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Summary

At a time when interest rates have fallen to historic lows, volatility within equity markets has risen, and geopolitical risks continue to be the catalyst for global market sentiment, the future challenges facing traditional insurance portfolio investors will likely increase. We believe insurers must adapt their investment strategy in the face of tougher regulatory changes, that will impact their earning and solvency. From a regulatory perspective, sustainability and climate risks are also on the agenda of the Solvency II review. Further challenges may arise as the European Commission evaluates the transparency of costs for retail products. This is likely to have a significant impact on the European insurance market. In this first edition of Insurer Investment Management Insights, we explore these issues. We will focus on the macro-economic trends and their impact on insurers' investment plans, on the regulatory changes and their impact on insurers' asset allocations, and on the optimization of the insurance balance sheet.

1 . Macro outlook update

H2 2019 outlook

As we look out to H2 2019, some may believe that two of the key risks to the economy and markets in 2018 - tariff wars and central bank tightening - don't appear to be as significant a threat. While these two risks seem to have abated for the time being, we have to recognize that these still represent some of the most significant risks to the economy and markets in 2019. This uncertainty, coupled with the overall increase in leverage globally, is also adding to risks this year and beyond.

Our key themes

1 - Disruption - both monetary and geopolitical Monetary policy disruption.

The Fed has taken an abrupt turn towards a more dovish stance for 2019. The "dot plot" released at the March FOMC meeting indicated no rate hikes prescribed for 2019. In addition, the Fed indicated that it expects to end balance sheet normalization later this year. This abrupt change in policy raises the risk that the Fed will not have enough 'dry powder' available for the next crisis. In addition, central banks are coming under greater risk of politicization, which threatens to undermine their credibility.

Geopolitical disruption

We have seen significant geopolitical disruption in recent months, and that is leading to structural fragmentation. Of course, the greatest geopolitical risk is the potential for full-blown trade wars, which remains a distinct possibility at this juncture, and which can place downward pressure on economic growth in a variety of ways.

Technological disruption

We expect innovation and the so-called Fourth Industrial Revolution or IR 4.0, as we like to call it, to maintain its trend-setting role across global and major national economies, with major implications for the distribution of global growth and the balance of power in the world. The potential for highly innovative firms to use technology to disrupt established businesses and business models is likely to continue - even if tech stocks come under further pressure as markets normalize and the regulation of private data and the political role of social media platform firms come under greater regulatory oversight and political scrutiny. IR 4.0 also feeds back into geopolitical disruption and international competition. US-China trade tensions are only partly about trade; the underlying issues are about investment and global economic and political influence - attaining and maintaining the technological frontier as reflected in US concerns about national security and the protection of intellectual property.

2 - Debt overhang

The world is becoming increasingly indebted. As monetary policy normalization continues and accelerates in coming years, this pressure is likely to increase. In addition to the short-term effects of debt pressure, there is a long-term effect as well: more money spent on servicing debt means less money able to be used for investment purposes, and that will impact longer-term economic growth.

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3 - Implications

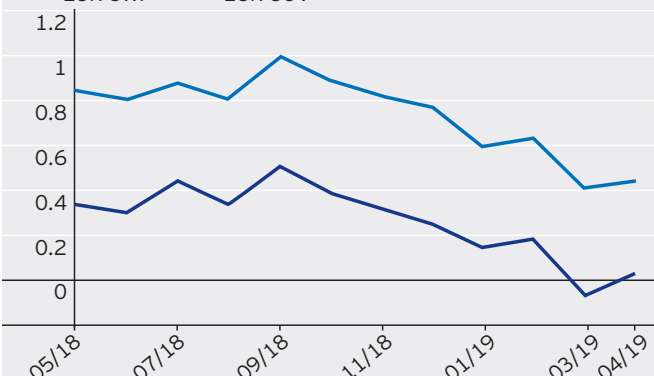
In this environment, we believe exposure to risk assets is important for meeting long-term goals - especially given that an upward bias for stocks continues to exist, although it is weaker. Mitigating against downside risk will be critical, and that includes being well-diversified within equities and fixed income; that is also important given the divergence in growth

in different economies. And, perhaps most important during this period of uncertainty, we believe that exposure to alternative investments can help with diversification and risk mitigation. That may include strategies such as market neutral portfolios and other lower-correlating asset classes, especially including those with income-producing potential such as real estate.

Figure 1: Risk free historical yields

10Y Risk free yields (%)

— EUR SWP — EUR SOV

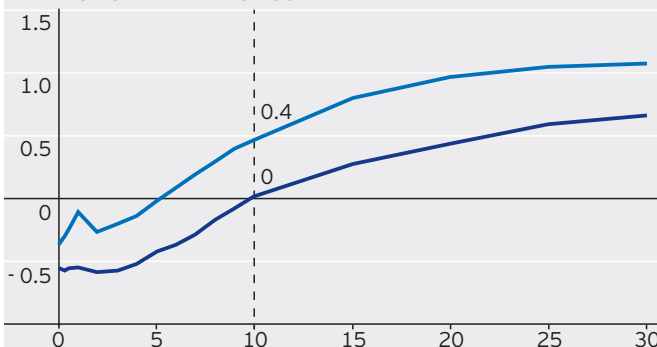


Source: Bloomberg Barclays US Corp, Euro Corp, UK Corp, US HY, Euro HY, UK HY, EMD Agg; Bloomberg; Invesco Analysis, April 30th 2019. Please refer to ^{2, 3, 4}.

