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WHITEPAPER

Insurance Investment Strategy

Applying the Prudent Person Principle to
Multi-Strategy Fixed Income

For today's investor

AVIVA INVESTORS

Contents

Solvency II and the Prudent Person Principle

- Solvency II is the prudential regulation of European insurance companies that came into force on 1 January 2016, with the objective of providing an enhanced and more consistent level of protection for policyholders across Europe.
- The Prudent Person Principle governs insurers' investment activity under Solvency II and stipulates that "insurance and reinsurance undertakings shall only invest in assets and instruments whose risks the undertaking concerned can properly identify, measure, monitor, manage, control and report, and appropriately take into account in the assessment of its overall solvency needs."*
- In addition, the use of derivatives is limited to specific applications. "The use of derivative instruments shall be possible insofar as they contribute to a reduction of risks or facilitate efficient portfolio management."**

Source: Solvency II Directive (Directive 2009/138/EC):
* Article 132(2); ** Article 132(4)

Multi-strategy fixed income

Capital preservation, predictable returns and diversification benefits have kept fixed income front of mind for insurers. This is unsurprising given the heavy regulatory demands and requirement to match liabilities they face. However, exceptional monetary policy measures have fundamentally changed the rules of the game – risk on traditional fixed income is rising.

Low starting yields on fixed income assets mean there is a limited cushion when prices fall. Furthermore, duration, which measures a bond's sensitivity to changes in interest rates, has been drifting higher as companies and governments have sought to lock in low interest rates and issue longer-dated debt.

In this environment, multi-strategy fixed income products – designed to draw on a wider range of sources of risk and return, resulting in a return profile that is less dependent on the overall trajectory of bond markets – are getting greater attention. These strategies could be valuable additions to insurers' toolkits, helping to increase diversification within portfolios.

The investment strategies of European insurers are governed by the Prudent Person Principle (PPP), which requires insurers to have a thorough understanding of the risks arising from their investments. While the rules governing investment strategy and risk assessment vary in other jurisdictions, they tend to share this common purpose.

In this paper, we explore how an insurer might apply the PPP to an allocation in an absolute return fixed income strategy, including:

A. Risk identification – Transparency of risk exposures

B. Risk management – Integrating risk into portfolio construction

C. Assessing solvency – Calculating Solvency Capital Requirements

In the process, we hope to throw some light on the key considerations for insurers considering an investment in multi-strategy fixed income.

Absolute Return Multi-Strategy Fixed Income

- Whereas managers of traditional fixed income products are encouraged to beat a specific benchmark, absolute return managers aim to deliver positive returns above cash whatever the market conditions.
- To do this, they access a variety of sources of return. These include long positions in government, corporate and emerging market debt, which enable the manager to take on duration and credit risk. Managers also have the flexibility to avoid traditional sources of fixed income risk when prospective returns look unattractive.

  For instance, absolute return funds can implement strategies that are designed to profit from changes in the level of market volatility, inflation expectations, the shape of the yield curve and changing dynamics in foreign exchange markets. Crucially, they can also profit from falling prices, by taking short positions.
- The ability to invest in directional and non-directional strategies means absolute return funds can generate positive returns in a wide range of environments. Funds normally target a return in the range of two to four per cent above cash, while attempting to limit the risk of drawdowns.

A. Risk identification - Transparency of risk exposures

Transparency is key. This is particularly relevant for allocations to more sophisticated investment strategies where an investment manager has discretion to generate returns from a broad universe. In fixed income, currency, curve, duration, inflation, volatility and spread risk all need to be considered.

Aviva Investors Multi-Strategy Fixed Income (AIMS FI) combines strategies designed to give protection in times of stress, exploit market mispricing and themes expected to perform in rising markets.

In practical terms, this means fine-tuning positioning around twenty-five to thirty different strategies. They include liquid, scalable opportunities to generate Market Returns, Opportunistic Returns or act as Risk-Reducing dampeners.

We aim to be wholly transparent about the strategies, the risks that they contribute to the portfolio (both individually and in aggregate) and the instruments used to implement those strategies.

