White Paper | February 2024

NEUBERGER BERMAN

TULLY CHENG
Head of EMEA Insurance Analytics

GILLES DRUKIER
Head of EMEA Insurance Solutions

FLORA XU
Insurance Strategist

Capital Market Assumptions 2024: Implications for European Insurance Portfolios

Each year, Neuberger Berman updates its capital market assumptions to create future return and risk estimates for major asset classes, agnostic of any tactical views or alpha-generating potential. Changes to those assumptions reflect changes in our economic and market outlooks and in asset valuations, and they can have a meaningful effect on the relative attractiveness of asset classes in portfolio optimizations.

In this paper, we present key findings from our 2024 capital market assumptions, following a year of recovering equity markets, volatile bond markets and persistent above-target inflation. We consider how those findings relate to some of the current challenges insurers are facing—such as claims inflation, asset-liability duration mismatches and the gap between book yields and market yields—and discuss some implications for euro-based insurance asset allocation.

Executive Summary

- Following a dramatic sell-off in both equities and bonds during 2022, 2023 brought some relief in equities, but continued uncertainty in fixed income, as inflation ran above target and policy rates were tightened further.
- We show the changes between 2023 and 2024 in our estimates for five- to 10-year return and volatility for a range of asset classes, as well as changes in estimated returns relative to Solvency Capital Requirement for Market Risk (market SCR).
- For an illustrative life insurer and an illustrative general insurer, we show the effect on estimated return, estimated volatility and market SCR of reallocating 1% of a portfolio *pro rata* to a range of asset classes under our 2024 capital market assumptions.
- When we relate these findings to insurers' current challenges, we see four key themes:

1) **Fixed income remains relatively attractive:** We see opportunities for insurers to close the duration gap between assets and liabilities at current yields, using government and investment grade corporate bonds alongside less-liquid securitized and private credit markets.
2) **Market dislocations create opportunity for providers of liquidity and long-term capital:** This lies behind competitive estimated returns for asset classes, such as private equity, private credit and specialty finance.
3) **Life insurers' book yields are still lower than yields in liquid cash and bond markets:** Private and less-liquid assets could help insurers close that gap, enabling their savings products to compete against bank deposits and money market funds.
4) **Inflation is pushing up the cost of claims for general insurers:** Loans, residential mortgages, private real assets and potentially commodities could help to mitigate the impact of inflation on liabilities.

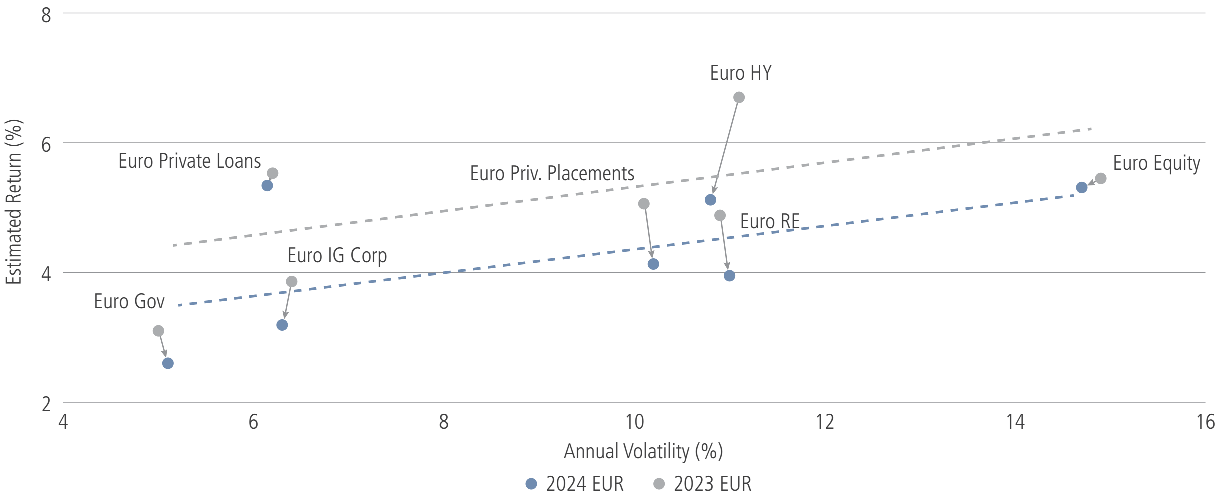
In 2022, a dramatic sell-off in both equity and bond markets meant that euro-based investors came into 2023 facing high fixed income yields (especially in short-dated fixed income) and lower equity market valuations. Coupled with higher U.S. dollar-hedging costs and higher volatility estimates, the overall effect on our capital market assumptions was a flatter capital-market line, significantly enhancing the relative attractiveness of fixed income assets over equities.