Figure 2: Risk free curves

ln % by maturity

— EUR SWP — EUR SOV



Source: Bloomberg Barclays US Corp, Euro Corp, UK Corp, US HY, Euro HY, UK HY, EMD Agg; Bloomberg; Invesco Analysis, April 30th 2019. Please refer to ^{2, 3, 4}.

Continuous decrease of the risk free yields in Europe leading to almost null average yields (+1 bp) for 10Y sovereign bonds.

Figure 3: Historical foreign exchange hedging costs

Currency hedging cost for 10Y USD hedges (bps)

— USD to EUR



Benchmark curves and currency basis curves are sourced from Bloomberg. All the hedging is based upon swap curves and basis curves from Bloomberg. April 30th 2019. Please refer to ^{2, 3, 4}.

Figure 4: Foreign exchange hedging costs

Currency hedging cost (bps) by maturity

— USD to EUR



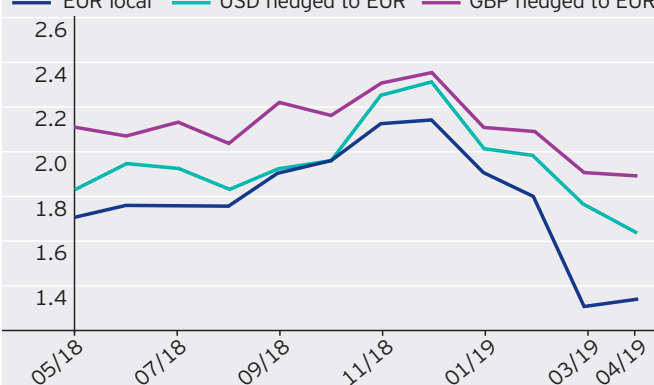
Currency basis curves are sourced from Bloomberg. All the hedging is based upon swap curves and basis curves from Bloomberg. April 30th 2019. Please refer to ^{2, 3, 4}.

Hedging costs are now back at attractive levels (-17 bps) for long duration hedges.

Figure 5: Credit historical yields

10Y Corporate bonds yields (%)

— EUR local — USD hedged to EUR — GBP hedged to EUR

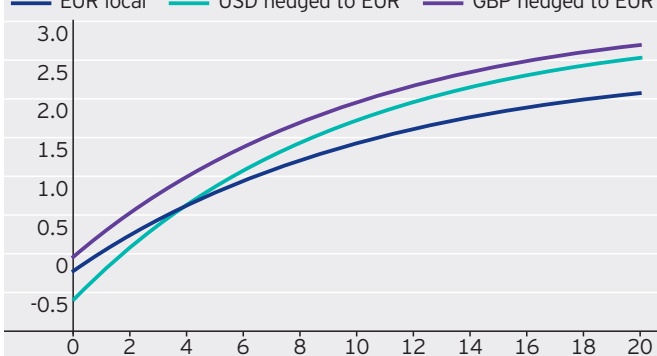


Source: Bloomberg Barclays US Corp, Euro Corp, UK Corp, US HY, Euro HY, UK HY, EMD Agg; Bloomberg; Invesco Analysis, April 30th 2019. Please refer to ^{2, 3, 4}.

Figure 6: Credit curves

10Y Benchmark corporate yield curves (%) by maturity

— EUR local — USD hedged to EUR — GBP hedged to EUR



Source: IG yield curves are built upon constituents in Bloomberg Barclays US Corp, Euro Corp, UK Corp and are all sourced from Bloomberg; Benchmark curves and currency basis curves are sourced from Bloomberg. All the hedging is based upon swap curves and basis curves from Bloomberg. April 30th 2019. Please refer to ^{2, 3, 4}.

Following a rise in corporate bond yields during the fourth quarter of 2018, corporate bond yields fell back to lower levels by the end of April 2019. This negative impact is partly compensated for USD bonds by lower hedging costs. The pick-up on USD hedged bonds (+50 bps) and GBP hedged bonds (+60 bps) are attractive to EUR based investors.

2 . Regulatory strategic news

The insurance sector, like the rest of the financial system, remains under the regulatory microscope. However, policymakers' concerns are moving beyond the risk posed to the system to consider how the financial system can better serve the economy and citizens. In this issue, we explore how debates in relation to systemic risk within the insurance sector have developed, as well as how sustainability and long-term financing of the economy are being addressed through insurance regulation. Finally, we cast our eye over developments affecting the retail insurance market.

Systemic risk is back on the agenda...