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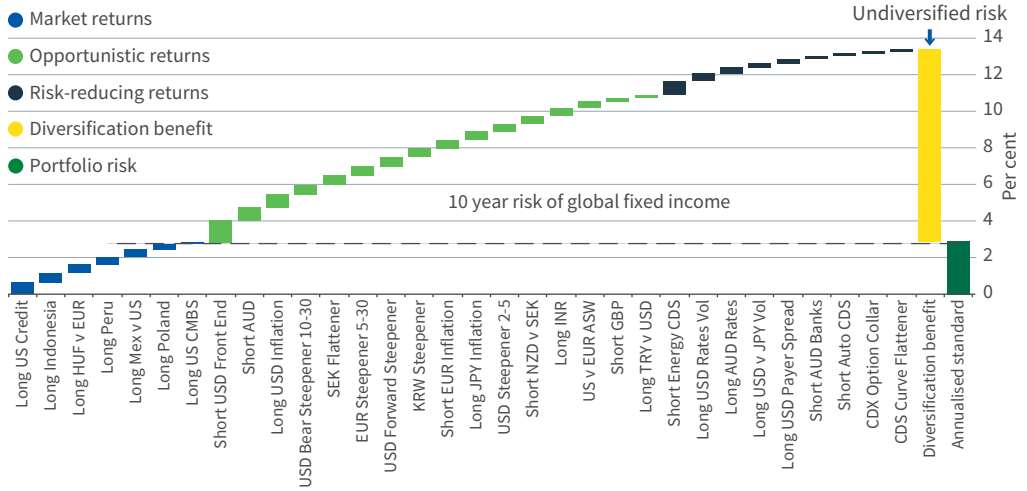
Figure 1. **Drawing on multiple risk drivers and enhancing diversification**



Source: Aviva Investors. Case study showing AIMS positions as at 31 December 2017. The data shown are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future risk or return.

Combining strategies intended to have a low correlation to each other can reduce risk through enhanced diversification and should contribute towards meeting the established return target across a range of future scenarios. It should also help reduce correlation to traditional fixed income asset classes.

We make extensive use of derivatives to implement the AIMS FI strategies – both within the Risk-Reducing strategies (managing risk across the fund) and within the Market Returns and Opportunistic Returns strategies (facilitating efficient implementation through isolating the desired return drivers).

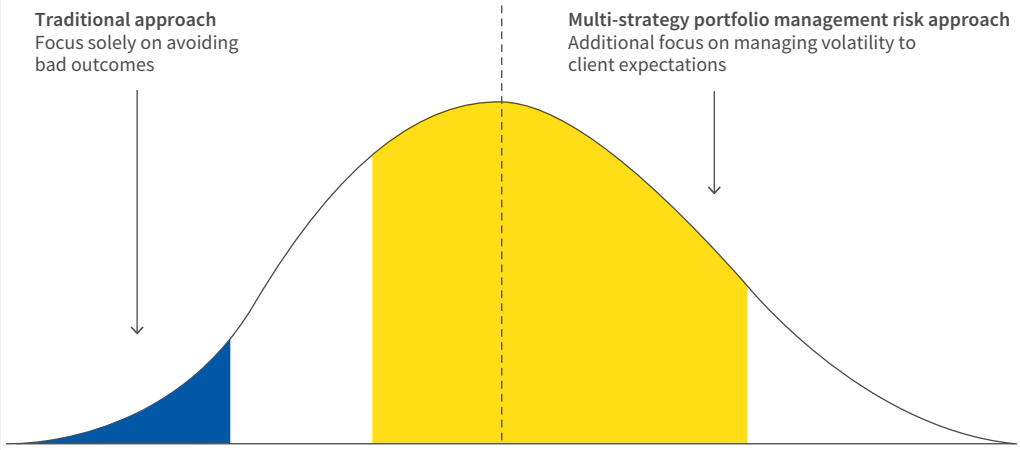
Preparing for volatile times | risk-reducing strategies: relying on diversification rather than tail hedging

Our Risk-Reducing strategies should provide a stabilising effect, smoothing returns and helping to preserve capital. The strategies are explicitly designed to soften any losses experienced from market directional allocations and allow us to run more risk on other parts of the portfolio.

