

August 2018

How Digital is Changing Insurance Asset Management Now and in the Future

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Agenda



- **Introduction**
- **Digital here and now**
 - Insurance asset data
 - Risk management
 - Optimal cash flow matching
 - Capital efficient asset portfolio optimisation
 - Diversification to manage risk
 - Protecting equity
 - Quantitative investment strategies
- **The future**

Introduction

- **Drivers of change**
 - Regulation and harsh investment environment
 - Cheaper and more powerful computing => can do more
 - More data and recognition of value-adding information they contain
 - Fear of disrupters
- **Constraints**
 - Legacy systems and lack of investment
 - Wrong skillsets
 - Complacency
- **Benefits**
 - Survival
 - Meet client needs more effectively and at lower cost
 - Can be a genuine differentiator

01

Digital here and now

I. Insurance asset data

Digital Here and Now: Insurance Asset Data

- **Solvency II's Tripartite Template**
 - Single format data exchange template for all to use
 - Agreed by national industry bodies
- **What's in it?**
 - All assets, line-by-line
 - 136 columns of data (eg credit rating, securitisation by type, both legs of swaps etc)
 - Full instrument description
- **What is it used for?**
 - Report market values (or to estimate them using models)
 - To stress market values
- **Data Aggregators**
 - Morningstar, Silverfinch etc
 - Offering to consolidate all data from all asset managers and present a combined view to insurers

Digital Here and Now: Insurance Investment Data

- **Speed** - industry standard is by Working Day 5 each month
- **Strategic partners**
 - Can receive by Working Day 2 as systems and processes are more integrated
- **Direction of travel is only one way**
 - Ever more granular data
 - Ever faster data transfer
- **Leading to**
 - Real time risk management
 - Individual trade pre-approval

II. Risk Management

Digital Here and Now: Risk Management

Solvency II Standard SCR

SCR Market Risk Report

PORTFOLIO: **SQ_FRAP**

ANALYSIS DATE: **March 31, 2017**
NAV/MV: **3,183,248,556**

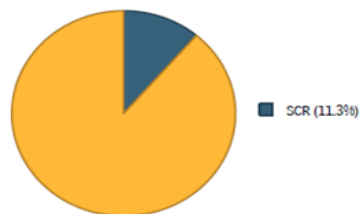
CURRENCY: **EUR**
UNDERLYING MV: **3,159,247,830**

Summary

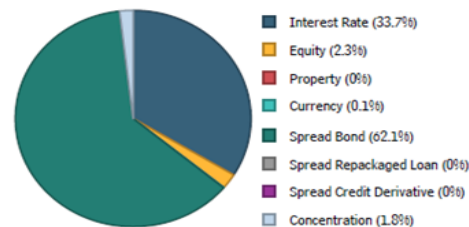
SCR Total: 350,643,634
Total Uncorrelated: 496,530,072

Module	Stress Result
Interest Rate	167,483,853
Equity	11,219,680
Property	-0
Currency	324,556
Spread Bond	308,376,464
Spread Repackaged Loan	0
Spread Credit Derivative	0
Concentration	9,133,319

