

The background of the slide is a photograph of a large, rugged mountain peak, likely Mount Everest, covered in snow and partially shrouded in mist. The image is split vertically: the left half is in a lighter, desaturated blue tone, and the right half, where the text is located, is in a darker blue tone.

Diversification of pension fund portfolios in extreme scenarios

Insurance-Linked Securities (ILS)

Urs Ramseier

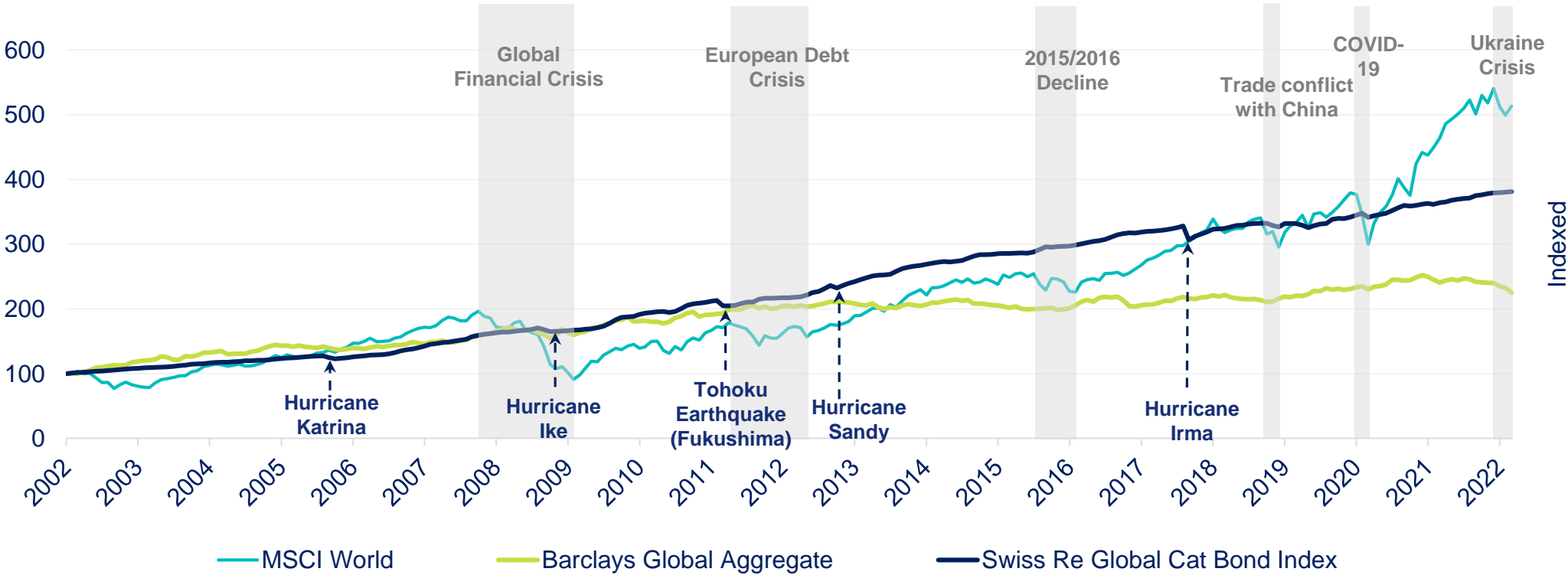
14 April 2022

Insurance-Linked Securities

Attractive returns



ILS (Cat Bonds) generated strong and stable returns with an average of around 7% p.a. since 2002



Source: Twelve Capital, Bloomberg. As at 31 March 2022. The MSCI World is a market cap weighted stock market index of more than 1'550 companies throughout the world. Swiss Re Global Cat Bond Index Total Return, calculated by Swiss Re Capital Markets, is a market value-weighted basket of natural cat bonds tracked by Swiss Re Capital Markets, calculated on a weekly basis. The Bloomberg Barclays Global-Aggregate Total Return Index Unhedged USD is a measure of global investment grade debt from 24 local currency markets. This benchmark includes treasury, government-related, corporate and securitized fixed-rate bonds from both developed and emerging markets issuers.

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Low correlation to financial markets



Correlation matrix

	Cat Bonds	Global Bonds	Global Equities	Hedge Funds	Commodity	Private ILS
Cat Bonds	1.00	0.05	0.20	0.24	0.22	0.57
Global Bonds	0.05	1.00	-0.21	-0.14	-0.27	0.05
Global Equities	0.20	-0.21	1.00	0.89	0.52	-0.01
Hedge Funds	0.24	-0.14	0.89	1.00	0.53	-0.01
Commodity	0.22	-0.27	0.52	0.53	1.00	-0.05
Private ILS	0.57	0.05	-0.01	-0.01	-0.05	1.00

Cat Bonds: The Swiss Re US Wind Cat Bond Total Return Index tracks the total return for all single peril US Wind Cat Bonds. Global Bonds: The Bloomberg Barclays Global High Yield Index is a multi-currency flagship measure of the global high yield debt market. Global Equities: MSCI Daily Total Return Net World USD. Hedge Funds: Hedge Fund Research HFRX Global Hedge Fund Index. Commodity: The Bloomberg Commodity Total Return Index is composed of futures contracts and reflects the returns on a fully collateralised investment in the BCOM. Private ILS: Private ILS advisory mandate managed by Twelve Capital.

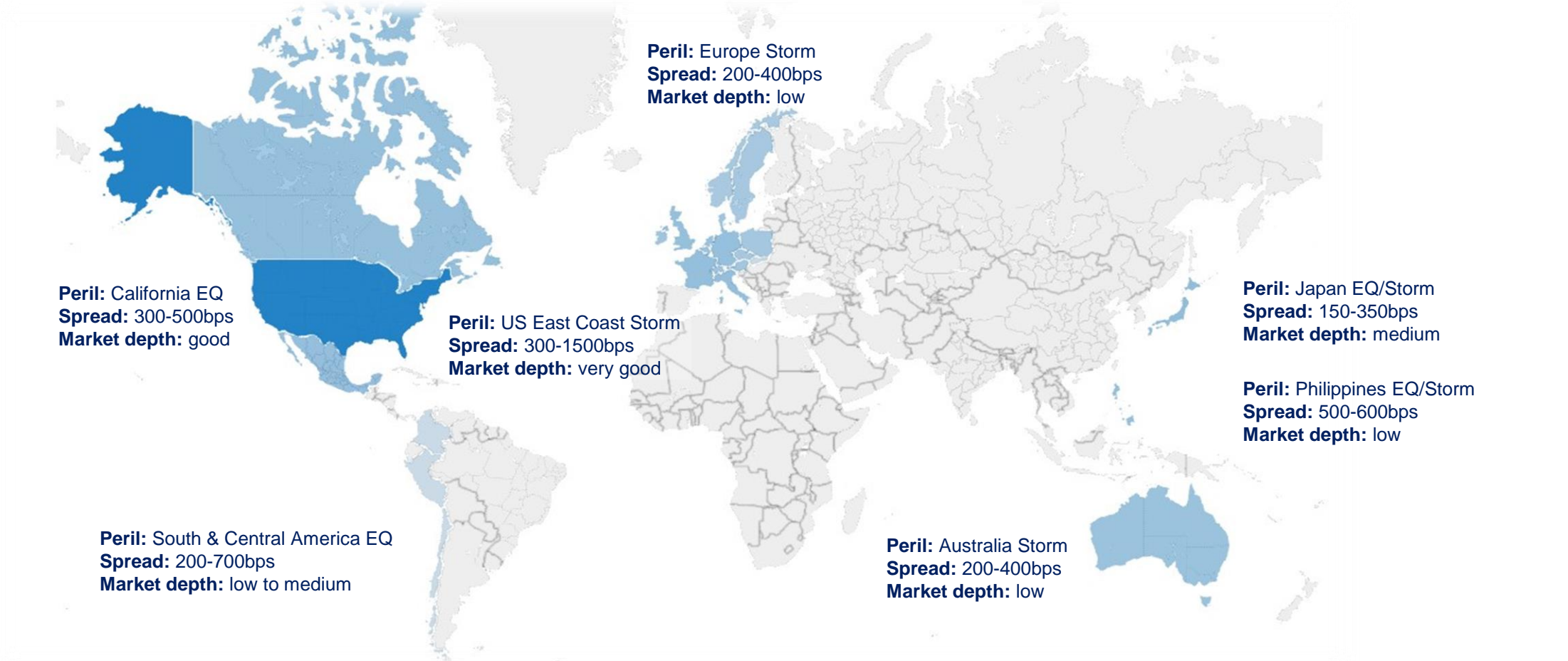
Source: Bloomberg, Twelve Capital. As at 31 December 2020. **Past performance is not indicative of future returns. The money placed in the fund can both increase and decrease in value and you may not get back the full invested amount.** All figures based on quarterly returns.