Our approach does not promote tail hedging, but relies on diversification and using long and short positions for volatility dampening. At the strategy level, extensive back testing shows significant benefits of including Risk-Reducing strategies, which can be achieved at comparatively low cost.

The strategies are explicitly designed to soften any losses experienced from market directional allocations and allow us to run more risk on other parts of the portfolio.

Figure 2.



Source: Aviva Investors. This chart illustrates the approach adopted in a multi-strategy portfolio.

Example: Credit Default Swap Index (CDX) option collar

One Risk-Reducing strategy that has been explored is the use of CDX option collars, a low-cost strategy designed to reduce the volatility of long credit positions without paying away premium. It involves establishing a short position through selling credit receivers and buying payer spreads.

The strategy is underpinned by the view that most value generation in the credit universe is likely to come from carry (i.e. from differentials in offsetting positions) rather than spread compression as markets adjust in the post-QE world. Global credit spreads are close to the tightest they have been for years, with several catalysts that might push spreads wider, but far fewer factors likely to trigger further spread compression.

On a stand-alone basis, the return impact of the CDX option collar strategy was expected to be positive if spreads widened, neutral if they remained broadly within prevailing ranges, but negative if spreads continued to tighten.

Integrating Environmental, Social and Governance (ESG) considerations

"Responsible investment means investing our clients' money to deliver superior long-term sustainable returns, being responsible owners of the assets we manage on their behalf and leveraging our influence to help shape a more sustainable future."

Dr Steve Waygood,
Chief Responsible Investment Officer, Aviva Investors

We have a long history of engagement in ESG issues. ESG considerations are incorporated into our investment analysis and decision-making processes to help improve investment outcomes for our clients and society, through reducing environmental, regulatory and obsolescence risk.

The Responsible Investment Team participates in the AIMS Strategic Investment Group, contributing towards idea generation and providing ESG insights via the macro, thematic and company lenses of the AIMS FI universe. Contributions have included analysis of the German automotive sector's response to emission regulations and anti-competitive practices, as well as defining our position on the Australian banking sector's governance issues and risks.

Through engagement, we aim to identify and reduce ESG risks. Where we consider the approach to governance or the management of sustainability impacts falls short of our expectations, we will engage to try to improve performance. We see exclusion as a last resort, applied in cases where issuers fail to demonstrate improvements and there is a risk of recurrence. If an excluded issuer demonstrates positive changes in their policies, it may be re-included in the investment universe. With that in mind, the ESG screens are updated quarterly.

B. Risk management – Integrating risk into portfolio construction

Risk management is a key consideration for insurers. In addition to risks within their asset portfolio, insurers must also consider the risks and constraints arising from their liabilities ("asset-liability management"), accounting balance sheet, regulatory balance sheets (see section C), or other constraints (such as rating agency requirements).

As such, portfolio construction for insurance investors can often be influenced more by risk, rather than return, considerations. This focus on risk mirrors the typical approaches within multi-strategy fixed income strategies – risk management plays an essential role within portfolio construction for AIMS FI.

Aviva Investors' investment team utilises in-house and third-party tools to structure the portfolio and model the impact of new investment decisions. The portfolio construction and risk teams undertake daily risk analysis, and produce risk reports to monitor metrics including Value at Risk (VaR), volatility and correlation. They also undertake stress testing, scenario analysis and hidden correlation identification. Both long- and short-term models are used to monitor how these metrics change over time.

Continuous risk monitoring

Continuous risk monitoring, combined with a detailed understanding of how the macro environment is evolving, allows us to fine-tune positioning. Doing so means taking account of the central strategy set out by our House View combined with an appreciation of key risks.

It also provides risk control for clients. Monitoring involves multiple lines of defence; our approach is designed to ensure risk exposures are wholly understood and clients are suitably positioned to withstand stress scenarios.