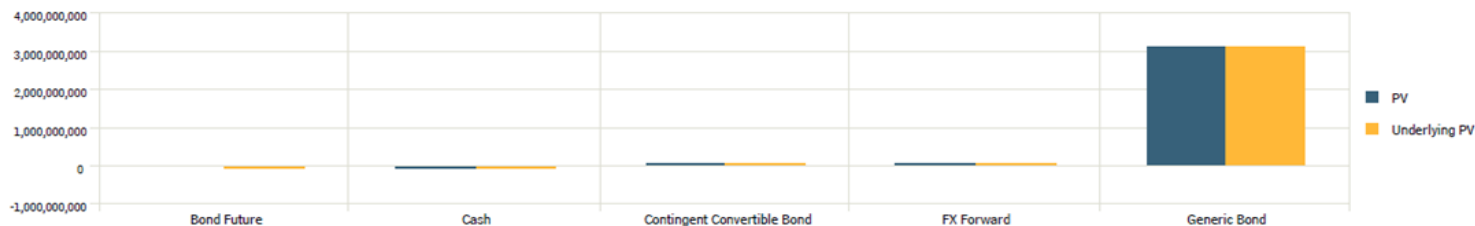
Market Value



SCR Breakdown



PV Summary

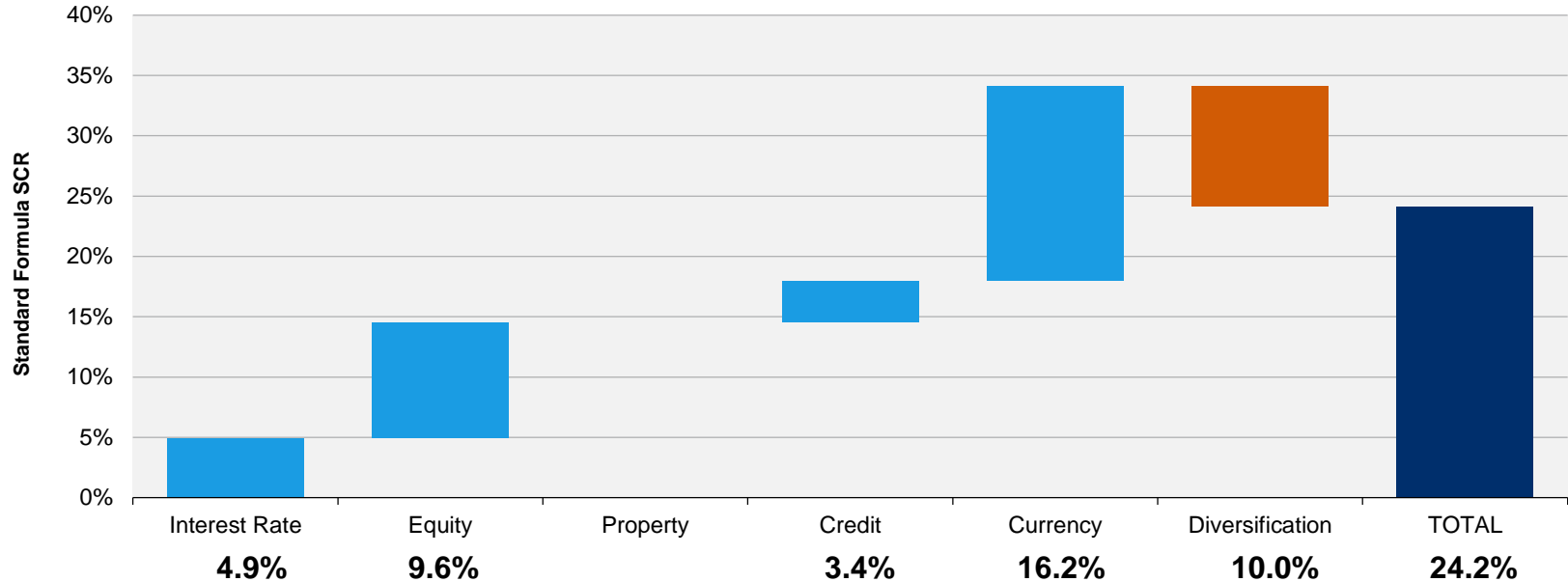


Source: Aberdeen Standard Investments

Digital Here and Now: Risk Management

Solvency II Standard SCR

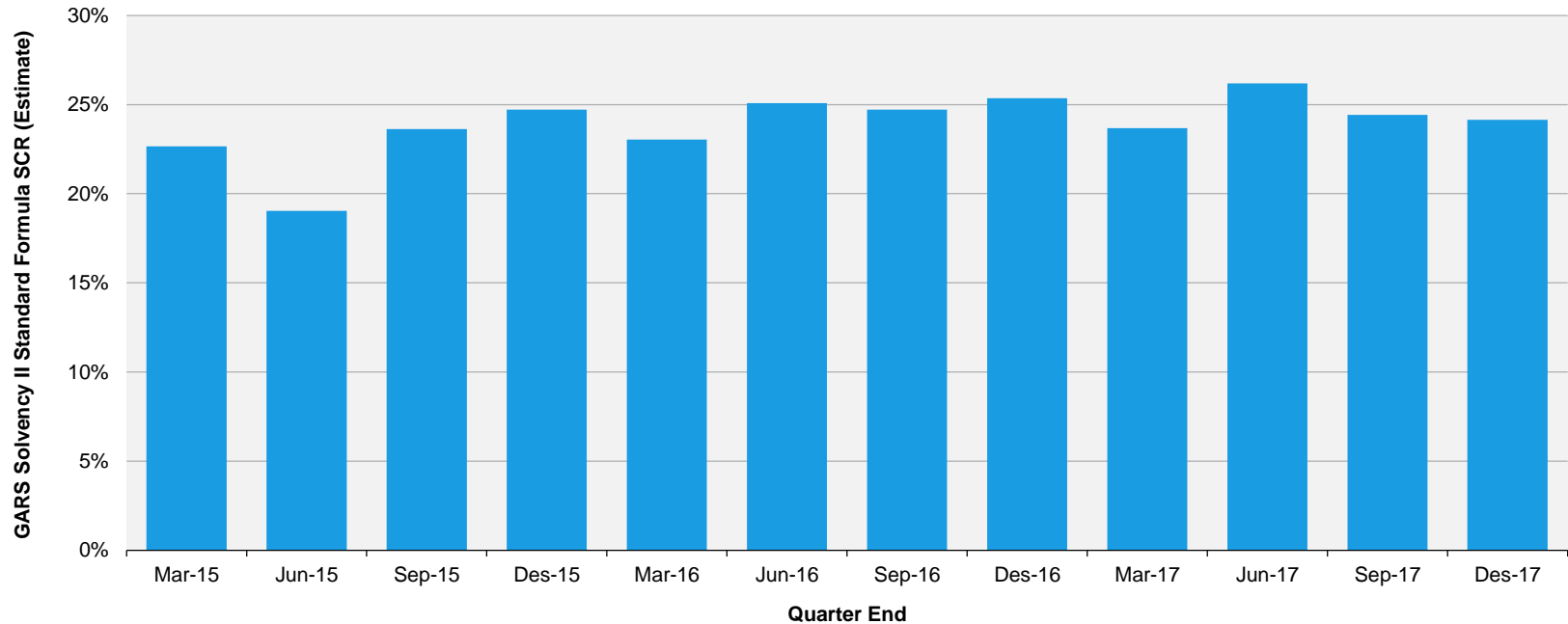
Multi-asset fund with over 1000 positions, including non-standard derivatives



Source: Aberdeen Standard Investments, 31 December 2017

Digital Here and Now: Risk Management

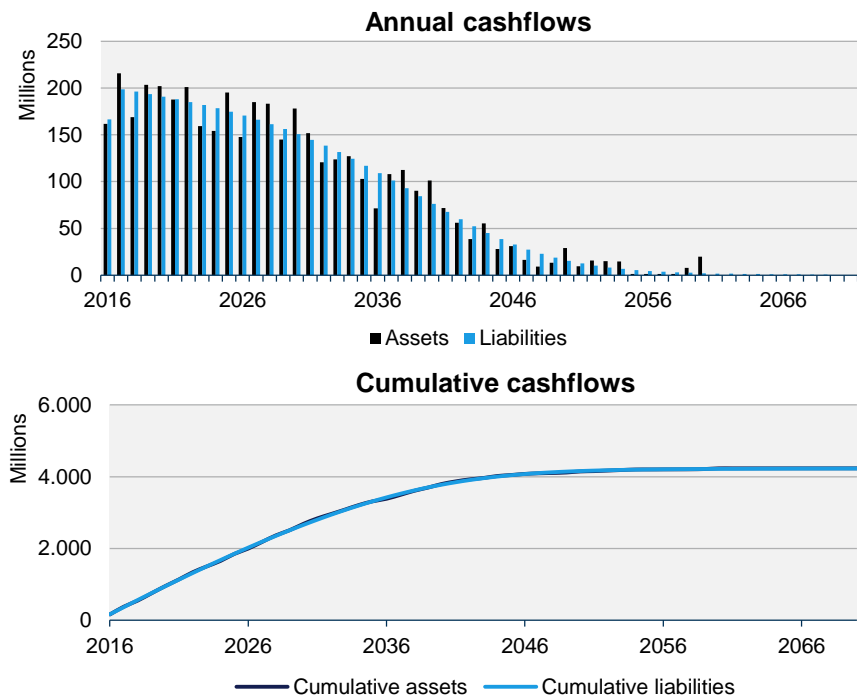
Solvency II Standard SCR



Source: Aberdeen Standard Investments, 31 December 2017

III. Optimal Cashflow Matching

Digital Here and Now: Cash Flow Matching



Liabilities

- Typical liability cashflow profile
- Either annuity cashflows or fixed /stable component of participating business

Asset allocation

- Portfolio composition (public/private/oseas) determined by strategic asset allocation
- Either client view or in consultation with SLI

Stock selection

- Investible universe of favoured credit determined by credit portfolio manager

Portfolio construction

- Use proprietary optimisation techniques to construct optimal portfolio subject to relevant constraints
- Able to construct optimal portfolio on a range of metrics: net spread, SCR, cashflow match

Portfolio management

- Ongoing management by credit PM
- Combining PM expertise and judgment with relevant quantitative insurance focussed metrics
- e.g. hurdle rates, SCR based risk/return metric, cashflow match

