ILS Analysis Report

Report issued at the request of **City Insurance** to serve for auditing purposes

Scope of the Report:

The Report addresses the enquiry of City Insurance to use (part of) its property investment as collateral for ILS investments, thus diversifying its portfolio of assets and reducing the property risk sub-module in the market risk module as defined under the Solvency II Standard Formula.

Disclaimer:

Risksearch BV analysis report addresses the use of ILS in general, from the investor's perspective, without marketing any specific solution and/or analysing a specific security.

Content:

1. Classification

Insurance linked securities (ILS) represent a class of alternative risk transfers (ART). According to CEIOPS-DOC-17/09, "insurance and reinsurance undertakings might be investors in ILS and take new forms of risks into their portfolios".

ART instruments can be divided into three main groups:
a) insurance derivatives
b) equity-like instruments
c) insurance linked securities (ILS)

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

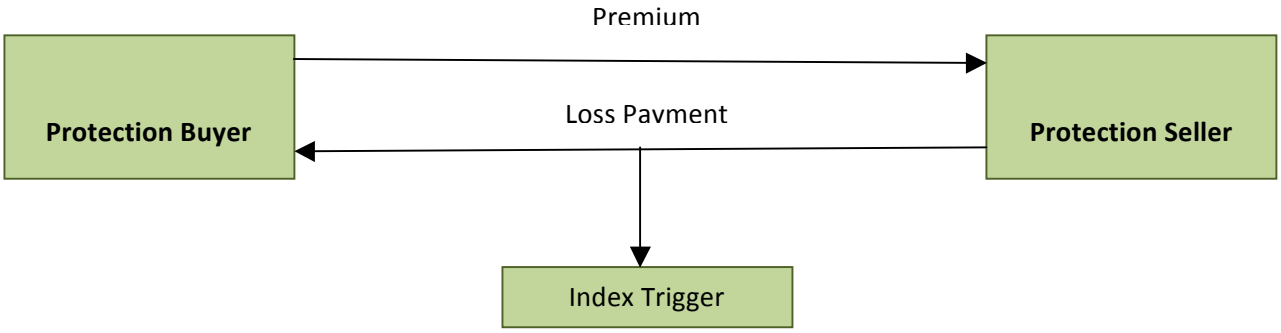
In the non-life sector the underlying risks are catastrophe or frequency risks. Typical features of securitised catastrophe risks are low probabilities of the events but high losses in case of an event triggered. Frequency risks have high probabilities of a loss event but low payments in case of an event.

According to CEIOPS-DOC-17/09, "in a 'true sale' transaction a complete portfolio of insurance contracts is transferred to a special purpose vehicle (SPV)". 'True sale' meaning according to EIOPA consists in the SPV being a legally and economically independent entity ("norecourse sale, especially in case of the insolvency of the originator").

ILW Product Classification

Industry loss warranties (ILW) are a form of insurance-linked security used to finance peak, non-recurrent insurance risks, such as hurricanes, tropical storms and earthquakes. ILWs are used to hedge risk in the property catastrophe retrocession market. ILWs use an industry loss index, therefore the payout is dependent on loss suffered by all insurers in connection with a catastrophe event and not just the loss of the insured.

A classic ILW takes the form of a bilateral reinsurance contract, as described below:



The term of the contract may be one year or less. The security can be purchased at any time, including the time when an event is imminent and immediately after an event has occurred but before losses are known.

Main characteristics of ILW:

a) substantially lower transaction costs compared to other ILSs;

b) unlikely to create moral hazard issues because payouts are based on an independent metric, rather than the insured's reported losses;

c) reduced adverse selection because payments are based on widely available information and there are few informational asymmetries to be exploited;

d) basis risk (the protection buyer attempts to protect a risk exposure with a proxy, i.e., an index trigger, which provides payment that does not perfectly match the potential loss);

e) ILWs are usually collateralized;

f) tendency to be more liquid than traditional instruments on account of the standardization of documentation and simplified wordings;

g) data quality (industry loss indexes provide high quality data).