Capital Market Assumptions: 2024 versus 2023

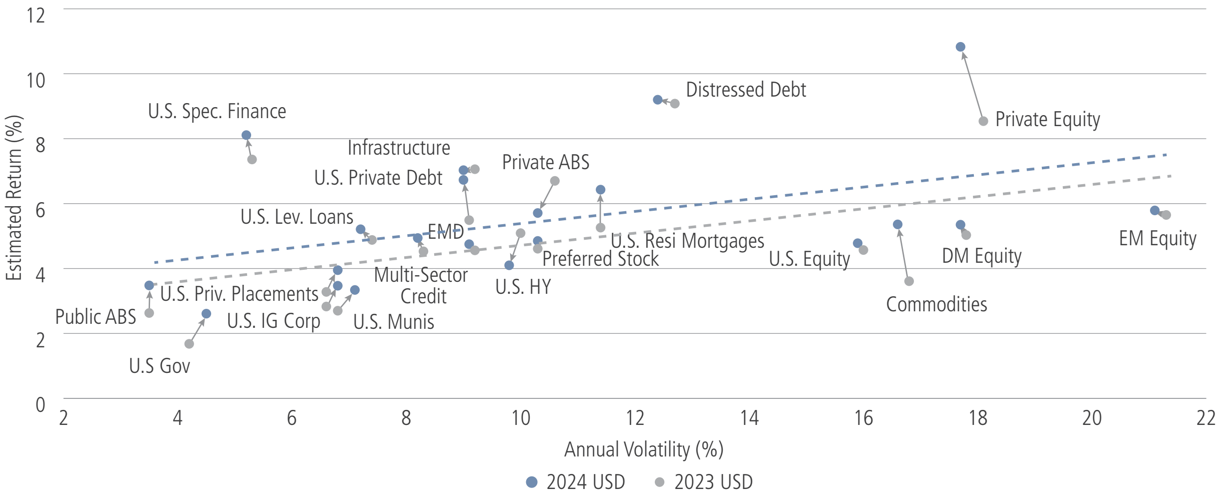
In 2023, inflation has stayed above central bank targets and policy rates tightened further, keeping fixed income yields at elevated levels. While U.S. dollar-hedging costs eased, economic growth was surprisingly resilient, especially in the U.S., helping stabilize equity markets and compress credit spreads. As figure 1 shows, lower hedging costs for non-euro assets have raised the capital market line and, while it remains fairly level, economic resilience has steepened it relative to a year ago—a move marginally in favor of riskier assets, especially private equity. For euro assets, the capital market line has moved lower overall, and is now even flatter than it was a year ago, further favoring investment grade fixed income.

FIGURE 1: NEUBERGER BERMAN CAPITAL MARKET ASSUMPTIONS: 2024 VS 2023

Estimated annualized return and volatility, five- to 10-year term, EUR asset classes



Estimated annualized return and volatility, five- to 10-year term, non-EUR asset classes



Source: Neuberger Berman, Bloomberg-Barclays, Cambridge Associates, FactSet; Analytics are as of December 31, 2023. Non-Euro assets are hedged to EUR using 3-month forwards (-1.47% USD to EUR for 2024 and -2.51% USD to EUR for 2023).

IMPORTANT: The performance and risk projections/estimates are hypothetical in nature and reflect the Neuberger Berman's Capital Market Assumptions. The estimates do not reflect actual investment results and are not guarantees of future results. Actual returns and volatility may vary significantly. Asset classes are represented by benchmarks and do not represent any Neuberger Berman investment product or service. Please see Additional Disclosures at the end of the presentation for asset class and index definitions, terminology definitions and Neuberger Berman Capital Market Assumptions. Investing entails risks, including possible loss of principal.

Looking more closely at the results, we find that the estimated returns for many hedged U.S. dollar fixed income asset classes have risen, as lower hedging costs have more than compensated for a general compression of credit spreads and decrease in risk-free rates. In our return estimates above, we incorporate implied forward rates for cash, short-dated fixed income and floating-rate instruments to address anomalies arising from inverted yield curves. Even with these adjustments, the estimated returns for multi-sector credit and U.S. loans remain more attractive than for public equity. U.S. high yield and emerging markets debt remain competitive, with these fixed income asset classes exhibiting much lower volatility and meaningfully lower market SCR than equity under Solvency II.

Some areas of private lending, such as speciality finance, U.S. residential mortgages and U.S. private placements, have seen their estimated returns rise compared with last year. This reflects a growing spread between public and private lending rates, particularly following the mini banking crisis of early 2023, which forced many banks to withdraw from these financing markets and raised demand for capital from the smaller asset-manager lending base.

Infrastructure's estimated return has also risen, driven by increasing income generation due to inflation and a strong growth tailwind from public policy and the energy transition. It is also worth noting that the return from commodities—a potentially useful portfolio diversifier and hedge against inflation spikes—has seen a similar rise as the market priced for an economic "hard landing" during the second half of 2023.

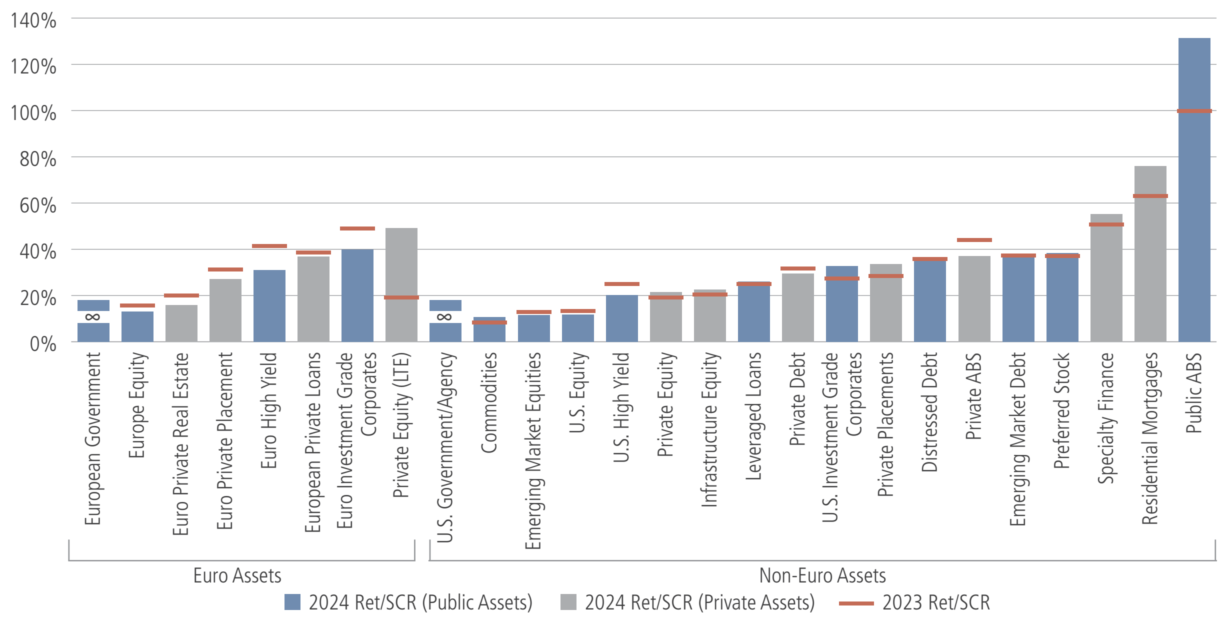
For this year's private equity estimates, we have moved from a model based on the historical relationship between private and public equity market performance to a model of the asset class's underlying fundamentals. Private equity looks more attractive than it did last year for both estimated return and volatility, and this reflects the resilience of revenue, earnings growth and other key fundamental metrics of privately owned companies in the face of economic headwinds. It is worth noting that our previous historical relationship model gives a similar result because private-market investments have historically had shallower drawdowns and faster recovery rates than public-market investments during downturns.[1]

