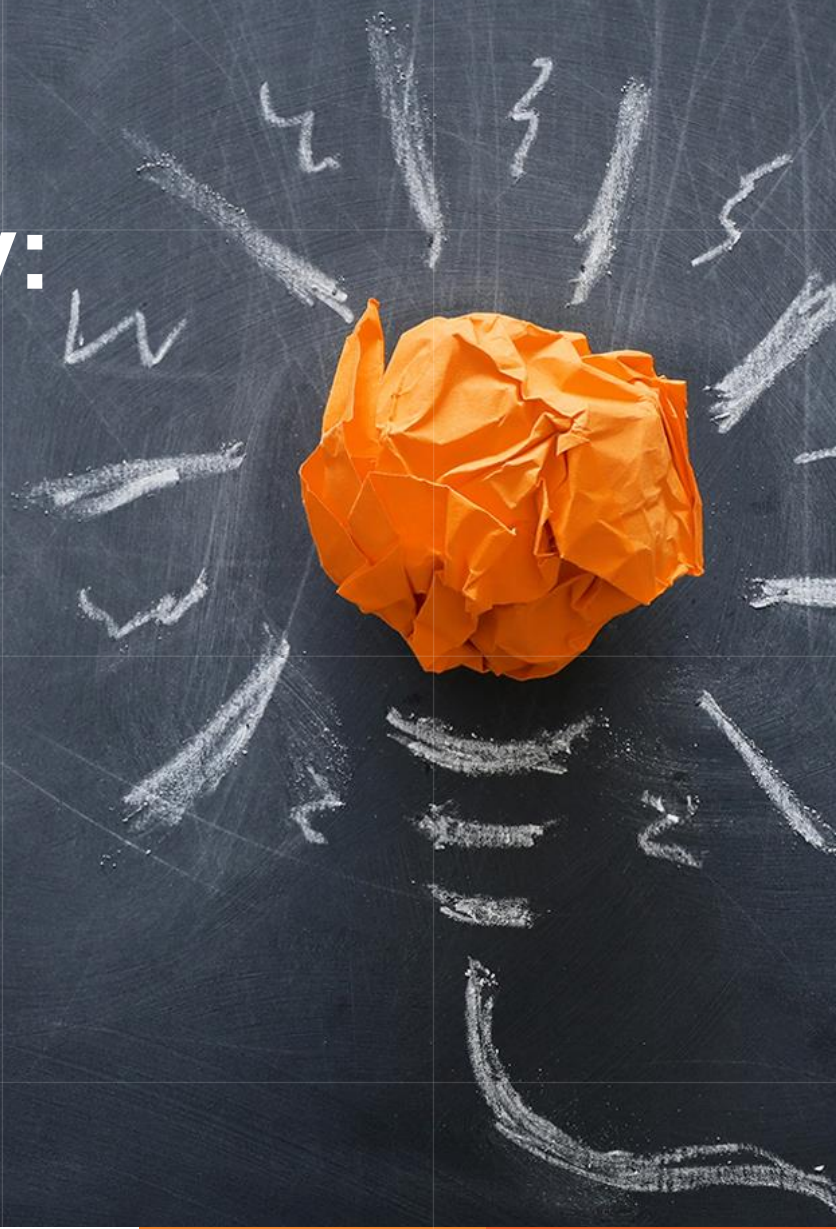
Investment opportunity: Catastrophe bonds

November 2023



Frontier Advisors

About us

Frontier Advisors has been at the forefront of institutional investment advice in Australia for over 25 years and provides advice on over $630 billion of assets across the superannuation, charity, public sector, insurance and university sectors. Our purpose is to empower our clients to advance prosperity for their beneficiaries through knowledge sharing, customisation, technology solutions and an alignment and focus unconstrained by product or manager conflict.

Author

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Isabella joined Frontier in July 2023 as a Consultant in the Alternatives Research Team. Isabella provides specialist advice to clients on alternative investments, focusing on the areas of multi-asset, insurance-linked securities, and discretionary hedge funds.

Prior to joining Frontier, Isabella worked for four and a half years at Funds SA, the investment manager for the South Australian Government. Her responsibilities at Funds SA were broad and focused on supporting large-scale institutional clients with top-down portfolio considerations such as the setting of investment objectives and development of risk-appetite statements, as well as performance monitoring, investment analysis, and various stakeholder engagement activities. Isabella completed her graduate year with the South Australian Department of Treasury and Finance.

Isabella is a Certified Investment Management Analyst (CIMA®). She graduated from Flinders University with First Class Honours and holds a Bachelor of Commerce (Advanced Leadership and Finance) (Honours).

Summary

Purpose and recommendations

This paper:

- Provides an overview of insurance-linked securities (ILS).
- Highlights the reasons Frontier believes ILS warrants consideration for inclusion in diversified institutional portfolios along with the current opportunity in the catastrophe bond market.
- Details the risks and considerations associated with ILS investments.

It is recommended investors and allocators consider the risks and opportunities associated with investing in ILS.

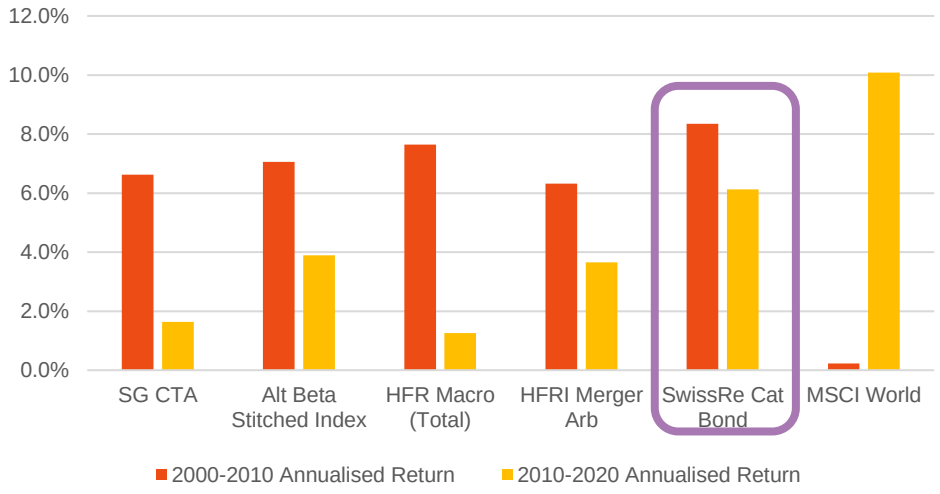
Setting the scene

The case for ILS (and alternatives)

Real S&P 500 Index and length of drawdown

Source: Robert Shiller, Bloomberg

Sector returns by decade



Source: Bloomberg

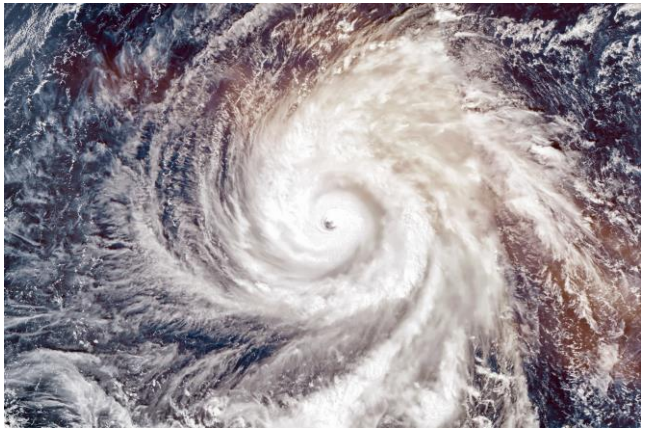
- While the value of equities has risen over the long-term, investors can experience prolonged periods of low returns. Alternatives, and ILS in particular, have performed well during periods where returns for equities have been flat (e.g. 2000 to 2010).
- Frontier believes an appropriate combination of alternative assets (including ILS) with traditional assets will help to deliver more consistent returns and provide for an investment portfolio that is more resilient to prolonged drawdowns.