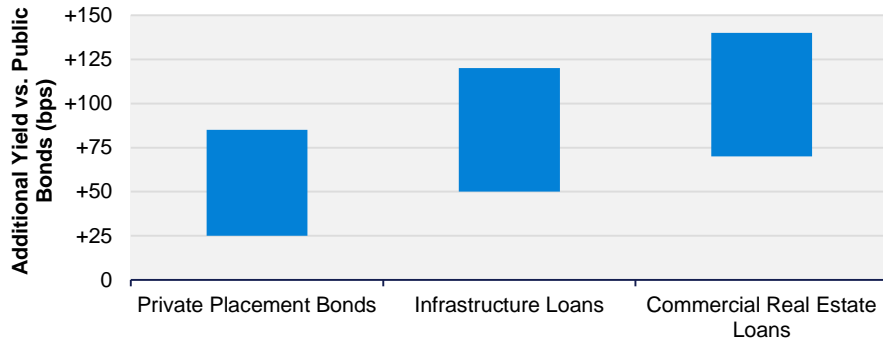
This slide is for illustrative purposes only and shows a sample cash flow matched portfolio. Source: Aberdeen Standard Investments

Private Credit Can Offer an Improved Risk-return Profile

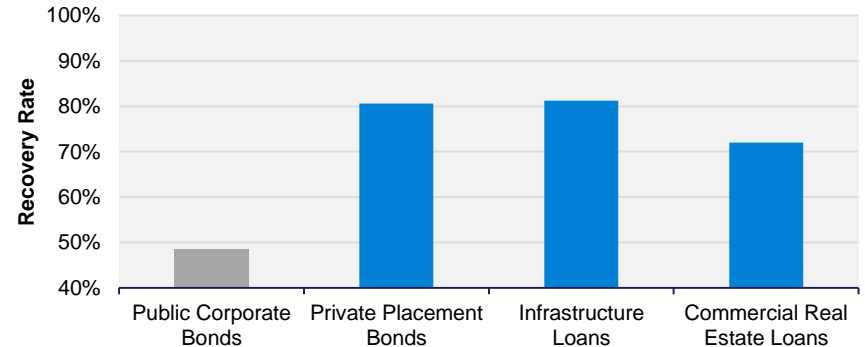
Private credit can offer higher yield and lower risk than public corporate bonds

- **Higher yield:** Illiquidity and complexity premia can lead to a higher yield relative to public credit markets
- **Lower risk:** Security, strong covenants and in-depth due diligence can lead to lower loss rates than in the public credit markets
- **Improved diversification:** Risk is further reduced through exposure to uncorrelated and hard-to-access economic drivers

Yield pick-up vs. public corporate bonds¹



Improved recovery rates vs. public corporate bonds²

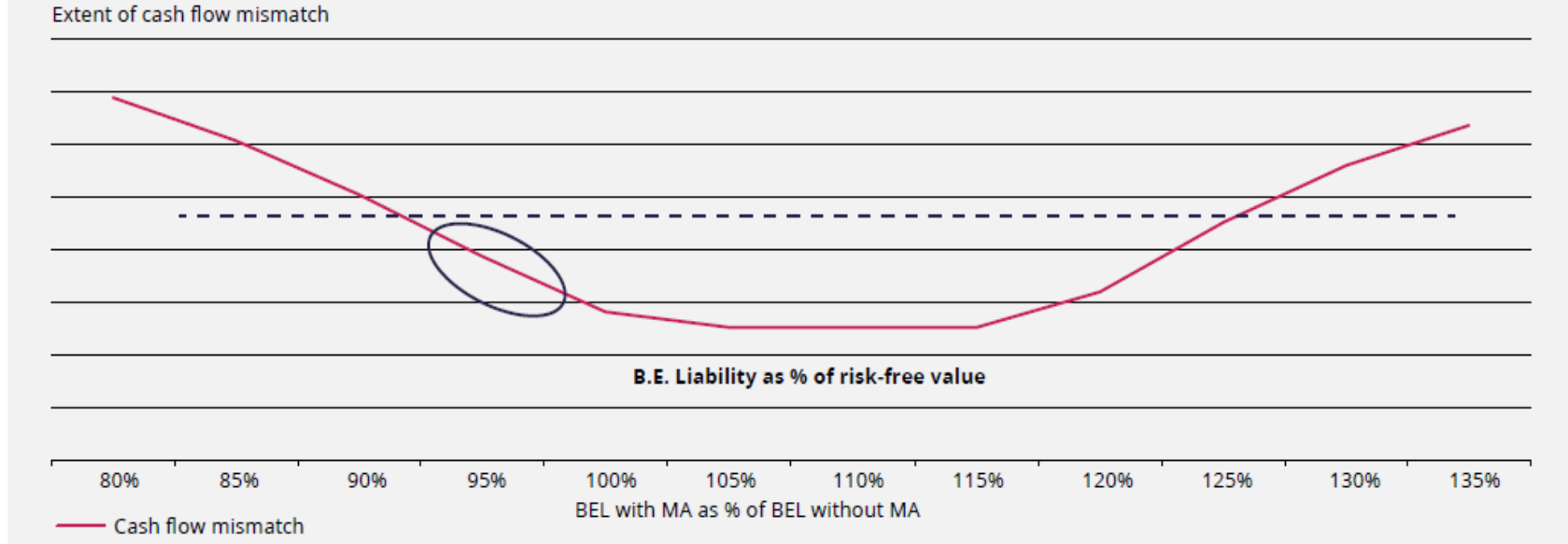


¹ Source: Aberdeen Standard Investments. Yield pick-up vs. similarly rated public corporate bonds. Yield pick-ups are indicative only. Gross of fees.

² The recovery rate for "public corporate debt" is based on BBB unsecured corporate debt and the recovery rate for "private corporate debt" is based on BBB senior secured loans. Both are sourced from Moody's Annual Default Study: Corporate Default and Recovery Rates, 1920-2016. The recovery rate for "infrastructure debt" is sourced from Moody's Default and Recovery Rates for Project Finance Bank Loans, 1983-2015. The recovery rate for "commercial real estate debt" is sourced from Cyclical Losses on Bank Loans by Bart Keijsers, Bart Diris and Erik Kole. Statistics based on ultimate recovery rates

