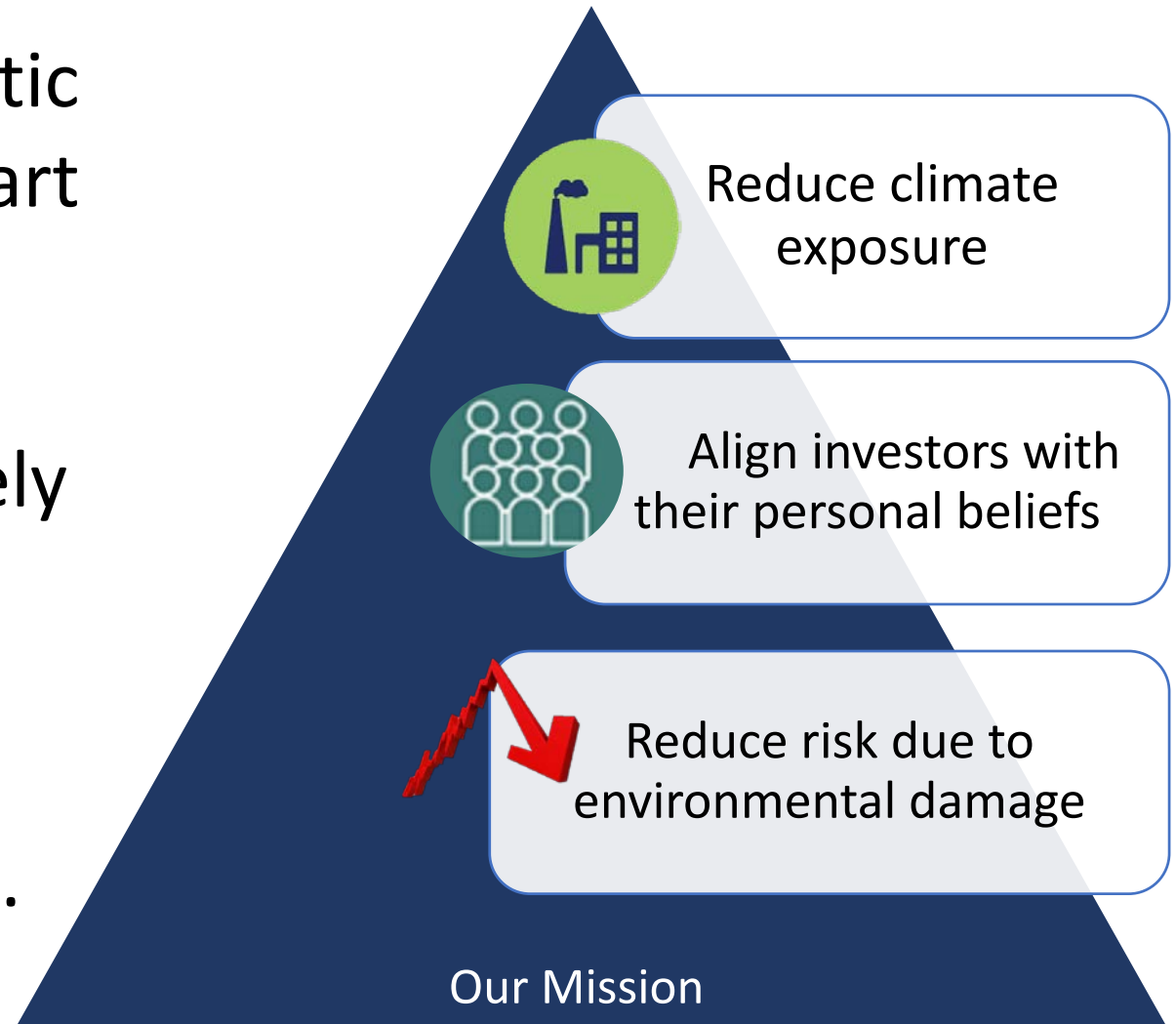# ENVEST
INDEX FUND

London, 13 April 2018

Aishwarya Sinh
Pratul Agarwal
Aayushi Pandit

Columbia University

WHAT IS ENVEST?

- Envest is a unique thematic index, integrated with a smart beta strategy

- Envest directs assets exclusively to the environmental theme with the long term aim of reducing the inherent risk caused due to climatic factors.
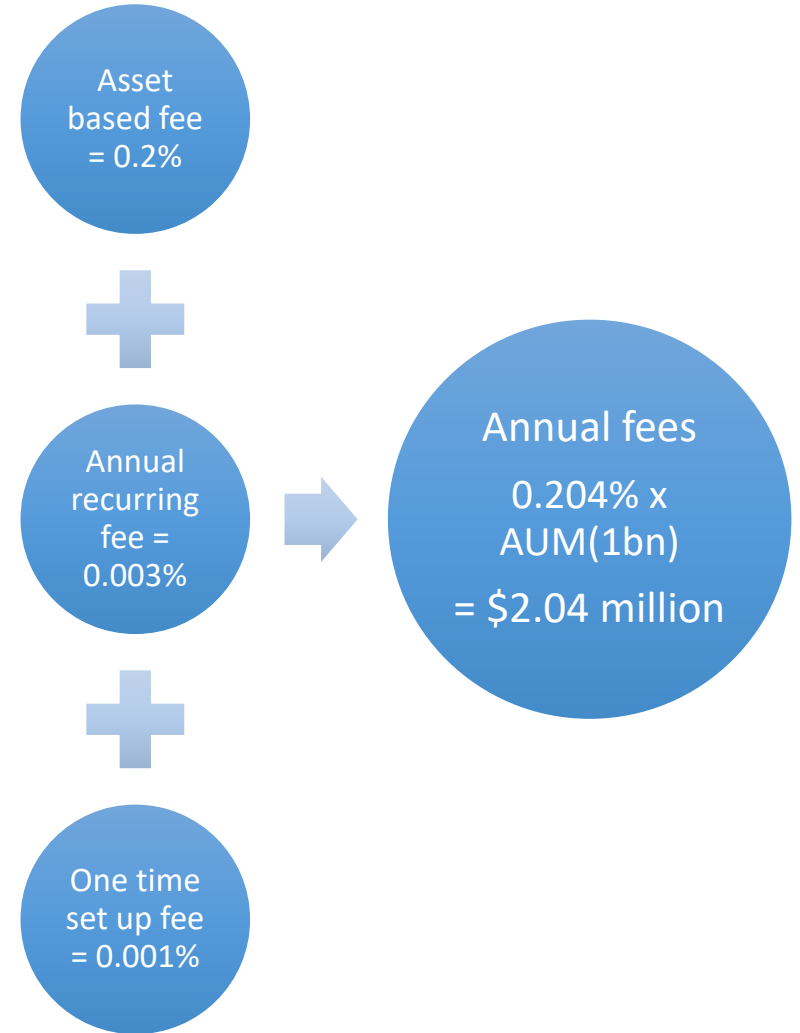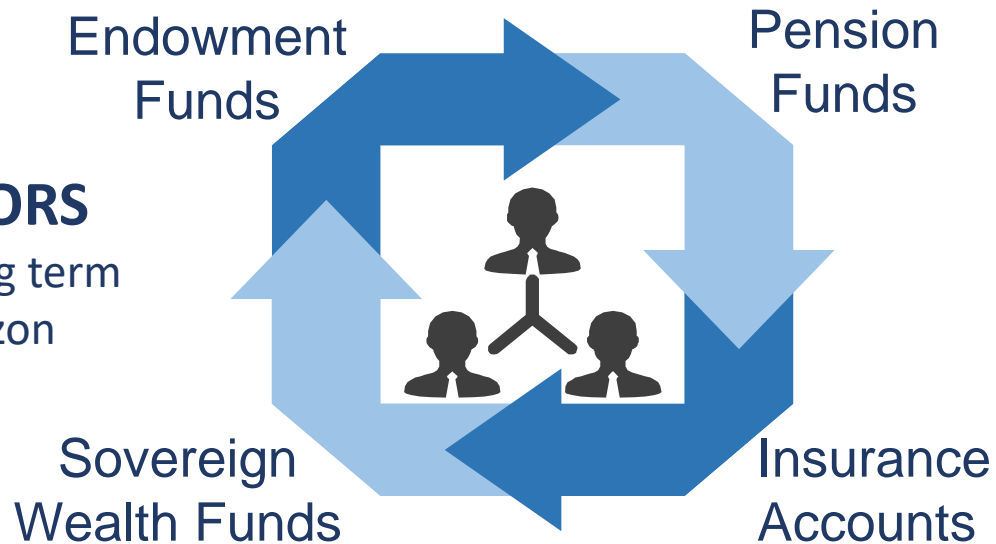
Reduce climate exposure

