Session 2a – Strategic Asset Allocation for Insurance Companies

Chris Howells, FIA
Strategic asset allocation for insurance companies

CHRIS HOWELLS
Head of Insurance Solutions, Asia Pacific
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Agenda

- Investment challenges
- Investment options
- Case study
Investment challenges faced by insurers

What’s keeping them awake at night?

- Expected long term future return on investments insufficient to meet guarantees
- Risk appetite increasing
  - Is risk understood
  - Is it adequately rewarded
- Changing regulatory landscape impacting investment portfolio design
  - Return vs capital charges
- Product design response
  - Policyholder and insurer may not be aligned
  - Pressure on profits from lower charges
- Lack of long duration ALM assets
- Dynamic link between assets and liabilities
  - Is the interaction understood
  - Hypothecation of asset pools to stated investment objectives

Source: Schroders, Iboxx, JP Morgan as at July 2016

Changing regulatory landscape

C-ROSS - a (very) brief summary

Summary

- Investments generate capital charges relative to the liabilities
- C-ROSS encourages closer scrutiny of ALM and Surplus management
- Look to diversify the sources of risk and return
- Risk and capital budgeting techniques should be brought to bear on portfolio construction
- There will be an increasing focus on investment risk, governance and data

Conclusions

- Regulation evolves, so should your risk management
- Pay attention to Pillar III – catching many off-guard in Europe
Isn’t SAA difficult? Can’t TAA solve all our problems?
“If something’s hard to do it’s not worth doing” – Homer*

<table>
<thead>
<tr>
<th>Impact of inattentive SAA</th>
<th>Benefits of optimised SAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure to market movements</td>
<td>Protected against adverse markets</td>
</tr>
<tr>
<td>Underperform peers</td>
<td>Improves chance of outperformance</td>
</tr>
<tr>
<td>Pressure on solvency</td>
<td>Solvency may be enhanced</td>
</tr>
<tr>
<td>Restrictions on new business</td>
<td>Financing available when needed</td>
</tr>
<tr>
<td>Regulatory intervention</td>
<td>Solvency position managed</td>
</tr>
<tr>
<td>Reduced dividends and bonuses</td>
<td>Profitability may be enhanced</td>
</tr>
<tr>
<td>Investment freedom constrained</td>
<td>Surplus aware asset allocation</td>
</tr>
<tr>
<td>Unable to meet claims</td>
<td>Liability aware asset allocation</td>
</tr>
<tr>
<td>Forced to liquidate assets</td>
<td>Whole balance sheet is managed</td>
</tr>
</tbody>
</table>

*Homer Simpson

Appropriate SAA is a critical element of portfolio design

The recipe for successful SAA
What you will need…some basic equipment and ingredients

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Ingredients</th>
<th>Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projection systems</td>
<td>Cashflow projections</td>
<td>ESG systems</td>
</tr>
<tr>
<td>Portfolio optimiser</td>
<td>Risk and return forecasts</td>
<td>Scenario analyses</td>
</tr>
<tr>
<td>Reporting tools</td>
<td>Risk appetite &amp; return target</td>
<td>RBC calculator</td>
</tr>
</tbody>
</table>

Let’s cook!
## Agenda
- Investment challenges
- Investment options
- Case study

## Potential investment responses
Key themes are financial optimisation, risk management and capital

<table>
<thead>
<tr>
<th>Investment option</th>
<th>Application</th>
<th>Watch out for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extend the ALM toolkit</td>
<td>Property, Infrastructure, High Yield, Risk Managed Investments</td>
<td>Risk and return characteristics may not be understood</td>
</tr>
<tr>
<td>Look beyond domestic market</td>
<td>Global bonds, Global equity</td>
<td>Regulation may restrict choice, Operational complexity, FX hedging may be required</td>
</tr>
<tr>
<td>Diversify assets</td>
<td>Across asset classes, Within asset classes</td>
<td>Correlation increases during times of stress, Need to understand assets</td>
</tr>
<tr>
<td>Hedge market risk</td>
<td>Interest rates, Volatility, Drawdown, Currency</td>
<td>Regulation may restrict choice of instruments (e.g. derivatives), Operational complexity, Accounting complexity, Collateral management</td>
</tr>
</tbody>
</table>

