Bond Investing In a Low Yield Environment
The Role of Insurance-Linked Strategies

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14 April 2016
Agenda

- Current Environment
- Fixed Income Road Map
- Overview Insurance-Linked Securities
- Managers
Section 1: Current Environment
### Current Environment - Lower expected returns (10 years)

**Example: Average Swiss Pension Plan Allocation**

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Strategic Allocation</th>
<th>Expected Return</th>
<th>Expected Volatility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>7%</td>
<td>-0.2%</td>
<td>0%</td>
</tr>
<tr>
<td>Core Bonds</td>
<td>37%</td>
<td>0.8%</td>
<td>5%</td>
</tr>
<tr>
<td>Equities</td>
<td>30%</td>
<td>5.6%</td>
<td>20%</td>
</tr>
<tr>
<td>Real Estate (Swiss)</td>
<td>21%</td>
<td>2.7%</td>
<td>5%</td>
</tr>
<tr>
<td>Alternatives</td>
<td>5%</td>
<td>4.0%</td>
<td>9%</td>
</tr>
<tr>
<td>Portfolio Pension</td>
<td>100%</td>
<td>2.7%</td>
<td></td>
</tr>
</tbody>
</table>

- 30bps TER

2.4%
Current Environment - How to combat lower expected returns?

- Diversify
- Increase risk
- Reduce manager fees
- Active Mgmt
- Illiquid assets
- Liability side - lower benefits
- Opportunistic ideas
- Do Nothing?
- TAA
- Passive
- Alpha
Section 2: Fixed Income Road Map
Fixed Income Investor's Objectives

- Protect capital + funding ratio
- Manage risk (duration/volatility)
- Improve diversification

Increase coupons
Generate capital gains
Match liabilities

Source: Partners Group
Fixed Income Road Map

1) Protect core allocation
   - Quality
   - Smart beta
   - Short duration
   - Duration hedging

2) Credit diversification
   - High grade corporate
   - Emerging market debt
   - High yield
   - Senior loans
   - Private debt
   - Infrastructure debt
   - Speciality finance

3) Alternative trading styles
   - Multi asset credit
   - Absolute return bonds

4) Alternative risk premia
   - Asset-backed
   - Inflation-linked
   - Insurance-linked

5) Alternative yield-enhancing asset classes
   - Infrastructure equity
   - Real estate
   - Convertibles
   - High dividend equities

Diversification vs. Deviation from core fixed income
Credit Diversification - Main Return Drivers

- Term
- Credit
- Inflation
- Illiquidity
- Alpha
Credit Diversification - Expected Returns (10 years)

Expected return (CHF hedged)
- AAA: 0.5%
- BBB: 2.3%
- High Yield Bonds: 4.8%
- Senior Secured Loans: 4.5%
- Private Debt: 5.0%
- Emerging Market Debt Sovereign: 5.1%
- Emerging Market Debt Corporate: 5.5%

Duration (modified, in years)
- AAA: 0.2
- BBB: 0.0
- High Yield Bonds: 4.4
- Senior Secured Loans: 0.2
- Private Debt: 0.0
- Emerging Market Debt Sovereign: 6.0
- Emerging Market Debt Corporate: 5.1

Diversify geographically

Liquid
- AAA: 7.0
- BBB: 6.3
- High Yield Bonds: 4.8
- Senior Secured Loans: 4.4
- Private Debt: 2.3
- Emerging Market Debt Sovereign: 7.4
- Emerging Market Debt Corporate: 6.0

Illiquid
Credit Diversification - Conclusion

- Despite low expected returns and significant duration risk, core bonds (high grade sovereign + corporate) remain an unavoidable building block of long term portfolio construction given their unique liability matching and decorrelation properties.

- However, a diversification towards other fixed income asset classes which can partially act as substitutes makes sense in order to increase the bond portfolio’s expected return.

- The increase in total portfolio risk (volatility, default probability) has to take into account the investor’s risk tolerance and budget.
Fixed Income Investing Road Map

1) Protect core allocation
   - Quality
   - Smart beta
   - Short duration
   - Duration hedging

2) Credit diversification
   - High grade corporate
   - Emerging market debt
   - High yield
   - Senior loans
   - Private debt
   - Infrastructure debt
   - Speciality finance
   - Multi asset credit
   - Absolute return bonds

3) Alternative trading styles
   - Asset-backed
   - Inflation-linked
   - Insurance-linked

4) Alternative risk premia
   - Infrastructure equity
   - Real estate
   - Convertibles
   - High dividend equities

5) Alternative yield-enhancing asset classes

Diversification

traditional

Deviation from core fixed income

alternative
Alternative Asset Classes

- Investors increasingly substitute core bonds with alternative bond instruments and other cash-flowing asset classes (infrastructure, real estate, convertibles, high-dividend equities)
- Insurance-linked securities is an attractive alternative to complement core bonds
Section 3: Overview Insurance-Linked Securities
Overview Insurance-Linked Securities - Definition

What are Insurance Linked Securities (“ILS”)?