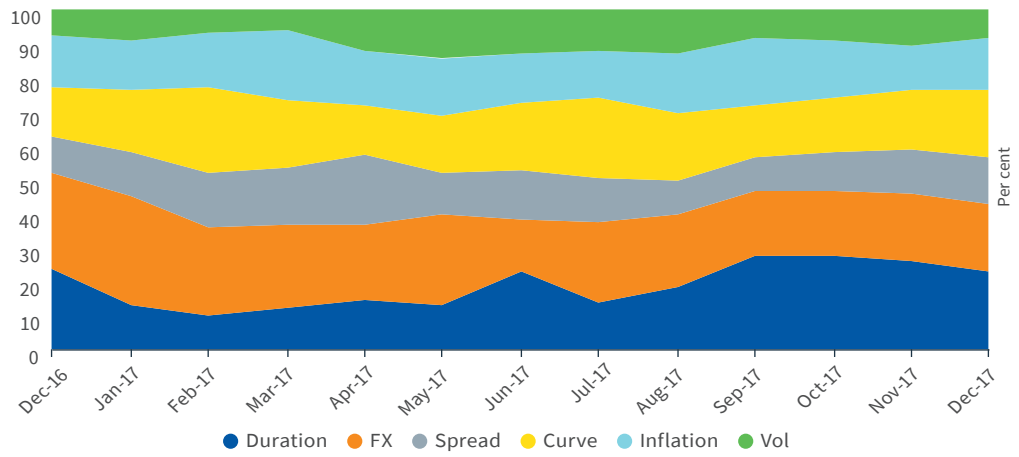
There are guidelines in place to maintain diversification and contain the build up of risk associated with individual risk drivers, constraining exposures by theme and investment idea:

- Aggregate stand-alone risk should not exceed 50 per cent per theme (i.e. spread, duration, curve, currency, inflation)
- Each single idea (e.g. long US credit) should not exceed 30 per cent of total portfolio risk

The chart below shows how the exposures to each theme evolved during the year 2017, which we have chosen as a case study in this paper.

Continuous risk monitoring, combined with a detailed understanding of how the macro environment is evolving, allows us to fine-tune positioning.

Figure 3. **Monitoring risk exposures by theme**



Source: Aviva Investors as at 31 December 2017. Case study showing evolution of risk exposures by theme over 2017. For illustrative purposes only.

C. Assessing solvency – calculating solvency capital requirements

The regulatory capital regime has a material impact on insurers' investment strategies. Globally, insurance regulation has become significantly more risk sensitive, with the capital requirements of an insurer reflecting their investment portfolio. Within Europe, this change has been implemented through the Solvency II regime. While the rest of this section will focus on Solvency II, many of the considerations are more widely applicable.

A European insurer has two options for calculating the solvency capital requirements (SCR) arising from its investment portfolio:

- A standard formula approach, where capital charges are set out in the Solvency II regulations.
- An internal model approach, where the insurer determines its own capital changes subject to regulatory approval.

For our case study (based on AIMS positions as at 31 December 2017), we used a standard formula approach to illustrate indicative SCR results for the strategy. The standard formula SCR approach reflects the defined risk measure under Solvency II; a VaR assessment, calibrated to a 99.5 per cent confidence level over a one-year time horizon. However, the standard formula is necessarily broad brush and not designed to reflect the underlying risk profiles of more sophisticated investment strategies, notably non-directional strategies.