Insurance-Linked Securities

ILS has become an important source of (re)insurance capital



USD 512bn Capital available in traditional reinsurance market	USD 100bn+ Estimated size of ILS market	~ USD 40bn Liquid Cat Bond market size	+547% ILS market size growth since 2006
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Source: Aon, Artemis, Twelve Capital. As at 31 December 2020. EQ: Earthquake.

Insurance-Linked Securities

What is ILS?

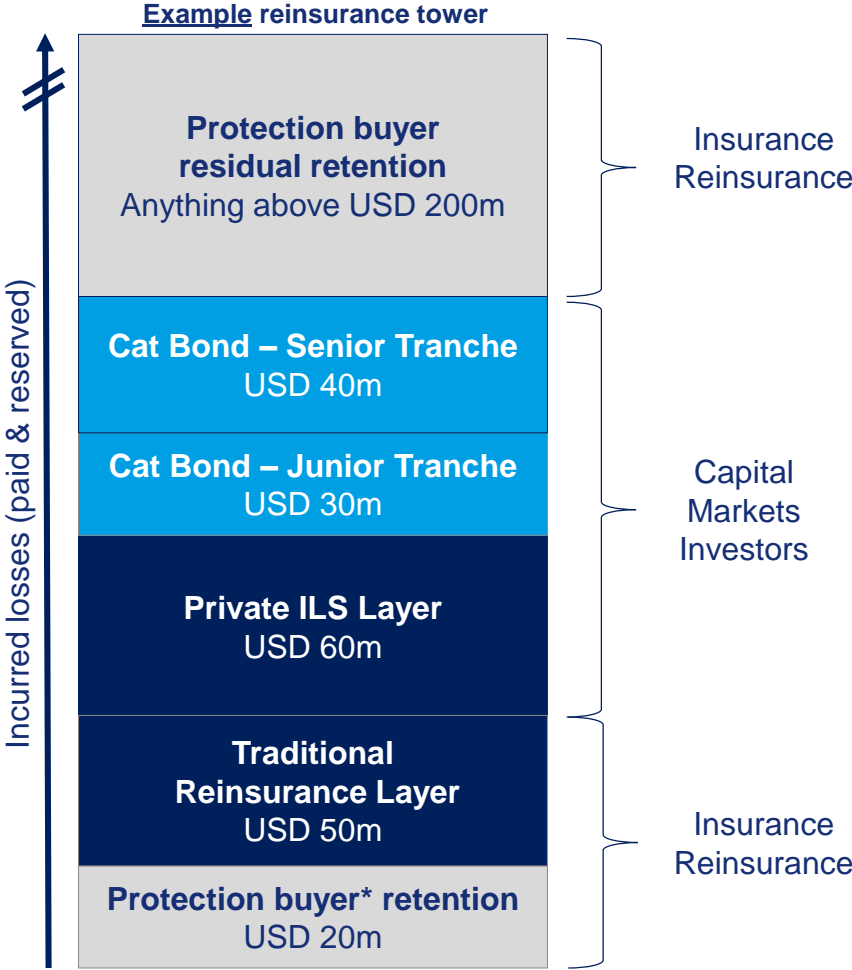
Insurance-Linked Securities (ILS) are financial instruments whose underlying value is driven by insurance risk