2. Accounting Principles

The investment in ILS performed by the insurance undertakings is reflected in the balance sheet as follows:

Assets

- Goodwill
- Deferred acquisition costs
- Intangible assets
- Deferred tax assets
- Pension benefit surplus
- Property, plant & equipment held for own use
- Investments (other than assets held for index-linked and unit-linked contracts)
  - Property (other than for own use)
  - Holdings in related undertakings, including participations
  - Equities
    - Equities - listed
    - Equities - unlisted
  - Bonds
    - Government Bonds
    - Corporate Bonds
    - Structured notes
    - Collateralised securities
  - Collective Investments Undertakings
  - Derivatives
  - Deposits other than cash equivalents
  - Other investments
- Assets held for index-linked and unit-linked contracts
- Loans and mortgages
  - Loans on policies
  - Loans and mortgages to individuals
  - Other loans and mortgages

The position will be "Other investments" in the Balance Sheet, and in the analytics it will be detailed as:

ILW investment through SPV/SSPE (securitisation special purpose entity) / (securitization special purpose entity).

The CIC Code for the investment position will be:

A) for dual trigger products:

XL = denoting that the asset is not listed on a stock exchange;

67 = denoting that it is a security mainly exposed to Cat or weather risk

B) for index ILW:

A7 = denoting a catastrophe and weather risk

Under SII regular reporting, the investment will be listed in Template S.06.02.01 with the following details:

Z Axis:								BC/Assets		BC/Assets	BC/Assets	BC/Assets				
CS/Solo																
SU/Assets other than derivatives and Assets held as collateral																
S.06.02.01.01																
ID Code	Item Title	Issuer Name	Issuer Code	Issuer Sector	Issuer Group	Issuer Group Code	Issuer Country	Currency (ISO code)	CIC	Participation	External rating	Rating agency	Duration	Unit SII price	Percentage of par SII value	Maturity date
C0040	C0190	C0200	C0210	C0230	C0240	C0250	C0270	C0280	C0290	C0310	C0320	C0330	C0360	C0370	C0380	C0390
A5/A4																
URI	A7	A8	A33/A31	A9	A10	A33/A32	A11	A13	A15	A16	A17	A18	A20	A23	A23A	A28

The CIC Code will be input for CO290 and translated from SII Engine into the XBRL DPM.

Valuation for CAT collateralised securities (for accounting purposes) (acc. CEIOPS-DOC-31/09)

Statement of financial position (IFRS 7): held-to-maturity investments

IFRS 9 Financial Instruments: Held-to-maturity investments are measured at amortised cost.

Initial recognition under IAS 39: measured at fair value, including transaction cost. IAS 39 permits entities to designate, at the time of acquisition or issuance, any financial asset to be measured at fair value, with value changes recognised in profit or loss. Fair value for initial recognition of ILS is the acquisition cost, less the transaction cost.

3. Impact on SII Standard Formula

Securitisation risk under Solvency II stands for an 'investment in a tradable security or another financial instrument based on repackaged loans' and 'securitisation position' and means an exposure to a securitisation within the meaning of Article 4(1)(61) of Regulation (EU) No 575/2013 of the European Parliament and of the Council.

$SCR_{securitisation}$ denotes the capital requirement for spread risk on securitisation positions.

The spread risk capital charge on securitisations positions is determined by multiplying the market value of the instrument with its modified duration and a risk factor stress i that depends on the credit quality step of the instrument.

The spread risk sub-module differentiates between securitisations positions of Type I and Type II other than resecuritisation exposures. Type I securitisations have to meet quality criteria regarding structural features, asset class eligibility and related collateral characteristics, listing and transparency features and underwriting processes.

The Delegated Acts (COMMISSION DELEGATED REGULATION (EU) 2015/35) are setting the rules on capital requirements for asset classes and promote high-quality securitisation by laying down lower capital requirements for investment by insurers in high-quality securitisation. Chapter VIII of the Delegated Regulation details the requirements for the recognition of the risk mitigation by way of investing in securitisation is for the originator (i.e. reinsurer) to maintain a material net economic interest securitisation of no less than 5 % on an on-going basis.