After years of significant lobbying, the International Association of Insurance Supervisors ("IAIS") has finally agreed to replace the "G-SII" framework for designating global systemically important insurers with a new activities-based approach. The new framework, due to be signed-off in November 2019, will focus on the **key drivers of systemic risk in the insurance sector: liquidity risks, interconnectedness through common macro-economic exposures or counterparty exposure, lack of substitutability of critical functions, as well as other risks such as cyber risks.**

IAIS proposes a new toolkit to ensure regulators have enhanced supervisory measures to limit the build-up of risk, enhanced intervention abilities when those risks materialise and enhanced global monitoring for risks.

Work is also ongoing at the European level, where the European Systemic Risk Board has recommended a number of changes to be included in the upcoming Solvency 2 review to address macroprudential risks in the insurance sector, including capital add-ons, liquidity requirements and a recovery and resolution framework for insurers.

While such changes will not bite for another few years, the insurance industry is likely to face enhanced scrutiny of its liquidity risk management systems, including whether they are holding sufficient liquid assets to cover surrenders and margin calls to avoid the need to liquidate illiquid assets in stressed markets, as well as a renewed focus on derivatives transactions, given that derivatives positions can increase leverage, increase interconnectedness through counterparty exposure and affect insurers' liquidity positions through margin calls. Recent proposals relating to liquidity and leverage in the fund industry may serve as guidance of what the insurance industry might expect further down the line.

...And the risk discussion is moving into sustainable and climate risk

Another type of risk that is gaining attention is sustainability and climate change risk. The Paris Climate Accord in 2015 put climate change, as well as broader environmental, social and governance ("ESG") issues, on the map. Since 2015, we have seen the finalisation of the Task Force on Climate-Related Disclosures recommendations, the creation of the G20 Green Finance Study Group and the European Commission's Action Plan on Sustainable Finance.

The insurance industry is considered to be on the frontline of these issues given their exposure to physical risks from extreme weather events but also from transition risks. The International Association of Insurance Supervisors ("IAIS") has been exploring how insurance companies and supervisors should respond to these challenges, including assessing the portfolio exposure to carbon asset risk and undertaking

scenario analysis and stress testing for climate change factors. The European Commission has asked EIOPA (European Insurance and Occupational Pensions Authority) to begin work, as part of the Solvency II Review in 2020, to consider changes to the framework to take into account sustainability risks, with a particular focus on climate change risk. **EIOPA is currently consulting on potential changes to the Solvency 2 regime and will present its findings to the European Commission in September 2019 and will consider the impact on prudential rules on insurers' sustainable investments and how insurers incorporate sustainability practice.**

The European Commission Action Plan on Sustainable Finance, launched in March 2017, goes beyond climate change to consider sustainability risks, i.e. environmental, social and governance risks, more broadly. The Action Plan is multi-faceted and includes a number of interconnected actions to address sustainability across the financial system:

- **a proposal for a framework for sustainable investments** (the "taxonomy") aims to define economic activities that can be considered sustainable;
- **a proposal on disclosure relating to sustainability risks** by financial market participants, an agreement in principle was reached in March;
- **changes to Solvency II and the Insurance Distribution Directive** to integrate sustainability risks and factors.

While the details of many of the initiatives above are yet to be defined, it is clear that going forward, insurance undertakings will be required to have an enhanced focus on sustainability issues. This will include enhanced analytical capabilities to undertake stress testing and scenario analysis in relation to their exposure to sustainability risks; and considering how to optimise their strategic investment allocation to sustainable investments and the integration of ESG considerations across their investment portfolio.

And all of these issues are likely to be picked up in Europe through the Solvency II review

In addition to the themes of systemic risk and climate change, the review of Solvency II, which has governed the insurance sector in Europe since 2016, will also address issues such as improving proportionality of the rules, as well as lowering disincentives to insurers' financing the real economy as part of the Capital Markets Union project. This includes a review of the Delegated Acts originally scheduled for 2018 (the "2018 review") that seeks to fine-tune the technical details under Solvency II, to be followed by a full review of the Solvency 2 Directive in 2020 (the "2020 review").

In March 2019, the European Commission unveiled the changes to the Solvency II Delegated Acts. Based on detailed input from EIOPA, the new rules include:

- Measures to facilitate financing of the real economy, including the creation of a new long-term equity category;
- Measures to enhance the proportionality of the framework by simplifying elements of the standard formula;
- Measures to harmonise the treatment of deferred taxes to absorb present losses;
- Measures to fine-tune the calibration and risk sensitivity in certain areas.

These changes should reduce the burden and complexity for insurance undertakings to calculate their capital requirements, including when investing in funds, as well as open up new investment opportunities in unrated debt and equity instruments. However, as the proposal currently stands, firms may find it challenging to make use of these new rules due to the complexity of the conditions attached to their use.

Work has also commenced on the more substantive 2020 review. The European Commission issued its call for advice to EIOPA in February 2019, with EIOPA asked to provide its advice by June 2020. In its request, the European Commission asked EIOPA to provide advice on 19 topics, including:

- the matching adjustment and volatility adjustment;
- risk margin;
- macroprudential issues (including recovery and resolution), and;
- European insurance guarantee scheme.