Align investors with their personal beliefs

Reduce risk due to environmental damage

Our Mission

ENVEST INDEX (USD)

FUND TYPE

Fund Type	Exchange Traded Fund
Asset Class	Equity
Market Cap	Broad Market
Geographic Focus	United States
Regulatory Structure	Open Ended Investment Company
General attitude	Environment + Smart Beta
Investment Period	5-10 years
AUM	USD 1 billion
Fees	0.20%

TARGET INVESTORS

Investors with a long term investment horizon

Endowment Funds

Pension Funds

Sovereign Wealth Funds

Insurance Accounts

COST STRUCTURE

Asset based fee = 0.2%

+

Annual recurring fee = 0.003%

One time set up fee = 0.001%

Annual fees

0.204% x AUM(1bn)

= $2.04 million

INDEX METHODOLOGY

Creating Value Score

Identifying climate factors

Creating climate score

Modelling portfolio risk
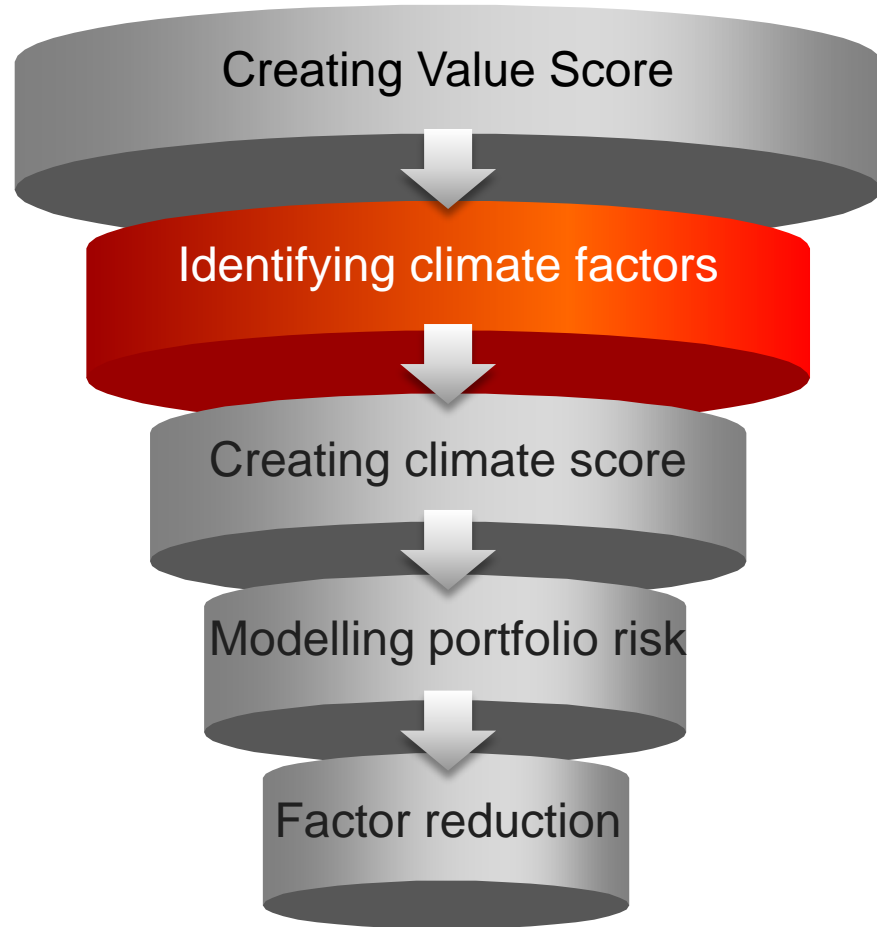
Factor reduction
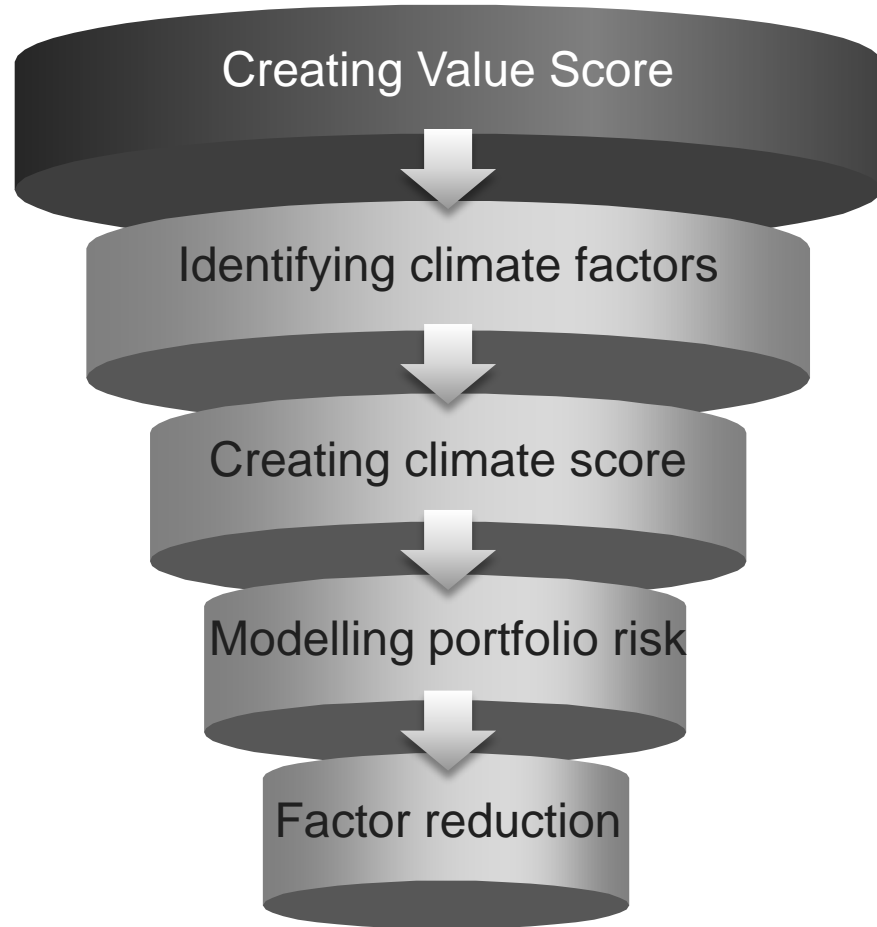
Value score methodology

- Forward P/E, P/B, EV/CFO (in case of non-financials)

- Taking inverse of each ratio

- Winsorize each variable (remove outliers)

- Normalize the series (z-score)