- Array of financial instruments…
- …linked to property losses caused by natural and man made catastrophes…
- …whose values are driven by insurance loss events
Overview Insurance-Linked Securities - Type of Catastrophes

Catastrophe bond and ILS risk capital outstanding by risk or peril

- Turkey earthquake: 2.0%
- Extreme mortality: 4.0%
- International multi-peril: 19.0%
- U.S. hurricane: 23.0%
- Healthcare: 2.0%
- U.S. multi-peril: 27.0%
- U.S. earthquake: 7.0%
- European windstorm: 8.0%
- Japan earthquake: 5.0%
- Other: 3.0%
- Other: 3.0%
Overview Insurance-Linked Securities - Market Place

**Consumers**
Underlying insurance policies purchased to protect from unforeseen events.

**Insurance**
Achieve diversification by pooling risk from thousands of underlying consumers.

**Reinsurance**
Diversify across perils by writing treaties covering individual insurers loss.

**Retrocession**
Accept risks from regional reinsurers across the world therefore achieving maximum diversification.

- **Florida Insurer**
  - State Farm
  - Liberty Mutual

- **California Insurer**
  - USAA
  - Nationwide

- **UK Insurer**
  - Aviva
  - RSA

- **Japan Insurer**
  - Zenkyoren
  - Tokio Marine

- **Reinsurer 1**
- **Reinsurer 2**
- **Global Retrocessionaire**
Overview Insurance-Linked Securities - Characteristics

- Access to “pure” insurance risk
- Performance linked to reinsurance premiums + floating interest rate
- Yield contributor in a low yield environment
- No duration risk (floating rate bonds)
- Low volatility but existing “fat tail” risk
- Contributes to lowering portfolio risk given low volatility + low correlation
## Overview Insurance-Linked Securities - Instruments

<table>
<thead>
<tr>
<th></th>
<th>Catastrophe Bonds (&quot;Cat Bonds&quot;)</th>
<th>Sidecars</th>
<th>Industry Loss Warranty (&quot;ILW&quot;)</th>
<th>Collateralized Reinsurance and Retrocession (&quot;Collateralized Re&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key Attribute</strong></td>
<td>Bonds issued by insurers to cover defined risks on an excess of loss basis; investors provide risk transfer above an agreed trigger level</td>
<td>Typically set up by insurers to quota share their existing business or to write new business; ability for investors to access reinsurer’s underwriting expertise</td>
<td>Reinsurance or derivative contract that covers industry-wide losses exceeding pre-agreed threshold</td>
<td>Coverage identical to traditional reinsurance and retrocession through collateralized limits</td>
</tr>
<tr>
<td><strong>Utilization</strong></td>
<td>Enables insurers to access funds if a severe disaster produces large-scale damage</td>
<td>Typically used as an asset management platform or after major catastrophes</td>
<td>Utilized by reinsurers who are comfortable with index-based protection for extreme industry events</td>
<td>Used primarily for lower layers of coverage and for treaties without reinstatable limits</td>
</tr>
<tr>
<td><strong>Term</strong></td>
<td>Typically multi-year (average 3 - 4 years)</td>
<td>Typically 1 - 2 years; some vehicles are permanent</td>
<td></td>
<td>Typically 1 year</td>
</tr>
<tr>
<td><strong>Return</strong></td>
<td>3% - 10%</td>
<td>8% - 20%</td>
<td>3% - 15%</td>
<td>8% - 25%+</td>
</tr>
<tr>
<td><strong>Liquidity</strong></td>
<td>Active secondary market</td>
<td>Limited</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>Collateral</strong></td>
<td>Risk-free</td>
<td>Risk-free</td>
<td>Risk-free or letters of credit Uncollateralized</td>
<td>Risk-free or letters of credit</td>
</tr>
<tr>
<td><strong>Market Size</strong></td>
<td>CHF 24 billion</td>
<td>CHF 9 billion</td>
<td>CHF 4 billion</td>
<td>CHF 33 billion</td>
</tr>
</tbody>
</table>