Liquid ILS

Catastrophe Bonds

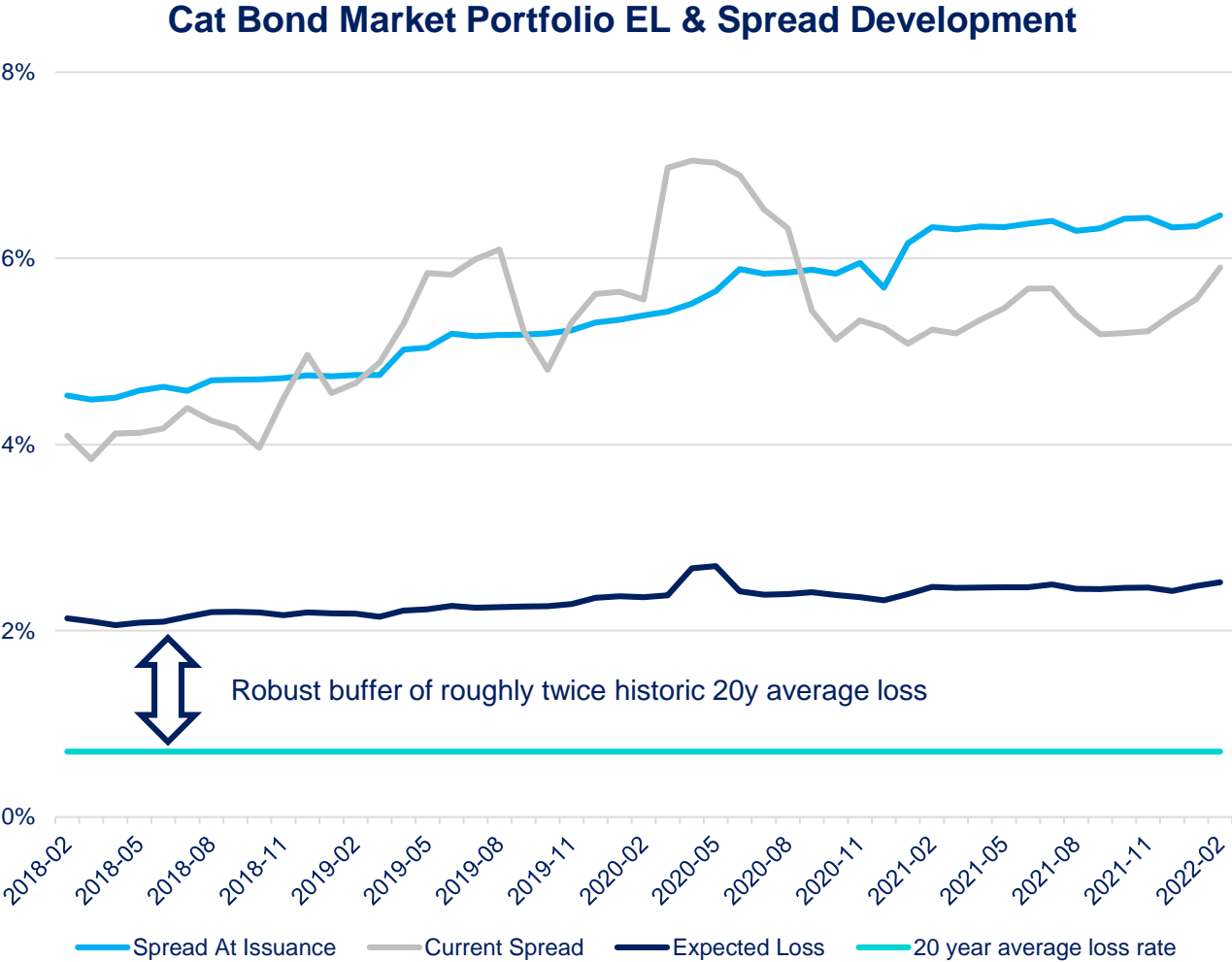
Private ILS

Collateralised reinsurance and private Cat Bonds



Insurance-Linked Securities

Spreads on a multi-year high



590 bps
Current Cat Bond spread

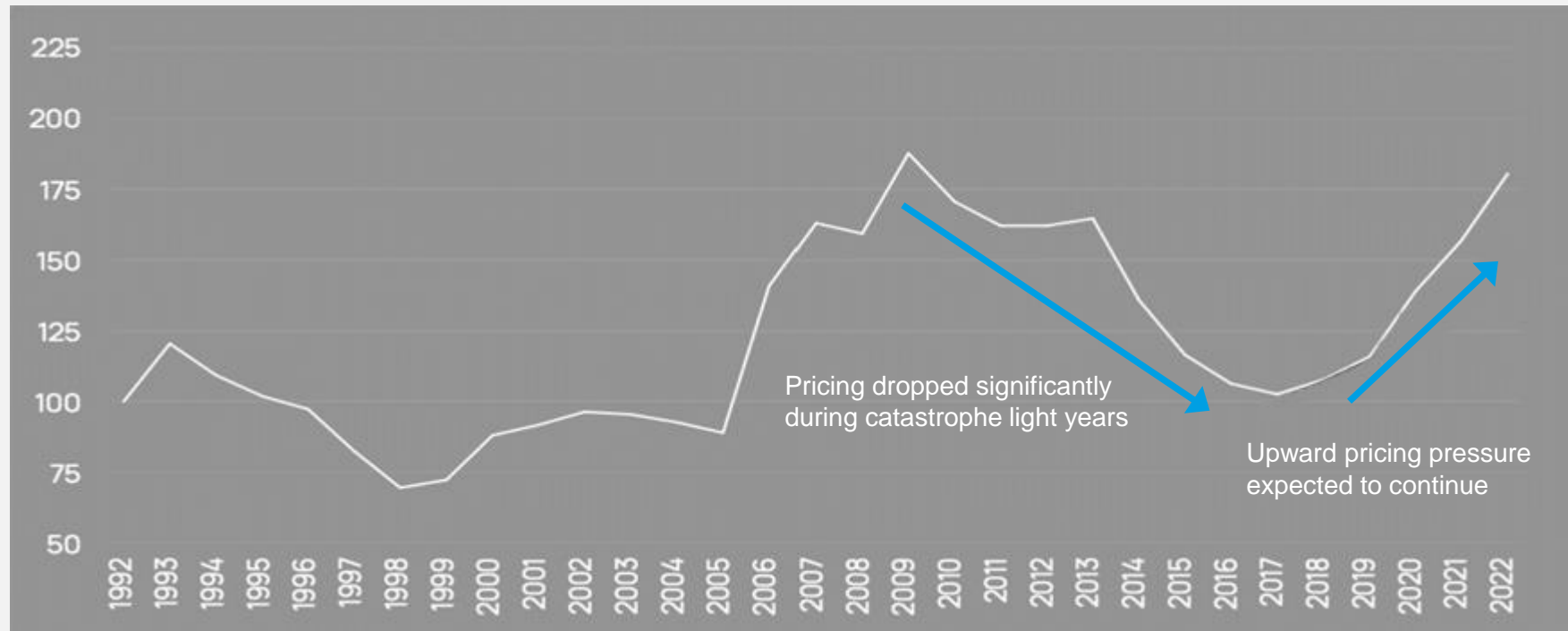
2.52%
Current expected loss

USD 3'316m
Notional issued in
cat bonds 2022 ytd

Insurance-Linked Securities

Reinsurance rates increasing

Premium development

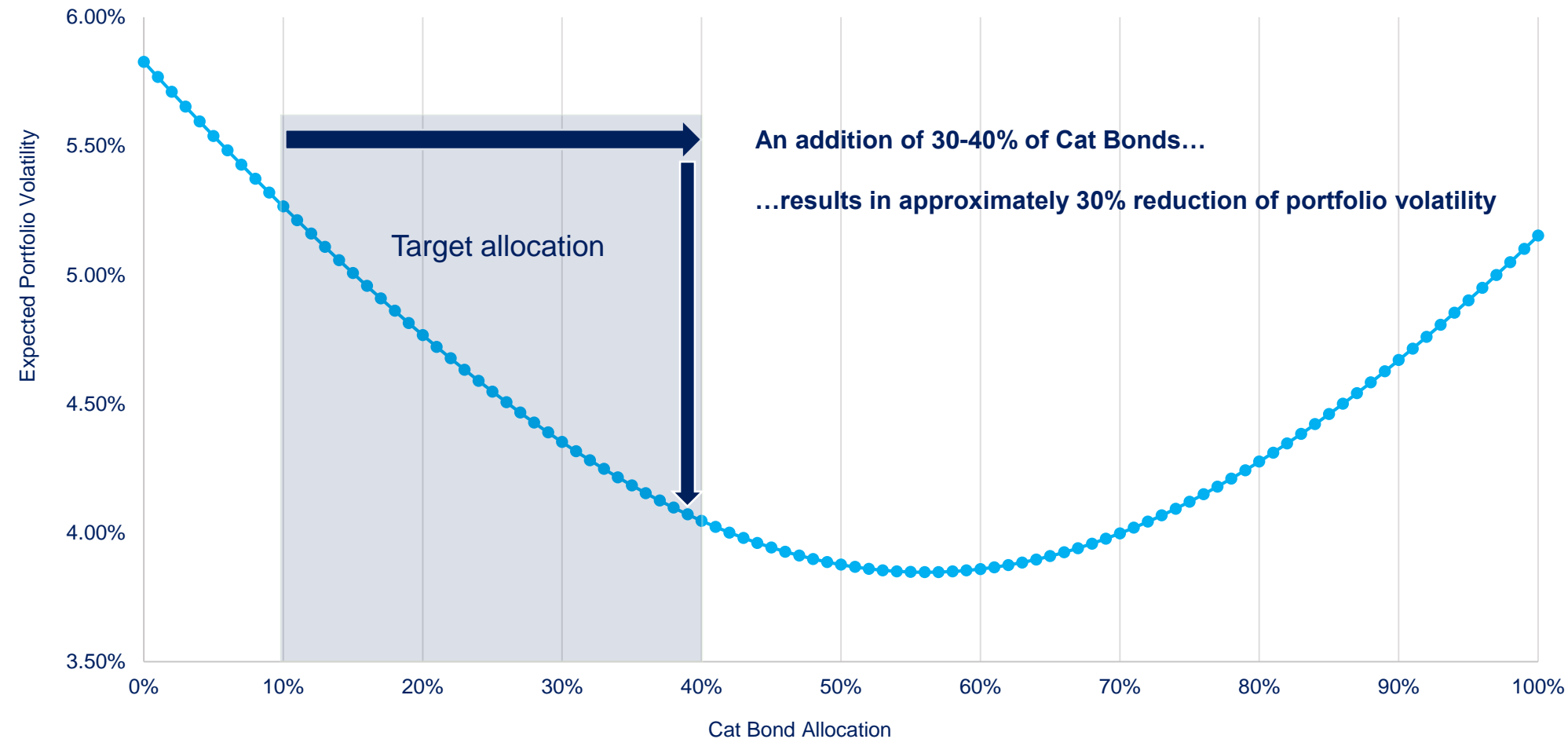


Rates are at their highest levels since 2009

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Reducing volatility by adding ILS

Adding Cat Bond content significantly reduces the volatility of a Debt and Equity portfolio.