Source: Schroders
Enhancing portfolio yield
Taking advantage of a global fixed income opportunity set

Global Investment Grade Corporate Bonds

<table>
<thead>
<tr>
<th></th>
<th>EUR</th>
<th>CHF</th>
<th>USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield (%)</td>
<td>1.52</td>
<td>0.20</td>
<td>4.31</td>
</tr>
<tr>
<td>US Index yield hedged to local currency (%)</td>
<td>2.50</td>
<td>1.10</td>
<td>4.31</td>
</tr>
<tr>
<td>Yield pick-up (%)</td>
<td>0.98</td>
<td>0.90</td>
<td></td>
</tr>
</tbody>
</table>

Note: Hedging costs are indicative and do not account for the cost of collateral; yields are shown based on local currencies and are not hedged to USD. The views and opinions are those of the Global Credit team and are subject to change. Source: Schroders estimates, Bloomberg, Indices are BERIC10, BUSC10 & BOHS10

Enhancing liquidity and credit diversification
Taking advantage of a global fixed income opportunity set

<table>
<thead>
<tr>
<th>iBoxx European Corporate 10+ Yr Index</th>
<th>iBoxx US Corporate 10+ Yr Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of issuers</td>
<td>Number of issuers</td>
</tr>
<tr>
<td>113</td>
<td>374</td>
</tr>
<tr>
<td>Market value</td>
<td>Market value</td>
</tr>
<tr>
<td>€168 bn</td>
<td>$1.15 tr</td>
</tr>
</tbody>
</table>

Issuer count across sectors

Source: iBoxx 10+ European Investment grade corporate Index, iBoxx 10+ US Investment grade corporate Index
Date: 08/06/2016
Extending the asset classes

Long-dated US corporate bonds

- After hedging to EUR, investors can improve yield by up to 150 basis points
- The US long-dated bond market is roughly six times larger than that of Europe
- There are three times as many credit issuers in the long-dated US market
- Good liquidity and diversity means there is a greater opportunity to add alpha

Source: Schroders

Infrastructure debt

- Stable long term cashflows suitable for liability matching
- Superior credit fundamentals to corporate bonds
- Superior risk / return characteristics c.f. corporate bonds
- Captures substantial illiquidity premium c.f. equivalently rated corporate bond
- Lower default rates (and higher recovery rates) than comparably rated corporate bonds
- Potentially favourable capital treatment

Source: Schroders
Extending the asset classes

Global high yield

- High yield bonds can provide equity-like returns with less volatility
- Interest rate sensitivity is modest for lower-rated credit
- High yield provides a good diversification benefit versus other asset classes in a portfolio context
- If government bond yields are rising, high yield can provide positive returns and outperform most other fixed income asset classes

Note: Correlations are calculated using monthly returns since 1984 for all asset classes except Emerging Markets Debt, for which data is only available since 1994. Except for S&P500 data, all figures reflect the respective Barclays bond indices. “IG Credit” denotes investment grade corporates – the Barclays US Credit Bond Index. Source: Barclays US High Yield Corporate Update, 4 January 2016; data through 31 December 2015.

Risk managed investments

- Deliver equity-like returns with lower risk
- Volatility indicators used to implement a systematic risk cap
- A variable control mechanism can react to increasing or decreasing volatility
- Potentially favourable capital treatment due to systematic nature of risk management

Extending the asset classes

Property
- Extremely stable 5% income
- Investors are likely to be rewarded with a high illiquidity risk premium
- Real estate can provide protection against inflation risk
- It is a suitable investment for both long term ALM purposes and surplus assets


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Case Study: Life & Health Insurer

Link the SAA objectives to the risk capacity and ALM needs

Cash
- A high quality money-market strategy
- Same day liquidity
- A buffer for liability backing and surplus assets

Fixed Income Core
- A strategy developed specifically to meet insurer’s liability duration
- Focus on generating a positive return, but with capital preservation a priority
- To secure the liabilities with a high degree of confidence

Multi Asset growth
- A diversified, dynamically managed strategy
- Captures the higher returns available from a broad universe of growth assets
- Risk-controlled framework
- Specific downside protection can be overlaid
- Generates capital growth