Source: Aon Securities Inc. Market size estimates as of 1H 2015
Overview Insurance-Linked Securities - Reinsurance Tower

Illustrative Reinsurance Tower

<table>
<thead>
<tr>
<th>Products</th>
<th>Typical Risks Covered</th>
</tr>
</thead>
</table>
| Cat Bonds | ▪ Property  
            ▪ Specialty (aviation, marine, etc.)  
            ▪ Life/health  
            ▪ Lottery winnings |
| Sidecars  | ▪ Property |
| Collateralized Reinsurance | ▪ Specialty (aviation, marine, etc.) |
| ILW      | ▪ Property |

Typical Risks Covered:
- Cat Bonds: Property, Specialty (aviation, marine, etc.), Life/health, Lottery winnings
- Sidecars: Property
- Collateralized Reinsurance: Specialty (aviation, marine, etc.)
- ILW: Property
Excess of Loss

- Excess of loss contracts provide protection against a single event occurrence that results into losses above a predetermined threshold
  - Coverage may be tailored to frequency (i.e., a second or third event protection)
  - Aggregate excess of loss coverage protects against an aggregation of losses over time - usually a year

Proportional

- Proportional or “Quota Share” transactions pay the pro rata share of losses in return for a proportion of the ceded premiums
  - May impose restrictions on indemnity such as an “occurrence limit” and/or “aggregate limit”
The Sponsor buys protection on a natural catastrophe from a Special Purpose Vehicle (‘SPV’)
The SPV collateralises the cover by issuing notes or shares to investors in the market
Proceeds from the notes or shares are invested in high quality securities and held in a collateral trust
Section 4: Asset Class Metrics
### Asset Class Metrics - Historical Performance (14 years)

<table>
<thead>
<tr>
<th>Event</th>
<th>Period</th>
<th>Aon ILS Index</th>
<th>Global Equities</th>
<th>Global Bonds</th>
<th>Hedge Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Crisis</td>
<td>Jul 2008 - Feb 2009</td>
<td>-3.00%</td>
<td>-51%</td>
<td>13%</td>
<td>-19%</td>
</tr>
<tr>
<td>DotCom</td>
<td>Apr 2000 - Mar 2003</td>
<td>19.6%</td>
<td>-48%</td>
<td>25%</td>
<td>2%</td>
</tr>
<tr>
<td>9/11</td>
<td>Sept 2001 - Dec 2002</td>
<td>11.4%</td>
<td>-26%</td>
<td>9%</td>
<td>1%</td>
</tr>
</tbody>
</table>

- **Aon Benfield ILS Index**
- **3-5 Year BB US High Yield Index**
- **S & P 500 Total Return Index**
- **HFRX Global Hedge Fund Index**

![Graph showing historical performance of asset classes during specific events](image-url)
Asset Class Metrics - Performance vs. Risk (12 years)

Risk Return Scatter Graph (2003-2015)
## Asset Class Metrics - Correlation (12 years)

Correlations from 1/2/2002 to 31/12/2014

<table>
<thead>
<tr>
<th></th>
<th>Swiss Re Cat Bond Total Return Index</th>
<th>Barclays Aggregate Index</th>
<th>Dow Jones US Total Stock Market Index</th>
<th>Citigroup 3 Month T-Bill</th>
<th>Barclays Long Government/Credit Index</th>
<th>Barclays Corporate High Yield Index</th>
<th>MSCI AC World Ex-US Index (net)</th>
<th>HFRI Fund Weighted Composite Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swiss Re Cat Bond Total Return Index</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barclays Aggregate Index</td>
<td>0.18</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dow Jones US Total Stock Market Index</td>
<td>0.20</td>
<td>-0.07</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citigroup 3 Month T-Bill</td>
<td>0.07</td>
<td>0.00</td>
<td>-0.07</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barclays Long Government/Credit Index</td>
<td>0.15</td>
<td>0.93</td>
<td>-0.07</td>
<td>-0.07</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barclays Corporate High Yield Index</td>
<td>0.26</td>
<td>0.19</td>
<td>0.71</td>
<td>-0.12</td>
<td>0.16</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSCI AC World Ex-US Index (net)</td>
<td>0.21</td>
<td>0.05</td>
<td>0.89</td>
<td>0.03</td>
<td>0.03</td>
<td>0.73</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>HFRI Fund Weighted Composite Index</td>
<td>0.25</td>
<td>-0.02</td>
<td>0.82</td>
<td>0.04</td>
<td>-0.04</td>
<td>0.73</td>
<td>0.91</td>
<td>1.00</td>
</tr>
</tbody>
</table>
## Asset Class Metrics - Specific Risks