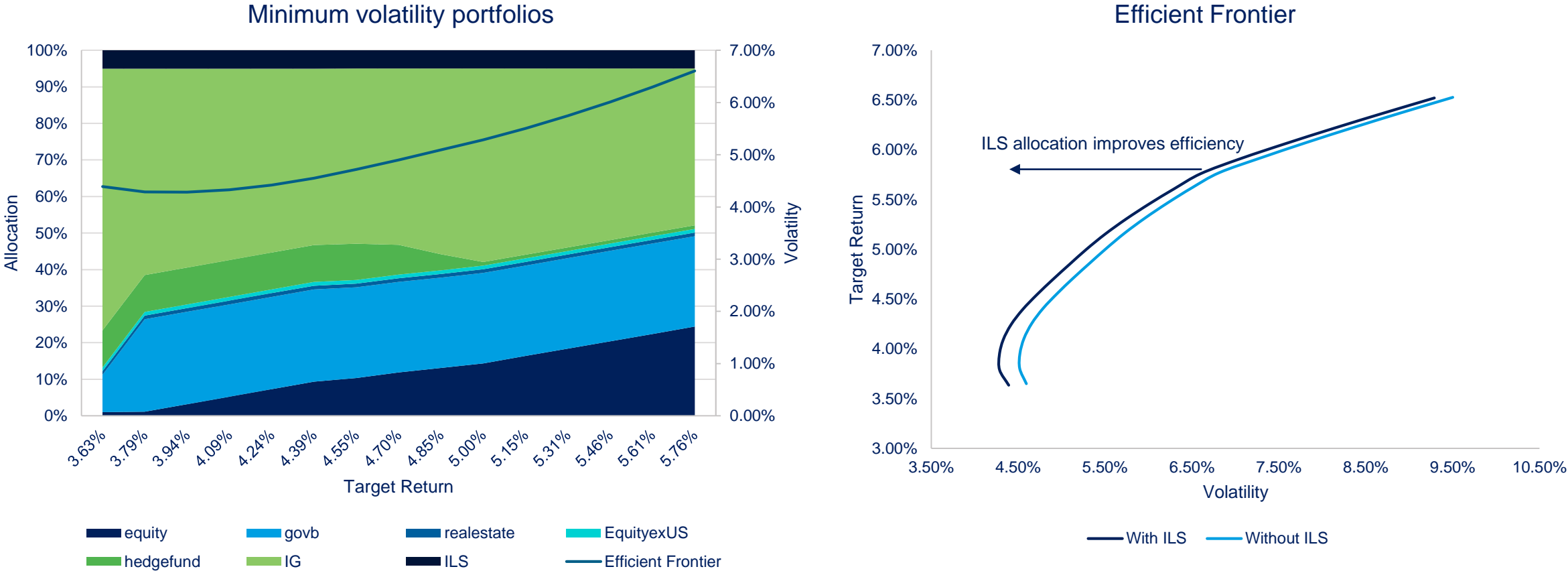
For illustrative purposes only. The 0% Cat Bond Allocation represents a portfolio without Cat Bonds scaled to 100% investment degree. The asset split is 65% Insurance Debt and 35% Equities. In order to estimate the volatility Bloomberg PORT's Monte Carlo simulation output is used which provides 10'000 representing a one year investment horizon. In a second step 10'000 years of AIR output for the Cat Bond market portfolio were iteratively added in +1% of NAV steps. Source: Twelve Capital, AIR & Bloomberg PORT.

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Diversification benefit in broader asset allocation



Idealised portfolio optimisation – An allocation to ILS reduces volatility across all simulated target return levels



Source: Twelve Capital, Bloomberg. As at 31 March 2022. ILS: The Twelve Cat Bond Market Portfolio (CB MaP) used as benchmark for comparison is a hypothetical portfolio of Cat Bonds tracked by Twelve Capital. Each known public Cat Bond is represented in this portfolio with its full outstanding notional. This is because the Swiss Re Cat Bond Index does not disclose constituent parts and hence cannot be used for detailed attribution analyses.

Equity: The S&P 500 is a market capitalisation weighted index of the largest 500 stocks in the US. Govb: Bloomberg Global Aggregate Sovereign Index is a measure of investment grade rated debt from 25 local currency markets. Realstate: Dow Jones U.S. Real Estate Index represents REIT and other companies that invest directly or indirectly in real estate through development, management or ownership, including property agencies. EquityexUS: MSCI ACWI ex USA Index is a free-float weighted equity index. Hedgefund: The HFRX Global Hedge Fund Index is designed to be representative of the overall composition of the hedge fund universe. IG: The Bloomberg Global Aggregate Bond (EUR Hedged) index tracks bonds issued in emerging and developed markets worldwide.

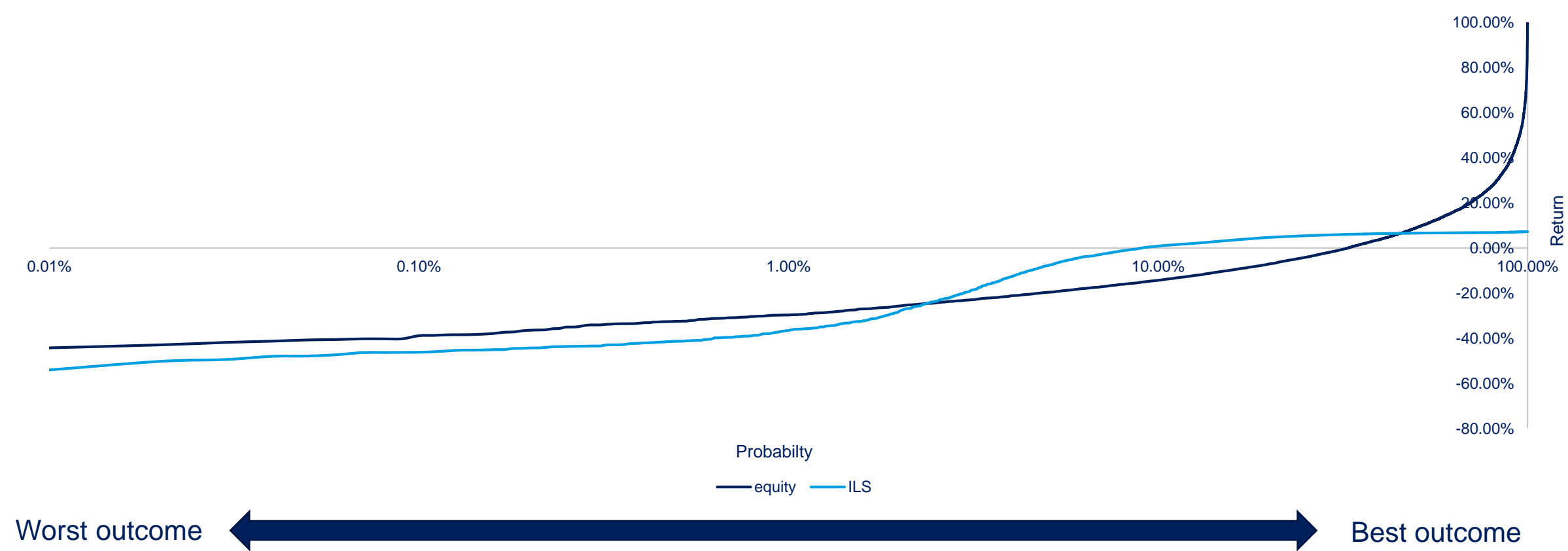
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The risk is in the tail



Large natural catastrophe events are infrequent which drives more tail-heavy risk compared to traditional asset classes

Return distributions



Source: Twelve Capital, Bloomberg. As at 31 March 2022. Equity: The S&P 500 is a market capitalisation weighted index of the largest 500 stocks in the US. ILS: The Twelve Cat Bond Market Portfolio (CB MaP) used as benchmark for comparison is a hypothetical portfolio of Cat Bonds tracked by Twelve Capital. Each known public Cat Bond is represented in this portfolio with its full outstanding notional. This is because the Swiss Re Cat Bond Index does not disclose constituent parts and hence cannot be used for detailed attribution analyses.