Combined investments target return, volatility and VaR capital charge

Setting the SAA parameters

Align portfolio with risk bearing capacity, ALM and return objectives

Determine risk capacity
- 1 Liability cashflow projection sets ALM targets
- 2 Capital adequacy ratio target imposes risk tolerance (top down)
- 3 Risk tolerance sets portfolio optimisation constraint
- 4 Pricing / guarantee hurdle rates set portfolio optimisation target
- 5 Strategic asset allocation combines requirements 1 – 4 above
Solution development
Finding the most efficient portfolio, focusing on the objectives and constraints

- Separate objectives for ALM and Surplus portfolios
- Annual loss tolerance of 6% of total assets at 95% confidence: risk budget 1-year VaR_95% 6%
- Max volatility of 7% p.a. in the Surplus portfolio
- Target 4% annual expected return
- High level of liquidity through the market cycle

- Capital charges applied to assets
- Apply economically consistent medium-term risk, return and correlation expectations
- Find the range of possible portfolios consistent with the objectives

Efficient frontier

Enhancing SAA in your portfolio
Illustrative portfolio components

<table>
<thead>
<tr>
<th>Buy and maintain</th>
<th>Multi-Asset</th>
<th>Risk Managed Equities</th>
<th>Infrastructure Debt</th>
<th>Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate and government bonds held to maturity</td>
<td>Global process Risk premia approach to investing</td>
<td>Equity exposure, with systematic process targeting lower volatility and reduced downside risk</td>
<td>Low default rates and high recovery rates</td>
<td>Commercial real estate Managed portfolio of properties, diversified by region, sector.</td>
</tr>
<tr>
<td>Corporates with credit fundamentals Optimised from yield / capital perspective</td>
<td>Identifies opportunities across asset classes Equity like returns with lower volatility</td>
<td>Potentially lower capital charge than equities</td>
<td>Longer duration higher spread and lower credit risk than comparable corporate debt</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Return</th>
<th>3-4%</th>
<th>4 - 5%</th>
<th>4 - 5%</th>
<th>5 - 6%</th>
<th>5 - 7%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALM assets</td>
<td>ALM assets / Surplus (growth) assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Schroders. Schroders' solution is a modelled expectation, relying on a number of underlying assumptions, it is not guaranteed.

Source: Schroders at 06 June 2016. For illustration only.
Applying risk - return analysis to portfolio construction
Trade-off between return seeking and risk reducing goals

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Portfolio Exposure</th>
<th>Capital Weight</th>
<th>Risk Contribution</th>
<th>% Total Capital</th>
<th>% Total Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>10.00%</td>
<td>10.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Overlay</td>
<td>31.21%</td>
<td>9.95%</td>
<td>-1.28%</td>
<td>-23.24%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Growth</td>
<td>80.05%</td>
<td>80.05%</td>
<td>6.81%</td>
<td>123.24%</td>
<td>5.64%</td>
</tr>
<tr>
<td>Total</td>
<td>121.26%</td>
<td>100.00%</td>
<td>5.52%</td>
<td>100.00%</td>
<td>5.64%</td>
</tr>
</tbody>
</table>

Combined portfolio results

<table>
<thead>
<tr>
<th>Factor Name</th>
<th>Exposure</th>
<th>Risk Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity Premium</td>
<td>0.34</td>
<td>76.18%</td>
</tr>
<tr>
<td>Credit Premium</td>
<td>0.50</td>
<td>32.12%</td>
</tr>
<tr>
<td>Equity Size Premium</td>
<td>0.02</td>
<td>0.91%</td>
</tr>
<tr>
<td>Equity Style Premium</td>
<td>-0.09</td>
<td>0.49%</td>
</tr>
<tr>
<td>Emerging Market Premium</td>
<td>0.02</td>
<td>0.77%</td>
</tr>
<tr>
<td>Carry Premium</td>
<td>0.03</td>
<td>2.72%</td>
</tr>
</tbody>
</table>

Source: Schroders. For illustration purposes only.

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Schroder Investment Management (Hong Kong) Limited
Level 33, Two Pacific Place, 88 Queensway, Hong Kong
Telephone +852 2521 1633 Fax +852 2524 7225