



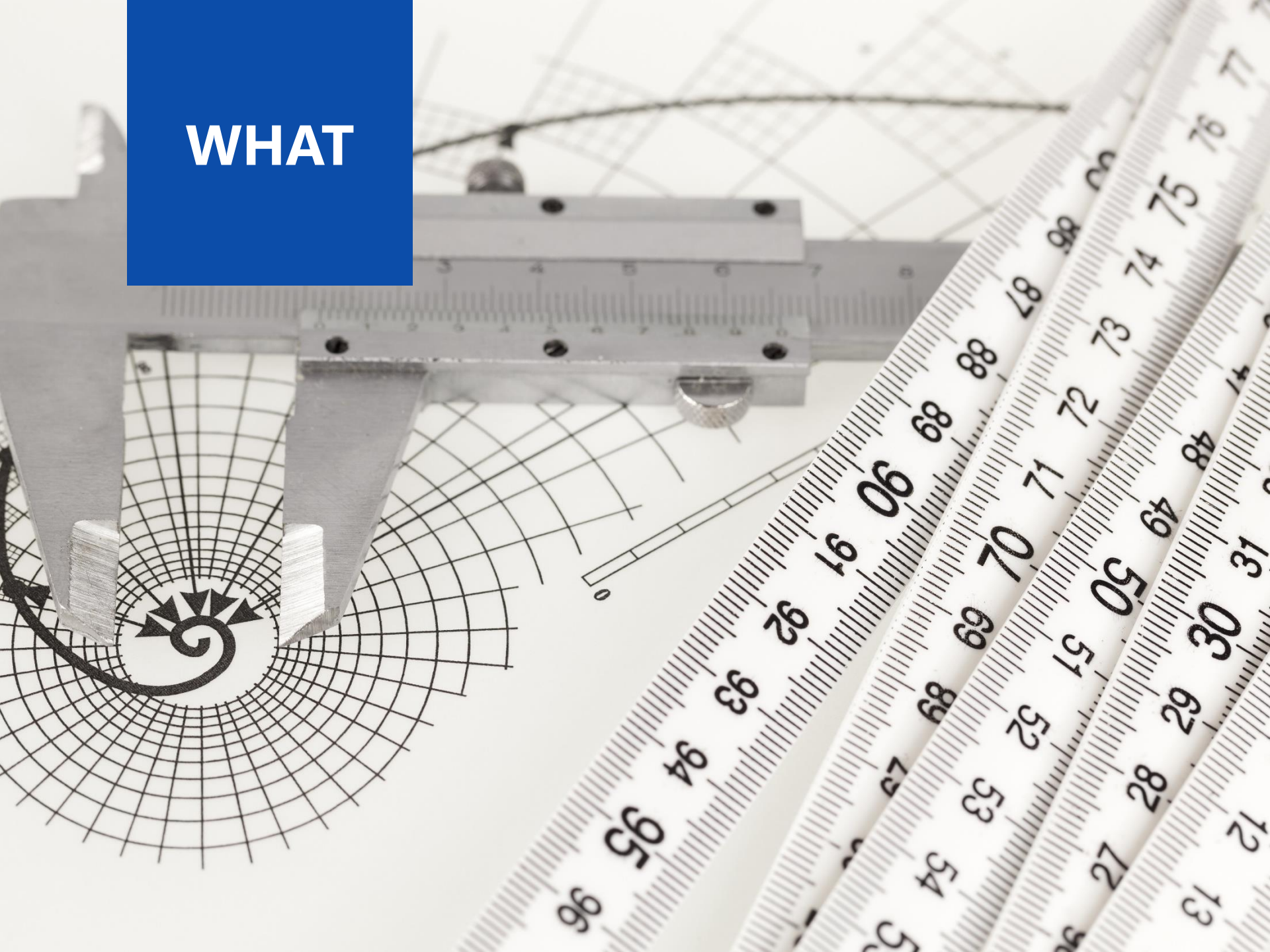
US TACTICAL BOND

FACTOR-BASED MODEL PORTFOLIO STRATEGY



2019/11

WHAT



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Summary

Key Points in a Nutshell

1

We are proud to introduce the Factor-Based US Tactical Bond Model Portfolio Strategy with institutional level of liquidity and high tax efficiency.

2

The portfolio gained an annualized return of 7.3% since 2004. It has proven to outperform on a relative basis against the Barclays US Aggregate TR.

3

The portfolio returns are achieved by tactically shifting weights of bond classes via 10 ETFs in an attempt to generate value-added for its investors.



Objectives

Setting a Way to Achieve Success

The portfolio is designed for potential investors with low risk tolerance seeking exposure to US debt instruments by following a rigorous bottom-up factor based quantitative approach. The investment objectives of the portfolio are to:

- 1 Provide a reasonable level of income while preserving capital with bonds.
- 2 Consistently deliver performance over the Barclays US Aggregate TR Index.
- 3 Maximize tax efficiency by using very liquid and low fee US listed ETFs.