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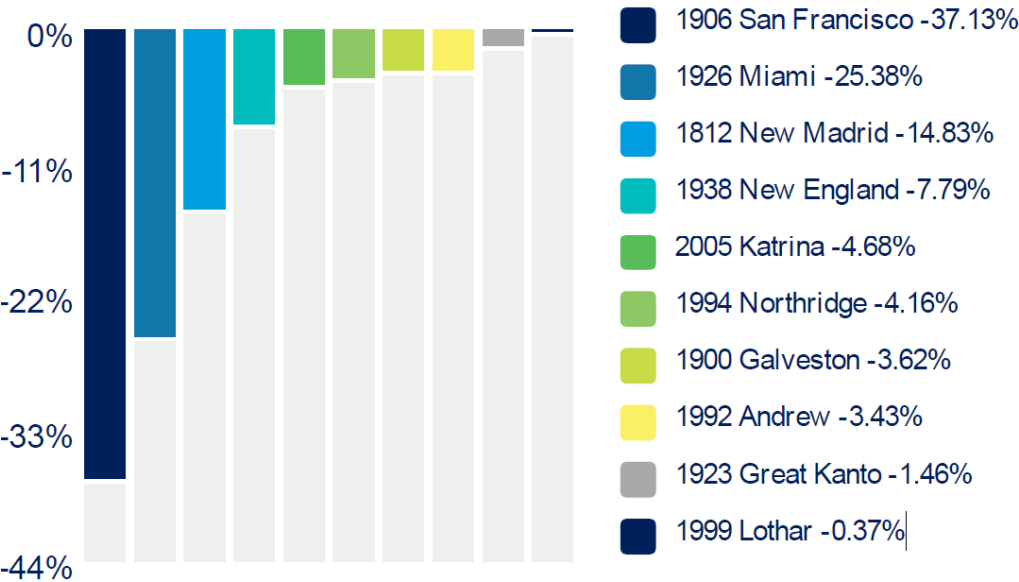
VaR and drawdown simulations of a sample ILS portfolio



P&L exceedance ¹

95% TVaR	26.69%
99% TVaR	46.78%
95% VaR	5.69%
99% VaR	42.32%
99.5% VaR	46.72%
P<0	7.52%

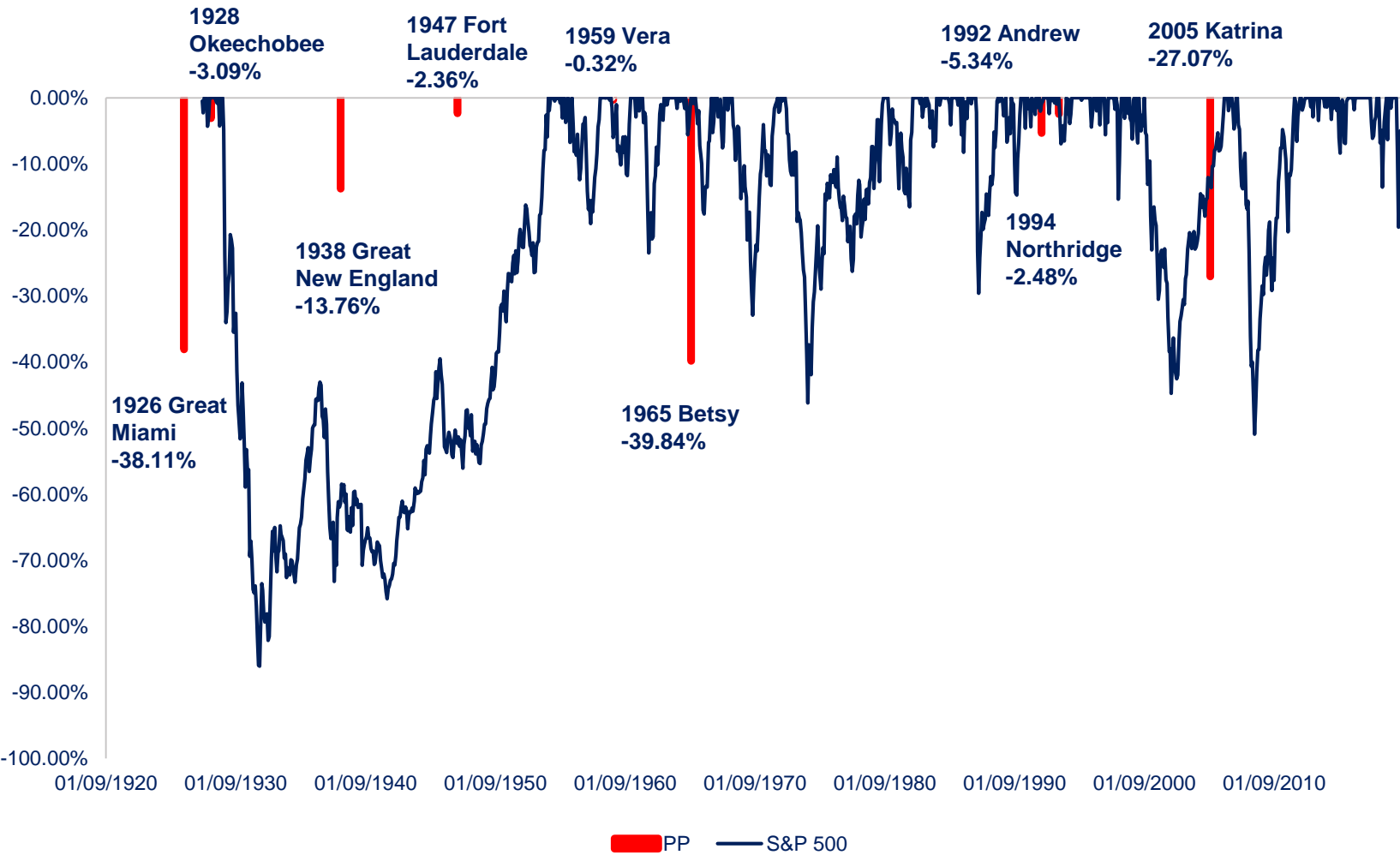
Historic drawdown simulations ²



As at 28 February 2022. ¹This shows the sample portfolio's profitability at specific points on the percentile distribution of returns. ²Calculation based on data provided by AIR & RMS. Event sets of historical natural catastrophes run against current sample portfolio risks to generate loss estimates.