Estimated Return Relative to Solvency Capital Requirements

Considering a different aspect of risk, we also examine the year-over-year change in our capital market assumptions in terms of Solvency Capital efficiency. Figure 2 compares 2023 return estimates versus the market SCR of each asset class (orange lines) with our new, 2024 return estimates versus market SCR (blue bars for public markets and gray bars for private markets).

FIGURE 2: SOLVENCY CAPITAL EFFICIENCY: 2024 VS 2023

Estimated annualized return divided by market SCR



Source: Neuberger Berman, Bloomberg-Barclays, Cambridge Associates, FactSet; Analytics are as of December 31, 2023. Non-Euro assets are hedged to EUR using 3-month forwards (-1.47% USD to EUR for 2024 and -2.51% USD to EUR for 2023).

IMPORTANT: The performance and risk projections/estimates are hypothetical in nature and reflect the Neuberger Berman's Capital Market Assumptions. The estimates do not reflect actual investment results and are not guarantees of future results. Actual returns and volatility may vary significantly. Asset classes are represented by benchmarks and do not represent any Neuberger Berman investment product or service. Please see Additional Disclosures at the end of the presentation for asset class and index

[1] See NB Private Equity Team and NB Institutional Solutions, *The Historical Impact of Economic Downturns on Private Equity* (May 2022) at https://www.nb.com/en/link?type=article&name=the-historical-impact-of-economic-downturns-on-private-equity definitions, terminology definitions and Neuberger Berman Capital Market Assumptions. Investing entails risks, including possible loss of principal.

While we see fewer dramatic changes than we did a year ago, we still see similar trends to those based on our volatility and return estimates. Private markets and fixed income, including some areas of extended credit, are more attractive than public equities. The biggest improvements compared with last year's levels are in private equity, infrastructure, U.S. investment grade corporate bonds, private placements, ABS and residential mortgages.[2]

We think it is important to note, that the implications of our new capital market assumptions can be quite different depending on whether we are considering equity or fixed income. With equity, a marginal euro has very similar exposure to a change in capital market assumptions as an already-invested euro. There is little benefit from divesting and reinvesting. By contrast, a marginal euro allocated to fixed income has not only avoided the price depreciation seen in 2022 and 2023, but also benefits from the higher coupons and yields available in 2024—whereas an already-invested fixed-income euro is stuck in a low-yielding security purchased at a high price, likely showing an unrealized loss.

In other words, the past two years have left insurers with a stark dichotomy between high market yields and low book yields (compounded by unrealized losses). This could present problems for insurers seeking to bridge the gap between book and market yields without crystalizing unrealized losses—for example, life insurers struggling to offer attractive rates on their with-profits products due to this drag from their "back book." Some countries experienced increased lapse, which triggered liquidity issues and increased SCR. While this can be partly managed by reinvesting only income, or principal only when existing assets reach maturity, that approach would take a long time. Reinvesting into markets that offer higher yields than core fixed income can help speed up the adjustment.

On a similar note, current fixed income yields offer a significant opportunity to close insurers' asset-liability duration gaps, which the Bank of International Settlements estimates at two years, on average, across major life insurance companies. Rising yields induced euro-area insurers to lower their credit, liquidity and duration risk-taking, but now that markets are pricing some easing of monetary policy in 2024, we think they should consider closing that duration gap. Traditionally, insurers used interest rate swaps and government bonds to match duration with a low SCR, but as we suggest below, high quality private fixed income assets could also offer some interesting opportunities that come with significant liquidity premia and strong covenants from investment-grade borrowers.

KEY ASSET ALLOCATION THEMES 2024

For All Insurers

- **Fixed income remains relatively attractive:** We see opportunities for insurers to close the duration gap between assets and liabilities at current, higher yields—especially using less-liquid markets that offer substantial premia versus government bonds or swaps.
- **Market dislocations create opportunity for providers of liquidity and capital:** The ongoing withdrawal of traditional bank financing and the development of alternative lenders lies behind the competitive estimated returns for many less-liquid fixed income and lending markets; for those that can consider the asset class, capital shortages and exit bottlenecks have also raised the competitive estimated returns in private equity.

For Life Insurers

- **Life insurers' book yields are lower than yields in liquid cash and bond markets:** Extended or less-liquid fixed income and lending markets could help insurers close that gap, enabling their savings products to compete against bank deposits and money market funds.

For General Insurers

- **Inflation is pushing up the cost of claims:** Loans, residential mortgages, private debt and private real assets (such as real estate, infrastructure and potentially commodities, if the heightened SCR can be tolerated) could help to mitigate the impact of inflation on liabilities.