- Create composite z-score

- Create sector relative z-score

- Create standard V-score for each security
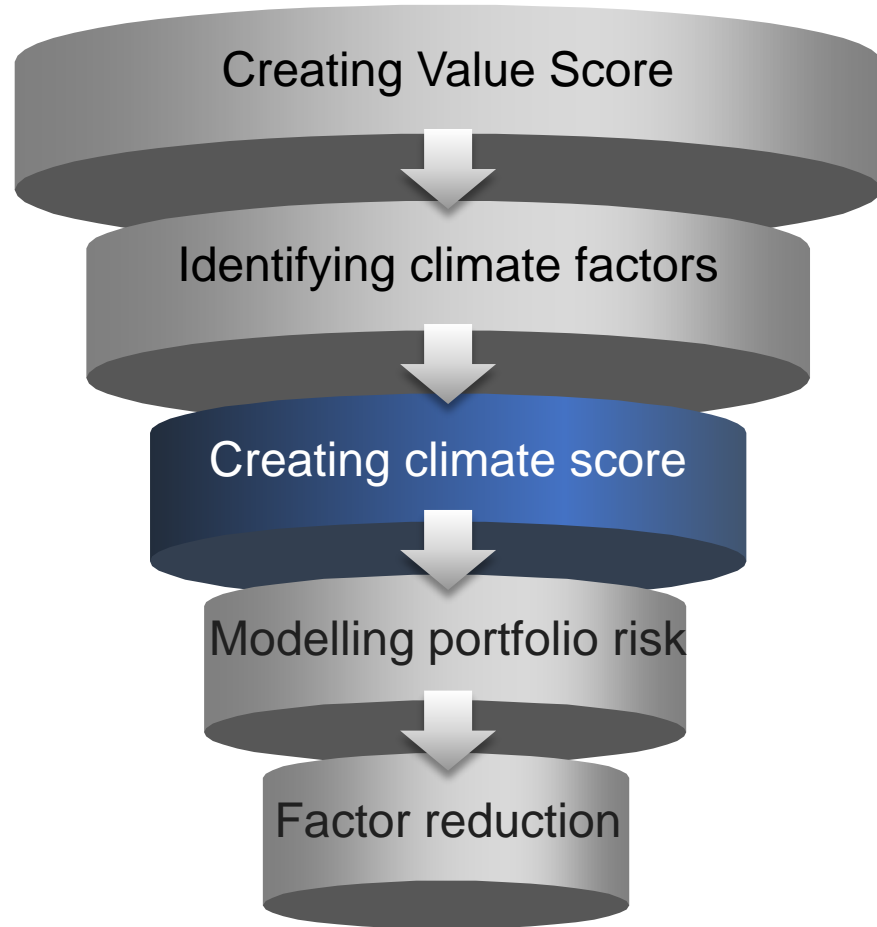
Data Source: Bloomberg

INDEX METHODOLOGY

Creating Value Score

↓

Identifying climate factors

↓

Creating climate score

↓

Modelling portfolio risk

↓

Factor reduction

Fields identifying climate exposure

- Total **Greenhouse Gas** emissions measured in millions of metric tons (ex CO2)
- Total **CO2** emissions measured in thousands of metric tons, it includes both direct and indirect emissions.
- **Total waste** measured in tons, depicts the waste that the company discards.
- Total amount of **water** used, measured in thousands of cubic meters; measures the total supply of water for its operational purpose including process and cleaning water including water retained through recycling.
- Total **energy consumption** measured in Mega Watt hour, includes energy directly consumed through combustion and chemical production in known equipment and in a controlled environment respectively.

Data Source: Bloomberg

INDEX METHODOLOGY

Creating Value Score

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Creating climate score

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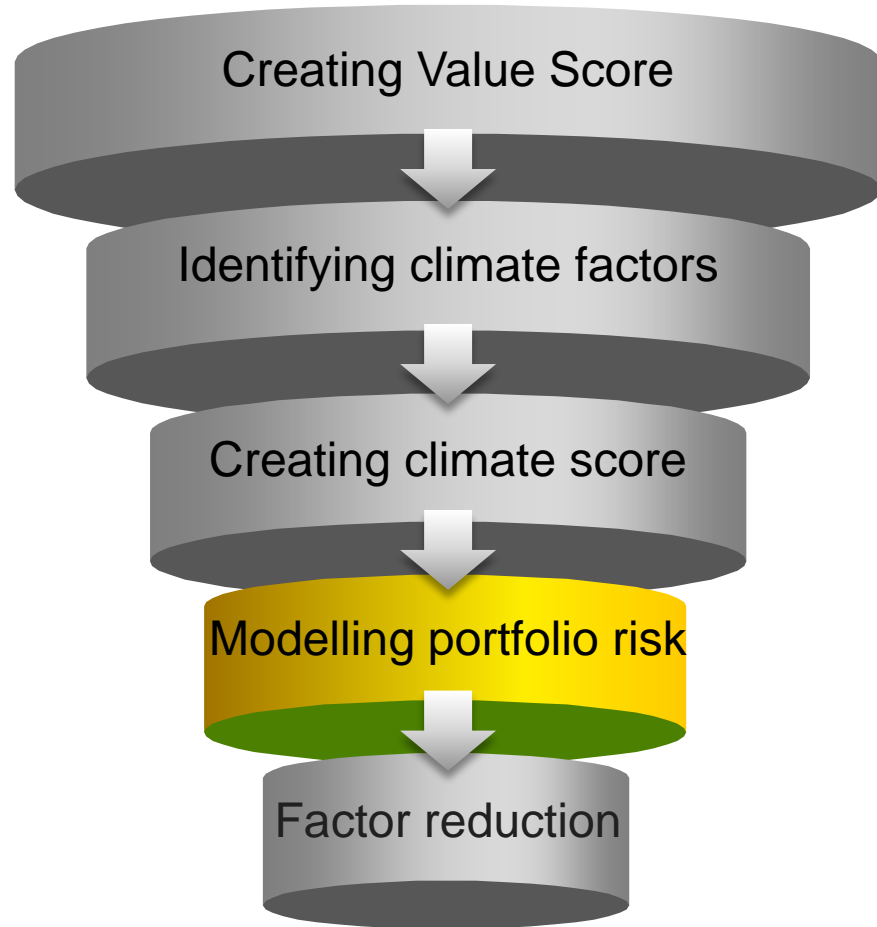
Factor reduction

Climate score

- Identified emission values for each security beginning 2011
- Estimated data points backwards, for companies which started reporting values only during recent times
- Used industry averages (emissions/sales) to estimate missing values
- Standardized each series by using Market capitalization
- Normalized each series (z-score)
- Created a weighted average z-score to form the climate score

Data Source: Bloomberg

INDEX METHODOLOGY

Creating Value Score

↓

Identifying climate factors

↓

Creating climate score

↓

Modelling portfolio risk

↓

Factor reduction

EWMA method for portfolio risk

- Used monthly returns for 3 years, as the basis for forward looking active risk model

- Implemented Exponentially Weighted Moving Average method to model next quarter tracking error

- Used 0.97 as the half-life parameter(lambda) for EWMA

- Used the estimated variance-covariance matrix as the basis for tracking error.

Data source: Bloomberg

INDEX METHODOLOGY

Creating Value Score

Identifying climate factors

Creating climate score

Modelling portfolio risk
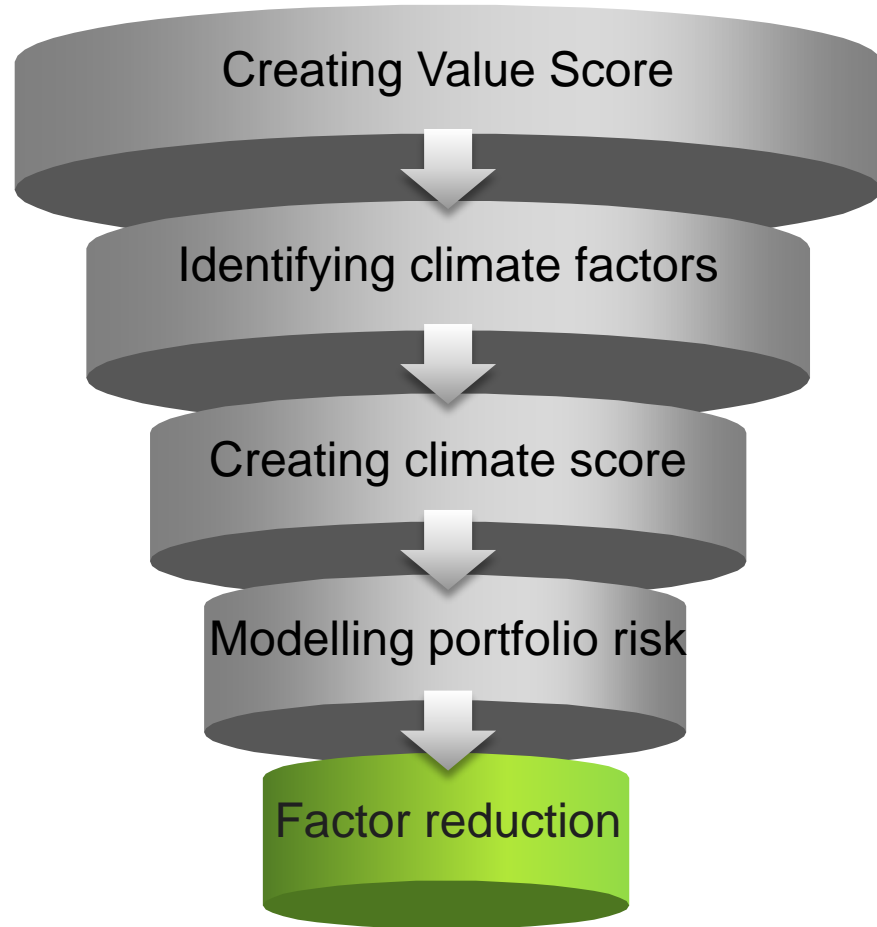
Factor reduction