Insurance-Linked Securities

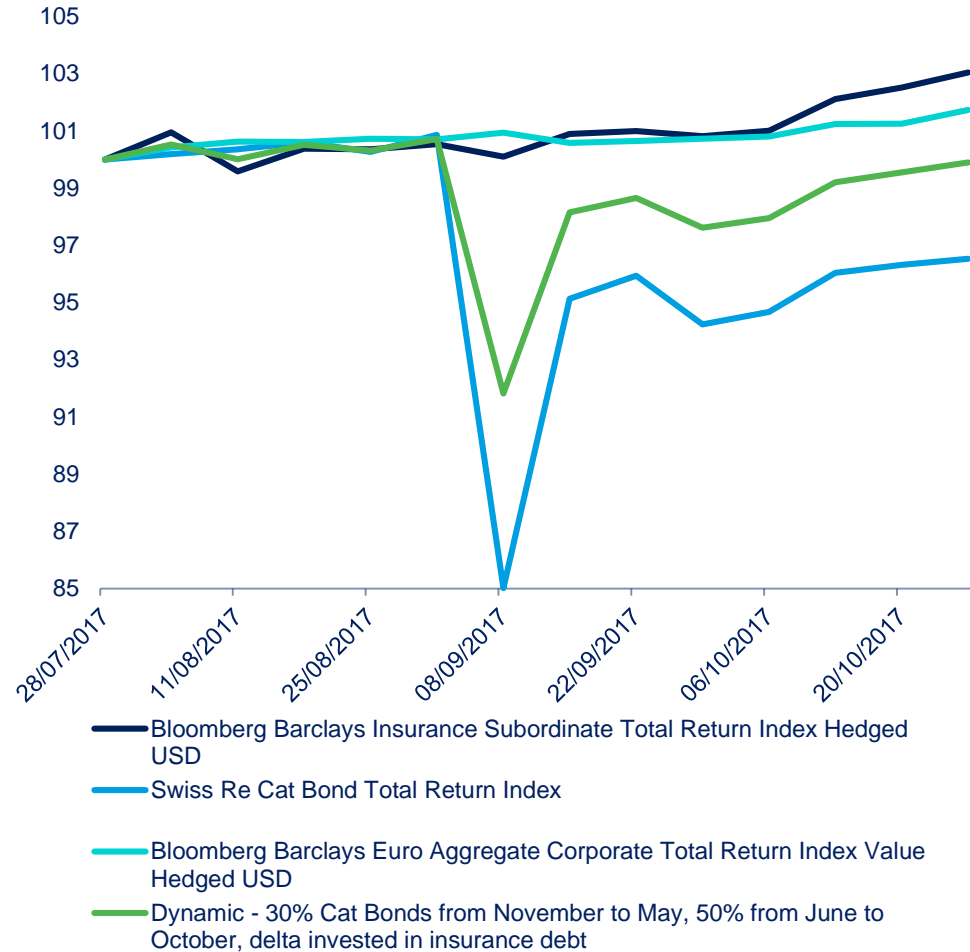
Drawdown scenarios equities versus ILS



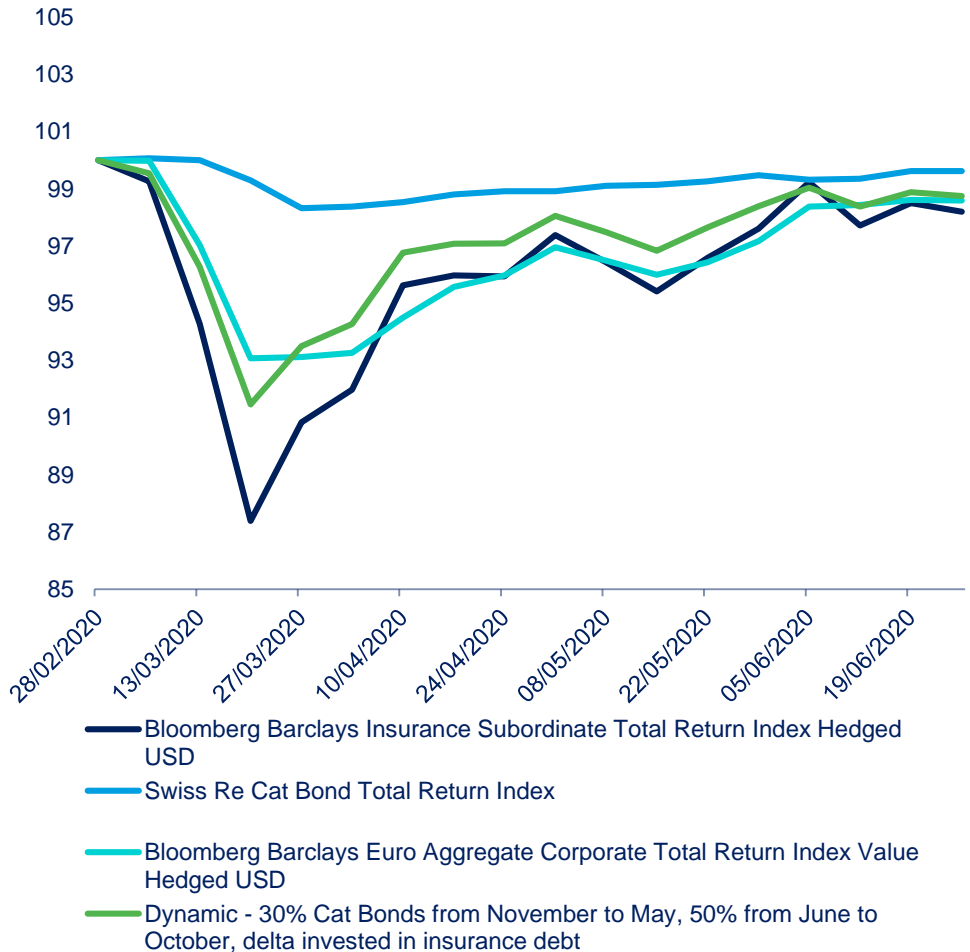
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Correlations in extreme scenarios

Hurricane Irma 2017



Covid-19 2020



Source: Twelve Capital, Bloomberg. As at 26 June 2020. Swiss Re Global Cat Bond Index Total Return, calculated by Swiss Re Capital Markets, is a market value-weighted basket of natural Cat Bonds tracked by Swiss Re Capital Markets, calculated on a weekly basis. Bloomberg Barclays Euro Aggregate Corporate Index is a benchmark that measures the corporate component of the Euro Aggregate Index. It includes investment grade, euro-denominated, fixed-rate securities. Bloomberg Barclays Insurance Subordinate Total Return Index Hedged USD: No official description available.

Sourcing

Instrument Analytics & ESG

Portfolio Construction

Trading & Risk Analytics

ESG Approach

- Twelve’s ESG investment approach serves as a guiding principle for investment decisions and ensures that the core values are integrated into investment practices and individual behaviors.
- ESG Rating: Sustainability Impact Rating is an internal score produced by Twelve Capital’s proprietary ESG Rating Framework, developed to assess the ESG aspects of an asset, and provide a meaningful output that can be built into investment decisions
- Four-stage ESG investment process:
 1. ESG Exclusion criteria: Exclusion of “hard” limits based on UN PRI (e.g. controversial weapons, tobacco) and exclusion of critical candidates within insurance universe based on proprietary Twelve screening.
 2. Including the ESG Risk Score into the risk return analysis
 3. Maintaining a min. average ESG Rating
 4. Promotion of ESG through Stewardship: Engagement with counterparties to increase sustainability scores.