In preparation, EIOPA is expected to launch consultations on different aspects of the review in autumn 2019. This review could therefore spell a significant change to the Solvency II framework and the broader insurance regulatory framework in Europe.

Meanwhile, the European Commission is looking again at transparency and the costs of retail products

As part of preparations for what we expect to be a big agenda item for the new European Commission, EIOPA published in December 2018 its first report on costs and part performance of retail insurance products. The report concludes that there are significant data quality and comparability issues in the insurance retail market, which led to only 20% of the sample being included in the final study. EIOPA concluded that further work was necessary to better define cost definitions and to develop common standards and methods for calculating comparable data on returns.

A full review of the Packaged Retail Investment and Insurance Products Regulation ("PRIIPs") will now take place in 2019. The review will seek to address the many issues that different financial market providers have encountered with the PRIIPs Key Investor Document ("KID"). The European Parliament and Member States have also agreed to postpone the inclusion of UCITS in the PRIIPs regime until 2022. To ensure that providers of multi-option products ("MOPs") such as unit-linked products, can continue to rely on UCITS KIIDs until 2022, EIOPA has recommended a quick fix to the regulatory technical standards and has called on the Commission to adopt the changes swiftly so that they can come into force before the European parliament elections.

Finally, in February, it was announced that the European Parliament and Member States had reached an agreement on a proposal for the creation of a new Pan-European Pension Product ("PEPP"). The new product label would apply to a private pension vehicle that can be ported across the EU. The product will include a default option, the basic PEPP, which can consist of either a guarantee or a life-cycling option. However, at the insistence of the European Parliament, the basic PEPP will be subject to a 1% fee cap. EIOPA will be tasked with developing regulatory technical standards, including around the new PEPP Key Investor Document and on risk mitigation techniques.

3 . Insurance asset allocation benchmarks market updates

Figure 7: Fixed income market credit spread - in EUR
12 months trading range (local currency in bps)

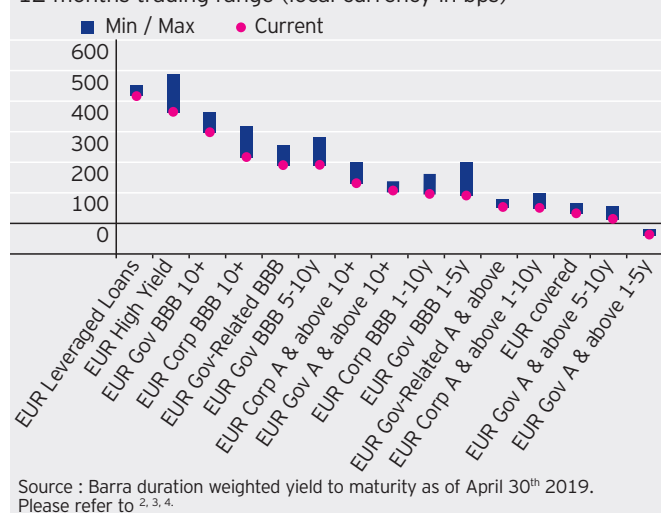
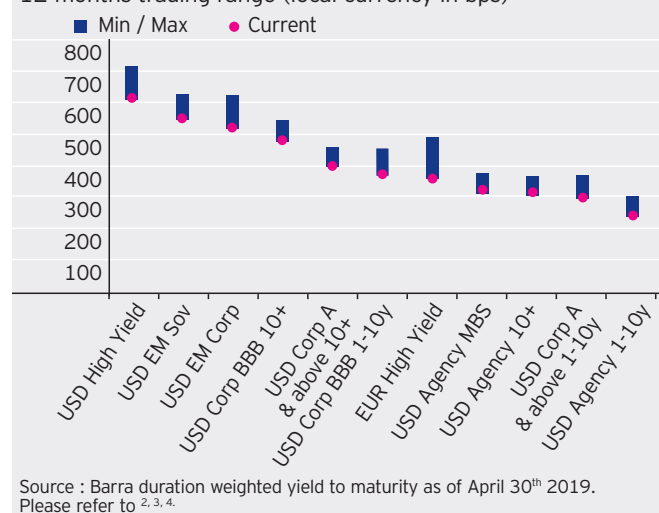
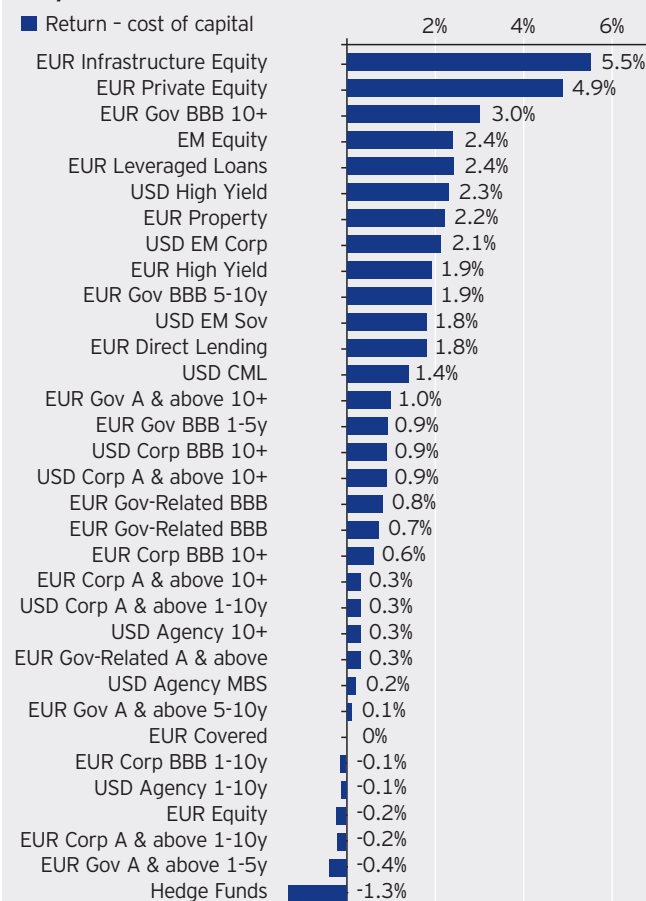