Digital Here and Now: Optimal Cash Flow Matching

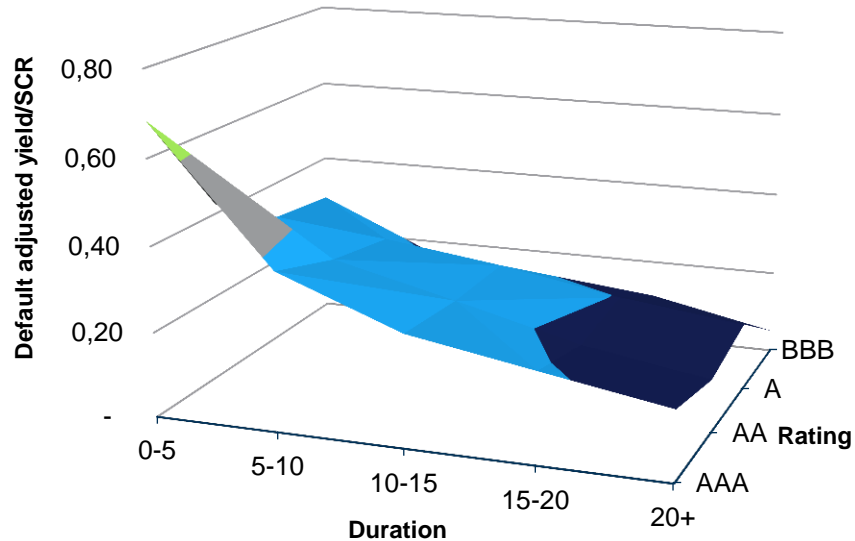
Figure 3: Asset allocation optimisation - the efficient frontier



Source: Aberdeen Standard Investments, February 2015

IV. Capital Efficient Asset Portfolio Optimisation

Digital Here and Now: Capital Efficient Asset Portfolio Optimisation

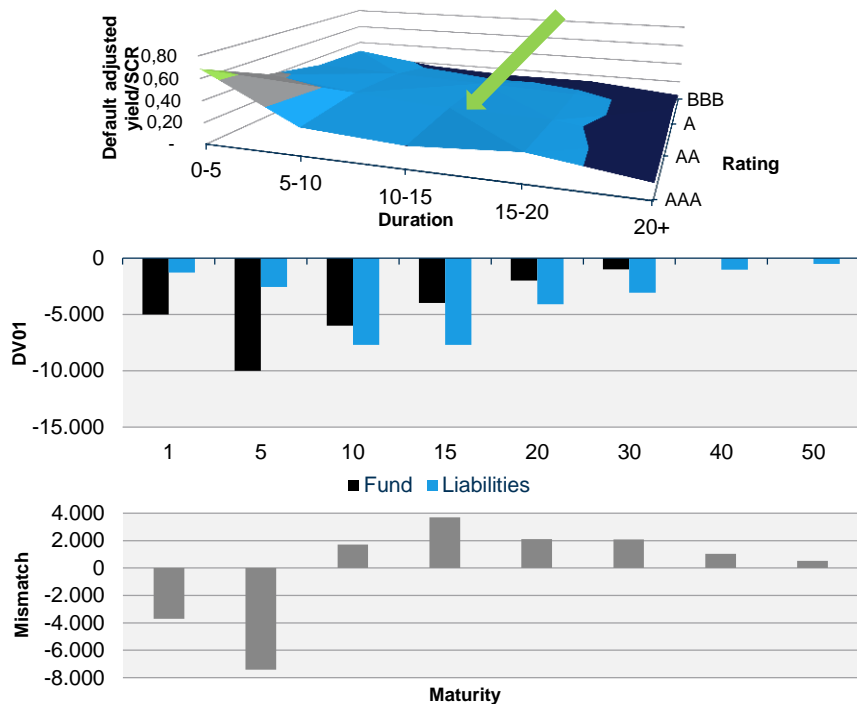


Analysis as of CoB 31 January 2017, representative portfolio of public and private credit assets. Market yields, EIOPA PD haircut

Source: Aberdeen Standard Investments

- Risk and return driven by SCR– either SF or IM
- SII capital efficiency driven by
 - Rating
 - Duration
 - Idiosyncratic spread
 - Liquidity
 - Balance sheet
- SII considerations drive decision making at each stage of the asset management process:
 - Asset allocation
 - Portfolio construction
 - Portfolio management

Digital Here and Now: Capital Efficient Asset Portfolio Optimisation



Source: Aberdeen Standard Investments

Liabilities

- Managing against yield curve exposure of best estimate liability cashflows
- Expressed in terms of DV01 ladder – looking at exposure across curve

Asset allocation

- Investment in specific fund based on insurer specific risk and return appetite: e.g. net yield vs SCR

Residual risk

- Unlikely that duration and curve exposure of fund is consistent with underlying liability
- No desire to hold capital against this unrewarded risk exposure

Hedge construction

- MAI Structuring desk manage portfolio of derivatives and cash assets to hedge residual curve risk
- Focus on efficient implementation

Portfolio management

- Credit fund managed as mandated
- Overlay managed to ensure efficient deployment of liquidity and risk budget
- Cognisant of economic mismatch as well as SII capital considerations

V. Diversification to Manage Risk

Digital Here and Now: Diversification to Manage Risk

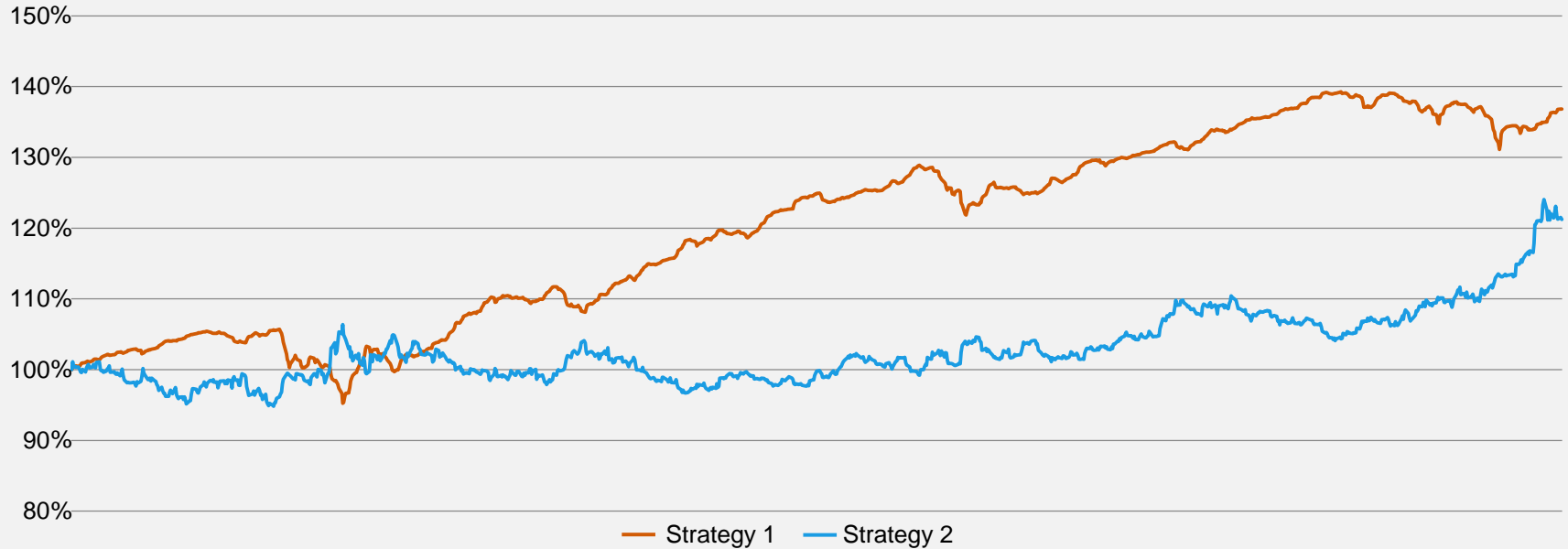
Monthly Returns for Two Strategies Over 4 Years