What are ILS?

What are ILS

ILS are instruments that allow insurance risk to be transferred from insurers/reinsurers to capital markets

- At its core, ILS are instruments that transfer insurance risk from one party to another e.g. from an insurance company to a reinsurance company. Then a transfer of risk from the reinsurance market to capital markets.
- Securities can be linked to catastrophe risk e.g. hurricanes, earthquakes, wildfires, and floods, or other types of insured risk such as life, cyber, and terrorism.
  - Frontier prefers ILS linked to natural catastrophe risk due to a low correlation to financial markets, the maturity of the industry and well-established but continually evolving models, insurance market expertise, and seasonality.



How does ILS work?

An ILS investor becomes and insurer at some layer of risk

The value of an ILS investment is directly linked to the outcome of an insured loss event.	ILS investors provide an insurance policy for asset owners (cedants).	ILS instruments vary in risk based on how remote they are from the primary insurer, the likelihood of the event, and the severity of the loss event insured.
Loss events: Hurricane, earthquake, wildfire, flood.	The cedant transfers insured risk to an ILS investor.	Low or cat bond risk (EL of 2-4%) Mid risk (EL of 4-10%) High risk (EL of 10-20% and higher)

- In ILS, a ‘cedant’ is typically a primary insurance or reinsurance company that transfers a portion of its business (in this case, insured risk), to another party (in this case, the ILS investor). Cedents can also referred to as counterparties, sponsors, or issuers.
- ‘EL’ means expected loss. It is the anticipated loss investors may incur over a specified period due to the occurrence of insured events. EL represents the average or mean loss expected from the underlying insurance or reinsurance portfolio supporting the ILS.

Types of ILS

ILS instruments vary in risk

ILS instruments vary in risk based on how remote they are from the primary insurer, the likelihood of the event occurring, and the severity of the loss event insured.

	Private ILS		
Catastrophe (Cat) bonds	**Collateralised reinsurance**	**Industry loss warranties (ILWs)**	**Quota shares**
• Fixed income instruments • ~3 years TTM • Typically, low frequency, high severity events • Tradable, funds typically have monthly liquidity • Lowest level of risk i.e. most remote	• Customisable across regions, perils, and risk layers • Provides exposure to insurer underwriting risk • Typically, one-year terms and once a year liquidity • Premiums accrued over 12 months in line with seasonality	• Loss is calculated by industry wide loss, not insurer specific and resolution following an event is therefore quicker • Customisable across regions, perils, and risk layers • Typically, one-year or shorter terms	• Investors buy a portion of an insurance book and therefore share in gains and losses • Typically, one to two-year terms and once a year liquidity • Efficient use of capital due to embedded leverage, i.e. position size is larger than the amount invested
Liquid	Illiquid (~liquidity once per year)		
Risk remote	Customisable layer of risk		Whole risk spectrum
Mostly peak perils	Peak and secondary perils		

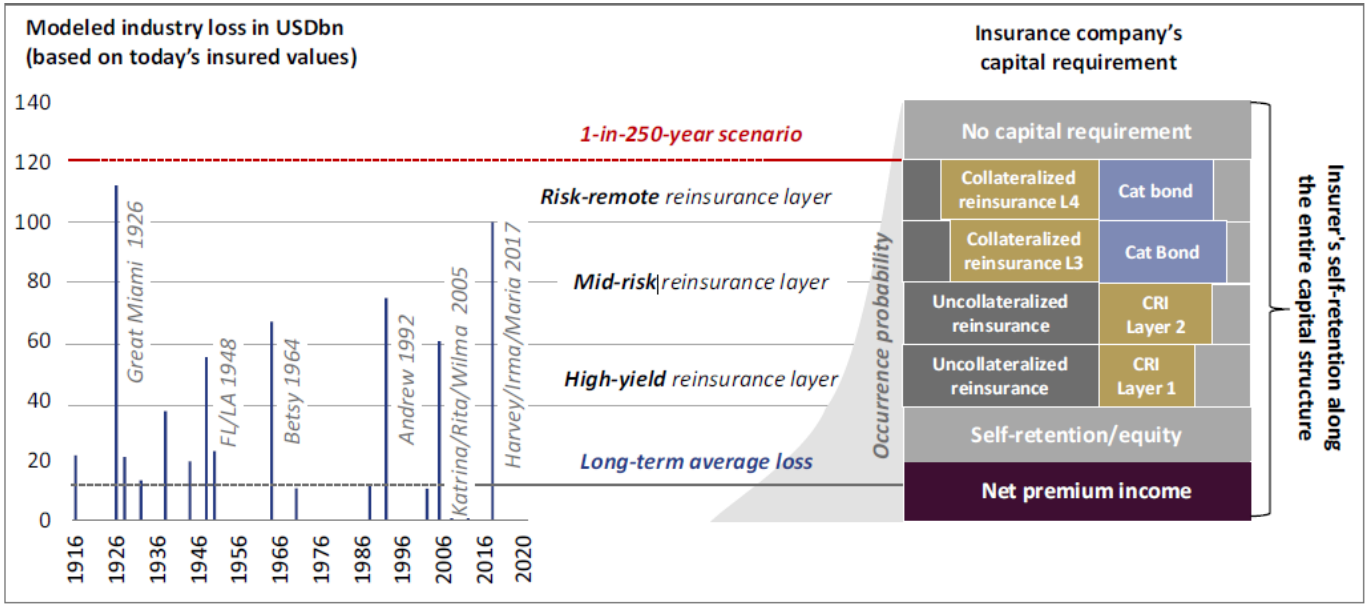
*Peak (or primary) perils refer to the most significant catastrophic events that result in substantial losses to the insurance industry such as hurricanes and earthquakes. Secondary perils are those events that happen relatively frequently but typically generate low to medium-sized losses to the insurance industry e.g. wildfire, flood, typhoon.

An illustrative example of risk layers

ILS instruments begin providing coverage at the point they ‘attach’ and stop providing coverage when they are ‘exhausted’

The chart below provides an illustrative example of where different ILS instruments sit relative to the primary insurer and how risk decreases the further away (or more remote) the instrument is from the primary insurer. While the numbers in the chart are for illustrative purposes only, they represent the approximate modelled losses to a US-based insurer from historical catastrophic events.