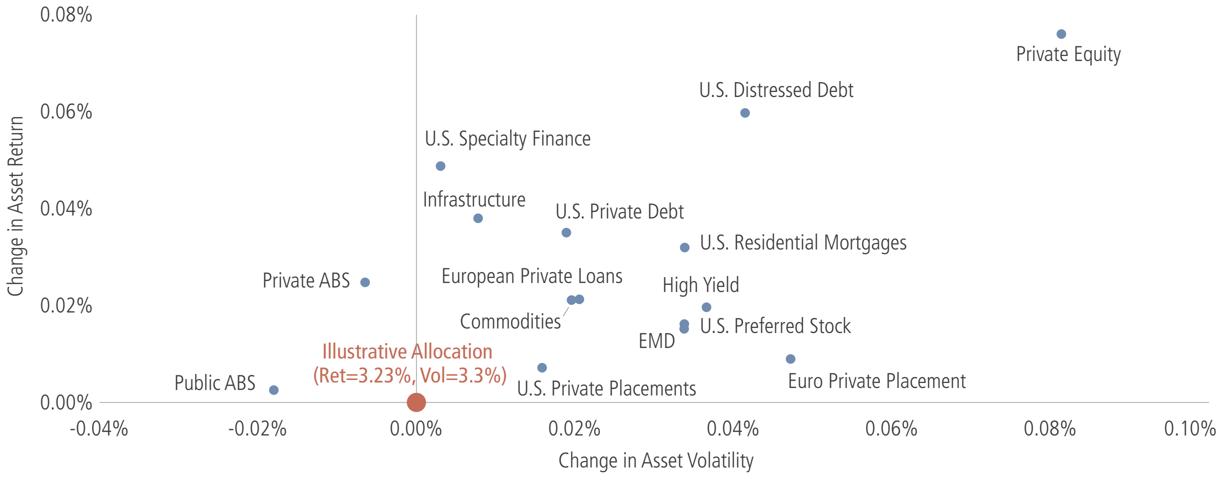
Marginal Analyses for Life and General Insurers

To further explore the potential for these investments to add value to an insurer's asset allocation, we run a marginal analysis for an illustrative life insurer (figure 3) and for an illustrative general insurer (figure 4). The marginal analysis takes illustrative insurer's current portfolio and reallocates 1% *pro rata* to each of the asset classes shown, in turn, and shows the effect that has on the portfolio's estimated return, volatility and market SCR. Details of the illustrative current portfolios are shown in the Appendix.

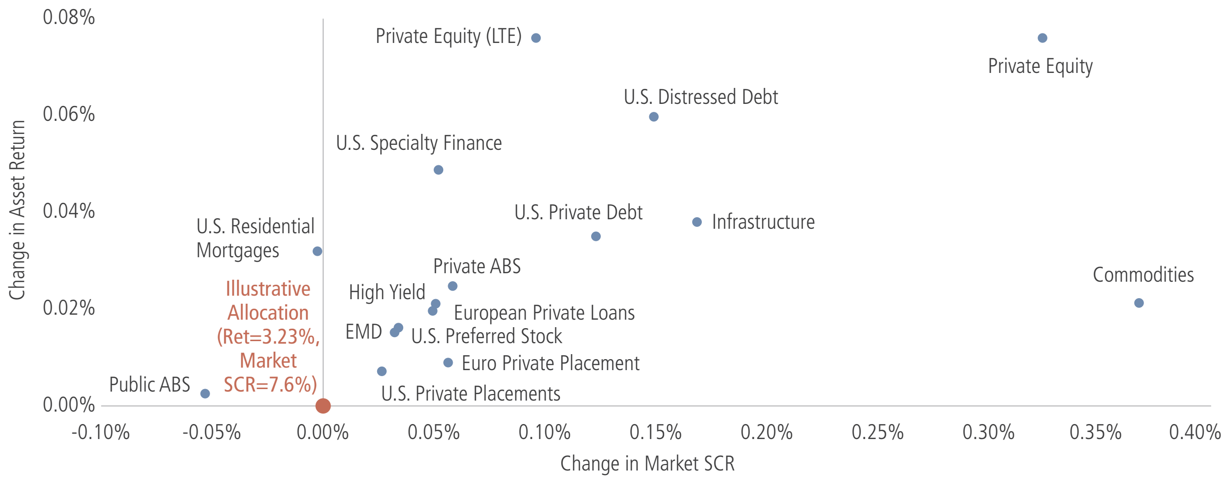
[2] For the purposes of this paper, we assume that public and private ABS qualify for treatment as "simple, transparent and standardized" (STS) securitizations under Solvency II, thereby incurring a lower SCR.

FIGURE 3: MARGINAL ANALYSIS: ILLUSTRATIVE LIFE INSURER

Change in estimated annualized return and volatility of a portfolio when 1% is reallocated *pro rata* to each named asset class



Change in estimated annualized return and market Solvency Capital Requirement of a portfolio, when 1% is reallocated *pro rata* to each named asset class



Source: Neuberger Berman, Bloomberg, Cambridge Associates, FactSet. Analytics as of December 31, 2023. Non-Euro assets are hedged to EUR using one-month forwards (-1.47% USD to EUR for 2024 and -2.51% USD to EUR for 2023). The original asset allocation of the illustrative insurer is shown in the Appendix. The performance and risk projections/estimates are hypothetical in nature and reflect the Neuberger Berman's Capital Market Assumptions. The estimates do not reflect actual investment results and are not guarantees of future results. Actual returns and volatility may vary significantly. Asset classes are represented by benchmarks and do not represent any Neuberger Berman investment product or service. Please see Additional Disclosures at the end of the presentation for asset class and index definitions and Neuberger Berman Capital Market Assumptions. Investing entails risks, including possible loss of principal.

In these charts, we show only those asset classes that raise estimated return and are not core assets commonly held in insurers' portfolios.

For our life insurer, ABS is the only asset class that both raises estimated return and lowers volatility. U.S. specialty finance, U.S. private debt, European private loans, distressed debt are attractive sustaining last year's theme of gaining efficiency via less-liquid credit markets.[3] On the alternative side, commodities, infrastructure and private equity also have higher risk-adjusted returns.