Source: Aberdeen Standard Investments, 01/01/2011 – 31/12/14

Digital Here and Now: Diversification to Manage Risk

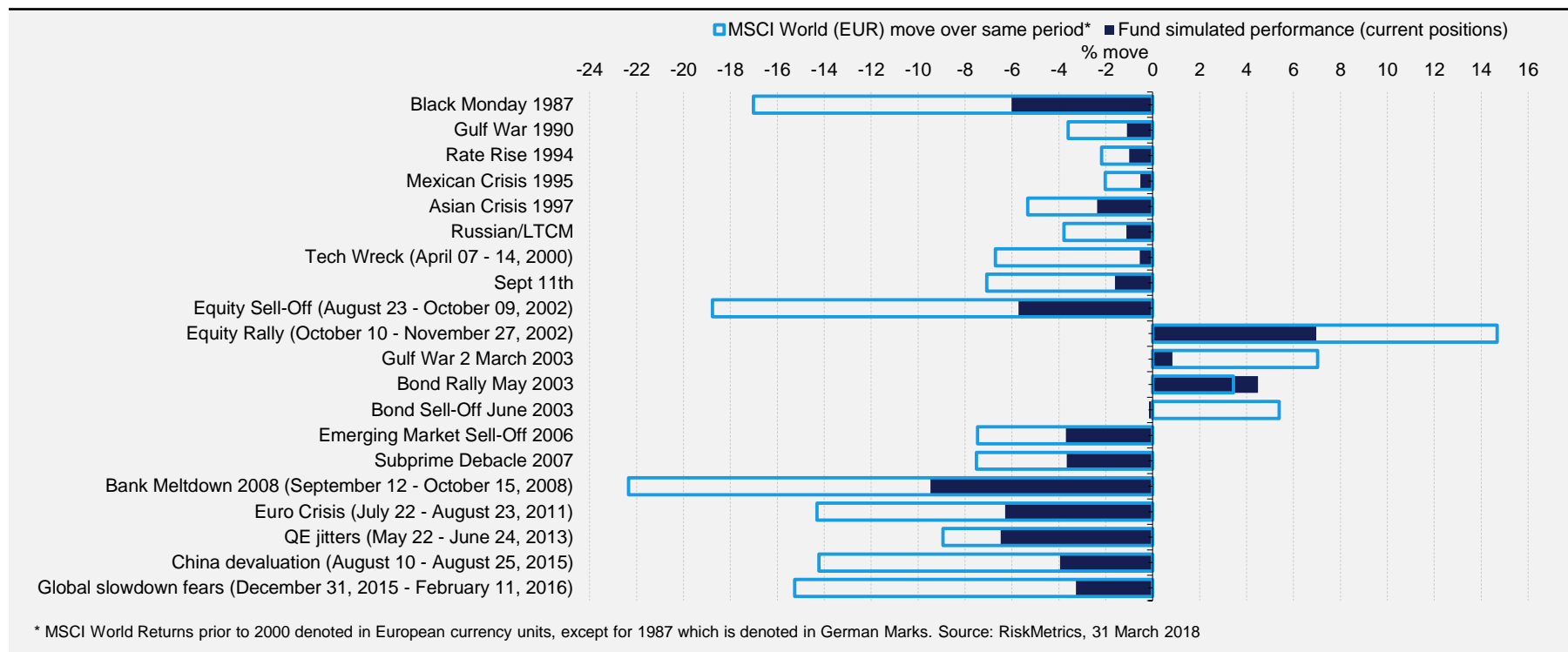
Cumulative Returns for Two Strategies over 4 Years



Source: Aberdeen Standard Investments, 01/01/2011 – 31/12/14

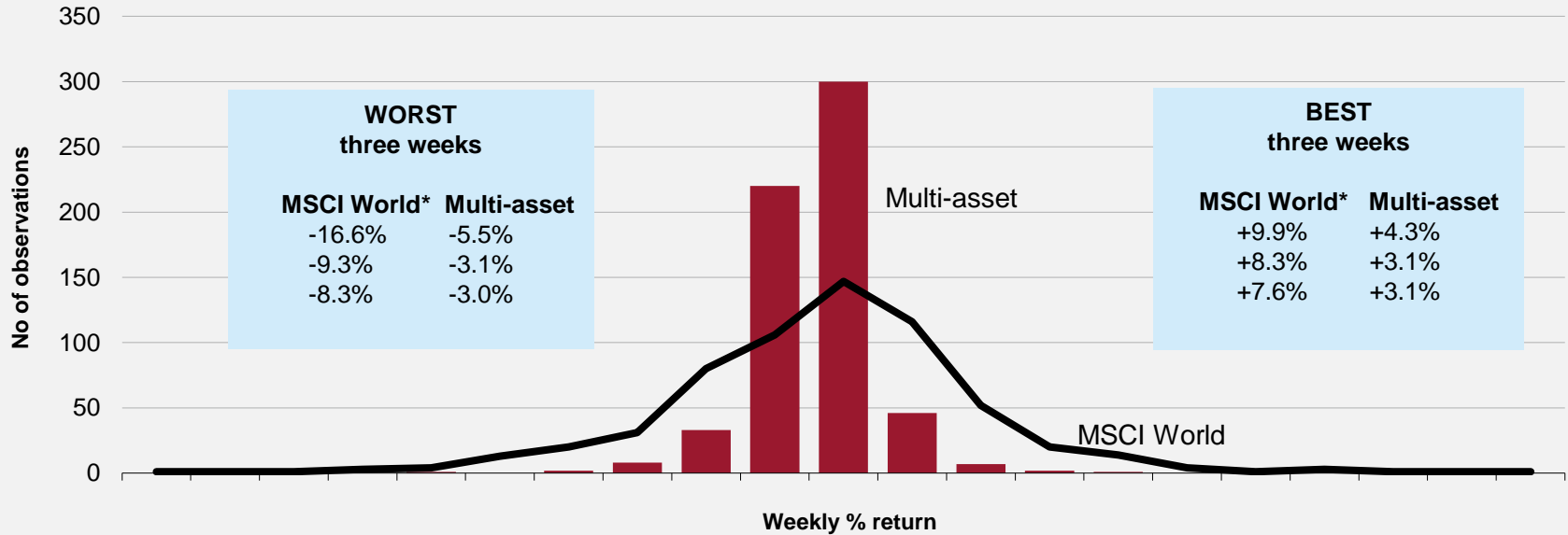
Digital Here and Now: Diversification to Manage Risk