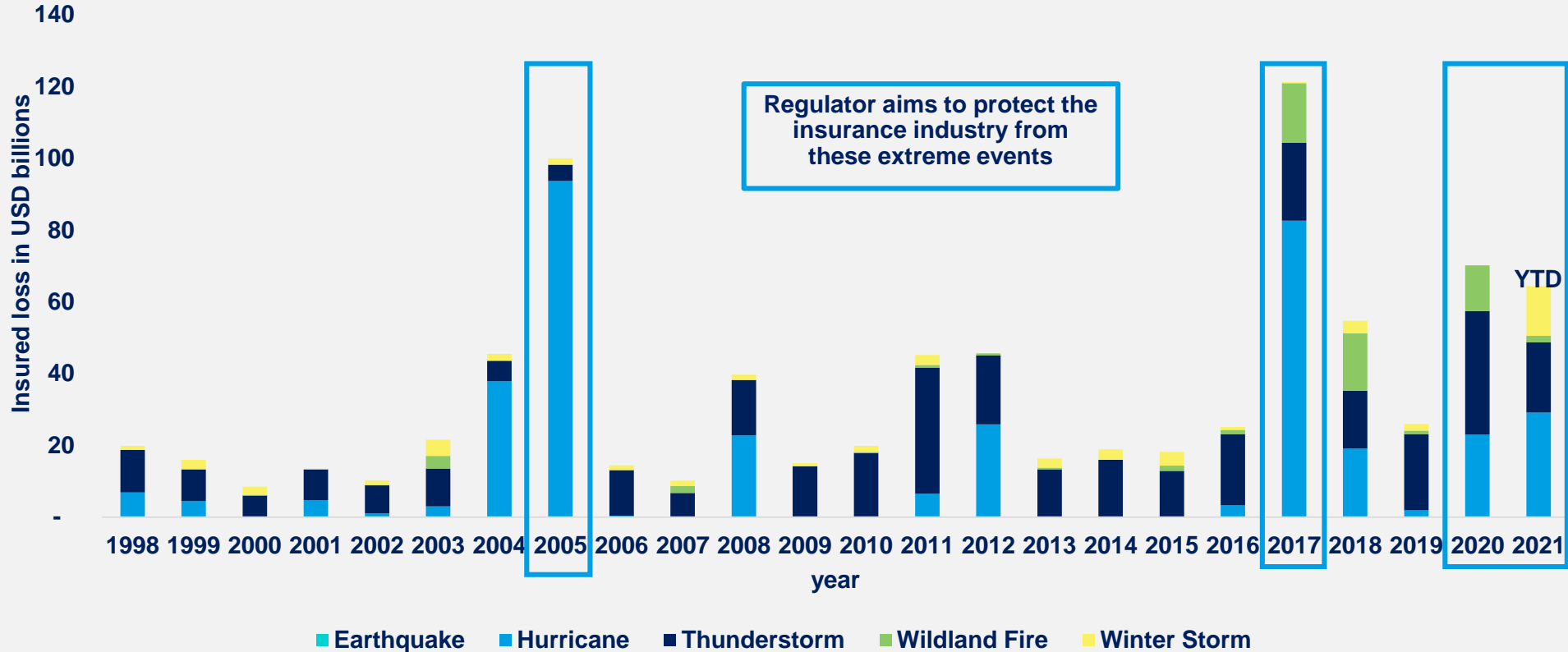
Operational Aspects

- Each Security is analysed from an ESG perspective.
- As part of the analysis, Twelve Capital considers both the “Issuer” and the “Instrument”. This allows Twelve to determine how a company is positioned in relation to a forward looking ESG stance as well as taking into account where the capital provided by the instrument is specifically utilised.
- The analysis uses a proprietary methodology developed by Twelve Capital to ensure a repeatable, robust and intuitive process.
- Assessment of the ESG Rating draws upon both internal expertise and analytics, as well as partnering with an ESG expert data provider.
- The data providers were selected according to a number of criteria, such as the coverage of the insurance sector, the quality of the analysis and the methodology’s transparency.

Insurance-Linked Securities

Insured natural catastrophe losses in recent years

Insured Natural Catastrophe losses in the US



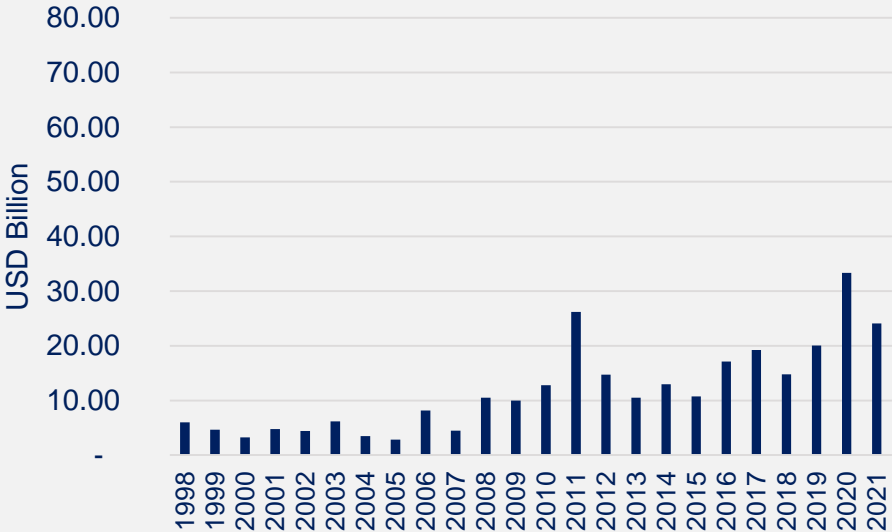
Since 1998 approximately 56% of major natural catastrophe insured losses in the US have been caused by secondary perils such as Thunderstorms, Wildfires and Winterstorms

Source: Property Claims Service. As at 2 December 2021. Loss numbers are inflation-indexed to 2020 USD assuming a 3% inflation rate per annum.

