for ART providers have not been very good to date. It is also similar to Korea and other Asian countries. Another reason is the relatively underdeveloped risk management culture existed in Asian countries. Even in Japan where technical and physical standards are very high, the function of risk management is very underdeveloped at the organizational level and trends to be considered as more of an administrative task. Swiss Re, Alternative risk transfer (ART) for corporation: a passing fashion or risk management for the 21st century, sigma No.2/1999, pp 38-39.

But things slowly started changing in Asia. The long stagnation in Japan and the economic and financial crisis that has gripped much of Asia have loosened the many formal and informal networks. Competitive pressure is also increasing as the market opens up more quickly to foreign providers. Many Asian corporates also try to enforce their risk management practices because they realized that better risk management practices have a positive effect on their financial earnings. In addition, with a lot of deregulation happening in many Asian countries and introduction of transfer of insurance risk to capital market investors, the RLS market will develop rapidly in Asia countries, especially in China.

V. The Prospect of RLS in China

According to the report, Emerging Market in the 21st Century, by Swiss Re that is one of leading insurers in the world, emerging markets will be at the frontier of insurance in the 21st century. Over the past ten years, life and non-life insurance premiums in emerging markets have risen annually by 10.4% and 7.3% respectively, compared with an average 3.4% and 2.6% for industrialized nations. Among the emerging markets, China and India are very much in the spotlight because of their huge populations, growing economic importance and fast liberalizing regulatory regimes¹⁶⁾.

16) Swiss Re, High growth potential puts emerging markets at frontier of insurance: China and India in the spotlight, sigma No.5/2004, pp. 1-3.

〈Table 5. Top Ten Countries in Emerging Markets〉

(Unit: USD Millions)

Life Insurance	Premium Volume	Emerging Markets Share	Non-life Insurance	Premium Volume	Emerging Markets Share
S. Korea	41,998	22.4%	S. Korea	17,760	14.4%
China	32,442	17.3%	China	14,468	11.8%
Taiwan	23,739	12.6%	Russia	9,257	7.5%
S. Africa	20,728	11.0%	Taiwan	8,662	7.0%
India	13,590	7.2%	Brazil	8,259	6.7%
Hong	10,117	5.4%	Mexico	6,690	5.4%
Brazil	6,306	3.4%	S. Africa	4,670	3.8%
Singapore	5,561	3.0%	Poland	3,946	3.2%
Russia	4,887	2.6%	India	3,712	3.0%
Mexico	4,230	2.3%	Singapore	3,337	2.7%
Total	163,598	87.1%	Total	80,762	65.7%

Source: Swiss Re, sigma No.5/2004

Life insurance premiums in China have grown by an annual average of 23.7% over the last decade, while non-life premiums have grown by 10.8% over the same period. In fact, China is the 8th largest life insurance markets and 13th in terms of non-life insurance worldwide. The premium growth is expected to remain strong at 20% per year in the next decade due to robust economic growth, increased stability, favorable regulatory, as well as new product offerings and distribution channels. Despite this impressive growth rates, China market is still relatively small, accounting for only 2.2% of global insurance premiums. However, its huge economy and population size, coupled with rapid industrialization and globalization will create ample opportunities for the rapid development of insurance industry. In particular, liberalization and deregulation are rendering this de-monopolized market more accessible and attractive to foreign insurers. Currently, majority foreign-owned insurers account for less than 5% of insurance premiums in China¹⁷⁾.

China has also suffered from various man-made and natural

catastrophes. In 2005, more than 1,000 people lost their lives and over 4.4 million suffer from catastrophes. Economic losses are also estimated 300 billion. The trend towards higher losses continues in view of the risk factors: higher population densities and higher concentrations of insured value, especially in endangered area. Top ten catastrophe disasters in China are shown on table 6.

〈Table 6. Top Ten Catastrophe Disasters in China〉

(Unit: USD Millions)

2002. 11-2003. 7	All Areas	SARS	17,900
1998. 7	Chang-Jiang Area	Flood	17,694
1999. 9. 21	Taiwan	Earthquake	9,200
1991. 6-7	Hui-He Area	Flood	4,146
1976. 7. 28	Tang-Shan	Earthquake	1,220
1975. 8	He-Bei Province	Flood	1,220
1954. 7	Chang-Jiang Area	Flood	1,220
1985. 8	Liao-He	Flood	573
2002. 7	Yun Nan Province	Flood	500
1987. 5. 6	Da-Sing-An-Ling	Fire	295

Source: China National Statistical Office, 2004

It is clear that the potential loss from an even greater catastrophe could severely challenge the China's entire economy. However, many policyholders have faced that no cover is available for catastrophic risks due to a lack of capacity on the (re)insurance markets. The Chinese government considers thus to set up catastrophe funds and to allow various kinds of capitalization like catastrophe bonds and insurance derivatives. Chinese Corporates also realize the importance of risk management and eager to import high-level risk management practices from

17) Jang, Jong-Hag, The SWOT Analysis of China Insurance Industry, Yanbian University of Science & Technology Research Center, 2005, pp. 13-14.

developed countries. Furthermore, foreign-owned insurers that already open their branch in China aggressively try to sell their innovative products such as catastrophe bonds and insurance derivatives. Thirty eight foreign-owned insurance companies are now operating in China including Lloyd's of London that is one of the biggest reinsures in the World. The China Insurance Regulatory Commission (CIRC) has already licensed several asset management companies owned by foreign shareholders like Swiss Reinsurance company under the new "Provisional Regulations on the Administration of Insurance Asset Management Companies" which came into effect on June 2004. These companies aim to develop various risk management skills to improve their profit margins while effectively handling catastrophe exposures for China's insurance industry.