Climate factor reduction from S&P

- The total sum of product of each security's weights in S&P 500 with their respective climate score, gives climate score for S&P

- Similarly, the total sum of product of each security's weights in portfolio with their respective climate score, gives climate score for the portfolio

- Created a function which identifies percentage reduction of portfolio climate score from the S&P 500 climate score

- Optimized the portfolio beginning 2011 since emission data was available from that year onwards on public domain.

PORTFOLIO OPTIMIZATION OBJECTIVES

TRACKING ERROR

- The portfolio should be very close to the benchmark, while weeding out the exposure to climate factors

- Objective is set to minimize the forward looking tracking error (active risk)

- Tracking Error is estimated using Exponential Weighted Moving Average method

- Used monthly returns for past 3 years.

- This model gives higher weightage to most recent values in estimating forward looking active risk.

MINIMIZE

Metric to measure active risk

MAXIMIZE

Metric to measure reduction

REDUCTION IN CLIMATE EXPOSURE FROM S&P

- The objective is to achieve maximum reduction in climate exposure from the benchmark, while being able to mimic the same levels of returns and risk profiles.

- Optimization Technique: **Quadratic Convex Optimization**

- $1 - w(p).C / w(b).C$

- C is the vector for climate scores of all securities in S&P

- This measures the percentage reduction in our final portfolio, relative to the benchmark, which we want to maximize.

- Rebalancing Frequency: **Quarterly**

OPTIMIZATION CONSTRAINTS

Sector level weights

Deviation of each GICS identified sector should be within +/- 2% from it's corresponding sector weight in the S&P 500

Deviation of energy sector allocation should be within +/- 4% from the benchmark

(since Energy stocks have higher values, we have relaxed the constraints)

Turnover

Maximum turnover for each quarterly rebalance capped at 40%

Security level weights

Weight of each security in the final portfolio should be less than 20 times its corresponding weight in the S&P 500

Value Score

Value exposure of the portfolio should be greater than 20% of the corresponding value in the S&P.

Enhanced Value Tilt

Active weights of securities

Portfolio Turnover

Active Sector Weights
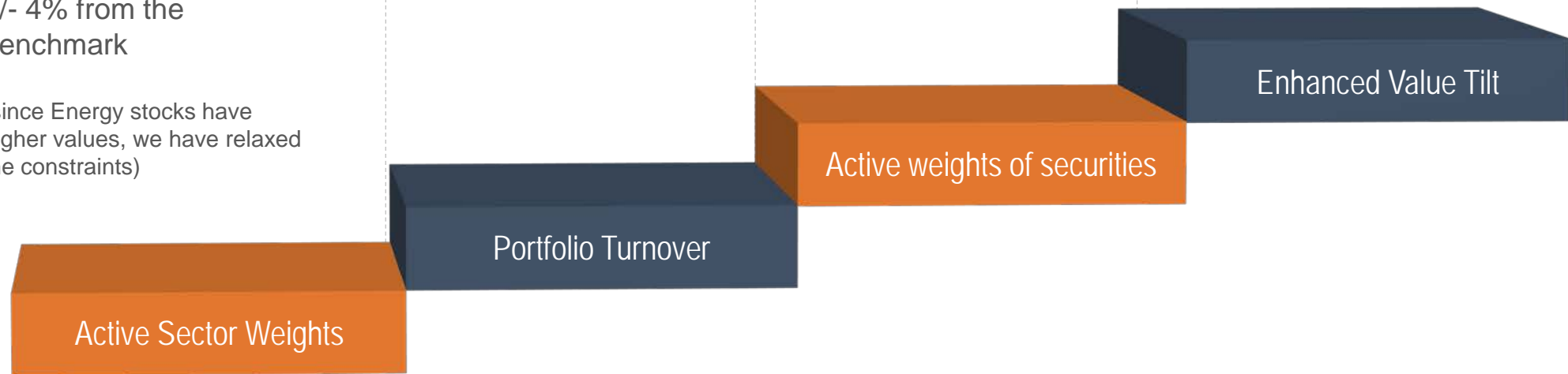
FUND PERFORMANCE

ANNUAL PERFORMANCE

Year	Envest	S&P
2011	5.71%	8.01%
2012	17.23%	15.38%
2013	25.81%	22.12%
2014	18.26%	12.43%
2015	-1.18%	2.61%
2016	15.94%	16.60%
2017	18.77%	14.45%

— Envest   — S&P 500

INDEX PERFORMANCE —NET RETURNS

	1 Mo	3 Mo	ANNUALIZED 1 Yr	3 Yr	5 Yr	10 Yr
Envest	-0.57%	0.00%	18.77%	10.81%	15.15%	N/A
S&P 500	-2.55%	-0.75%	14.45%	11.04%	13.46%	N/A

INDEX RISK AND RETURN CHARACTERISTICS

|	Beta	Tracking Error	Turnover	ANNUALIZED STD DEV (%) 3 yr	5 yr	10 yr	SHARPE RATIO 3 yr	5 yr	10 yr	MAXIMUM DRAWDOWN 2011 Q4
Envest	1.08	0.43%	40.09%	10.72%	13.96%	N/A	0.83	0.95	N/A	19.49%
S&P 500	1	0	8.61%	10.61%	12.68%	N/A	0.86	0.91	N/A	16.51%

1. 1 m LIBOR(USD) on 31st March, 2018
2. Returns annualized as of Q1 2018.

RISK AND DRAWDOWN ANALYSIS

- Active Risk – Have been able to achieve a low tracking error of 0.43% historically

- Drawdown – Maximum Drawdown was observed during Q4 2011. Post that period, the drawdown profile looks very similar to the benchmark.