Figure 8: Fixed income market credit spread - in USD
12 months trading range (local currency in bps)



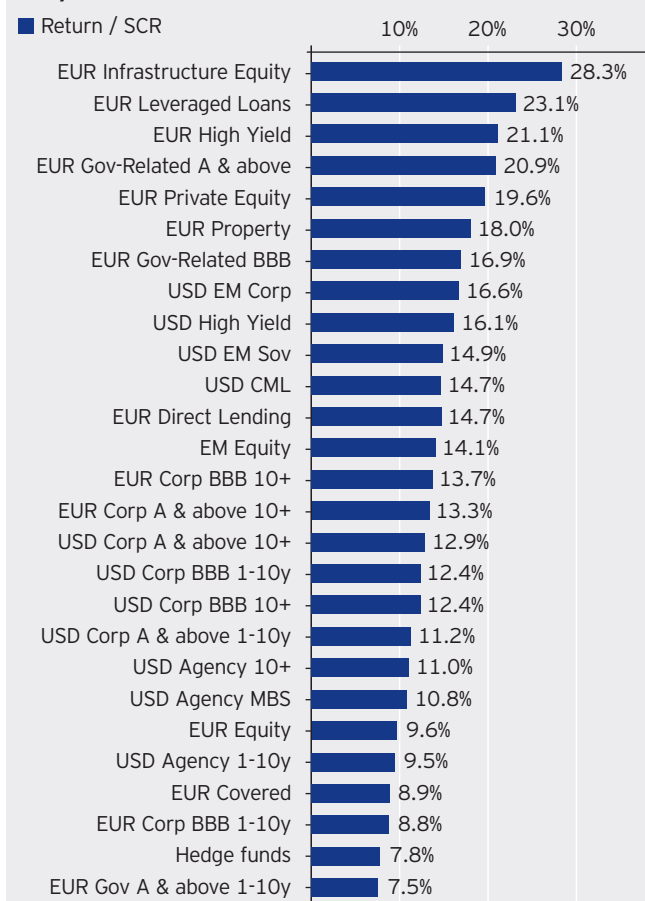
Spreads of the fixed income assets are in the low range compared to the last 12 months.

Figure 9: Return adjusted by the cost of regulatory capital (10 years horizon)



Return on Capital = Expected Return - 10% * SCR (Solvency capital required). Data in EUR as of April 30th. Performance, whether actual or simulated/hypothetical, is no guarantee of future performance. CMA estimated return and risk information is forward looking, is not a guarantee, and involves risks, uncertainties and assumptions. Please refer to CMA methodology¹. For illustrative purpose only. Please refer to ^{2, 3, 4}.

Figure 10: Return on the regulatory capital (10 years horizon)



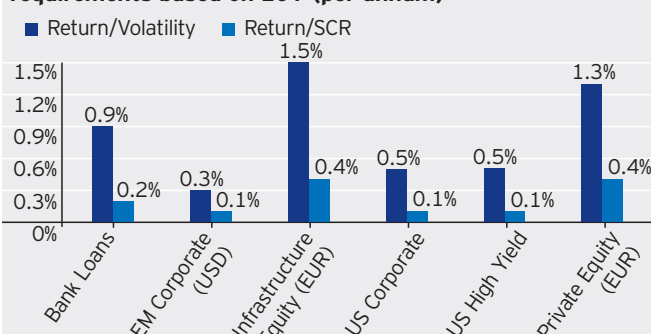
Return on Capital = Expected Return / (Solvency Ratio * 100% SCR (Solvency capital required)). Data in EUR as of April 30th. Performance, whether actual or simulated/hypothetical, is no guarantee of future performance. CMA estimated return and risk information is forward looking, is not a guarantee, and involves risks, uncertainties and assumptions. Please refer to CMA methodology¹. For illustrative purpose only. Please refer to ^{2, 3, 4}.