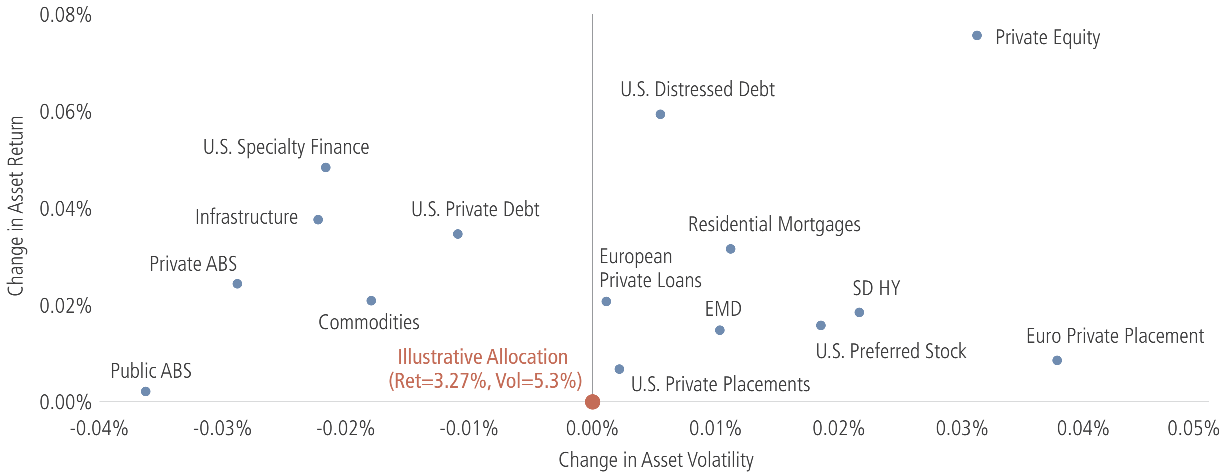
When we optimize for SCR, public ABS continues to come out well. It is notable that U.S. residential mortgages is the only other asset class that both raises return and lowers SCR; this is because they are penalized much less on SCR than on volatility, as they incur no market SCR at all if they are subject only to counterparty risk and have a loan-to-value ratio less than 60%.

[3] "Speciality finance" encompasses a range of lending markets, including consumer lending, small-business lending (including distressed debt), receivables finance and bridge loans.

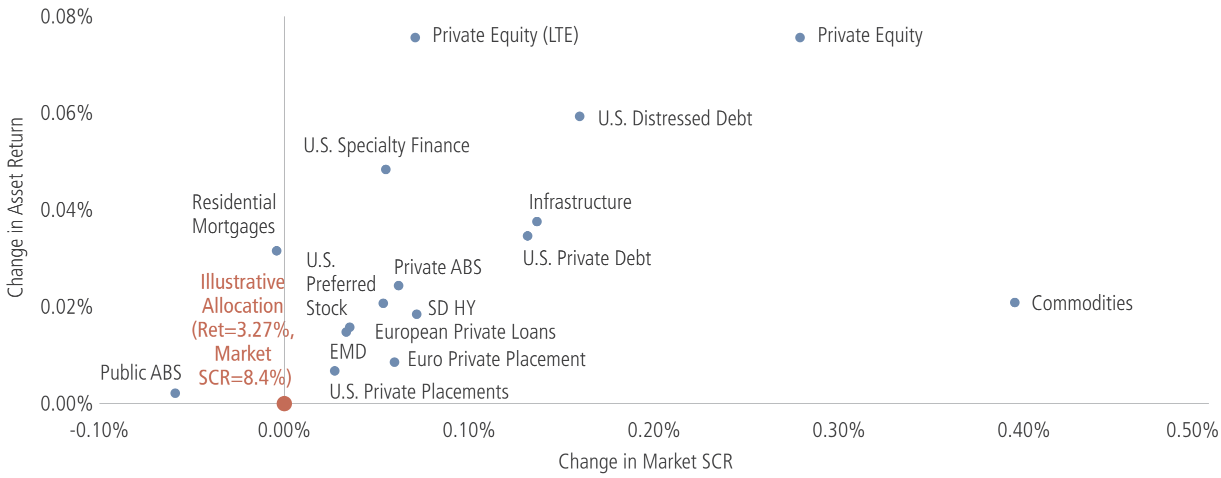
Specialty finance and distressed debt also continue to look attractive. While the improvement in commodities' risk-adjusted returns and diversifying qualities make them attractive from a conventional perspective, they carry a high SCR that is likely to make them unaffordable for most insurers. But perhaps the outstanding observation to make here is the efficiency that could be gained by adding private equity investments that are eligible for treatment as long-term equity under Solvency II, where the SCR can be reduced from as much as 49% with a symmetric adjustment to just 22%.

FIGURE 4: MARGINAL ANALYSIS: ILLUSTRATIVE GENERAL INSURER

Change in estimated annualized return and volatility of a portfolio when 1% is reallocated *pro rata* to each named asset class



Change in estimated annualized return and Solvency Capital Requirement of a portfolio, when 1% is reallocated *pro rata* to each named asset class



Source: Neuberger Berman, Bloomberg, Cambridge Associates, FactSet. Analytics as of December 31, 2023. Non-Euro assets are hedged to EUR using one-month forwards (-1.75% USD to EUR for 2024 and -2.51% USD to EUR for 2023). The original asset allocation of the illustrative insurer is shown in the Appendix. The performance and risk projections/estimates are hypothetical in nature and reflect the Neuberger Berman's Capital Market Assumptions. The estimates do not reflect actual investment results and are not guarantees of future results. Actual returns and volatility may vary significantly. Asset classes are represented by benchmarks and do not represent any Neuberger Berman investment product or service. Please see Additional Disclosures at the end of the presentation for asset class and index definitions and Neuberger Berman Capital Market Assumptions. Investing entails risks, including possible loss of principal.

For our illustrative general insurer, we find a little less room for efficiency gains given its shorter-dated liabilities. Continuing the private markets theme, we find private ABS, infrastructure, U.S. private debt and U.S. specialty finance meaningfully raising estimated return while lowering volatility. Commodities is the only public market asset class that achieves the same result, reflecting its strong diversification benefits. European private loans, U.S. residential mortgages, distressed debt and private equity would also be attractive additions.

Once again, ABS looks attractive when we optimize for SCR, as do residential mortgages (for the reasons described above—a general insurer would likely opt for shorter maturities in this asset class than a life insurer). A host of extended and less-liquid fixed income and lending markets raise estimated return with only a slight increase in SCR.