<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Loss</td>
<td>An event is triggered and a full or partial loss of capital is suffered by the investor</td>
</tr>
<tr>
<td>Model Risk</td>
<td>Risk modelling reliant on software and manager’s expertise</td>
</tr>
<tr>
<td>Cash Entrapment</td>
<td>An event is triggered and cash is withheld while the loss amount is established</td>
</tr>
</tbody>
</table>
## Asset Class Metrics - Expected Loss vs. Return Target

<table>
<thead>
<tr>
<th>Return target range (indicative):</th>
<th>Expected Loss</th>
<th>VAR (99%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Libor + 4%</td>
<td>1.5%</td>
<td>10%</td>
</tr>
<tr>
<td>Libor + 6 to +8%</td>
<td>2.0%</td>
<td>20%</td>
</tr>
<tr>
<td>Libor + 10% to +12%</td>
<td>3.5%</td>
<td>40%</td>
</tr>
</tbody>
</table>
Section 4: Managers
## Managers - Type of ILS Managers

<table>
<thead>
<tr>
<th>DNA</th>
<th>Access to deal flow</th>
<th>Portfolio construction</th>
<th>Risk management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bond Managers</strong></td>
<td>Limited. Focus on Cat bonds or securities which resemble traditional debt securities. Deal flow is constrained by the universe of securitized investments.</td>
<td>Focus on portfolio diversification. Cat risk is not offered as a segregated strategy (i.e. part of the wider bond portfolio).</td>
<td>Limited. Resources dedicated to cat risk are limited.</td>
</tr>
<tr>
<td><strong>Hedge Funds</strong></td>
<td>Limited. HF's have been a strong source of capital however resource limitations constrain the level of complexity of deals which can be efficiently evaluated.</td>
<td>Focus on return enhancement, minimal attention paid to diversification – Cat risk is not typically offered as a segregated strategy (i.e. part of the wider HF structure).</td>
<td>Limited. Access to tools and the risk management processes available to insurance and reinsurance companies is limited. Resources dedicated to cat risks are limited.</td>
</tr>
<tr>
<td><strong>Independent Specialist</strong></td>
<td>Actively managed cat risk portfolios. Focus on producing strong risk adjusted returns.</td>
<td>Focus on risk adjusted returns, with adequate portfolio diversification. Specialized portfolio construction tools are used to assess pricing and overall portfolio fit.</td>
<td>Adequate. Investment teams tend to be small, resources dedicated to risk management are sufficient but often limited. Most firms have risk management tools however, systems lack that of the larger reinsurance firms.</td>
</tr>
<tr>
<td><strong>Investment Banks / Insurer Backed</strong></td>
<td>Deal focused. Actively managed cat risk portfolio. Focus often depends on deal availability and client demands/requirements.</td>
<td>Focus on high quality deals. Wider portfolio construction considerations are often secondary. Specialized securities evaluation tools are used to assess pricing.</td>
<td>Strong. Risk management processes tend to be better integrated within the wider firm controls/structure. Resources tend to be extensive and systems re those of the reinsurance industry.</td>
</tr>
</tbody>
</table>
Managers - Landscape

More ILS managers have entered the industry since 1998
## Managers - Independent vs. Insurer-backed

### Independent Specialist ILS Managers\(^1\)

<table>
<thead>
<tr>
<th>Manager</th>
<th>Country</th>
<th>CHF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Manager 1</td>
<td>Bermuda</td>
<td>9,500M</td>
</tr>
<tr>
<td>2 Manager 2</td>
<td>Switzerland</td>
<td>6,500M</td>
</tr>
<tr>
<td>3 Manager 3</td>
<td>US</td>
<td>5,000M</td>
</tr>
<tr>
<td>4 Manager 4</td>
<td>Switzerland</td>
<td>5,200M</td>
</tr>
<tr>
<td>5 Manager 5</td>
<td>UK</td>
<td>3,283M</td>
</tr>
<tr>
<td>6 Manager 6</td>
<td>US</td>
<td>3,290M</td>
</tr>
<tr>
<td>7 Manager 7</td>
<td>US</td>
<td>2,250M</td>
</tr>
<tr>
<td>8 Manager 8</td>
<td>Switzerland</td>
<td>1,700M</td>
</tr>
<tr>
<td>9 Manager 9</td>
<td>Switzerland</td>
<td>984M</td>
</tr>
<tr>
<td>10 Manager 10</td>
<td>UK</td>
<td>550M</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>CHF 38,257M</strong></td>
</tr>
</tbody>
</table>