Based on our CMAs¹, EUR infrastructure equity and high yield are the most profitable asset classes compared the related capital requirements. Hedge funds is the least profitable asset class in this framework.

Note: For fixed income assets, Barra's duration weighted yield to maturity is used as expected return. For other assets, Invesco CMAs¹ are used where available. Otherwise manual inputs from Invesco Solutions are used. Cost of capital is assumed to be 10%. EUR Direct Lending and USD CML (Consumer and Mortgage

Loans) are assumed to be in private equity-style fund vehicles. All the hedging of fixed income assets is based upon swap curves and basis curves from Bloomberg; otherwise based upon Bloomberg Generic Govt 10Y Yield.

Figure 11: Risk Adjusted Performance - Impact of a change in Strategic Asset Allocation on Own funds & Capital requirements based on 10Y (per annum)



Source: Baseline portfolio consists of: Euro Govt. 40%; Euro Corporates 40%; Euro High Yield 2%; EM Debt (USD) 3%; Equity - Euro ex UK 10%; REITs 5%. All the hedging of fixed income assets is based upon swap curves and basis curves from Bloomberg; otherwise based upon Bloomberg Generic Govt 10Y Yield. SCR charges reflecting interest rate risk are included for government bonds. April 30th 2019. Performance, whether actual or simulated/hypothetical, is no guarantee of future performance. CMA estimated return and risk information is forward looking, is not a guarantee, and involves risks, uncertainties and assumptions. Please refer to CMA methodology¹. Please refer to ^{2, 3, 4, 5}.

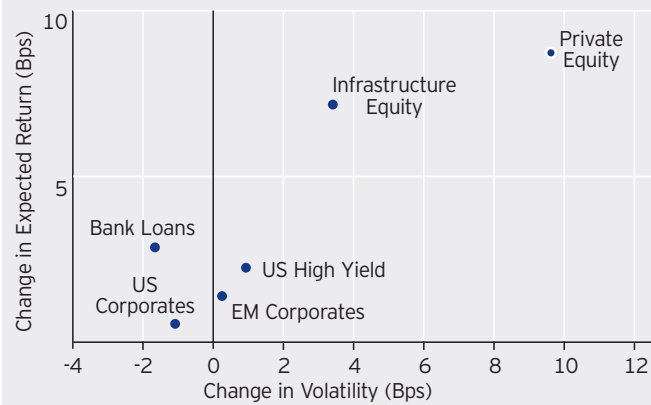
Methodology presentation

We analysed the impact of investing 1% of a typical EMEA portfolio in different asset classes. We were able to obtain this allocation by proportionally reducing all the existing allocations by 1% reallocating to most attractive asset classes (highlighted in figure 11). The typical EMEA insurance portfolio that we considered is allocated as follows : Euro Govt. 40%; Euro Corporates 40%; Euro High Yield 2%; EM Debt (USD) 3%; Equity ex UK 10%; Real Estate 5%. This portfolio would have 1.37% of return, 10.93% of SCR for a volatility of 3.86%.

Adding 1% senior secured loans has the potential to improve the Return / SCR by 20bps, while adding 1% EM corporates or private equity may improve the Return / SCR by 40bps. They are the most efficient asset classes on the own funds volatility and capital requirement perspectives.

Figure 12: Allocating 1% of the portfolio to the asset class below. Impact on the economic profitability

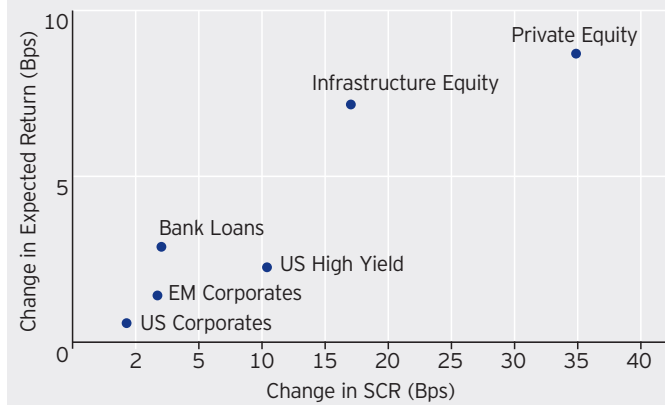
Impact on Expected Return / Volatility



Senior secured loans continue to look as the most attractive asset class for insurers, improving the return and diversifying the risk of the portfolio. The US corporates and emerging market debt are some of the most diversifying asset classes. Investment grade emerging market bonds and US corporates seem to be very attractive options for the liability matching book after cross currency hedge into EUR. On the return seeking assets, infrastructure equity is preferable to private equity in terms of risk adjusted returns.

Figure 13: Allocating 1% of the portfolio to the asset class below. Impact on the regulatory profitability

Impact on Expected Return / SCR



In an environment where yields fallen to minimal levels compared to 12 months ago, insurers should continue to diversify their portfolios. We believe that diversification can be carried out efficiently, without adding additional risk to the portfolio. This can be achieved by choosing the new assets based on insurers current holdings and liabilities.