Insurance-Linked Securities

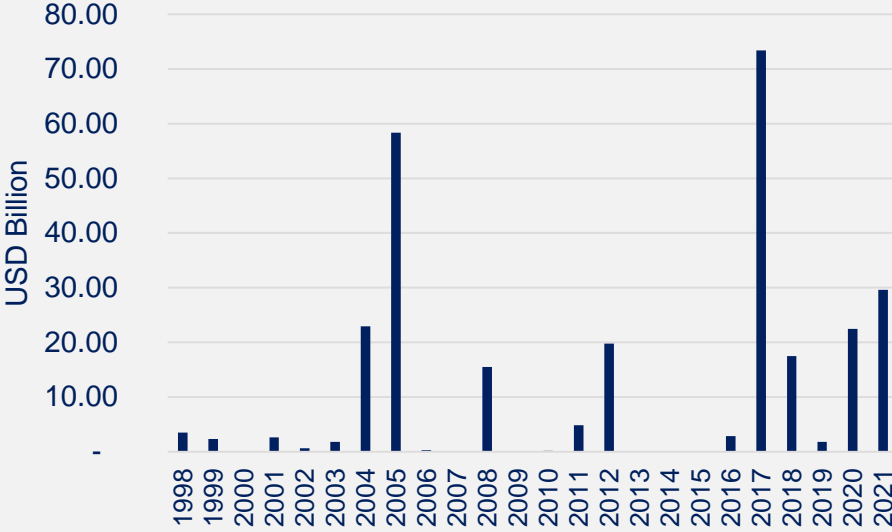
Assessing climate change

Severe Convective Storm



Expected loss USD 11.9 bn
Standard Deviation USD 8.1 bn

Hurricanes

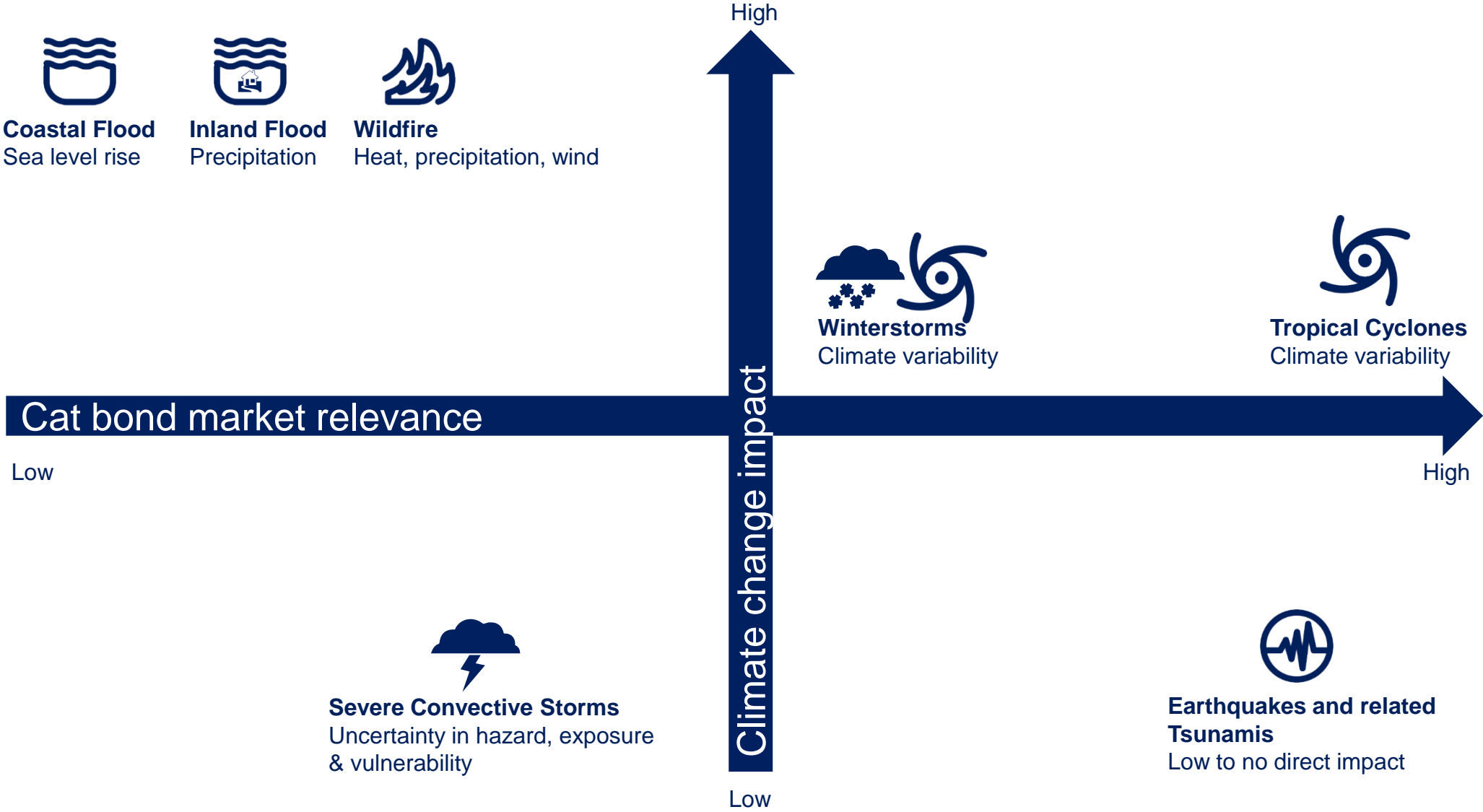


Expected loss USD 11.7 bn
Standard Deviation USD 19.1 bn

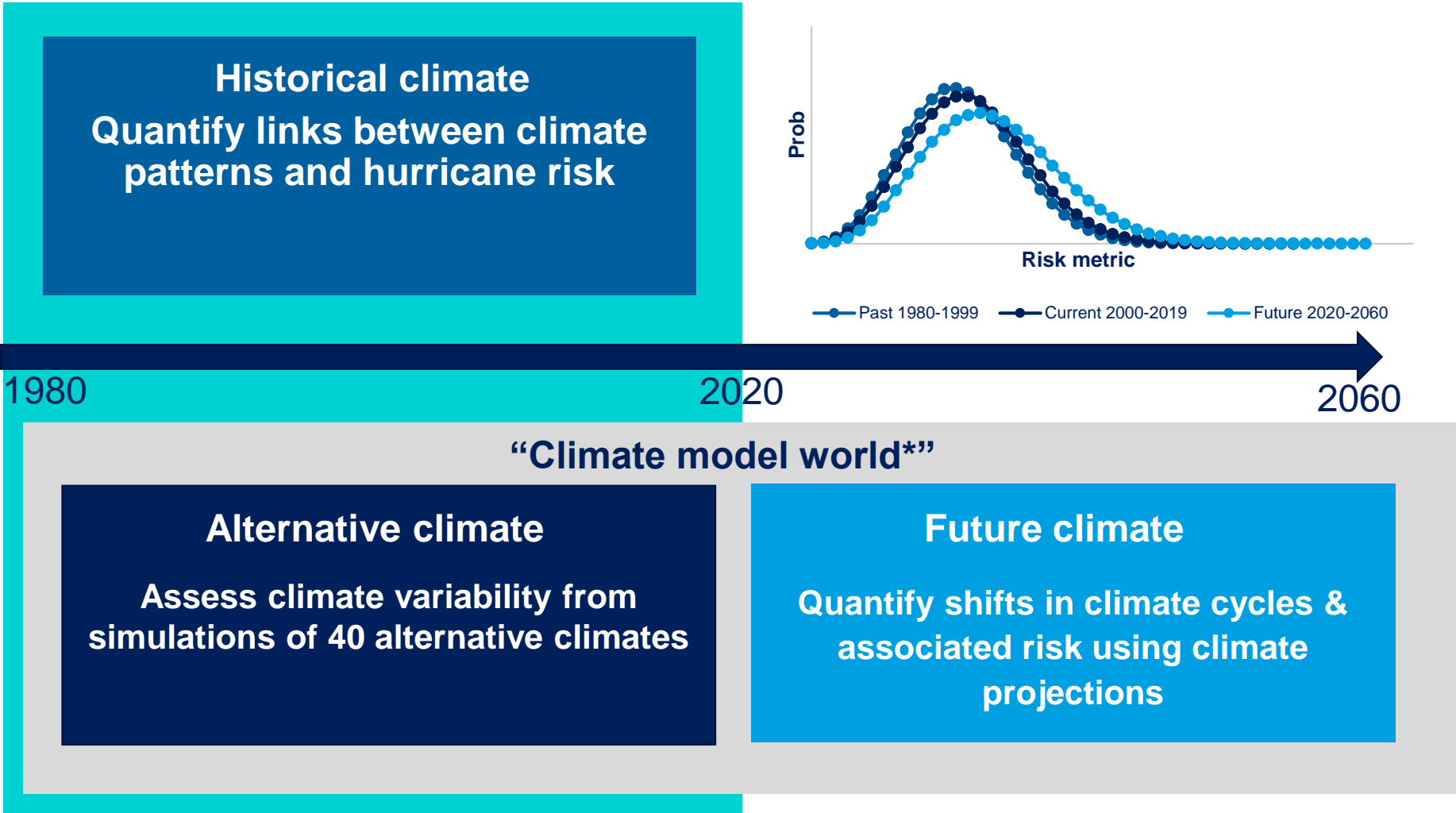
Source: PCS. All figures are in USD. As at 31 December 2021.

Insurance-Linked Securities

Where does climate change have impact?



Source: IPCC, Twelve Capital. Cat Bond Market Risk measured by contribution to expected loss.



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Climate change: Hurricane activity and landfall risk

Activity

- Increase in total hurricane activity of approx. 14% due to more dominant La Niña-type sea surface temperate patterns coupled with a warm tropical Atlantic basin.
- Continuation of trend observed over the periods 1980-1999 and 2000-2019

Landfall risk

- Increased risk of East Coast landfalls due to a changing wind patterns

Activity	1980-1999 CESM	2000-2019 CESM	2020-2060 CESM
North Atlantic Basin total	12.4	13.2 (+6.5)	15 (+13.6%)
East Coast	4.5	4.8 (+6.7%)	5.5 (+14.6%)
Main Development Region (MDR)	4.7	5 (+6.4%)	5.7 (+14%)
Gulf/West Caribbean	3.2	3.4 (+6.2%)	3.8 (+11.8%)

Landfalls	1980-1999 CESM	2000-2019 CESM	2020-2060 CESM
East Coast	0.9	0.96 (+6.7%)	1.15 (+19.8%)
Main Development Region (MDR)	0.95	1 (+5.3%)	1.11 (+11%)
Gulf/West Caribbean	1.81	1.86 (+2.76%)	2.01 (+8%)

- ILS offer fundamental diversification for any pension fund portfolio
- The diversification effect also holds in extreme scenarios
- Allocation decisions to ILS is mostly driven by tail risk considerations
- ILS scores highly in the context of ESG
- Climate change will increasingly drive supply – demand and pricing of ILS in the future
- Potential risk factors include event risk or model risk

The background of the slide is a composite image of a lake and mountains. The left half is a dark, moody blue-toned image of a lake with mountains in the background. The right half is a lighter, teal-toned image of a lake with mountains and clouds. The text "Contact / Disclaimer" is centered over the dark blue portion.

**Contact /
Disclaimer**

Twelve Capital AG

Dufourstrasse 101
8008 Zurich, Switzerland
Tel.: +41 (0)44 5000 120

Twelve Capital (UK) Ltd

Moss House, 15-16 Brook's Mews
London W1K 4DS, Great Britain
Tel.: +44 (0)203 856 6760

Twelve Capital (DE) GmbH

Theatinerstraße 11
80333 Munich, Germany
Tel.: +49 (0)89 839316 111

info@twelvecapital.com
www.twelvecapital.com

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