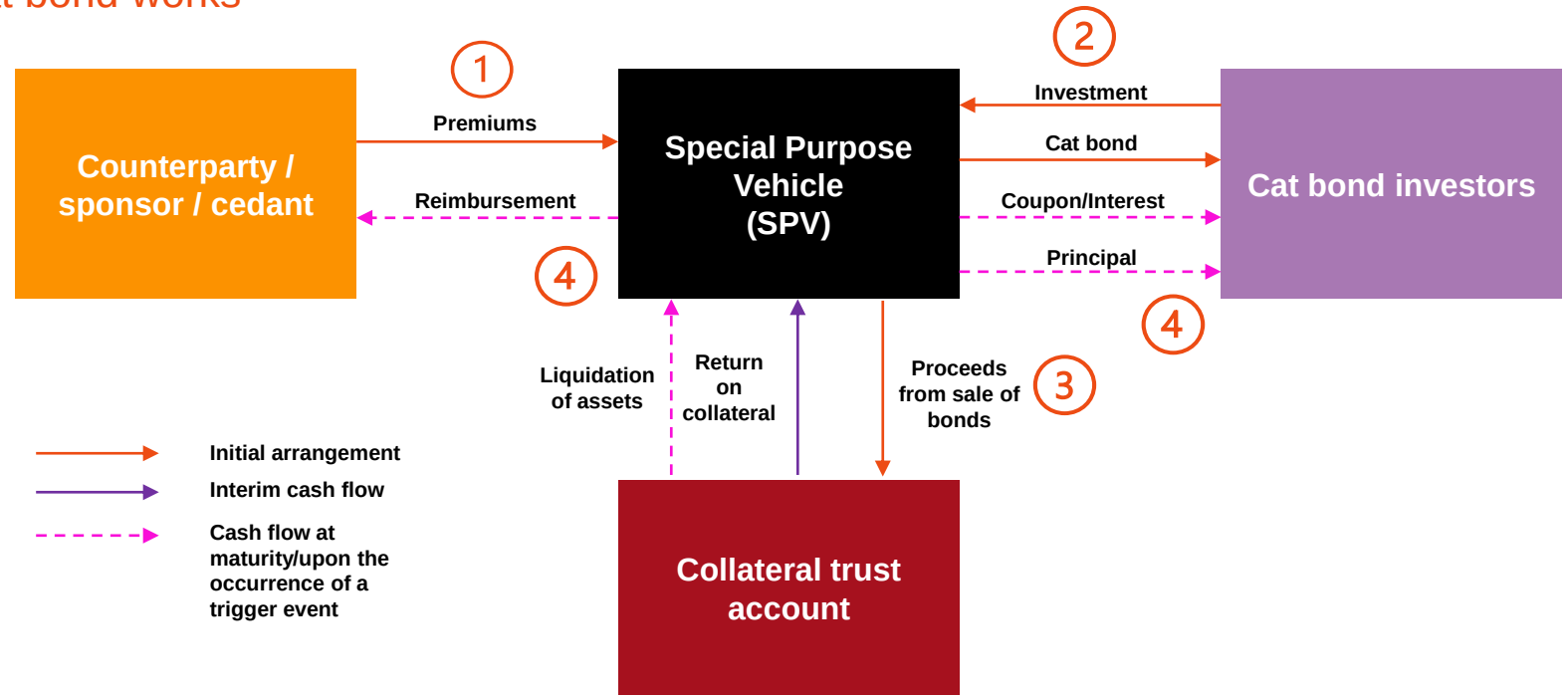
- Cat bonds that sit in the risk-remote reinsurance layer have an ‘attachment point’ of $100 billion of insured losses. The attachment point is the threshold at which an insurance-linked security starts providing coverage for losses. It represents the level of losses that must be reached before the ILS investors' principal becomes at risk. Therefore, cat bonds that sit in the risk-remote reinsurance layer will only start covering losses for the sponsoring insurer or reinsurer when the losses from a specific event reach $100 billion. If losses do not reach $100 billion, the bond will experience no losses and therefore no negative return.
- Cat bonds in the risk-remote reinsurance layer have an ‘exhaustion point’ of $120 billion. This means these bonds will cover losses up to $120 billion. Any losses beyond that point are covered by the next layer. In this example that responsibility goes back to the primary reinsurer.
- The left side of the chart highlights a handful of historic catastrophic events and how the losses from these events penetrated the ILS market.



Source: LGT Capital Partners

The structure of a cat bond

How a cat bond works

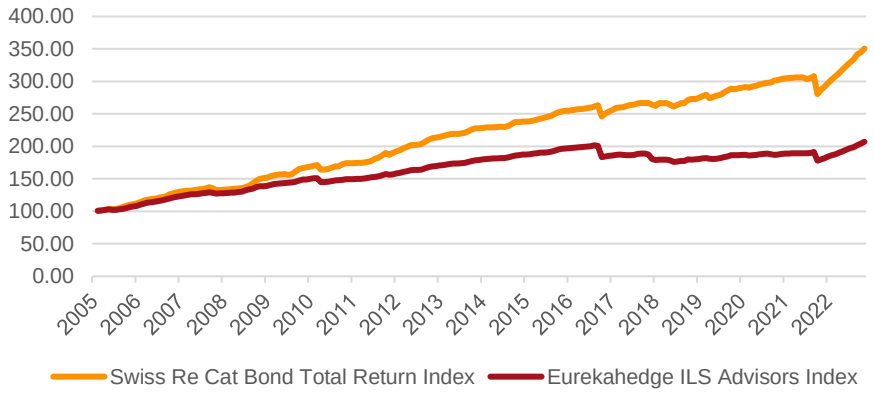


1. The sponsor (i.e. the insurer or reinsurer looking to transfer a portion of insured risk), enters into a risk transfer contract with a special purpose company established specifically for the transaction (the SPV). An SPV is a separate legal entity that holds the proceeds from the bond issuance and manages the financial transactions related to the bond. The SPV is typically a bankruptcy-remote entity, designed to protect investors in case of the issuer's insolvency, and ensures the funds are used solely for the intended purpose (i.e. paying out claims in the event of a specified catastrophe).
2. The SPV issues notes (i.e. cat bonds) to investors in the capital market.
3. Proceeds from the cat bonds are transferred into a collateral trust account and are typically invested in three-month T-Bills.
4. If the event(s) covered in the cat bond does not occur during the risk period, the bonds are redeemed at 100% of face value. However, if a covered event occurs and meets the threshold detailed in the contract, funds will be withdrawn from the collateral trust account to make payment(s) to the sponsor. The redemption price of these bonds reduce accordingly.

Performance of private ILS vs cat bonds

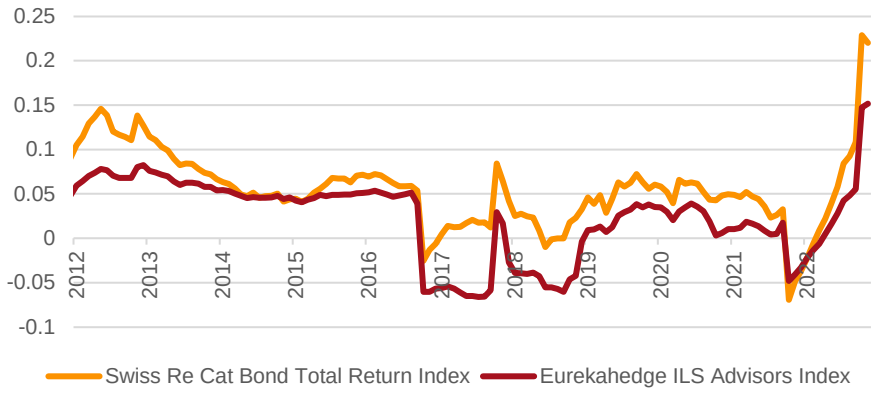
While the no loss yield on private ILS is higher than that for cat bonds, cat bonds have outperformed private ILS