¹About our capital market assumptions methodology

We employ a fundamentally based “building block” approach to estimating asset class returns. Estimates for income and capital gain components of returns for each asset class are informed by fundamental and historical data. Components are then combined to establish estimated returns (Figure 8). Here we provide a summary of key elements of the methodology used to produce our long-term (10-year) estimates. Five-year assumptions are also available upon request. Please see Invesco’s capital market assumption methodology whitepaper for more detail.

Figure 14: Our building block approach to estimating returns					
	Income		Capital		
Fixed Income	Yield	+	Valuation change	+	Roll return – Credit adjustment
Equity	Yield	+	Valuation change	+	Earnings growth

Fixed income returns are composed of:

- Average yield: The average of the starting (initial) yield and the expected yield for bonds.
- Valuation change (yield curve): Estimated changes in valuation given changes in the Treasury yield curve.
- Roll return: Reflects the impact on the price of bonds that are held over time. Given a positively sloped yield curve, a bond’s price will be positively impacted as interest payments remain fixed but time to maturity decreases.
- Credit adjustment: Estimated potential impact on returns from credit rating downgrades and defaults.

Equity returns are composed of:

- Dividend yield: Dividend per share divided by price per share.
- Buyback yield: Percentage change in shares outstanding resulting from companies buying back or issuing shares.
- Valuation change: The expected change in value given the current Price/Earnings (P/E) ratio and the assumption of reversion to the long-term average P/E ratio.
- Long-term (LT) earnings growth: The estimated rate in the growth of earnings based on the long-term average real GDP per capita and inflation.

Currency adjustments are based on the theory of Interest Rate Parity (IRP) which suggests a strong relationship between interest rates and the spot and forward exchange rates between two given currencies. Interest rate parity theory assumes that no arbitrage opportunities exist in foreign exchange markets. It is based on the notion that, over the long term, investors will be indifferent between varying rate of returns on deposits in different currencies because any excess return on deposits will be offset by changes in the relative value of currencies.

Volatility estimates for the different asset classes, we use rolling historical quarterly returns of various market benchmarks. Given that benchmarks have differing histories within and across asset classes, we normalise the volatility estimates of shorter-lived benchmarks to ensure that all series are measured over similar time periods.

Correlation estimates are calculated using trailing 20 years of monthly returns. Given that recent asset class correlations could have a more meaningful effect on future observations, we place greater weight on more recent observations by applying a 10-year half-life to the time series in our calculation.

Arithmetic versus geometric returns. Our building block methodology produces estimates of geometric (compound) asset class returns. However, standard mean-variance portfolio optimisation requires return inputs to be provided in arithmetic rather than in geometric terms. This is because the arithmetic mean of a weighted sum (e.g., a portfolio) is the weighted sum of the arithmetic means (of portfolio constituents). This does not hold for geometric returns. Accordingly, we translate geometric estimates into arithmetic terms. We provide both arithmetic returns and geometric returns given that the former informs the optimisation process regarding expected outcomes, while the latter informs the investor about the rate at which asset classes might be expected to grow wealth over the long run.

² Market update proxies

Asset Class	AssetDescription
EUR Leveraged Loans	Credit Suisse Western European Leveraged Loan Index
Hedge funds	IVZ Hedge Fund US HFRI Equity Hedge
EUR Corp A & above 10+	Bloomberg Barclays Corporate sub-index (Stat EOM): A-AAA 10+ Year
EUR Corp BBB 10+	Bloomberg Barclays Corporate sub-index (Stat EOM): BBB 10+ Year
EUR Gov-Related A & above	Bloomberg Barclays Government-related sub-index (Stat EOM): A-AAA
EUR Gov A & above 1-5y	Bloomberg Barclays Treasury sub-index (Stat EOM): A-AAA 1-5 Year
EUR Gov A & above 10+	Bloomberg Barclays Treasury sub-index (Stat EOM): A-AAA 10+ Year
EUR Gov A & above 5-10y	Bloomberg Barclays Treasury sub-index (Stat EOM): A-AAA 5-10 Year
EUR Gov BBB 1-5y	Bloomberg Barclays Treasury sub-index (Stat EOM): BBB 1-5 Year
EUR gov BBB 10+	Bloomberg Barclays Treasury sub-index (Stat EOM): BBB 10+ Year
EUR Gov BBB 5-10y	Bloomberg Barclays Treasury sub-index (Stat EOM): BBB 5-10 Year
USD high yield	Bloomberg Barclays High-Yield Index (Stat EOM)
EM equity	MSCI EM (EMERGING MARKETS) IMI - Monthly
EUR equity	MSCI EUROPE ex UK IMI - Monthly
EUR Private equity	IVZ Private Equity Europe ex-UK All PE excl Mezz & Dist
EUR Direct Lending	IVZ Private Debt floating Europe ex-UK SME
USD CML	IVZ Private Debt fixed US Senior CRE
EUR Infrastructure equity	IVZ Infrastructure Equity Europe ex-UK Renewables
EUR property	IVZ Real Estate Europe ex-UK Property
EUR high yield	Bloomberg Barclays Euro HY
USD EM corp	Bloomberg Barclays EM USD Agg: Corporate
USD Corp A & above 10+	Bloomberg Barclays US Credit: A-AAA 10+ Year
USD Corp A & above 1-10y	Bloomberg Barclays US Credit: A-AAA 1-10 Year
EUR Corp A & above 1-10y	Bloomberg Barclays Euro Agg Corporate: A-AAA 1-10 Year
EUR Corp BBB 1-10y	Bloomberg Barclays Euro Agg Corporate: BBB 1-10 Year
USD Agency 10+	Bloomberg Barclays US Agency Long
USD EM sov	Bloomberg Barclays EM USD Agg: Sovereign
EUR Gov-Related BBB	Bloomberg Barclays Euro-Aggregate: Government-Related Baa
USD Corp BBB 10+	Bloomberg Barclays US Long Credit Baa
USD Corp BBB 1-10y	Bloomberg Barclays US Intermediate Credit Baa
USD agency 1-10y	Bloomberg Barclays US Agency Intermediate
USD agency MBS	Bloomberg Barclays U.S. MBS: Agency Fixed Rate MBS (Ret)
EUR covered	Bloomberg Barclays Euro-Aggregate Securitized - Covered (Ret)