Envest vs S&P Risk

Envest vs S&P Drawdown

Risk and drawdown as of Q1 2018
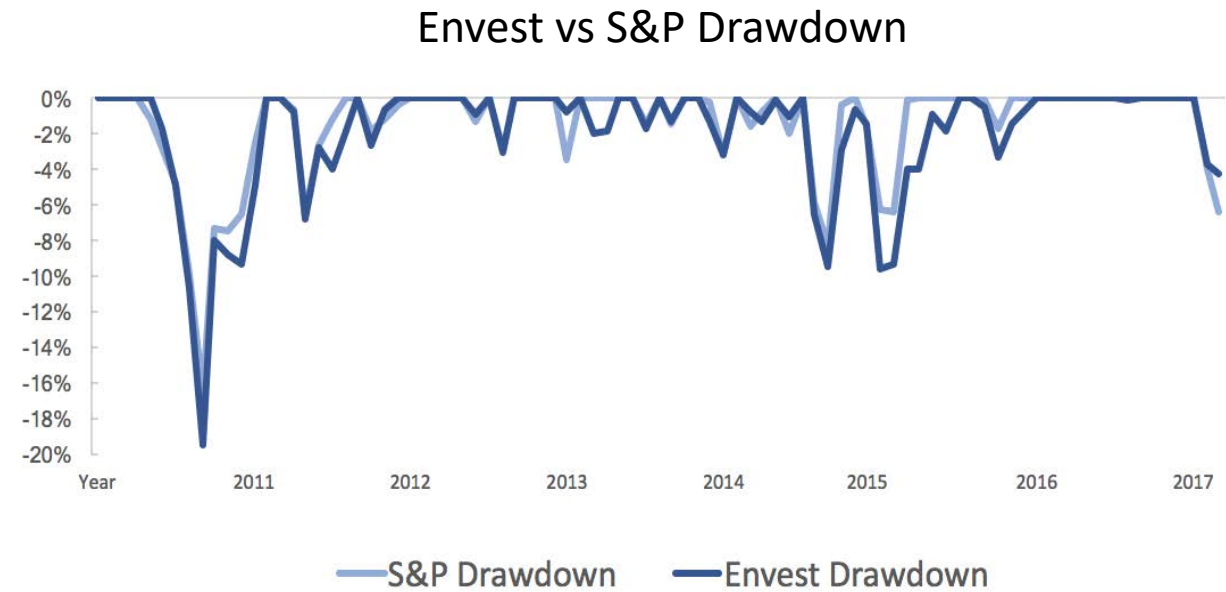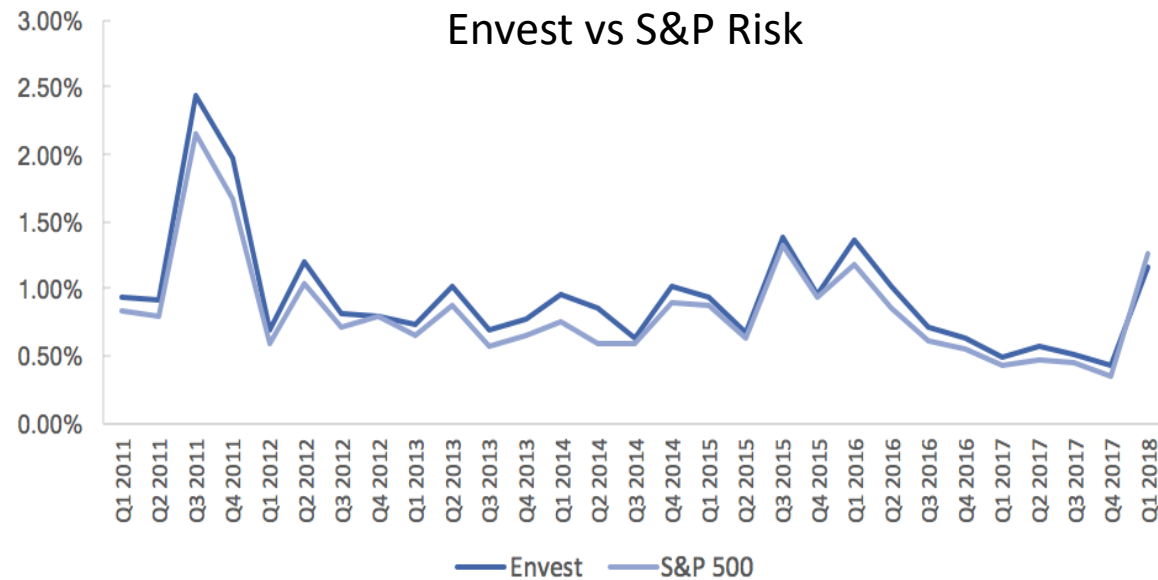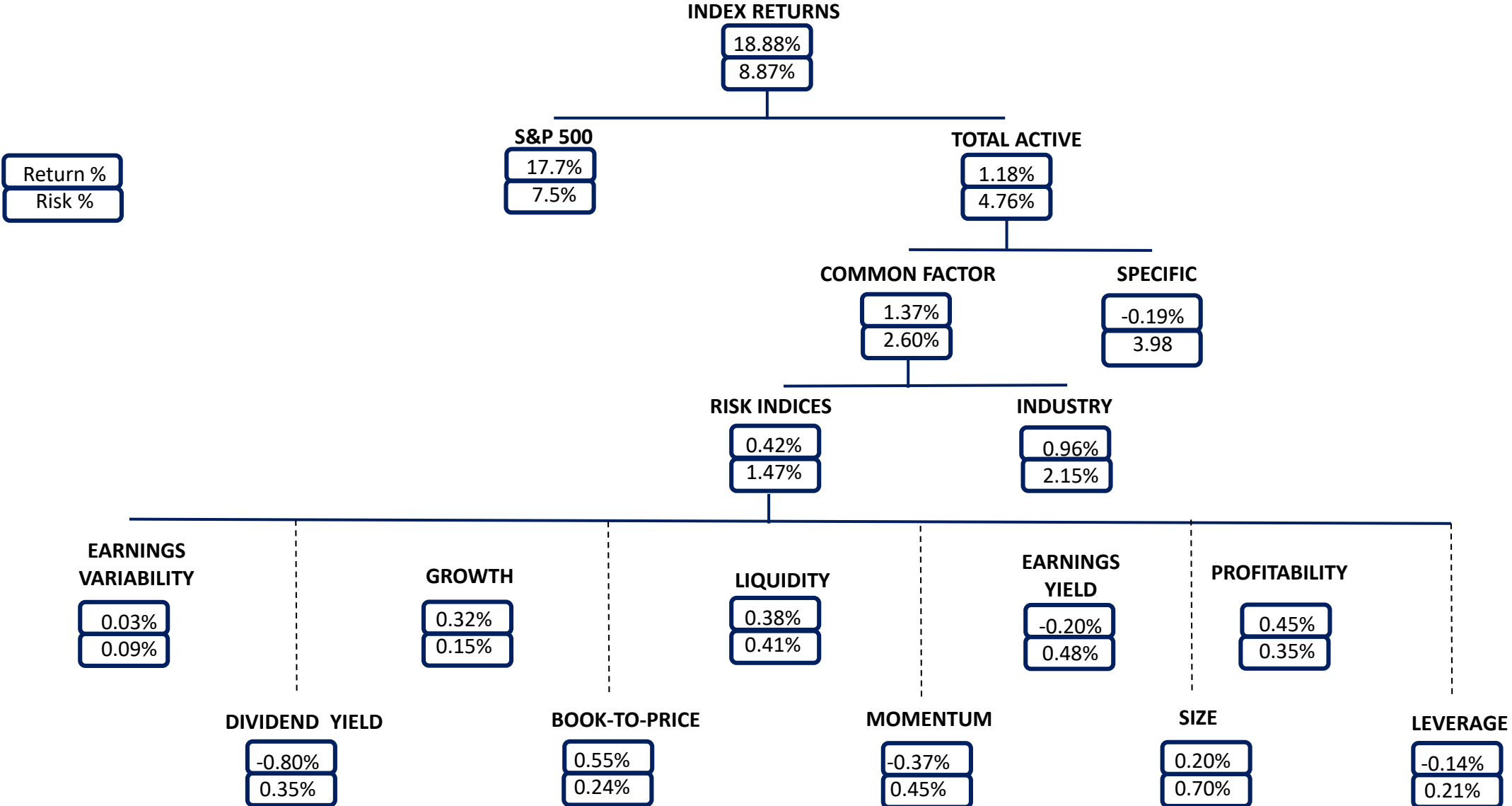
SECTOR ALLOCATION

- Information Technology and Financials have shown consistently higher allocations due to their low emission standards

- Real Estate, despite having low emissions have been underweighted due to underreported data