Cumulative performance of private ILS and cat bonds



Source: Frontier Advisors, Bloomberg, Eurekahedge

Rolling 12-month returns of private ILS and cat bonds



Source: Frontier Advisors, Bloomberg, Eurekahedge

Cat bonds have outperformed private ILS on a historical, realised basis for a number of reasons:

- Cat bonds typically provide protection higher up the risk tower. Consequently, the cat bond market tends to only be significantly impacted by major catastrophic events, e.g. Hurricane Ian in 2022. Private ILS tends to hold contracts lower in the layers (i.e. closer to the primary insurer), resulting in greater exposure when loss activity occurs.
- Since 2017, private ILS portfolios have tended to hold a greater proportion of 'aggregate' versus 'per occurrence' contracts. Aggregate contracts are structured to cover cumulative losses over multiple events within a specified period. Per occurrence contracts are designed to cover an individual event e.g. a hurricane. Private ILS strategies tend to have a higher level of diversification across perils. As a result, private ILS strategies are often exposed to the smaller loss events and geographies that aren't elevated to the cat bond market.
- Loss creep from industry losses that occurred as result of events from 2017 to 2021 has been a drag on private ILS performance.

It is important to note the Eurekahedge ILS Advisors Index includes the impact of fees whereas the Swiss Re Cat Bond Total Return Index does not. However, after adjusting for fees, cat bonds have still outperformed private ILS by 2-2.5% per year.

Despite the relative underperformance of private ILS to cat bonds, it is important to be mindful that cat bond fund strategies can suffer more severe losses from single major catastrophe losses, given the greater concentration to peak peril exposures. Cat bond funds often underperform the Swiss Re Cat Bond Index due to the impact of fees, cash drag, and a preference for managing risk and limiting downside rather hitting return targets.

Key takeaways

- ILS are financial instruments that transfer risk from insurance and reinsurance companies to capital markets.
- ILS instruments vary in risk based on how remote they are from the primary insurer (risk layers), and the severity and frequency of the loss event insured.
- Cat bonds are the most liquid ILS instrument. Cat bonds can be considered the ‘least risky’ of the ILS instruments, however, are still subject to major losses due to the market’s greater concentration to peak perils.

Why invest in ILS?

Why invest in ILS?

Access to pure insurance risk with drivers of return uncorrelated to traditional assets

Fundamentally uncorrelated

Attractive risk-adjusted returns

Low exposure to interest rate and financial market risk

Maturing market with robust long-term structural growth potential

Current spreads and market environment are attractive

Incorporation of ESG issues are continually improving and increasing

Why invest in ILS?

The drivers of ILS risk and return are fundamentally uncorrelated to traditional asset classes

ILS are structurally uncorrelated to financial markets and macroeconomic factors and therefore are an attractive tool for diversification.

- Natural catastrophes are not dependent on macroeconomic factors or influenced by market movements.

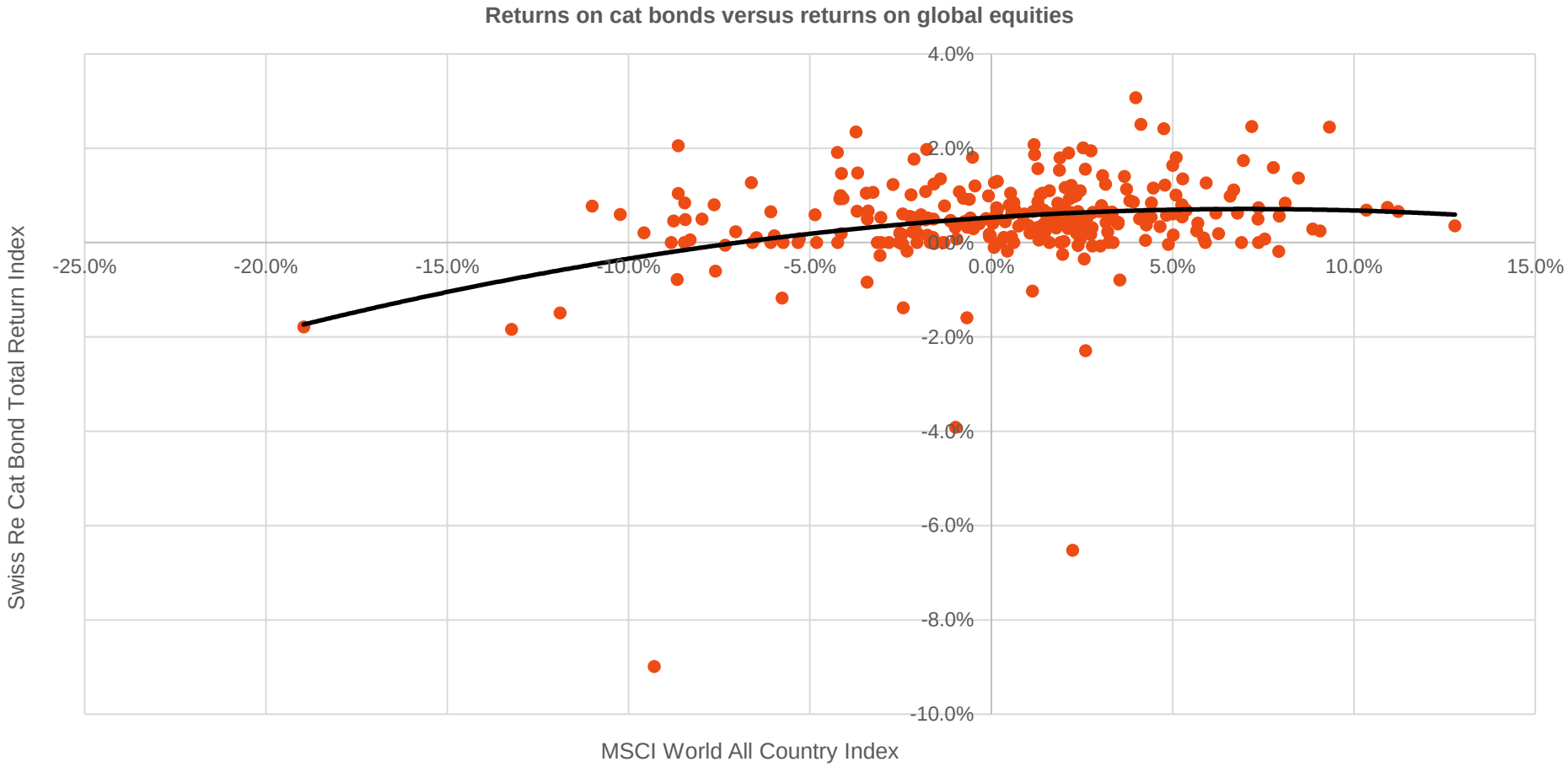
Correlation matrix

	Equities	Bonds	Credit	Infrastructure	Property	Commodities	Cat bonds
Equities	1.00						
Bonds	-0.07	1.00					
Credit	0.46	0.66	1.00				
Infrastructure	0.86	0.09	0.57	1.00			
Property	0.71	0.15	0.50	0.71	1.00		
Commodities	0.49	-0.17	0.22	0.56	0.32	1.00	
Cat bonds	**0.24**	**0.18**	**0.31**	**0.27**	**0.21**	**0.17**	**1.00**

Source: Bloomberg. Data from 03/2002 to 09/2023. Indices used: MSCI World for equities, Bloomberg Global Government for Bonds, Bloomberg Global Corporate for Credit, S&P Global Infrastructure for Infrastructure, FTSE Nareit All Equity REITs for Property, Bloomberg Commodity Index for Commodities.