Many insurance experts expect that the innovative risk management concepts can be applied to risks that were uninsurable in the past in China. That is, the use of insurance derivatives as protection against previously uninsured threats to the earnings of an industrial or service company offers a lot of potential. Weather is a good example. The revenue of many different companies are susceptible to weather pattern such as energy producers and building firms, food and beverage manufacturers, companies in the leisure sector and many more besides. Detailed analyses of the degree to which the sales of certain companies are dependent on temperature, rain, snow, sunshine, etc will encourage the emergence of specific insurance derivatives. At the same time, with financial markets becoming more and more volatile, a wide range of new financial instruments has come into the market for hedging systematic risks in China. Many financial derivatives already exist in the Chinese financial market and the most prominent financial instruments are futures, options and swaps. It is vital to recognize that various financial derivatives are an integral part of some of the most critical financial reforms now being carried out in the Chinese government because the lack of various financial derivative products including risk-linked securities seriously hinders active participation from domestic and foreign professional institution investors. Therefore, the China Securities Regulatory Commission (CSRC), the China Bank Regulatory Commission (CBRC) and the China Insurance Regulatory

Commission (CIRC) make a joint effort to further develop the financial derivative market and provide hedging products for investors. For the first step, CSRC is considering launching stock index futures in 2006. These financial instruments are creating a new challenging environment for the China insurance industry. Insurance swaps of insurance derivatives will be accepted at first¹⁸⁾. Many Asian multinational companies have used insurance swaps because the insurance derivative is convenient for use and more profitable¹⁹⁾. The presence of many professional institutional investors including QFII (Qualified Foreign Institutional investors), insurers, securities brokers and social securities companies would also make it more likely that derivatives market are run properly in China.

Meanwhile, globalization is making some industries such as energy, marine shipping and aviation vulnerable by the price fluctuation in the world market. Large companies' social liabilities and financial burdens are also rapidly increased under new statutes such as "Act of Insurance against Industrial Injury" and "Product Quality Law" in China²⁰⁾. In addition, large infra-structure projects now depend increasingly on private financing. Both principals and contractors are being confronted financial risk exposure following the shift from governmental funding programs to private funding schemes. These conditions compel the parties involved to acquire the possible insurance cover. But although it is difficult to purchase appropriate coverage through the Chinese insurance markets, direct insurers cannot deal with foreign reinsurers without permission of CIRC according to Reinsurance Regulations effect on 2004²¹⁾. This will continue for a while, so both underwriters and other parties have to solve the problem in domestic insurance markets. These conditions have prompted a sharp rise in demand for new types of risk-linked securities. Securitization can also be driven by large scale corporations that issue catastrophe securities directly in capital markets bypassing the insurance and reinsurance markets. In 2005, eighteen Chinese companies have gained

18) Jang, Jong-Hag, The Prospect of Alternative Risk Transfer Market in China, International Symposium, Yanbian University of Science & Technology (YUST), 2005, p. 13.

19) A Japanese insurer made a 2 million US dollar contract with a Swiss insurer at 2004.

20) Ma Shi, Alternative Risk Transfer in China: Feasibility and Market Potential, 2004. 11.

21) China Insurance Regulatory Commission, Economic Review for 21th Century, 2004. 12.

places on Fortune global top 500 list including 15 from Chinese mainland, 2 based in Taiwan and 1 in Hong Kong. The highest Chinese company on the list is SINOPEC that is ranked the 31st and the State Grid and China National Petroleum Corporation (CNPC) are followed.

There are a number of factors that can affect the success or failure of risk-linked securitization offerings in China. One factor is credit risk that the contracting party to the transaction will fail to when the triggering event occurs. The credit risks of CAT bonds and exchange traded options are low. But the credit risk of catastrophe equity put options is relatively high because the puts traded are not issued through an organized exchange much like traditional reinsurance. So it is important that organized exchanges control the credit risk through appropriate instruments. Another important factor in securitization is moral hazard. Moral hazard can be occurred that the insurer will write too much insurance in regions protected by the CAT securities. In most CAT bonds, moral hazard is dealt with by including percentage coinsurance in which the insurer collects only certain percentage of its CAT losses. The purpose of the coinsurance is to reassure bondholders that the insurer will not act against their interests. Another method to prevent moral hazard is to use index-based contracts. The moral hazard of index-based contracts is very low because they can eliminate moral hazard through the parametric criterion. One of the most important factors in risk-linked securitization is basis risk. Basis risk is the risk that the payoff of the CAT securities will be less than perfectly correlated with an insurer's losses. When the payoff is based on an index, the insurer will collect more or less than it expects. Various studies is being made to solve the basis risk problems²²⁾.