- Materials, Energy and Utilities have lesser allocation on account of heavy dependency on GHG, water and energy
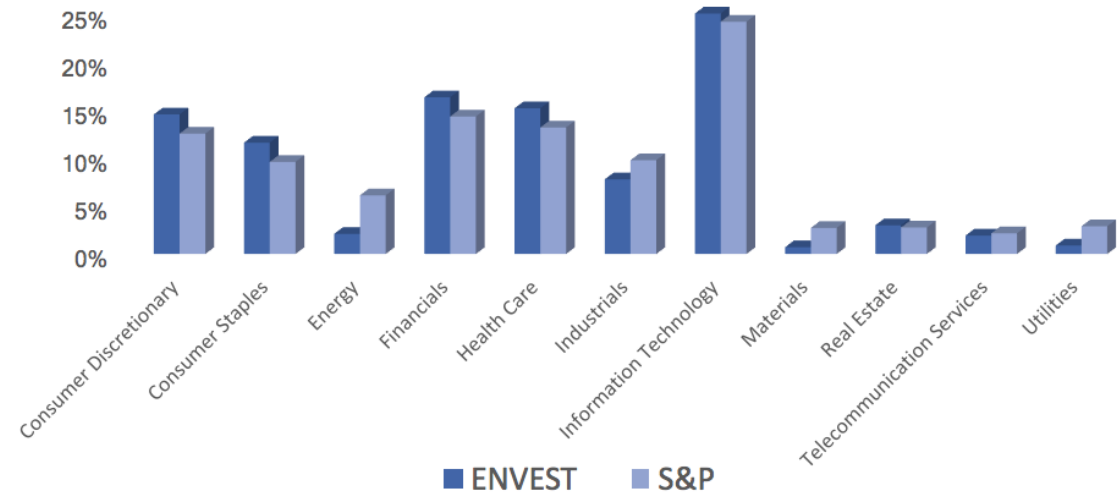
Sector Allocation across years

Sector/Years	2011	2012	2013	2014	2015	2016	2017	2018
Consumer Discretionary	12.49%	10.72%	14.22%	14.02%	14.77%	14.77%	14.51%	10.57%
Consumer Staples	9.41%	13.26%	12.42%	12.19%	12.28%	12.88%	11.57%	6.72%
Energy	7.93%	6.88%	6.22%	5.74%	3.35%	2.48%	2.10%	7.85%
Financials	16.13%	14.62%	16.52%	16.23%	15.82%	14.65%	16.29%	14.09%
Health Care	13.17%	13.09%	14.28%	14.85%	16.22%	15.94%	15.14%	10.86%
Industrials	9.64%	10.21%	11.14%	8.67%	7.85%	8.61%	7.76%	11.56%
Information Technology	20.82%	22.56%	20.27%	22.09%	23.46%	24.74%	26.14%	23.87%
Materials	1.60%	1.79%	1.47%	1.47%	0.95%	0.67%	0.71%	0.79%
Real Estate	3.81%	2.82%	0.38%	2.66%	2.31%	2.12%	2.99%	4.59%
Telecommunication Services	3.70%	2.34%	2.05%	1.23%	2.13%	2.08%	1.91%	3.87%
Utilities	1.26%	1.70%	1.01%	0.83%	0.84%	1.05%	0.88%	4.61%

INDEX CONSTITUENTS

INDEX CHARACTERISTICS

	Envest	S&P 500
Number of Constituents	78	505
	Weight%	
Largest	7.18	3.36
Smallest	0.028	0.02
Average	1.28	0.2
Median	0.95	0.09

2017 Q4

Legend:
- Consumer Discretionary
- Consumer Staples
- Energy
- Financials
- Health Care
- Industrials
- Information Technology
- Materials

Pie chart values: 14.18%, 10.68%, 1.73%, 16.34%, 15.50%, 7.81%, 27.35%, 0.78%, 3.14%, 1.63%, 0.84%

TOP 10 CONSTITUENTS

	Index Wt(%)	Parent Index Wt(%)	Sector	Contribution to Portfolio Revenue Exposure
NIKE Inc	7.18%	0.36%	Consumer Discretionary	10.67%
Adobe Systems Inc	6.20%	0.31%	Information Technology	6.01%
Charles Schwab Corp/The	4.66%	0.25%	Financials	5.90%
CME Group Inc	3.80%	0.19%	Financials	2.26%
Intuitive Surgical Inc	3.20%	0.16%	Health Care	1.47%
Analog Devices Inc	2.67%	0.13%	Information Technology	1.51%
Monster Beverage Corp	2.65%	0.14%	Consumer Staples	1.34%
VF Corp	2.11%	0.11%	Consumer Discretionary	3.85%
Edwards Lifesciences Corp	1.95%	0.10%	Health Care	0.95%
Paychex Inc	1.81%	0.09%	Information Technology	0.89%
Total	36.24%	1.84%		

As of 31st Dec, 2017

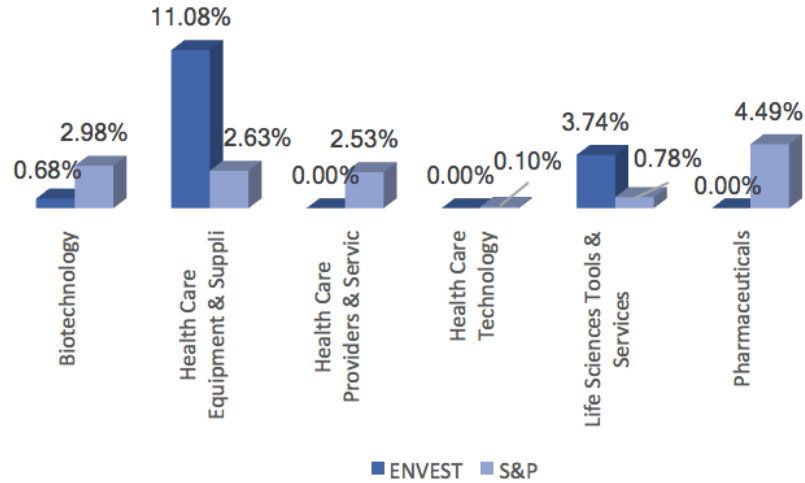# INDUSTRY ALLOCATION

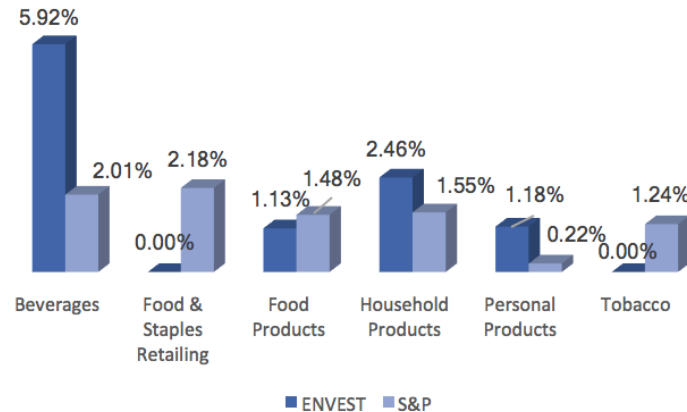Health Care Industry Allocation 2017 Q4
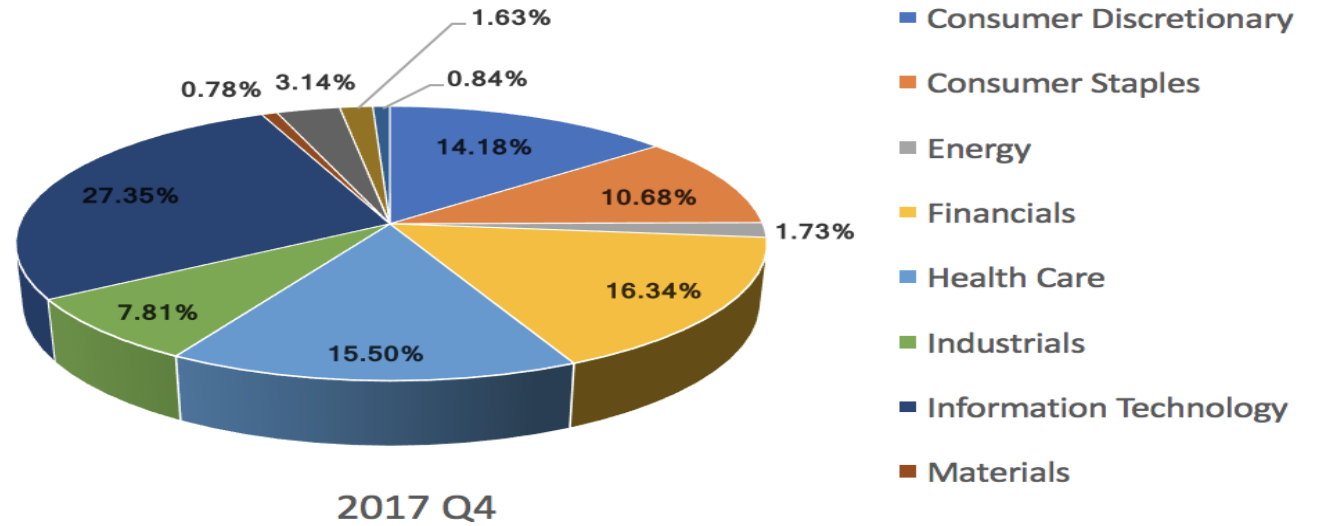
Drilling down to the Industry level:-