Why invest in ILS?

ILS provides performance that is independent of traditional asset classes such as equities



Source: Frontier Advisors, Bloomberg, MSCI

Why invest in ILS?

Attractive risk adjusted returns

Cat bonds have produced a solid return premium to cash at much lower volatility relative to equities.

Return and risk statistics

	Equities	Bonds	Credit	Infrastructure	Property	Commodities	Cat bonds
2023 CYTD (%)	11.1	1.5	1.5	-3.7	-5.6	-7.1	**15.7**
Five-year returns (% p.a.)	7.3	0.7	1.1	4.1	2.8	4.2	**5.2**
Annualised returns (% p.a.) March 2002 to September 2023	7.2	3.3	4.0	8.6	8.5	0.7	**6.9**
Annualised risk (% p.a.) March 2002 to September 2023	15.6	3.1	5.0	15.6	21.2	16.2	**3.7**

Source: Bloomberg. Data from 03/2002 to 09/2023 in USD terms. Indices used: MSCI World for equities, Bloomberg Global Government for Bonds, Bloomberg Global Corporate for Credit, S&P Global Infrastructure for Infrastructure, FTSE Nareit All Equity REITs for Property, Bloomberg Commodity Index for Commodities.

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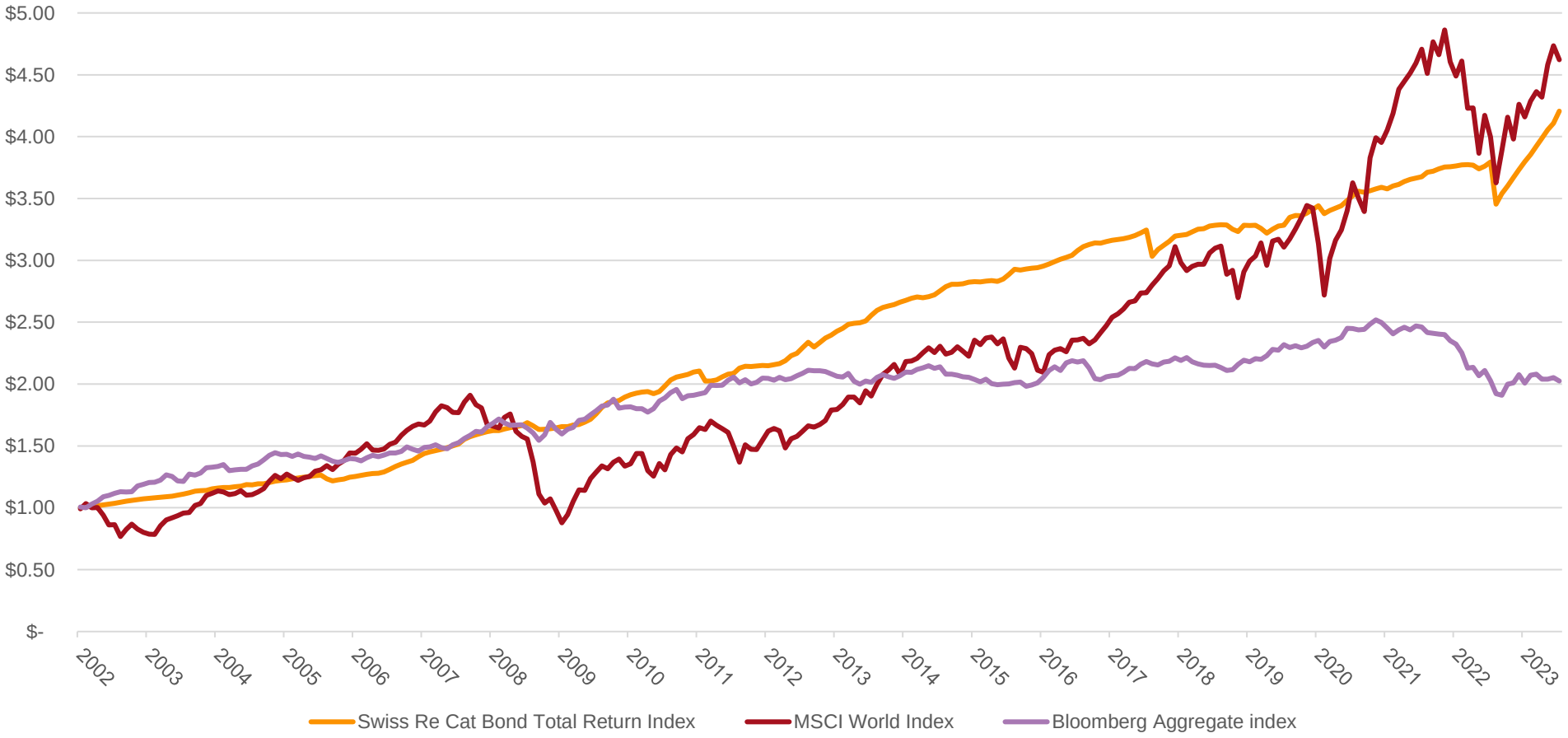
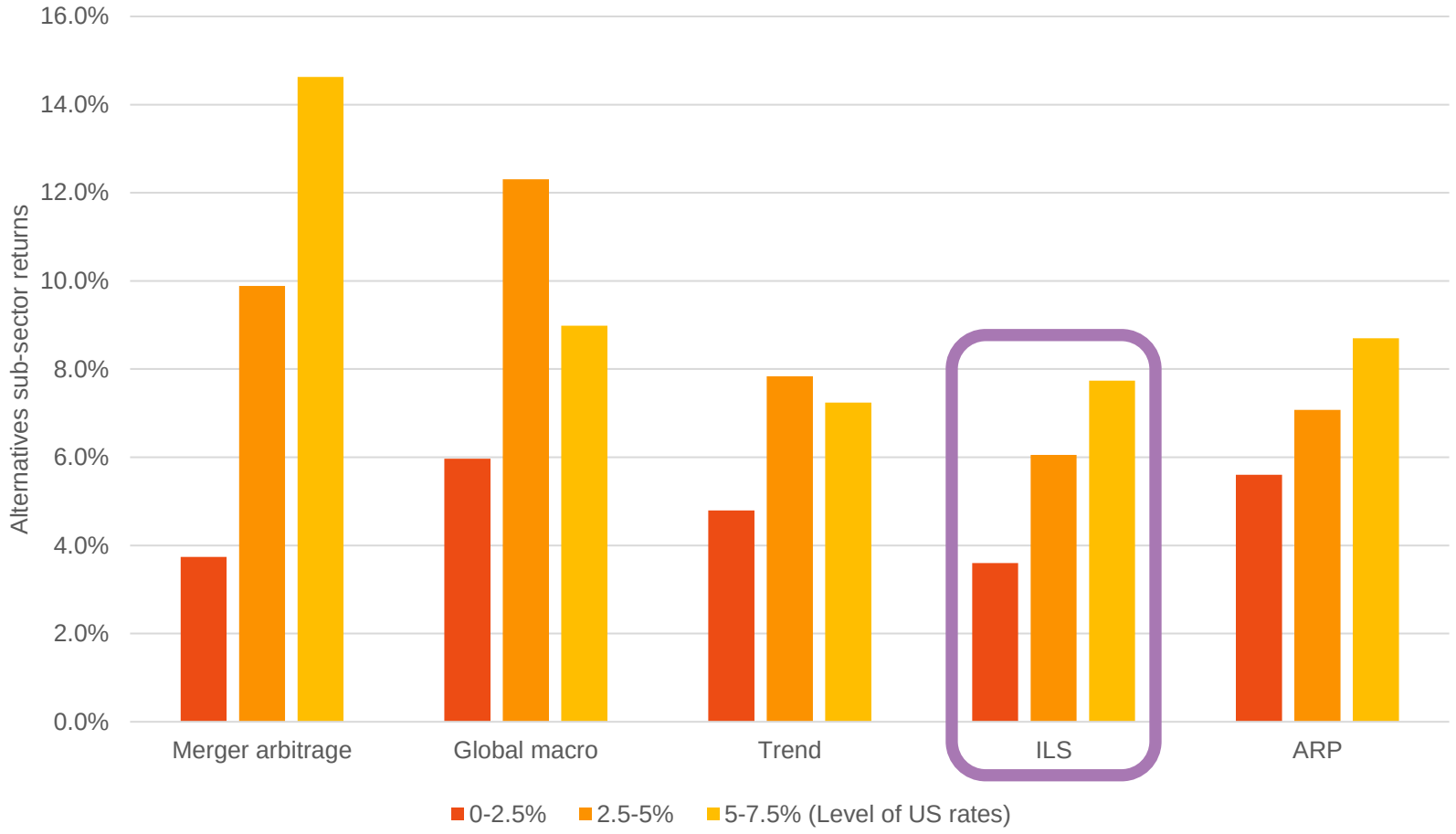