Conclusion: Major Change Demands Major Decisions

The market environment, and therefore capital market assumptions, has materially changed since the end of 2021. We believe that increases the importance of rethinking asset allocation—for all investors, but particularly for insurance companies that invest heavily in the fixed income markets that have moved so dramatically over the past two years.

During 2023, the availability of attractive yield and credit spread led European insurers to overallocate to high quality public market bonds in their local currencies. At the same time, their duration mismatch narrowed as the duration of liabilities decreased more than that of assets, leading to an improved solvency position, but also a massive drag from their "back book".

We think insurance companies should navigate this regime shift and the increased rates volatility carefully during 2024, balancing the need to generate yield in line with the market with the constraints of their existing asset mix. While the overall picture has changed less dramatically through 2023 than it did through 2022, we believe the opportunities in extended and private fixed income investment have in many cases become still more attractive, often due to capital shortages caused by banks withdrawing from certain lending and liquidity-provision roles.

We think insurers that can follow the "smart money" into these asset classes and strategies—such as subordinated private debt, asset-backed lending and residential mortgages—should consider doing so. These strategies have the potential to meaningfully enhance the estimated risk-adjusted returns of insurance portfolios, improve their Solvency-Capital efficiency and address some of the key challenges currently facing insurers.

Appendix

Indices Used

Europe Government	Bloomberg Euro Treasury Index
Euro Investment Grade Corp	Bloomberg Euro Corporate Index
Euro HY	Bloomberg Euro High Yield Index
European Private Loans	iBoxx Euro Non-Financials BBB (5-7 years) Index
Europe Equity	MSCI Europe Index
Europe Real Estate	Custom Index: Dynamic combination of MSCI Europe Large Cap Index and S&P Eurozone Sovereign Bond Index
U.S. Government/Agency	Bloomberg U.S. Government Index
U.S. Investment Grade Corporate	Bloomberg U.S. Corporate Index
U.S. Municipal Bonds	Bloomberg Municipal Bond Index
U.S. Private Placement	Custom Index: Bloomberg U.S. Corporate Index + 50 bps
Euro Private Placement	Custom Index: Bloomberg Euro Corporate Index + 80 bps
U.S. HY	Bloomberg U.S. Corporate High Yield Bond Index
Leveraged Loan	60% Morningstar LSTA US BB Ratings Loan Index & 40% Morningstar LSTA US B Ratings Loan Index
Emerging Markets Debt	Custom Index: 50% J.P. Morgan Emerging Markets Bond Global Diversified Index (EMBI Global Diversified) / 50% J.P. Morgan Corporate Emerging Markets Bond Index (CEMBI)
Residential Mortgages	Bloomberg Barclays Capital U.S. MBS / Citi Legacy RMBS
U.S. Equities	S&P 500 Index
Non-U.S. Equities	MSCI All Country World Index ex USA
Non-U.S. Developed Market Equities	MSCI EAFE Index
Emerging Markets Equities	MSCI Emerging Markets Net Return Index
Private Equity	Burgiss Global Buyout Funds Index
Private Equity (LTE)	A sub-set of equity investments consisting only of equities that are listed in the European Economic Area (EEA) or of unlisted equities of companies that have their head offices in countries that are members of the EEA.
U.S. Private Debt	Burgiss U.S. Private Debt Funds Index
Specialty Finance	Bloomberg U.S. Corporate BB High Yield (1-3 years) Index
Public ABS	Bloomberg ABS Index
Private ABS	Bloomberg ABS Index plus a liquidity premium, represented by 85% A rated U.S. ABS and 15% BBB rated U.S. ABS
Distressed Debt	Credit Suisse Distressed Loan Index
Infrastructure	Burgiss Infrastructure Index

Neuberger Berman Capital Market Assumptions Framework

Asset Class	Return Estimate	Risk Estimate
Fixed Income	Market yields of public indices adjusted for default cost[1]	Historical volatility of monthly return series from 2007
Equity	"Building Block" approach[2]	
Liquid Alternatives	Factor regression	
Illiquid Alternatives	"Building Block" approach[2]	Historical volatility of quarterly series from 2007 with de-smoothing

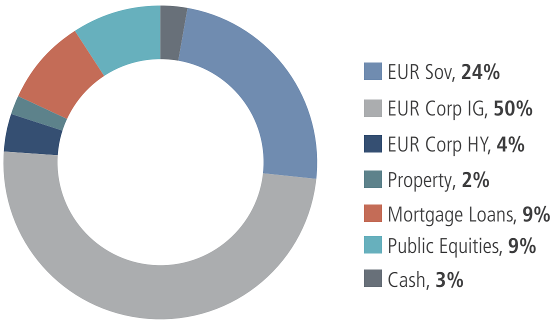
Source: Neuberger Berman. For illustrative purposes only.

[1] For certain asset classes where a standard public index may not be readily available, NB will create a proxy index using a combination of similar asset classes. Default costs are estimated at the CUSIP level then aggregated to the index level; where CUSIP-level data is unavailable, NB will estimate default costs at the index level.

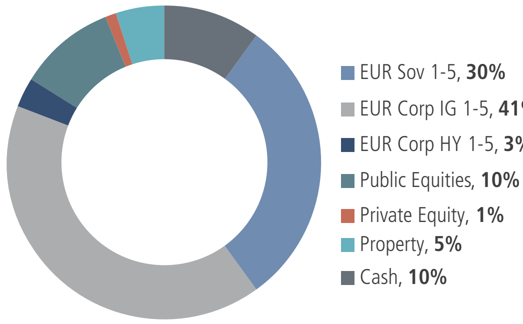
[2] Separate estimates are made for different sources of return (income yield, valuation change, earnings growth), and these "blocks" are aggregated to establish an asset class-level estimated return.