³ Risk-Ret proxies

Asset Class	AssetDescription
Euro Govt.	Bloomberg Barclays Euro Agg: Government Related
Euro Corporates	Bloomberg Barclays Euro Agg: Corporate
Euro High Yield	Bloomberg Barclays Euro HY
EM Debt (USD)	Bloomberg Barclays Emerging Markets (U.S. Dollar) (Stat EOM)
Equity - Euro ex UK	MSCI EUROPE ex UK IMI - Monthly
REITs	FTSE EPRA/NAREIT Developed Europe REITS Index
Bank loans	Credit Suisse Western European Leveraged Loan Index
EM Corporates (USD)	Bloomberg Barclays EM USD Agg: Corporate
Infrastructure equity (EUR)	IVZ Infrastructure Equity Europe ex-UK Renewables
US Corporates	Bloomberg Barclays Corporate sub-index (Stat EOM)
US High Yield	Bloomberg Barclays High-Yield Index (Stat EOM)
Private Equity (EUR)	IVZ Private Equity Europe ex-UK All PE excl Mezz & Dist

⁴ For the benchmark (government and swap) curves, the Bloomberg tickers are:

YCGT0025 Index	USD SOV
YCGT0016 Index	EUR SOV
YCGT0022 Index	GBP SOV
YCSW0023 Index	USD SWP
YCSW0201 Index	EUR SWP
YCSW0222 Index	GBP SWP
Note that EUR SOV= Germany	

⁵ The 1% re-allocation is sourced via a pro-rated reduction of baseline portfolio holdings.
For fixed income assets, Barra's duration weighted yield to maturity is used as expected return.
For other assets, Invesco CMAs¹ are used where available.
Note: the 1% re-allocation is sourced via a pro-rated reduction of baseline portfolio holdings. For fixed income assets, Barra's duration weighted yield to maturity is used as expected return. For other assets, Invesco CMAs¹ are used where available. Otherwise manual inputs from Invesco Solutions are used.

About Invesco Insurance Investments

The Invesco Insurance Investment Solutions team works closely with insurance Chief Investment Officers and their teams to achieve their business objectives.

Through deeper understanding of the insurance environment and experience in insurance investment management we are privileged to partner with our clients whilst seeking to provide a differentiated value-added outcome across the full investment cycle that could produce enhanced business results.

Meeting the evolving needs of our insurance clients

Focusing on specific clients' goals, our approach is designed to optimize investment return for both policyholder and shareholder under specific insurance constraints:

- Liabilities: duration, duration volatility, guaranties cost, estate protection, required liquidity, product design;
- Accounting Earnings: aiming to deliver steady, stable and sustainable outcome for shareholders and policyholders under local and international standards;
- Regulatory capital: seeking to preserve the solvency ratio, limit the volatility of the general account or improve the return on capital;
- Risk Management: financial risk sensitivities, concentration risk, liquidity risk, eligible instruments (prudent person).

Using advanced analytics in conjunction with the insurance specific regulatory & accounting constraints, our approach offers you the potential to:

- design liability matching portfolios and evaluate the performance and risk of insurance portfolios in conjunction with liabilities using our proprietary methods and compare it with regulatory requirements;
- enhance current portfolio outcome by assessing a broader range of asset classes and factor exposures;
- design innovative strategies allowing our clients to build high value add competitive products for their clients.

In developing customized solutions for clients, the team's approach includes liabilities, risk analytics and practical implementation challenges including current asset allocation and liquidity challenges:

- assisting clients in North America, Europe and Asia, Invesco Investment Solutions Invesco's Global Solutions team consists of over 50 professionals, with 20+ years of experience across the leadership team;
- the team benefits from Invesco's on-the-ground presence in more than 20 countries worldwide*, with over 150 professionals* to support investment selection and ongoing monitoring.

*Source: Invesco, April 30th of 2019

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