Source: Bloomberg, Frontier Advisors. USD terms.

Why invest in ILS?

Consistent with other alternatives sub-sectors, ILS typically performs well in higher rate environments

ILS typically performs well in higher rate environments. This is due to the short duration of cash flows and increasing returns on collateral.



Source: Bloomberg. Data from 1992 to 2022.

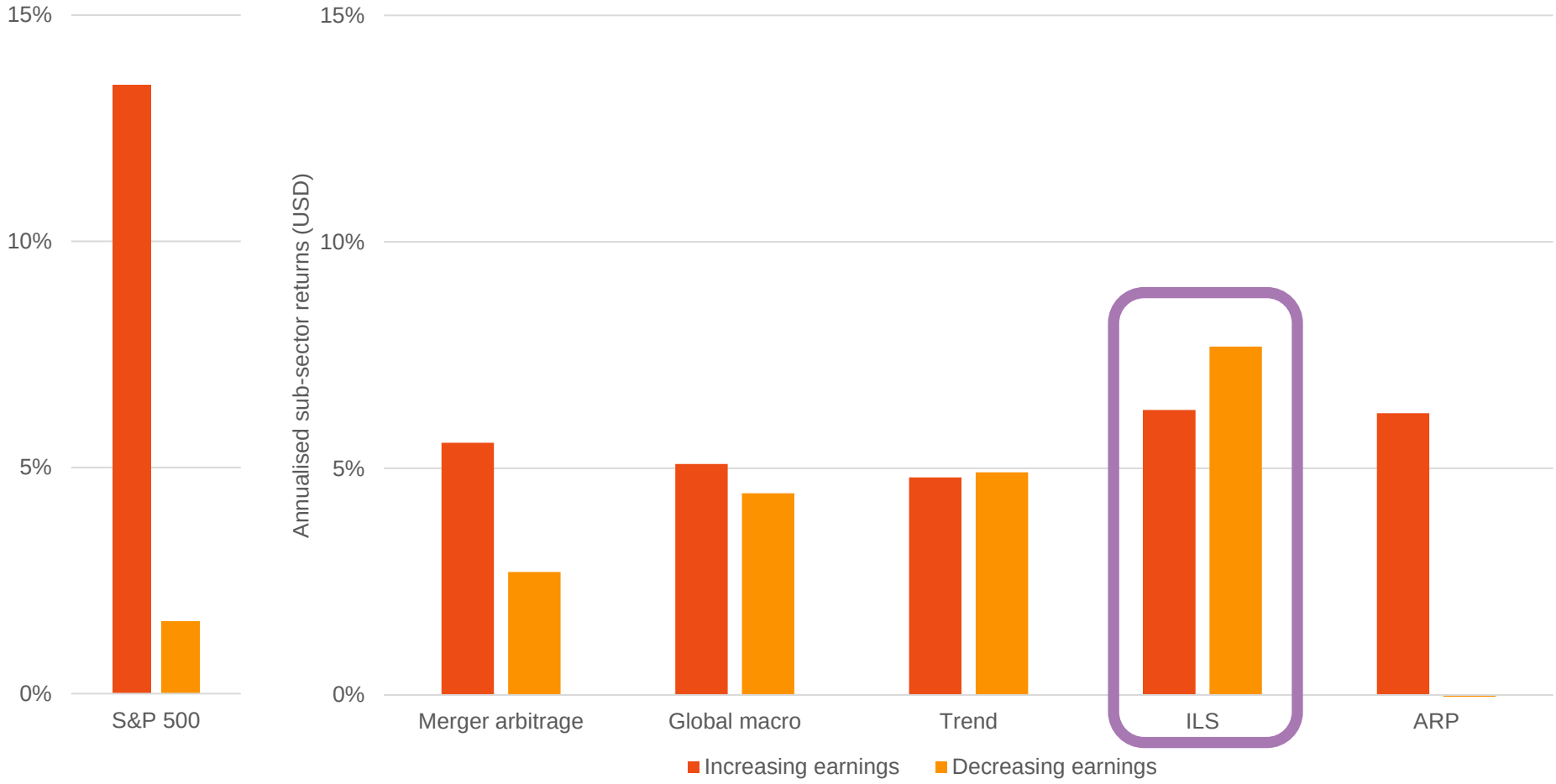
Why invest in ILS?

Returns on ILS and cat bonds are broadly unaffected by inflation

Source: Frontier Advisors, Bloomberg. Data from 2002 to 2022.

Why invest in ILS?