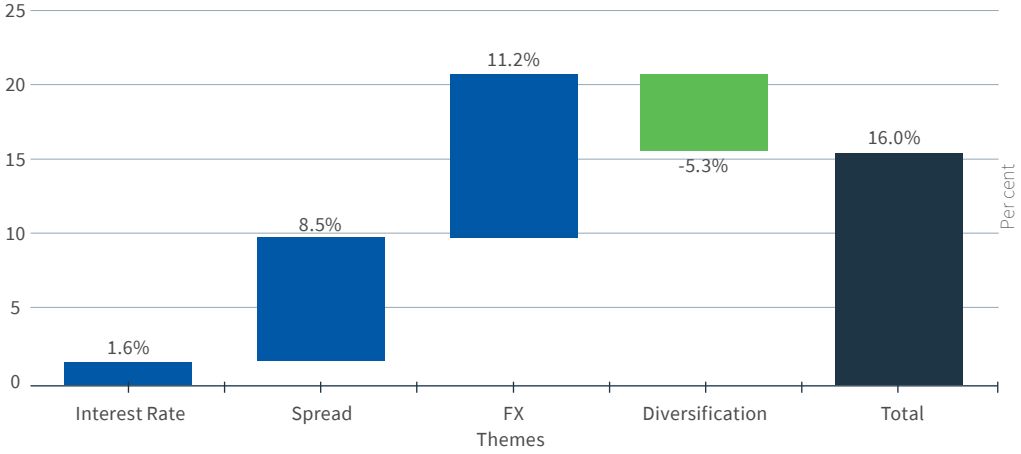
Therefore, our case study compares the SCR calculated for each of the individual strategies to an economic 99.5 per cent VaR for each strategy, using the same risk model that was used within the portfolio construction process for AIMS FI. This VaR measure is not a Solvency II internal model. It has been calibrated using a different methodology, different data, and a different historical data period to the calibration of the standard formula SCR. The reasons for this will become clear as you read on.

The following chart sets out the indicative standard formula SCR for the AIMS FI strategy. This result, and all other results in this paper, have been calculated:

- on a "look-through" basis, applying the relevant SCR charges on a line-by-line basis to the holdings within the strategy
- using third-party standard formula SCR calculation software, and then subject to detailed internal review
- applying the SCR stresses to all positions (both long and short) within each (non-directional) strategy

Globally, insurance regulation has become significantly more risk sensitive, with the capital requirements of an insurer reflecting their investment portfolio.

Figure 4. **Standard formula standard capital requirement by theme**



Source: Aviva Investors. Case study showing standard formula SCRs for AIMS positions as at 31 December 2017. For illustrative purposes only.

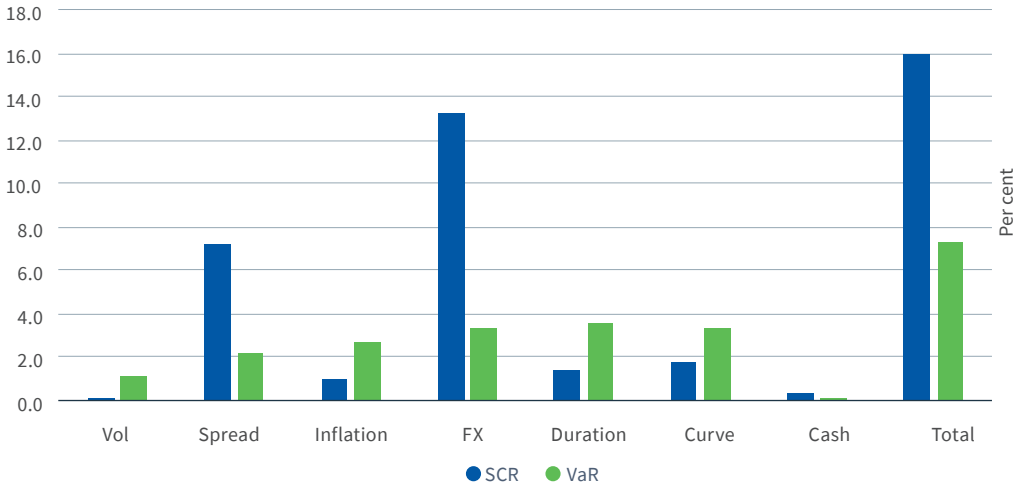
The categories in the chart on page 8 (interest rate, spread and currency) immediately highlight some of the key limitations of the standard formula SCR – there are no specific capital charges that arise from exposures to the remaining themes (curve, inflation and volatility). The strategies relating to these themes contributed over 40 per cent of the undiversified risk exposure of AIMS FI, as at 31 December 2017; viewed from this lens the standard formula SCR could appear to be too low relative to the level of risk taken.