Sources risks through open (re)insurance markets

### Insurer-backed ILS Managers\(^1,2\)

<table>
<thead>
<tr>
<th>Manager</th>
<th>Country</th>
<th>CHF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Manager 11</td>
<td>Bermuda</td>
<td>2,800M</td>
</tr>
<tr>
<td>2 Manager 12</td>
<td>Bermuda</td>
<td>2,300M</td>
</tr>
<tr>
<td>3 Manager 13</td>
<td>UK</td>
<td>1,970M</td>
</tr>
<tr>
<td>4 Manager 14</td>
<td>Bermuda</td>
<td>1,765M</td>
</tr>
<tr>
<td>5 Manager 15</td>
<td>Bermuda</td>
<td>810M</td>
</tr>
<tr>
<td>6 Manager 16</td>
<td>Bermuda</td>
<td>540M</td>
</tr>
<tr>
<td>7 Manager 17</td>
<td>France</td>
<td>500M</td>
</tr>
<tr>
<td>8 Manager 18</td>
<td>Bermuda</td>
<td>350M</td>
</tr>
<tr>
<td>9 Manager 19</td>
<td>Bermuda</td>
<td>300M</td>
</tr>
<tr>
<td>10 Manager 20</td>
<td>Bermuda</td>
<td>296M</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>CHF 11,631M</strong></td>
</tr>
</tbody>
</table>

Sources risks through reinsurance partner and open reinsurance market

### Manager Participation Estimates by Alternative Capital Product

- **Catastrophe Bonds / Sidecars AuM**: 48%
- **Collateralized Reinsurance and Retrocession AuM**: 52%

\(^1\) AuM estimates as of 2015

\(^2\) Excludes passive sidecars (Davinci & Top Layer for RenRe, AlphaCat Re 2014-1 & 2015-1 for Validus Re and Blue Capital Re for Blue Capital Management)
Managers - Return Dispersion

Source: Aon Hewitt Research
## Managers - Due Diligence

<table>
<thead>
<tr>
<th>Factor</th>
<th>Key Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea Sourcing</td>
<td>Access to deal flow and good reinsurance relationships</td>
</tr>
<tr>
<td>Investment Process</td>
<td>Ability to understand complex deals</td>
</tr>
<tr>
<td></td>
<td>Access to specialist skills (actuaries, meteorologists, etc...)</td>
</tr>
<tr>
<td></td>
<td>Modelling capabilities and software</td>
</tr>
<tr>
<td>Governance</td>
<td>Interest alignment between insurer and manager</td>
</tr>
<tr>
<td>Terms &amp; Conditions</td>
<td>Acceptable liquidity terms</td>
</tr>
<tr>
<td></td>
<td>Match between contractual and underlying investment liquidity</td>
</tr>
</tbody>
</table>
Managers - Fees and Structure

- Fees: 0.75%-2% Management Fees often with a Performance Fee
- Benchmark: LIBOR
- Liquidity: Monthly (Cat Bonds) / Quarterly (Blend)
- Redemption Notice: 30 – 180 days
- Lock up / Gate: Some early redemption fees and possible gating at 25% of fund AuM
- Domicile: Tend to be offshore – Lux/ Guernsey/Cayman some Cat Bonds funds are onshore and Ucits
- Structure: QIF/SICAV
Dominique Grandchamp, CFA, Head Investment Consulting Switzerland

Dominique Grandchamp heads the Investment Consulting arm for Aon in Switzerland where he advises an institutional client base consisting of large pension plans, banks, family offices and insurance groups in the field of asset liability management, asset allocation, portfolio management, manager selection and investment controlling. Prior to joining Aon Dominique worked 4 years as senior investment consultant for Mercer. Prior to that Dominique held positions such as Chief Investment Officer, portfolio manager and research analyst for institutional asset managers and funds of funds such as Harcourt in Zurich. Dominique started his career working in management consulting for PriceWaterhouseCoopers. He obtained a Master of Arts in Economics from the University of Basel, Switzerland. Dominique holds the Chartered Financial Analyst (CFA) designation and speaks four languages fluently (English, French, German, Spanish).
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