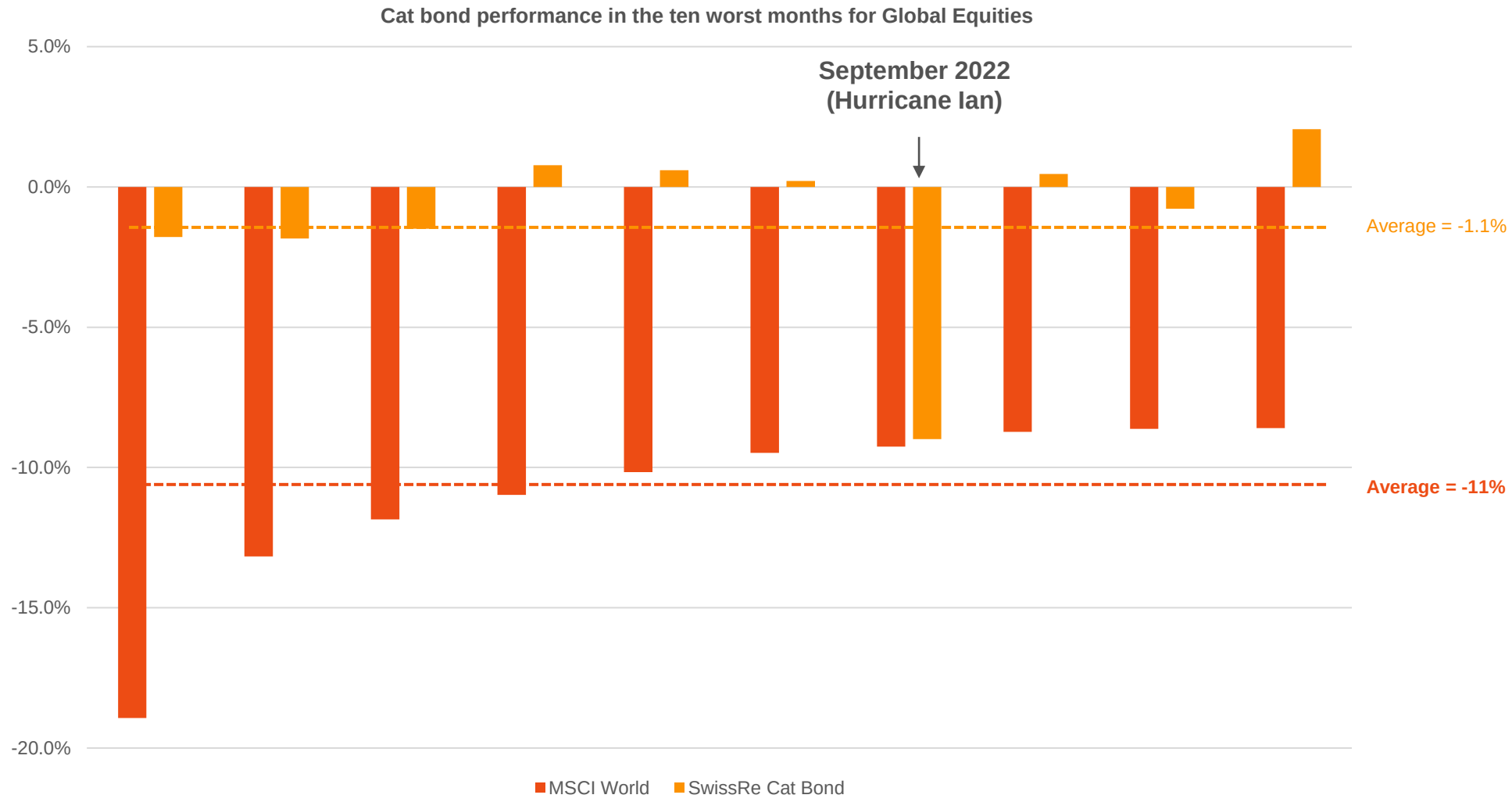
ILS performance is unaffected by swings in company profits



Source: Bloomberg, Case-Shiller, Frontier Advisors. Data from 2002 to 2023.

Why invest in ILS?

Returns on ILS are resilient to equity market sell-offs



Source: Bloomberg, Frontier Advisors. Data from January 2002 to June 2023.

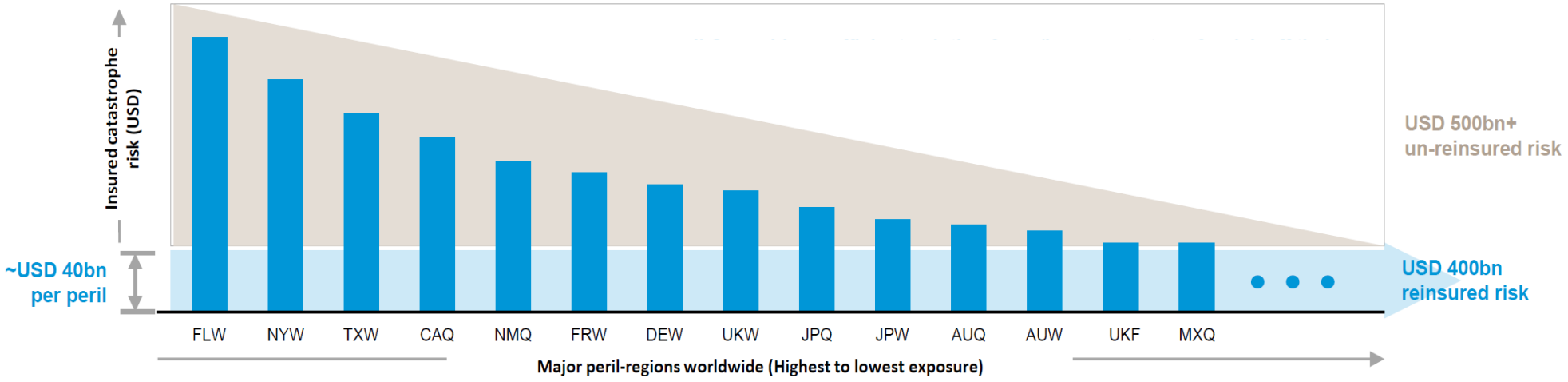
Why invest in ILS?

A maturing market with robust long-term structural growth potential

Insurance regulation has created a long-term structural growth story.

- Ratings agencies constrain the amount of risk traditional reinsurers can have on their balance sheets, currently ~USD 40bn per peril (vertical height of light blue area below).
- This leaves a USD 500bn+ disaster gap that traditional reinsurers cannot cover (grey triangle below).
- Insurers and reinsurers are prepared to pay an attractive structural premium to transfer this risk.
  - ILS instruments provide an efficient solution for insurers and reinsurers to transfer risk off their balance sheet to capital markets where the risk is able to be absorbed.

Amount of insured catastrophe risk by region and peril



Source: Fermat, GAM

FLW = Florida hurricane, NYW = New York hurricane, TXW = Texas hurricane CAQ = California earthquake, NMQ = New Mexico earthquake, FRW = French windstorm, DEW = German windstorm, UKW = UK windstorm, JPQ = Japanese earthquake, JPW = Japanese typhoon, AUQ = Australian earthquake, AUW = Australian cyclone, UKF = UK flood, and MXQ = Mexico earthquake