However, the capital charges for currency risk are significantly higher than would be assessed under our VaR calculation. The SCR arising from each currency exposure must be assessed individually, and then these SCRs are added together to give the total SCR for currency risk. This assumes perfect correlation or perfect anti-correlation between currency markets, whichever is more onerous for the insurer. An economic VaR measure allows for more realistic correlations between currency markets.

The implicit correlation assumptions within the standard formula result in other complications. For example, yield levels within global interest rate markets are correlated (i.e. yields all rise together), as are credit markets (i.e. spreads all rise together). This results in low SCR charges, relative to an economic VaR model, for relative value strategies across or within fixed income markets.

The combined impact is shown in the following chart, which compares the Standard Formula SCR results with those based on an economic VaR calculation. The aggregate capital charge for the AIMS FI strategy was 16 per cent on the standard formula basis compared to an economic VaR estimate of 7.3 per cent. The primary drivers of this difference were the currency and spread themes.

Figure 5. **Comparing capital charges by approach and theme**



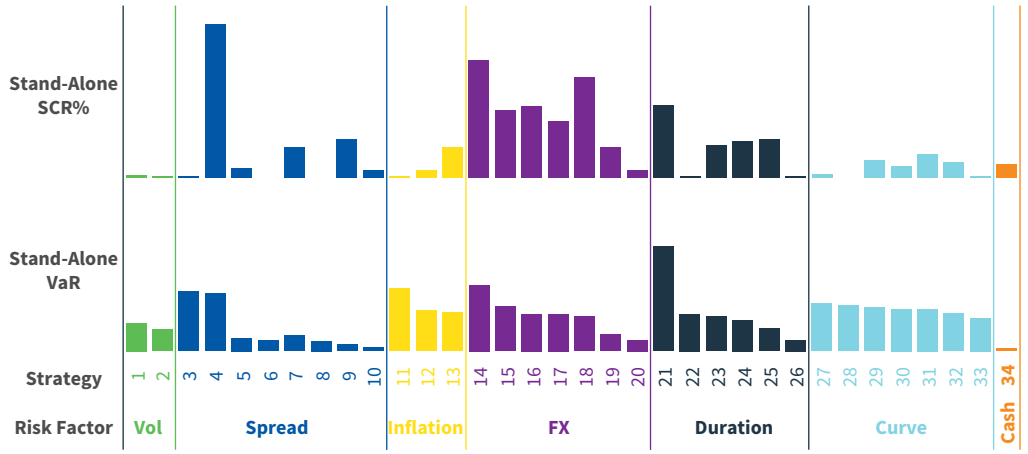
Source: Aviva Investors. Case study showing standard formula SCRs vs economic VaR for AIMS positions as at 31 December 2017. For illustrative purposes only.

Drilling down into the parent themes helps bring greater insights into how risk is constituted, and whether it is possible to take a more refined view of the risk.

The following table shows how the contribution of each individual strategy to the stand-alone risk exposure (i.e. exposure before allowing for any diversification between strategies) differed between the SCR and VaR results.

The combined impact is shown in the following chart, which compares the Standard Formula SCR results with those based on an economic VaR calculation.
The aggregate capital charge for the AIMS FI strategy was 16 per cent on the standard formula basis compared to an economic VaR estimate of 7.3 per cent.

Figure 6. **Comparing stand-alone SCR and stand-alone VaR**



For illustrative purposes only. VaR: Economic VaR. SCR: Standard Formula SCR. Percentages rounded to one decimal place. Numbered strategies are set out in the Appendix. Source: Aviva Investors. Case study based on AIMS positions as at 31 December 2017.

The illustration highlights that the measurement of risk for individual strategies can vary materially between stand-alone SCR and VaR. For example:

Overall, it appears that the Standard Formula SCR result was somewhat conservative relative to an economic VaR model.