1. From 2016-2017, utilities have been underweighted due to zero allocation in electric, power and multi utilities.

2. Beverage industry in Consumer Staples and Equipment and Supplies in Healthcare have higher allocations compared to their respective industry peers.

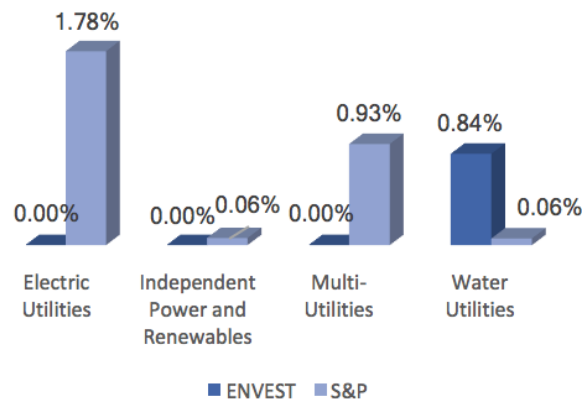3. With regards to the Energy sector, it has been underweighted due to a dip in allocation in both oil and equipment sub-sectors

Consumer Staples Industry Allocation 2017 Q3

Utility Industry Allocation 2017 Q3

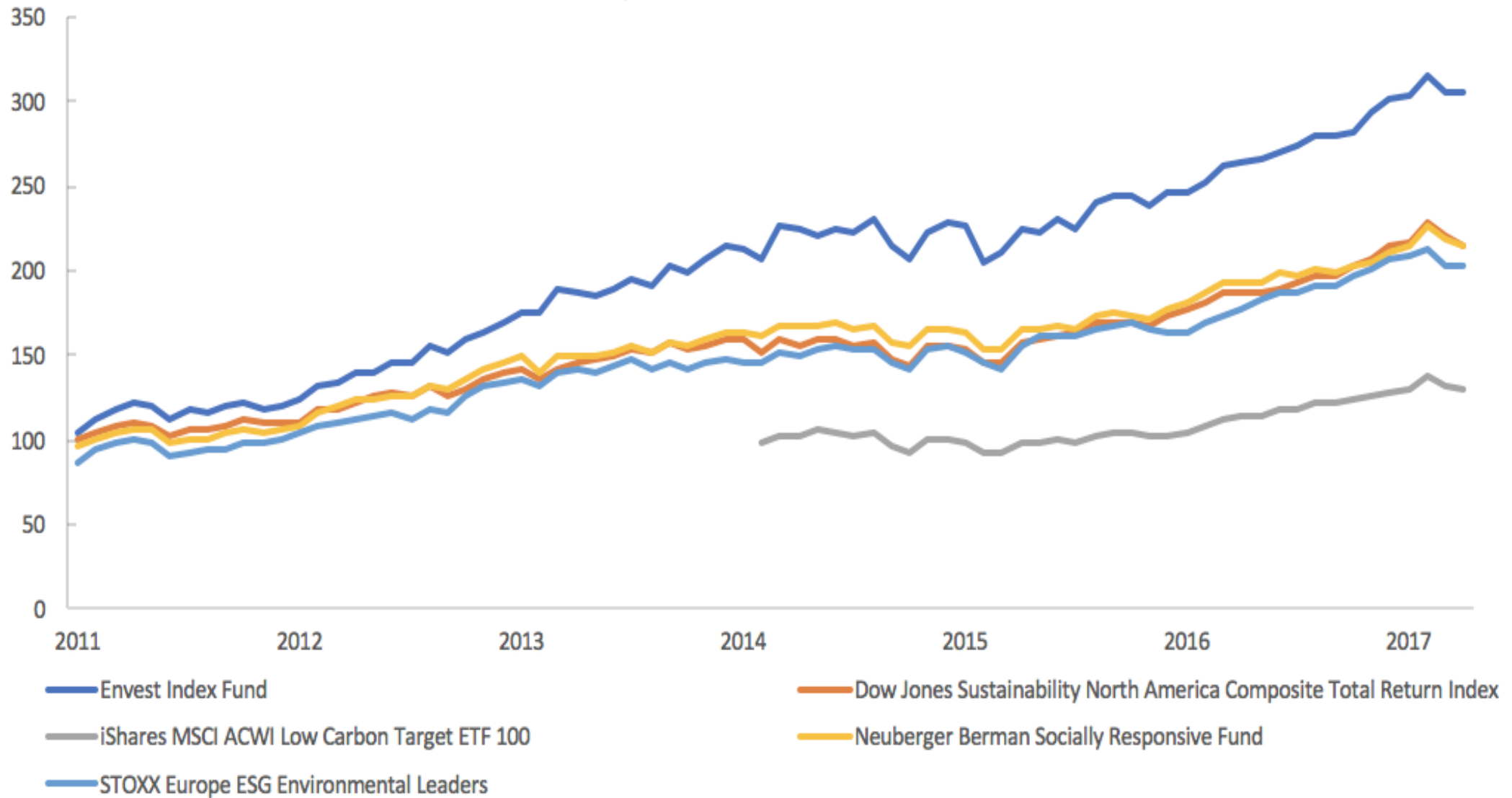

Energy Industry Allocation 2017 Q4
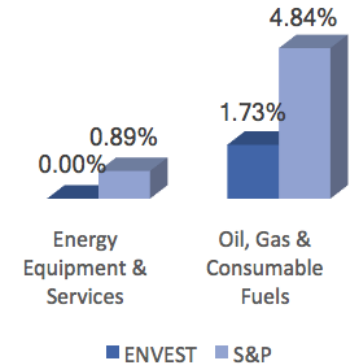
COMPARING WITH PEER INDEXES
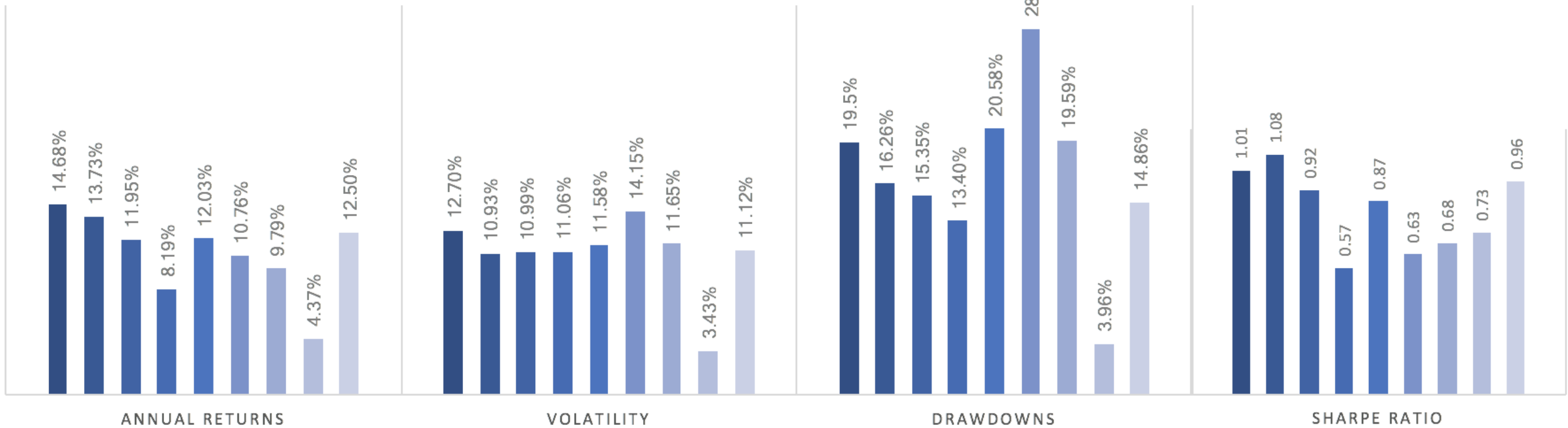