The Delegated Acts identify two types of securitisation exposures: type 1 and type 2. ILS instruments are type 1 exposures, the position being assigned to credit quality step 3 or better, being SPV (SSPE) arrangements and backed by residential loans (in accordance with art 177 of the Delegated Regulation).

In accordance to art 178 of the Delegated Regulation, the capital requirement for spread risk on type 1 securitisation positions shall be equal to the loss in the basic own funds that would result from an instantaneous relative decrease of stress i in the value of each type 1 securitisation position i. The risk factor stress i shall be equal to the following:

$$\text{stress}_i = \min\left(b_i \cdot \text{dur}_i; 1\right)$$

where:

(a) dur i denotes the modified duration of securitisation position i denominated in years;

(b) b_i shall be assigned depending on the credit quality step of securitisation position i according to the following table:

Credit quality step	**0**	**1**	**2**	**3**
b_i	2,1 %	3 %	3 %	3 %

Assigning the Credit quality step

The credit quality step will be assigned according to the Standardised Approach issued by the Joint Committee of the European Supervisory Authorities at 30 Oct 2014:

Credit assessment	Credit quality step
AAA	2
AA	2
A	3
BBB	4
BB	5
B	6
CCC	6
CC	6
C	6
D	6

Conclusion: most of ILS will be assigned a credit quality step of 2 or 3, triggering a b_i of 3%.

Unqualified securities for type 1 securitisation exposures

Where the cumulative conditions for type 1 securitisation exposures are not met, the instruments issues under the denomination of insurance-linked securities (having the "industry loss warranties" or ILW as a sub-category) will fall into type 2 securitisation exposures.

The capital requirement for spread risk on type 2 securitisation position shall be equal to the loss in the basic own funds that would result from an instantaneous relative decrease of stressi in the value of each type 2 securitisation position i. The risk factor stressi shall be equal to the following:

$$\text{stress}_i = \min(b_i \cdot \text{dur}_i; 1)$$

where:

(a) dur i denotes the modified duration of securitisation position i denominated in years;

(b) b i shall be assigned depending on the credit quality step of securitisation position i according to the following table:

Credit quality step	0	1	2	3	4	5	6
b_i	12,5 %	13,4 %	16,6 %	19,7 %	82 %	100 %	100 %

The capital requirement for spread risk on resecuritisation positions shall be equal to the loss in the basic own funds that would result from an instantaneous relative decrease of stress i in the value of each resecuritisation position i. The risk factor stress i shall be equal to the following

$$\text{stress}_i = \min(b_i \cdot \text{dur}_i; 1)$$

where:

(a) dur_i denotes the modified duration of resecuritisation position i denominated in years;

(b) b_i shall be assigned depending on the credit quality step of resecuritisation position i according to the following table:

Credit quality step	0	1	2	3	4	5	6
b_i	33 %	40 %	51 %	91 %	100 %	100 %	100 %

The modified duration dur_i referred to in paragraphs 1 and 2 shall not be lower than 1 year.

Securitisation positions for which a credit assessment from a nominated ECAI is not available shall be assigned a risk factor stress i of 100 %.

Treatment of ILW as Reinsurance contracts

For dual trigger ILS/ILW, article 189 of the Delegated Regulation applies as follows: all exposures in relation to risk-mitigation contracts including reinsurance arrangements, special purpose vehicles, insurance securitisations and derivatives are Type 1 exposures.

For type 1 exposures, the probability of default on a single name exposure shall be equal to the average of the probabilities of default on each of the exposures to counterparties that belong to the single name exposure, weighted by the loss-given-default in respect of those exposures.

Single name exposure i for which a credit assessment by a nominated ECAI is available shall be assigned a probability of default PD_i in accordance with the following table.