Retrospective stress testing



Digital Here and Now: Diversification to Manage Risk

To avoid the extreme returns of equity investing

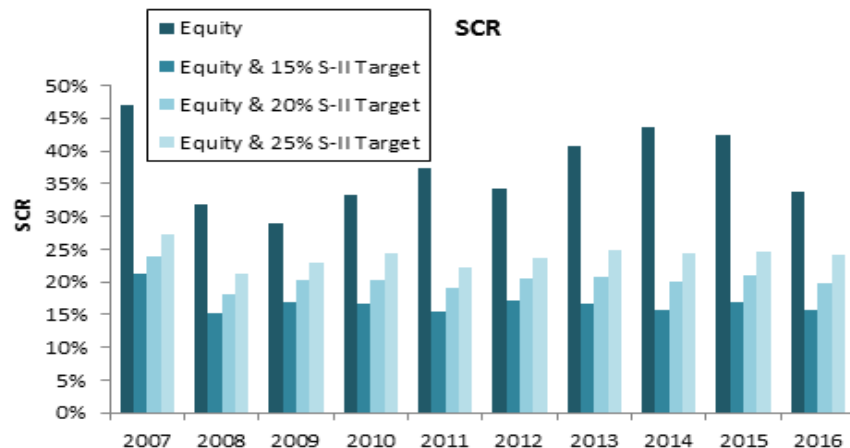
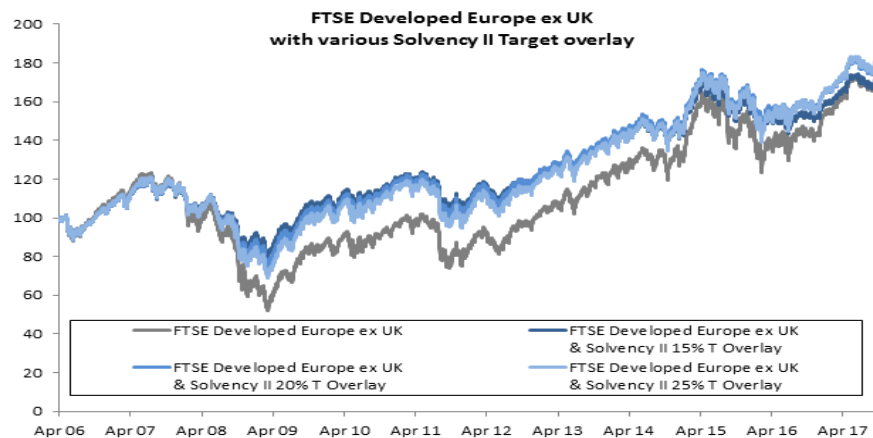


* Source: FactSet, MSCI World (£) net of tracker fund fee. Portfolio performance is based on the £, institutional pooled pension portfolio
Source: Aberdeen Standard Investments, net performance (offer-to-offer) from 12/06/2006 to 31/03/2018

VI. Protected Equity

Digital Here and Now: Protected equity

Targeted algorithmic collar strategy to manage volatility and capital



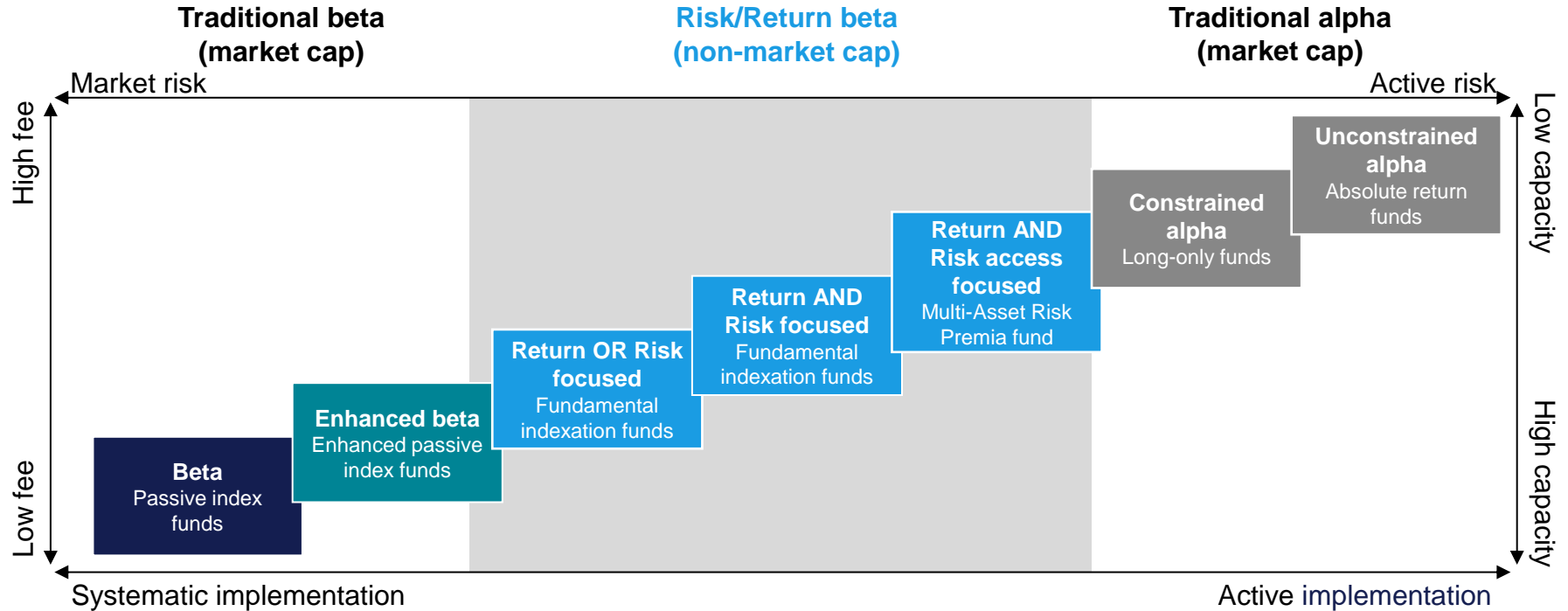
	FTSE Developed Europe ex UK	With Solvency II 15% SCR Target Overlay	With Solvency II 20% SCR Target Overlay	With Solvency II 25% SCR Target Overlay
Performance	4.77%	4.76%	5.18%	5.25%
Realized volatility	20.62%	12.61%	13.98%	15.43%
Sharpe	0.23	0.38	0.37	0.34
Max drawdown	-57.98%	-33.83%	-38.87%	-43.14%