Comparable Index Values

Legend:
- Envest Index Fund
- Dow Jones Sustainability North America Composite Total Return Index
- iShares MSCI ACWI Low Carbon Target ETF 100
- Neuberger Berman Socially Responsive Fund
- STOXX Europe ESG Environmental Leaders

CLIMATE FACTOR EXPOSURE

Results from the optimizer:

1. The optimizer has been able to achieve a reduction by the order of 30-40% in climate exposures from the S&P while maintaining a low tracking error of 0.43%.

2. AAA rating depicts the securities with the least climatic risks. Our portfolio allocation primarily comprises of securities with AAA and AA ratings.
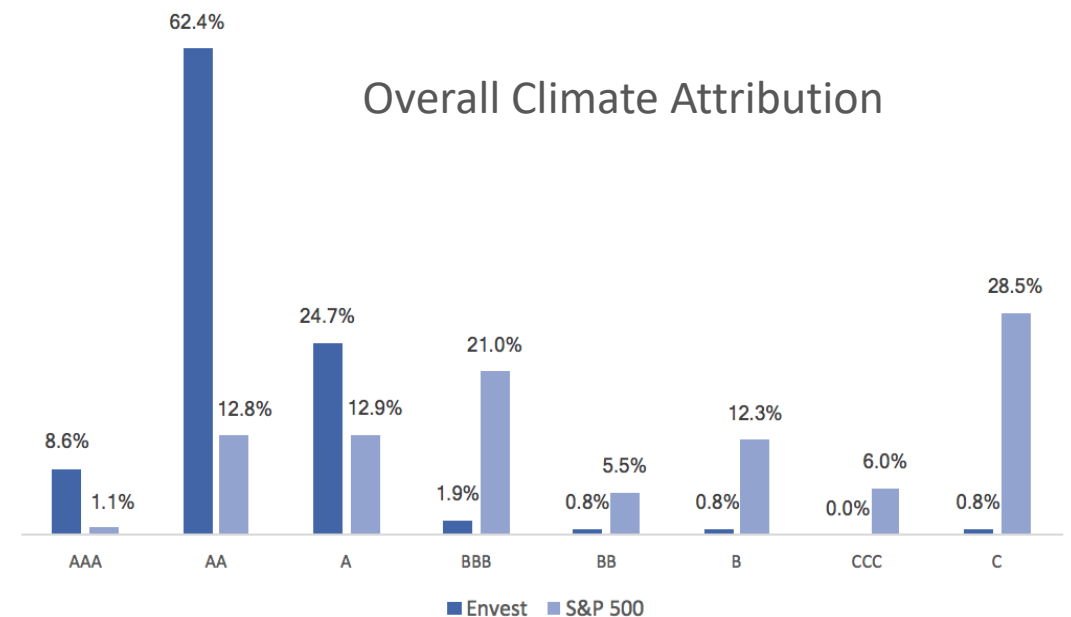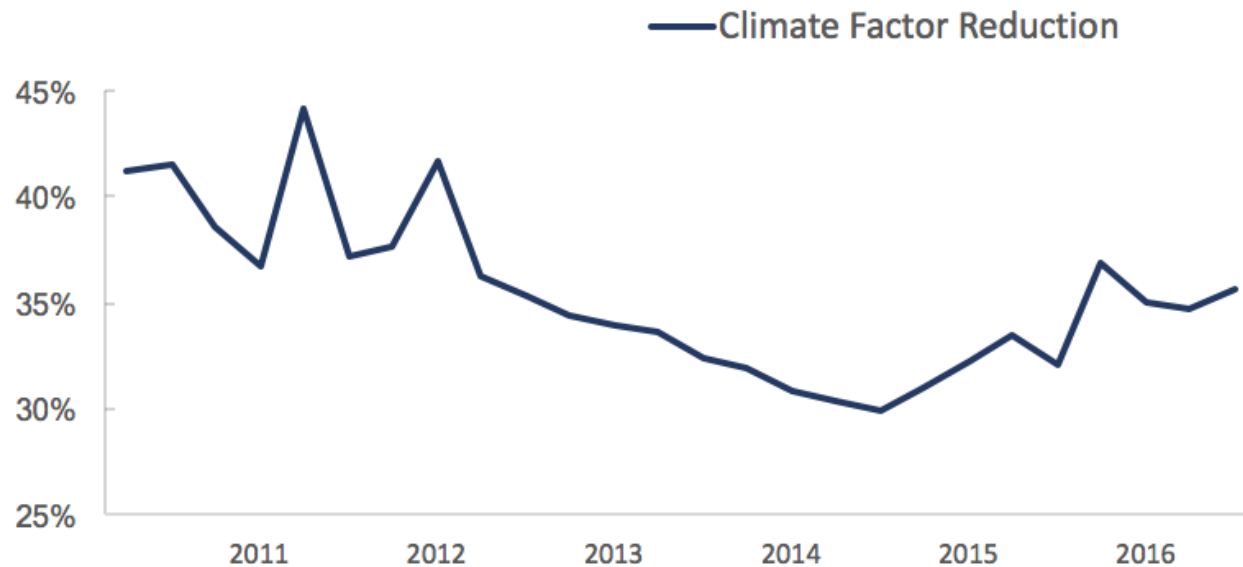
- Climate change can trigger regulatory risk as Governments prepare to deal with the potential hazards from climate change. Changes to zoning laws due to sea level rise, for example, could dramatically impact real estate prices.

- As asset prices shift with climate change, such thematic indexes and investment managers will support inclusion of companies showing good resilience towards their environmental practices.

- This will force other companies to comply their operations with sustainable practices, and thereby make the world a better place.

LIMITATIONS AND RISKS

1. Input Data

- Emission data reported by Bloomberg might not be reliable

- Real Estate and Healthcare have grossly underreported data

- Data estimation methods might not be very accurate

- No data available prior to 2011

- Stress testing portfolio against extreme events gives abnormal returns

2. Regulatory Risk

- If future regulations deem it unnecessary to report ESG metrics

3. Implementation in other markets and asset classes

- Emerging markets – more data scarcity

- Commodities – more challenging asset class

- Alternative investments – reduced transparency contrary to the objectives

SCALABILITY

Covering a wider asset base
Diversify our fund further by adding fixed income instruments.

Expand geographically
Adding assets from universe outside the United States

Integrating smart beta strategies
Improve returns, by integrating pure factor strategies, while being consistent with thematic constraints.

Currency hedged indexes
Creating more efficient portfolios by mitigating currency risks, as we diversify our fund outside US

FUTURE SCOPE

01

Return/Risk attribution

Creating a more robust model, that better explains drivers of return.

02

Flexible evaluation

Incorporating a model by less penalizing companies which are consistently moving towards sustainability.

03

Impact Investing

Allowing room for investors looking to invest in green financing projects.

04

Industry based negative screening

Excluding companies involved in controversial weapons, tobacco, animal trafficking, etc.

MEET THE TEAM

Aishwarya Sinh

Pratul Agarwal

Aayushi Pandit

Thank you!