ILLUSTRATIVE INSURER PORTFOLIOS USED IN THE MARGINAL ANALYSES

Illustrative Life Insurer Portfolio



Illustrative General Insurer Portfolio



Source: Neuberger Berman.

Estimated Return, Risk and Solvency Capital Requirement of Asset Classes Used in the Marginal Analyses

Asset Class	Currency	Expected Return (%)[1]	Annual Vol (%)	OAS (bps)	Rating	Market SCR (%)
Illustrative General Insurer Portfolio	-	**3.23**	**3.3**	**76**	**A**	**7.6**
Illustrative Life Insurer Portfolio	-	**3.27**	**5.3**	**89**	**A**	**8.4**
SD HY	EUR	5.19	9.4	382	BA2/BA3	14.4
HY	EUR	5.12	10.8	381	BA2/BA3	16.4
European Private Loans	EUR	5.34	6.2	347	BAA2	14.5
EUR Private Placement	EUR	4.13	10.2	210	A2/A3	15.2
EMD	USD	4.75	9.1	334	BAA3	12.4
Residential Mortgages	USD	6.43	11.4	386	A2	8.4[2]
Private Debt	USD	6.73	9.0	572	B2	22.8
Distressed Debt	USD	9.20	12.4	1719	B3/CAA1	25.7
Specialty Finance	USD	8.11	5.2	154	BA2/BA3	14.7
Private Equity	USD	10.83	17.7	N/A	N/A	50.5 (22.0 if LTE[3])
Private ABS	USD	5.71	10.3	312	A2/A3	15.4
Commodities	USD	5.36	16.6	N/A	N/A	50.5
Infrastructure	USD	7.03	9.0	N/A	N/A	31.1
PP Corp	USD	3.95	6.8	149	A3/BAA1	11.8
Preferred Stock	USD	4.85	10.3	182	BAA1/BAA2	12.6
Public ABS	USD	3.48	3.5	68	AAA/AA1	2.7

Source: Neuberger Berman, Bloomberg, Cambridge Associates, FactSet. Analytics as of December 31, 2023. Non-Euro assets are hedged to EUR using one-month forwards (-1.47% USD to EUR for 2024 and -2.51% USD to EUR for 2023). The original asset allocation of the illustrative insurer is shown in the Appendix. The performance and risk projections/estimates are hypothetical in nature and reflect the Neuberger Berman's Capital Market Assumptions. The estimates do not reflect actual investment results and are not guarantees of future results. Actual returns and volatility may vary significantly. Asset classes are represented by benchmarks and do not represent any Neuberger Berman investment product or service. Please see Additional Disclosures at the end of the presentation for asset class and index definitions and Neuberger Berman Capital Market Assumptions. Investing entails risks, including possible loss of principal.

[1] Non-EUR assets are assumed to be fully hedged into EUR via rolling three-month currency forwards. For fixed income assets, estimated return is defined as market yield-to-worst adjusted for expected default costs; for equity and alternative assets it is defined as intermediate-term (five- to 10-year) expected returns.

[2] Mortgage loans of sufficient quality are subject only to counterparty credit risk under Solvency II; the capital charge is then nil if the loan-to-value ratio is less than 60%.

[3] LTE: Long-Term Equity treatment means a 22% capital charge in listed and unlisted equities, where specific regulatory requirements are met.

Additional Disclosures

Index Definitions

The **Bloomberg Euro Treasury Index** consists of fixed-rate, investment-grade public obligations of the sovereign countries participating in the European Monetary Union. This index currently contains euro-denominated issues from 18 countries. The index was created in 1998, with history backfilled to June 1, 1998.

The **Bloomberg Euro Corporate Bond Index** is a broad-based benchmark that measures the investment grade, euro-denominated, fixed-rate corporate bond market. Inclusion is based on currency denomination of a bond and not country of risk of the issuer. The Index was launched on 1 June 1998.

The **Bloomberg Euro High Yield Index** measures the market of non-investment grade, fixed-rate corporate bonds denominated in Euro. Inclusion is based on the currency of issue and not the domicile of the issuer. The index excludes emerging market debt. It was created in 1999 and is part of the Global High Yield Index.

The **Markit iBoxx EUR Liquid Non-Financials Index** is a subset of the Markit iBoxx EUR Non-Financials bonds universe and contains up to 20 investment grade rated non-financial securities with maturity 5-7yrs and a BBB rating. All bonds need to have an average rating of investment grade from Fitch Ratings, Moody's Investor Service and Standard & Poor's Rating Services.

S&P Eurozone Sovereign Bond Index seeks to measure the performance of fixed-rate locally denominated sovereign debt publicly issued by Eurozone country governments for their domestic markets.

The **Bloomberg U.S. Government Index** includes Treasuries (public obligations of the U.S. Treasury that have remaining maturities of more than one year) and U.S. agency debentures (publicly issued debt of U.S. Government agencies, quasi-federal corporations, and corporate or foreign debt guaranteed by the U.S. Government).

The **Bloomberg Municipal Bond Index** covers USD-denominated, long-term, tax-exempt state and local general obligation bonds, revenue bonds, insured bonds, and prerefunded bonds.

The **Bloomberg U.S. Corporate Index** measures the investment grade, fixed-rate, taxable corporate bond market. It includes USD-denominated securities publicly issued by U.S. and non-U.S. industrial, utility and financial issuers that meet specified maturity, liquidity and quality requirements. The Index was launched on January 1, 1973.

The **Bloomberg U.S. Corporate High Yield Bond Index** covers the USD-denominated, non-investment grade, fixed-rate, taxable corporate bond market. Securities are classified as high-yield if the middle rating of Moody's Fitch, and S&P is Ba1/BB+/BB+ or below. The index excludes Emerging Markets debt. The Index was created in 1986, with index history backfilled to January 1, 1983.

The **Morningstar LSTA U.S. Leveraged Loan Index** is a market-value weighted index designed to measure the performance of the market in U.S. syndicated, term leveraged loans that are held within top-tier institutional investor loan portfolios tracked by PitchBook and LCD.