Source: JP Morgan and Aberdeen Standard Investments, December 2017

VII. Quantitative Investments Strategies

Digital Here and Now: Quantitative Investment Strategies

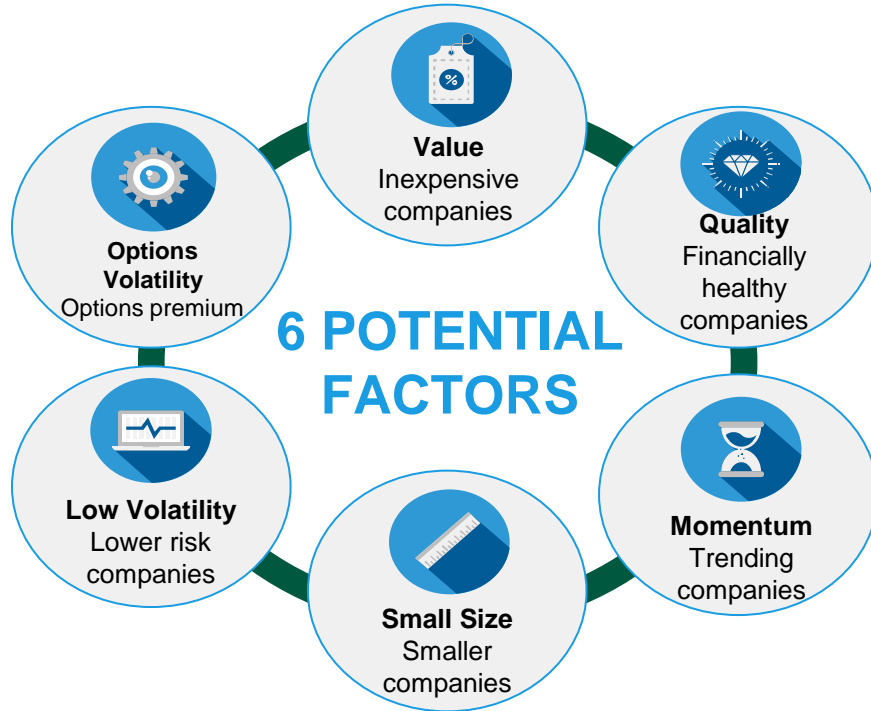
Our range of quantitative investment strategies covering traditional beta, enhanced beta, and traditional alpha



Source: Aberdeen Standard Investments

Digital Here and Now: Factor Based Investing

Six Potential Factors



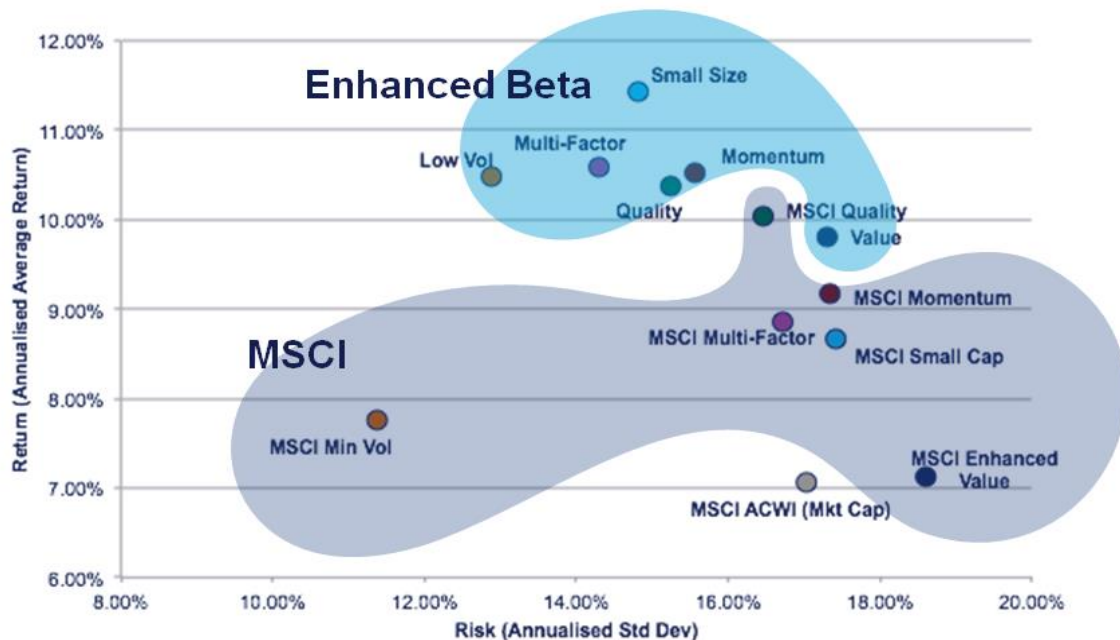
- **Value** – buying cheap companies and selling expensive ones
- **Quality** – investing in prudently managed companies that maximise value creation and return capital to shareholders and those financially robust companies with strong balance sheets and increasing profitability
- **Momentum** – investing based on improving trend (companies that display positive price momentum and improving earnings) and sentiment (positive change in investors' perceptions)
- **Small Size** – investing in small companies vis-à-vis large companies (based on market capitalisation)
- **Low Volatility** – investing in companies displaying low volatility vis-à-vis high volatility
- **Options Volatility** – capturing the spread between implied and realised volatility via index options

Source: Aberdeen Standard Investments

Digital Here and Now: Enhanced Beta Objectives

- Maximises Information Ratio
- Starting point is market cap weights
- Factors strategically weighted
- Aims to enhance returns (by c.0.75%)
- Same absolute risk as market cap index
- Tracking error focused (0.75% to 1.50%)
- 'ESG Inside': Controversial Weapons' excluded and ESG score optimised

Digital Here and Now: Enhanced Beta Has Outperformed Relative to Capitalisation Weighting