Credit quality step	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Probability of default PD_i	0,002 %	0,01 %	0,05 %	0,24 %	1,20 %	4,2 %	4,2 %

Single name exposures i to an insurance or reinsurance company for which a credit assessment by a nominated ECAI is not available and where this company meets its Minimum Capital Requirement, shall be assigned a probability of default PD_i depending on the company's solvency ratio, in accordance with the following table:

Solvency ratio	**196 %**	**175 %**	**150 %**	**125 %**	**122 %**	**100 %**	**95 %**	**75 %**
Probability of default	0,01 %	0,05 %	0,1 %	0,2 %	0,24 %	0,5 %	1,2 %	4,2 %

Where the solvency ratio falls in between the solvency ratios specified in the table above, the value of the probability of default shall be linearly interpolated from the closest values of probabilities of default corresponding to the closest solvency ratios specified in the table above. Where the solvency ratio is lower than 75 %, the probability of default shall be 4,2 %. Where the solvency ratios is higher than 196 %, the probability of default shall be 0,01 %.

For the purposes of this paragraph, 'solvency ratio' denotes the ratio of the eligible amount of own funds to cover the Solvency Capital Requirement and the Solvency Capital Requirement, using the latest available values.

4. Investor's Risk

From the Investor's perspective, we list below the advantages and disadvantages of investing in ILS according to CEIOPS-DOC-17/09:

Advantages:

- ILS have a low correlation (if any) with capital markets and other investments

- ILS have a comparably high yield in contrast to equally rated corporate bonds even during the financial crisis

- ILS enlarges investors' investment universe and leads to a superior risk - return – allocation, thus, leading to a more efficient capital allocation

- In general, short time-to-maturity of cat bonds

Disadvantages:

- historic correlations of ILS can be misleading (positive correlation of man-made catastrophes with capital markets on September 11th 2001)

- investors assuming high risks (worst case: total losses) due to the possibility of high losses from catastrophic events; partially investors also bear the investment risks and counterparty risks of the investment trusts when these fail under extreme circumstances

- ILS are very complex transactions, partly lack of transparency / knowledge of investors (asymmetric information and adverse selection problems resulting in monitoring and possibly legal costs); standardised products required to strengthen transparency

- Liquidity effects for investors as well as for financial markets are to be considered when the ILS market grows rapidly

- ILS also depend on the expertise of rating agencies to assess the complex and partly non-transparent deals especially regarding monoline insurance of transactions

- ILS has a residual risk for investors if collateral arrangements are not risk-free

The Market

According to Swiss Re report on "The fundamentals of insurance-linked securities", "historically, catastrophe bonds have offered investors excellent performance and compare favourably with corporate bonds of similar credit quality and other benchmarks". Insurance-linked securities offer fixed income investors the dual advantage of attractive returns and a method to improve their overall portfolio risk profile. According to Swiss Re, Cat bonds have offered investors excellent performance and compare favourably with corporate bonds of similar credit quality and other benchmarks: "Cat bonds offer attractive returns over time and since 2002 have yet to incur a 12-month period with a negative return".

SII – specific advantages

Building on recommendations from the European Insurance and Occupational Pensions Authority (EIOPA), the Commission delegated act includes a detailed list of criteria to identify high-quality securitisation. These criteria are mainly related to i) the structural features of transactions, ii) underlying assets' characteristics, iii) transparency features and iv) underwriting processes. Insurance companies investing in these instruments will be required to hold less capital for market risk when they invest in securitisations that feature a high degree of simplicity, transparency and credit quality. This high-quality category would include the most senior tranches of securitisations backed (under a "true sale" mechanism) by residential mortgages, auto loans and leases, SME loans or consumer loans and credit card receivables, but excluding re-securitisations and synthetic securitisations.