Strategy 3: Short Energy Credit Default Swaps (CDS)

- This strategy was designed to deliver returns should credit spreads in the energy sector increase by more than those across the broader market.
- The SCR calculation assumes that all credit spreads move in the same direction, resulting in a stand-alone SCR of 0.03 per cent (relative to a stand-alone VaR of 1.8 per cent).

Strategy 14: Short Australian Dollar (AUD)

- This strategy was designed to deliver returns should the Australian dollar depreciate relative to the US dollar.
- The SCR calculation assumes the AUD appreciates (relative to the portfolio currency) and the US dollar depreciates (relative to the portfolio currency) - resulting in a stand-alone SCR of 3.5 per cent (relative to a stand-alone VaR of two per cent).

It is worth noting that these illustrative assessments of the SCR and VaR reflect the position of the fund at a single point in time.

Over time, the SCR and VaR results will change:

- as the underlying portfolio changes – reflecting changes in the allocation of risk between the different themes (as shown in Section B) and changes in the underlying strategies within those themes
- as the historical data used to calibrate the VaR calculation (and market conditions within that period) change.

As a result, the relative levels of the aggregate SCR and VaR results could vary materially over time.

Overall, it appears that the Standard Formula SCR result was somewhat conservative relative to an economic VaR model in the case study we used for the analysis. Insurers investing in multi-strategy fixed income investments will need a degree of sophistication to calculate the standard formula SCR, and to meet the wider requirements of the PPP. Those insurers could look to develop an internal model SCR, which could result in a lower SCR charge for their multi-strategy fixed income investment.

Conclusion

The processes established to manage the requirements of multi-strategy fixed income strategies like AIMS FI are well aligned with the requirements of the Solvency II PPP, facilitating investment by insurers. Risks must be clearly identified, measured, monitored, managed, controlled and reported – all of which will be necessary for managers to deliver on the return target, regardless of market conditions.

Insurers investing in multi-strategy fixed income will however require a degree of sophistication to meet the requirements of the PPP and to calculate the impact on their solvency position.

For insurers using the standard formula, we've highlighted that the standard formula SCR result can appear somewhat conservative relative to an economic VaR model, which reflects some of its limitations.

Insurers are increasingly seeking diversification within their investment portfolios. The broad investment universe of multi-strategy fixed income funds, combined with the risk-based portfolio construction typical of these funds, can help insurers to achieve this goal.

Insurers investing in multi-strategy fixed income will however require a degree of sophistication to meet the requirements of the PPP and to calculate the impact on their solvency position.

Key Risks

The value of an investment and any income from it can go down as well as up. Investors may not get back the original amount invested.

Bond values are affected by changes in interest rates and the bond issuer's creditworthiness. Bonds that offer the potential for a higher income typically have a greater risk of default.

These strategies use derivatives, these can be complex and highly volatile. Derivatives may not perform as expected meaning the strategies may suffer significant losses

Appendix

Figure 7. **Key: Fixed income strategies (Case study based on AIMS positions as at 31 December 2017)**

Risk Factor	Strategy	
Vol	1. Long USD Rates Vol 2. Long USD v JPY Vol	
Spread	3. Short Energy CDS 4. Long US Credit 5. Short AUD Banks 6. Short Auto CDS	7. CDX Option Collar 8. CDS Curve Flattener 9. Long Bank Sub Debt 10. Long US CMBS
Inflation	11. Long USD Inflation 12. Short EUR Inflation 13. Long JPY Inflation	
FX	14. Short AUD 15. Long Indonesia 16. Short NZD v SEK 17. Long Peru	18. Long INR 19. Short GBP 20. Long TRY v USD
Duration	21. Short USD Front End 22. Long HUF v EUR 23. Long Mex v US 24. Long AUD Rates	25. Long Poland 26. Long USD Payer Spread
Curve	27. USD Bear Steepener 10-30 28. SEK Flattener 29. EUR Steepener 5-30 30. USD Forward Steepener 5-10	31. KRW Steepener 32. USD Steepener 2-5 33. US v EUR ASW
Cash	34. Cash & Currency Hedge	

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