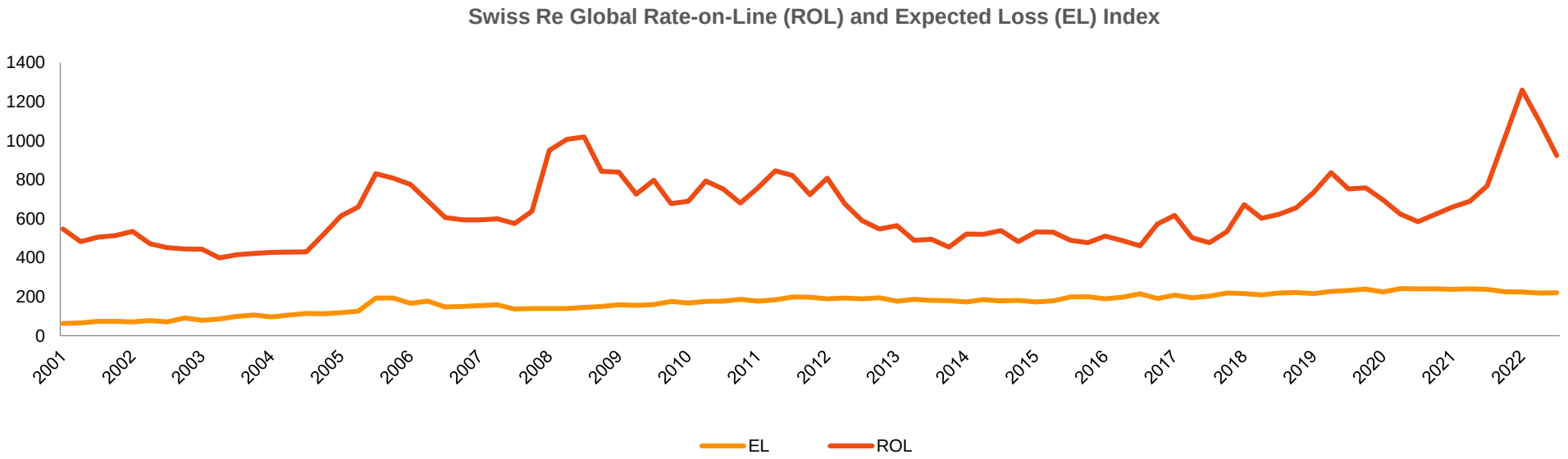
Why ILS?

Currents spreads and market environment present an attractive investment opportunity

After peaking at an all-time high of 13.3% following Hurricane Ian, cat bond market spreads have tightened but still remain at their highest sustained level since 2012. The current dynamics in the cat bond market are sustaining an attractive investment opportunity.

- Sponsor demand for cat bonds remains high due to constrained capacity in the property catastrophe reinsurance sector, growth in sponsor exposure due to increasing rates and inflation, and ratings agencies continuing to focus on insurance and reinsurance company balance sheets (see previous page).
- Rising interest rates continue to provide additional yield due to investment of cat bond collateral.
- Recent loss activity (2017-2021) led to market-wide improvements in contract terms and conditions providing for features considered to be more 'investor friendly'. These include higher attachment points with commensurate lower expected losses, a preference for non-cascading per occurrence events, and revised mechanics that limit the potential for trapped capital.

The chart below plots the Swiss Re Global Rate-on-Line and Expected Loss indices and shows the expected returns from cat bonds remain attractive. ROL can be thought of as the coupon received (or premium paid) on a cat bond and is typically referred to as a 'spread'. EL is the average or mean loss expected from the cat bond. The expected return on a cat bond is the ROL – EL. Note: ROL does not include the return on collateral.



Source: Fermat, GAM, Swiss Re Capital Markets, Frontier Advisors

Why ILS?

Incorporation of ESG issues are continually improving and increasing

Consideration of ESG issues is deemed by market participants as critical for the development of the ILS market and for insurance and reinsurance markets more broadly.

- ILS managers are increasingly focused on improving ESG practices throughout the entire investment process.
- Manager selection matters when considering ESG factors. Frontier has observed many instances in recent periods where ILS managers will deem contracts uninvestable on the basis that counterparties do not meet ESG criteria. However, there is variation with how stringent managers are with this process.

Environmental	Social	Governance
• Environmental and climate change risk is of high importance to ILS managers. As such, managers are increasingly devoting time and resources to assess the impact of climate change on specific perils to understand the impact on investments. • While climate events remain inevitable, ILS investments are used to support resilience against natural disasters. This aligns with environmental sustainability goals.	• ILS investments inherently provide positive social impact in that they support the efficient functioning of the insurance market. • When a catastrophic event does inevitably occur, ILS contributes to the availability of funds for rebuilding and supporting affected areas, allowing communities to recover quicker.	• The governance practices of ILS mangers have become increasingly robust over recent years. • It is typical for managers to conduct deep assessments of governance factors associated with all parties involved in ILS investments.

Key takeaways

- The drivers of ILS risk and return are fundamentally uncorrelated to traditional asset classes making ILS an attractive tool for diversification. However, consecutive years of negative returns can occur, and there is a risk that these coincide with economic downturns and falls in equity markets.
- Cat bonds have produced a solid return premium to cash at much lower volatility relative to equities. However, investors should be aware that cat bonds can be susceptible to sharp, albeit short lived, drawdowns following large, catastrophic events that penetrate the cat bond market (e.g. Hurricane Ian in September 2022).
- Low exposure to interest rate risk and financial market risk.
  - ILS typically performs well in higher rate environments due to the short duration of cash flows and increasing returns on collateral
  - Returns on ILS are broadly unaffected by inflation and swings in company profits, and are resilient to equity market sell-offs
- Maturing market with robust long-term structural growth potential.
- Current spreads and market environment are attractive.
- Incorporation of ESG issues are continually improving and increasing.

Risks and considerations

Risks associated with ILS

An appropriate understanding of risk factors is essential when considering ILS

Risks	Detail
Multiple loss years	Given ILS provide insurance coverage for catastrophic events, the primary risk is that these events occur and result in losses for investors. Further to this, is the risk that multiple loss events occur in consecutive years. Ensuring an appropriate level of diversification across peril and region, as well as appropriate pricing of contracts, can help mitigate this risk.
Concentration risk	Being overly concentrated to a specific peril and region can increase the risk of losses. Ensuring an appropriate level of diversification can help to mitigate this risk. However, investors should be mindful that too much diversification can result in overexposure to aggregate, secondary peril contracts and this can increase the risk of loss.
Trapped collateral	Trapped collateral refers to investor capital that is held or 'trapped' following a catastrophic event, typically due to uncertainty surrounding potential loss payments or claims. Recent improvements in contract terms and conditions have helped to decrease this risk for investors however the risk is still present. Ensuring managers have strong relationships with insurers and brokers, as well as a strong approach to risk management, can help to mitigate this risk.
Liquidity risk	Liquidity risk is more prevalent in private ILS than cat bonds. Cat bonds are tradable instruments and may be liquidated if necessary, however investors should be mindful this can occur at a discount.
Modelling risk	Managers typically use industry models to assess the risk associated with an ILS contract and whether or not the contract is priced appropriately for that risk. There is a level of uncertainty associated with these models. While managers often make 'prudent adjustments' to the models, there is still the risk the models possess a certain level of inaccuracy and may result in unexpected losses for investors. Manager selection is important in mitigating modeling risk. Ensuring the team is comprised of appropriately qualified and experienced researchers, stringent back-testing of models has occurred, and there is a commitment to continually improve the models with the receipt of new data. Expertise in climate and meteorology is also viewed favourably.
Climate change risk	An appropriate analysis of the climate risks associated with particular contracts is essential to ensure the risks have been appropriately priced and incorporated. Manager selection is key to this risk and expertise in climate and meteorology is viewed favourably.
Capacity constraints	The sector, and cat bonds in particular, has some capacity constraints. Manager selection is important in managing this risk. Managers that represent a large portion of the market have less discretion in the contracts they invest in, may be subject to a greater level of cash drag, and can be overexposed to aggregate, secondary peril contracts increasing the risk of loss.

Key takeaways

Key takeaways

ILS are instruments that transfer risk from insurers and reinsurers to capital markets.

The drivers of ILS risk and return are fundamentally uncorrelated to traditional asset classes.

The current environment for ILS is attractive. The current level of spreads and hardening of contract Ts&Cs present a compelling investment opportunity.

An appropriate understanding of the risks associated with ILS investments is essential when considering the sector.

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