Securitisation positions that meet the "high quality" requirements will attract significantly lower capital requirements for insurers, compared to other securitisation positions. Their treatment under the standard formula follows a look-through approach, whereby capital requirements on those positions cannot be higher that capital requirements on the underlying securitised exposures if they were held directly by insurers. Securitised exposures would typically be treated as unrated loans, attracting a 3%-per-year-of-duration stress in the standard formula. Therefore, risk factors applicable to high-quality securitisation positions are capped at 3%.

5. Case study: Phoenix CRetro Reinsurance Company Ltd

SSPE: Phoenix C Retro Reinsurance Company Ltd

F.B. Perry Building, 40 Church Street

Hamilton HM HX

Bermuda

Authorized and regulated by the Bermuda Monetary Authority under the License no. 47416

Criteria for issuing Type 1 securitisation positions (acc. Commission Delegated Regulation (EU) 2015/35):

Criterion	Assessment of Phoenix CRetro Reinsurance
The position has been assigned to credit quality step 3 or better	Letters of credit bear a confirmation from an 'A' rated bank for 100% of ceded liability. Wilmington Trust, National Association rating Aa (Moody's)
The securitisation is listed in a regulated market of a country which is a member of the EEA or the OECD	On 5th of June, 2015 Bermuda was granted by the EC equivalence for the solvency calculation for a period of 10 years
The position is in the most senior tranche or tranches of the securitisation and possess the highest level of seniority at all times during the ongoing life of the transaction	ILS proposed has one single tranche, with no junior tranches
The underlying exposures have been acquired by the securitisation special purpose entity (SSPE) in a manner that is enforceable against any third party and are beyond the reach of the seller (originator, sponsor or original lender) and its creditors including in the event of the seller's insolvency	SACA Agreement guarantees the position of the segregation account beyond the reach of the originator
The transfer of the underlying exposures to the SSPE may not be subject to any severe clawback provisions in the jurisdiction where the seller (originator, sponsor or original lender) is incorporated	The SSPE enters the agreement on behalf of the segregated account; the segregated account is available only to meet liabilities to the account owners and creditors of the segregated account (i.e. City Insurance and its creditors)

The underlying exposures have their administration governed by a servicing agreement which includes servicing continuity provisions to ensure, at a minimum, that a default or insolvency of the servicer does not result in a termination of servicing	The SSPE is managed by R&Q Quest, one of the leading captive service companies in Bermuda. If the SSPE defaults to insolvency, R&Q Quest will continue to manage the company. Mr Nicholas Frost, Director of the SSPE, is President of R&Q Quest.
The securitisation position is backed by a pool of homogeneous underlying exposures	Residential loans secured with a first-ranking mortgage in favour of Wilmington Trust, National Association
The position is not in a resecuritisation or a synthetic securitisation as referred to in Article 242(11) of Regulation (EU) No 575/2013	The position is a securitisation (non-synthetic)
The underlying exposures do not include transferable financial instruments or derivatives, except financial instruments issued by the SSPE itself or other parties within the securitisation structure and derivatives used to hedge currency risk and interest rate risk	No derivatives or transferable instruments outside the scope of SACA (issued by the SSPE)
At the time of issuance of the securitisation or when incorporated in the pool of underlying exposures at any time after issuance, the underlying exposures do not include exposures to credit-impaired obligors	No part of SACA is credit-impaired (as of 1st of January 2016 – to date)
At the time of issuance of the securitisation or when incorporated in the pool of underlying exposures at any time after issuance, the underlying exposures do not include exposures in default within the meaning of Article 178(1) of Regulation (EU) No 575/2013	ILS are linked by CAT events, not default events
The repayment of the securitisation position is not structured to depend predominantly on the sale of assets securing the underlying exposures	The repayment is made out of the segregated account, not depending of the sale of the collateralised assets
At the time of issuance of the securitisation, the borrowers (or, where applicable, the guarantors) have made at least one payment, except where the securitisation is backed by credit facilities	ILS is backed by a credit facility
Issuer, originator or sponsor of the securitisation	TBA

ILWs transactioned by Phoenix C Retro Reinsurance Company Ltd are index only ILWs, this qualifying as securitisation.