Although the risk-linked securities issued to date have been private placements, the development of a public market is within the next decade. The standardization and simplification of the contracts are necessary for the development of a public market. Publicly traded RLS could be issued on a wide range of events throughout the world. Recently, a guideline for securitization has been announced by the China Bank Regulatory Commission (CBRC) and the China Securities Regulatory Commission

22) Cummins, J. David, The Insurance Link to Securities, Risk Management, August 1999, pp. 18-20.

(CSRC). Following Japan and Korea that already have the law of asset-backed securitization, it is expected that a similar legislation will be passed in China²³). The RLS will also affect the role of (re)insurers. Traditionally, (re)insurers have played the role of underwriters and ultimate risk bearers for their policyholders. In the future, (re)insurers will bear less of risks directly and lay of higher proportion of risk to the RLS markets. The widespread securitization of other types of insurance such as automobile, liability and life insurance will emerge in the near future. However, risk-linked securities will not replace traditional insurance cover but rather supplement them.

VI. Conclusion

Over the past two decades, life and non-life insurance premiums have risen annually by 23.7% and 10.8% respectively in China. As a result, China is the 8th largest life insurance markets and 13th in terms of non-life insurance worldwide. The premium growth is expected to remain strong at 20% per year in the next decade due to robust economic growth, increased stability, favorable regulatory as well as new product offerings and distribution channels. On the other hand, China has suffered from various man-made and natural catastrophes. The policyholders' exposure to catastrophes is constantly increasing because demographic trends and rising property value are escalating the concentration risk in catastrophe-prone areas. Furthermore, catastrophe exposures in the future are great for the capital beyond any figures previously imagined. But policyholders have faced that no cover is available for catastrophic risks due to a lack of capacity on the (re)insurance markets. The Chinese government considers thus to set up catastrophe funds and to allow various kinds of risk-linked securitizations such as catastrophe bonds and insurance derivatives. Corporates also have recognized that better risk management practices have a positive effect on their earnings, and tried to import high-level risk management practices from developed countries.

23) Park, Whon-II, Asset Backed Securitization, Kyung Hee University, College of Law, 2000.

The innovative risk management concepts can be applied to risks that were uninsurable in the past in China while a wide range of new financial instruments has come into the market for hedging systematic risks in China. The most prominent financial instruments that already exist in the Chinese financial market are futures, options and swaps. The development of new and innovative financial derivatives is the most critical financial reforms now being carried out in the Chinese government. Therefore, the China Securities Regulatory Commission (CSRC), the China Bank Regulatory Commission (CBRC) and the China Insurance Regulatory Commission (CIRC) have made a joint effort to further develop the financial derivative market. For the first step, CSRC is considering launching stock index futures in 2006 and insurance swaps of insurance derivatives will be accepted in the near future. With many professional institutional investors including QFII (Qualified Foreign Institutional investors), insurers, securities brokers and social securities companies, derivatives market are run properly in China.

Various alternative risk transfer products will also give a good chance to (re)insurers, investors and institutions in capital market, and even government through increasing the efficiency of the risk transfer, broadening the spectrum of insurable risks, and tapping the capital markets for additional capacity. The ART products consist of three instruments: captive insurance, finite risk and risk-linked securitization. The ART products have expanded rapidly over the last few decades in which the focus has been initially on captives. Captives allow companies to deal with high-frequency risks in a more cost-efficient way than through traditional insurance. Finite risks are another well established type of ART. Finite risk concepts are based on the spreading of individual risks over time while traditional insurance is based on the law of large numbers. There are three important finite risk products: Multi line/Multi year products (MMPs), Multi-trigger products (MTPs) and contingent capital. Through the risk-linked securitization in the forms of catastrophe bonds and insurance derivatives, insurance risks can be transferred to capital market investors. Recently, the active participation of capital market investors has provided the thrust towards the emergence of new risk-linked securities and

boosted the availability of a wide range of innovative financial instruments in the ART market worldwide.

The securitization of insurance risk has the potential to rapidly alter the China's risk management landscape. The customers such as policyholders, (re)insurers, investment banks and investors start demanding more innovative and customized solutions for risk management. However, the traditional insurance can not meet their needs because of its structural inefficiency such as information asymmetry, adverse selection, moral hazard, credit risk and capacity limitation. This is paving way the development of the RLS market in China. Through the development of the RLS markets, policyholders can be protected from (re)insurer's credit risk, (re)insurers can overcome the limitation of capacity, and investors can diversify their portfolios. The growth and survival of the RLS market in China lies in coming up with the products to suit the diverse needs of various customers and act as a close substitute for the traditional (re)insurance market.

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