Past performance is not a guide to future results

Gross Total Return in USD

Source: Aberdeen Asset Management, Markit, Bloomberg and MSCI

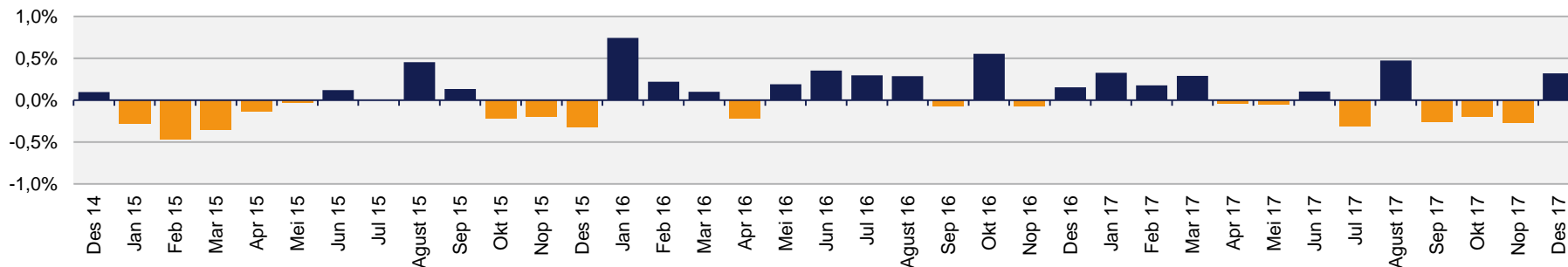
Data from Jan 07 to April 18

Digital Here and Now: Asia Pacific Equity Enhanced Index

Composite performance summary as at 31 December 2017

Date	Annualised Performance (GBP)				
	Strategy	BM	Alpha	TE	IR
31 December 2017					
3 months	7.81%	7.98%	-0.17%	NM	NM
1 year	38.09%	37.32%	0.77%	0.94%	0.82
3 years (pa)	10.79%	10.13%	0.66%	1.00%	0.65
5 years (pa)	7.66%	7.23%	0.43%	0.97%	0.45
Since Inception (pa, 30 September 2007)	4.17%	3.95%	0.22%	0.79%	0.28

Discrete monthly relative performance over the past three years



Past performance is not a guide to future results

Performance is shown gross of fees and does not reflect investment management fees. Had such fees been deducted, returns would have been lower

Source: Aberdeen Standard Investments, 31 December 2017

03

The Future

The Future

- **Data**
 - Faster and more granular with systems connected and integrated
 - New sources of data and information
- **Risk management/ALM**
 - Optimise a defined problem to find solutions - need technology, algorithms and skillsets
 - Genuine differentiator
- **Liquid asset class themes**
 - Less “traditional active” management
 - More quantitative investment solutions, with lower fees
- **Less liquid asset class themes**
 - “Traditional active” management can still add value
 - Value add can differentiate and justify higher fees

Appendix

Quantitative Investments Strategies

Digital Here and Now: Rationale for Existence/Persistence of Factors

Rationale for the existence/persistence of factor premia and their common construction

Factor	Premise	Common Constructions	Rationale
Value	Stocks priced low (high) relative to fundamental measures of value outperform (underperform) so bias portfolio towards cheap stocks	Metrics based on P/B, P/E, D/P or composites of these and other fundamental value metrics	<p>Behavioural: Value stocks are financially distressed and investors persistently overreact to bad news.</p> <p>Structural: The Value risk premium is simply compensation for buying financially distressed stocks</p>
Quality	Stocks of higher quality companies tend to outperform so bias portfolio towards stocks with a strong measure of quality	Metrics such as ROE, earnings stability, dividend growth stability, strength of balance sheet, financial leverage, accounting policies, strength of management, accruals, cash flows	<p>Behavioural: Investors under-estimate the persistent profitability of higher quality companies</p> <p>Structural: The high cost of capital means firms will only invest in the most profitable projects</p>
Momentum	Price trends tend to persist so bias portfolio towards stocks that have recently performed well	Metrics based on past returns (eg. 6 or 12 months, often excluding a recent period), sometimes normalised for volatility	<p>Behavioural: Momentum outperformance is due to investor herding, investor over and under-reaction and also confirmation bias</p> <p>Structural: Stocks with improving fundamentals are more sensitive to shocks in expected growth.</p>
Small Size	Small companies tend to outperform larger ones so bias portfolio towards stocks with a smaller market capitalisation	Metrics based on market capitalisation (full or free float)	<p>Behavioural: Sell-side research neglects smaller companies which in turn creates a disconnect between price and fundamentals.</p> <p>Structural: Smaller companies are inherently higher risk. Their outperformance compensates investors for illiquidity and business risk</p>
Low Volatility	Contrary to predictions of financial theory, less risky stocks tend to outperform riskier ones so bias portfolio towards stocks with historically low absolute variability of returns	Metrics based on beta and realised volatility, eg standard deviation (1 year, 2 years, 3 years), downside standard deviation, standard deviation of idiosyncratic returns, beta	<p>Behavioural: Many investors willingly accept lottery-like risk in pursuit of high returns</p> <p>Structural: Leverage constrained investors are forced to buy riskier stocks in order to beat their benchmarks</p>

Source: Aberdeen Standard Investments

Digital Here and Now: Rationale for Existence/Persistence of Factors

Rationale for the existence/persistence of factor premia and their common construction

Factor	Premise	Common Constructions	Rationale
Options Volatility	<p>To capture the volatility risk premium via selling out of the money call options. The risk premium is the difference between the volatility implied in option prices and the realised volatility</p> <p>Call overwriting can be viewed as selling a form of insurance, whereby the option seller (in this case the fund) receives an upfront premium for writing an insurance contract and the buyer gains long market exposure with limited downside risk. As with all forms of insurance, this comes at a cost to the buyer known as the options premium</p> <p>Over the long-term, implied volatility (used to price options) has historically been higher than subsequent realised volatility, the “volatility spread”, thus providing a positive return for the sellers of call options</p>	<p>Systematic writing of one month calls with fixed strikes to target premium (ie. BuyWrite 105 strategies)</p>	<p>Behavioural: Excessive demand for insurance results in the systemic over-pricing of risk and the lottery effect, which in turn leads to the exploitable low volatility anomaly</p> <p>Structural: Overuse of the options market for portfolio insurance purposes since the 1987 crash means that there is an excess demand resulting in an options premium. Part of the reason for premium is that the various counterparties on the supply side eventually hedge via the cash market i.e. they take direct shorts in the cash market and (1) there are borrow costs which add to the cost of shorting as they are usually at a premium to market rates; and (2) shorting is inherently more risky/onerous due to the unlimited potential losses – another reason to demand a premium from the instrument sold (against which you are building your hedge)</p>
ESG Inside	<p>ESG performance influences the fundamental value of a company in a way that analysts and financial markets are slow to recognise</p>	<p>Metrics based on environmental, social, and corporate governance scores. Also examine the controversial behaviour of companies, such as environmental pollution, bribery, corruption, and human rights issues, etc</p>	<p>Behavioural: ESG performance influences the fundamental value of a company in a way that analysts and financial markets are slow to recognise</p> <p>Structural: ESG score levels reflect intangible benefits of better corporate sustainability and governance</p>

Source: Aberdeen Standard Investments

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