The **JPMorgan Emerging Markets Bond Global Diversified Index (EMBI GD)** includes U.S. dollar-denominated Brady bonds, Eurobonds, and traded loans issued by sovereign and quasi-sovereign entities.

The **JPMorgan Corporate Emerging Markets Bond Diversified Index (CEMBI)** is a market-capitalization weighted index of corporate bonds issued by entities in emerging countries.

The **S&P 500 Index** consists of 500 U.S. stocks chosen for market size, liquidity and industry group representation. It is a market value-weighted index (stock price times number of shares outstanding), with each stock's weight in the Index proportionate to its market value.

The **MSCI All Country World Index** ex USA is a market value-weighted index of more than 2,700 stocks from 22 developed and 24 emerging countries, excluding the U.S.

The **MSCI EAFE Index** aims to capture the performance of large and mid cap quality growth stocks across 21 developed market countries excluding the U.S. and Canada.

The **MSCI Emerging Markets Index** is a market-value weighted index designed to represent the performance of large- and mid-cap securities in 26 emerging markets.

The **MSCI Europe Index** captures large and mid cap representation across 15 Developed Markets countries in Europe. With 427 constituents, the index covers approximately 85% of the free float-adjusted market capitalization across the European Developed Markets equity universe.

The **Burgiss Global Buyout Funds Index** tracks the performance of closed-ended private equity buyout funds in the Burgiss Manager Universe, converted to U.S. dollars.

The **Burgiss U.S. Private Debt Funds Index** tracks the performance of U.S. closed-ended private debt funds in the Burgiss Manager Universe.

The **Burgiss Infrastructure Index** tracks Investments in long-life assets, properties, or other structures that provide some type of essential product or service; these often generate investment returns through income. Includes midstream and downstream oil and gas, power generation, transmission and distribution, telecommunication, and logistic assets.

The **Bloomberg U.S. Corporate BB High Yield (1-3 years) Index** measures the USD-denominated, high yield, fixed-rate corporate bond market with maturities of 1-3 years and a BB rating.

The **Bloomberg ABS Index** tracks the investment grade ABS components of the Bloomberg U.S. Aggregate index. Securities must be rated investment-grade by at least two of the following ratings agencies: Moody's, S&P, Fitch. If only two of the three agencies rate the security, the lower rating is used to determine index eligibility. If only one of the three agencies rates a security, the rating must be investment-grade. Securities must be ERISA eligible under the underwriter's exemption. 144A securities are not included. The ABS index includes pass-through, bullet, and controlled amortization structures. The ABS index includes only the senior class of each ABS issue and the ERISA-eligible B and C tranche.

The **Credit Suisse Distressed Loan Index** is a subset of the Credit Suisse Leveraged Loan Index, and includes loans priced at 90% of par or lower, as at the Index Rebalance Day.

Asset Class Assumptions & Estimates

Capital market assumptions used herein reflect Neuberger Berman's forward-looking estimates of the benchmark return or volatility associated with an asset class. Estimated returns and volatilities are hypothetical return and risk estimates generated by Neuberger Berman's Institutional Solutions Group. Estimated returns and volatilities do not reflect the alpha of any investment manager or investment strategy/vehicle within an asset class. Information is not intended to be representative of any investment product or strategy and does not reflect the fees and expenses associated with managing a portfolio or any other related charges, such as commissions and surrender charges. Estimated returns and volatilities are hypothetical and generated by Neuberger Berman based on various assumptions and inputs, including current market conditions, historical market conditions and subjective views and estimates. Capital market assumptions shown reflect Neuberger Berman's long-term (20+ years into the future) estimates or intermediate-term (5-7 years into the future) estimates which are reviewed at least annually. Results will differ depending on whether they are based on Neuberger Berman's long-term (20+ years into the future) or intermediate-term (5-7 years into the future) capital market assumptions. Neuberger Berman's capital market assumptions are derived using a building block approach that reflects historical, current, and projected market environments, forward-looking trends of return drivers, and the historical relationships asset classes have to one another. These hypothetical returns are used for discussion purposes only and are not intended to represent, and should not be construed to represent, predictions of future rates of return. Actual returns may vary significantly. Neuberger Berman makes no representations regarding the reasonableness or completeness of any such assumptions and inputs. Assumptions, inputs, and estimates are periodically revised and subject to change without notice. Estimated returns and volatilities should not be used, or relied upon, to make investment decisions.

Rate of Return Estimate: Rate of return or geometric return is a measure of average returns of an investment over a period of time. Geometric rate of returns are typically referred to as annualized compound rate of returns and are always less than or equal to the arithmetic mean return of the same time series. Geometric rate of returns are used for straight-line calculations within the analysis, for example, the cash flow calculations. In straight-line calculations, each year is represented as a gain, so the compound (geometric mean) rate of return is used to adjust for the amount needed to make up for a loss in a given year. For example, if you lose 5% in one year, and gain 5% the year after, you still have less than you started with at the beginning of year one.

Arithmetic Mean Estimate: Arithmetic mean or average return is calculated by dividing the sum of a series of numbers by the number of overall items. This is more typically thought of as an "average" of the data set. Arithmetic mean or average return ignores the impact of compounding in the context of analyzing investment returns and is the simple average of returns observed over a period of time. Arithmetic mean returns are used in this material and, if applicable, the Efficient Frontier, because, through randomization, losses and gains are being accounted for each year.

Standard Deviation: A statistical measure of the volatility based on the distribution of a set of data from its mean (average value). For example, a portfolio with an average return of 10% and a standard deviation of 15% would return a result between -5% and +25% the majority of the time (68% probability or 1 standard deviation), almost all of the time the return would be between -20% and +40% (95% probability or 2 standard deviations). If there were 0 standard deviation then the result would always be 10%. Generally, more aggressive portfolios have a higher standard deviation and more conservative portfolios have a lower standard deviation.

NEUBERGER | BERMAN

Neuberger Berman
1290 Avenue of the Americas
New York, NY 10104-0001

www.nb.com