Characteristics

Comparison of Smart Beta Strategies

	Market Cap Weighted Index	Factor-Based US Tactical Bond
Risk management goals	None	None
Systematic rebalancing	Quarterly	Quarterly
Human input required	No	Supervised
Use of Leverage	None	None
Systematic Risk	Medium	Medium
Portfolio turnover	Low	Low
Investment process	None	Bottom-Up
Investment style	None	Factor-Based
Market behavior	Trend Following	Relative return



Systemically applying a factor-based approach is highly effective in enhancing risk-adjusted performance in bond class allocations and generating levels of income and return.



Methodology

Quantitative Modeling



HOW IT WORKS

A quantitative model systematically identifies mispriced bonds and attempts to deliver absolute and relative performance. Briefly, a ranking system sorts bonds from a universe based on pre-selected factors and the portfolio periodically overweight best ones and underweight the ones in which conditions have deteriorated over time following rules.

WHY IT WORKS

By rigorously adhering to this bond selection framework based on a thoroughly tested ranking system, we are able to remove the emotional element of the investment process. 80% of portfolio managers cannot beat their benchmark because 1) it is difficult to do so and 2) they unconsciously let fear and greed emotions affect their investment decisions.

A high-contrast, black and white close-up photograph of several interlocking metal gears. The gears are made of a polished, reflective metal, likely steel, and their teeth are sharply defined. The lighting creates strong highlights and deep shadows, emphasizing the texture and mechanical nature of the components. A blue rectangular box is overlaid in the upper left corner, containing the word "HOW" in white, bold, sans-serif capital letters.

HOW

Philosophy

Factor-Based (FB)

1. QVMS

Overweight/underweight ETFs using a factor-based approach to fixed-income using four factors: quality, value, momentum and seasonality.

2. Undexing

Our goal is to beat the market over the long run. We believe the best way to do it is to create a portfolio that looks very different from it.

3. Concentration

We are striving to achieve a balance between diversifying to remove specific risk yet not too much to avoid ending up mimicking the index.

4. Tax efficiency

The sheer amount of fixed income securities and the non-transparent yet high trading costs makes the purchase of ETFs the best choice.

Overview

Our Investment Process

6. Monitoring

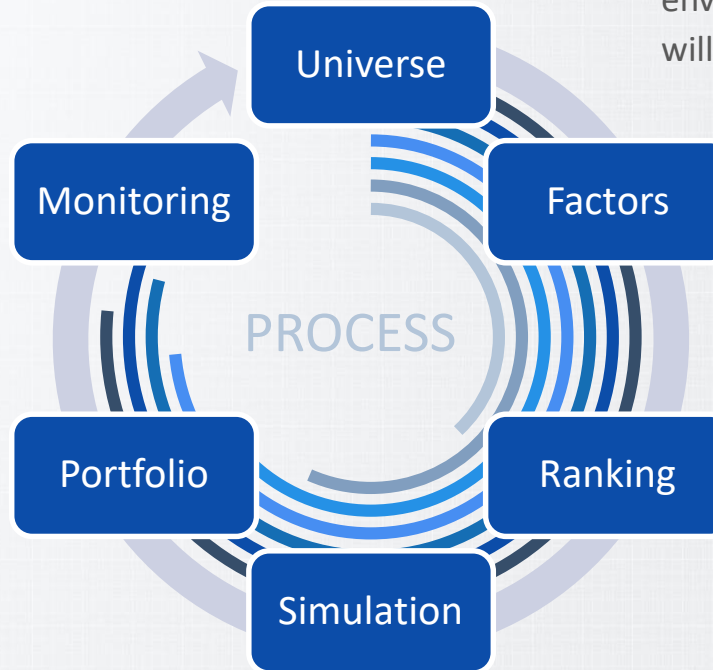
Monitor the portfolio, rebalance and carry out performance attribution.

5. Portfolio

Build the live portfolio by investing real money in the defined strategy.

4. Simulation

Form a strategy resulting from a mix of set rules and filters applied to the ranking system.



1. Universe

Define the investment environment in which we will pick our companies.

2. Factors

Design factors based on academic literature and innovative concepts.

3. Ranking

Create a composite of factors to rank ETFs from our defined universe.

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Universe

Barclays US Aggregate Index

300

\$million of debt issue minimum for the inclusion in the index due to new liquidity constraints.

20

\$trillion worth of bond securities, which represents approximately half of the total US fixed-income universe.



8,000

Bonds are part of this benchmark, the gold standard to gauge the performance of US fixed-rate taxable bonds.

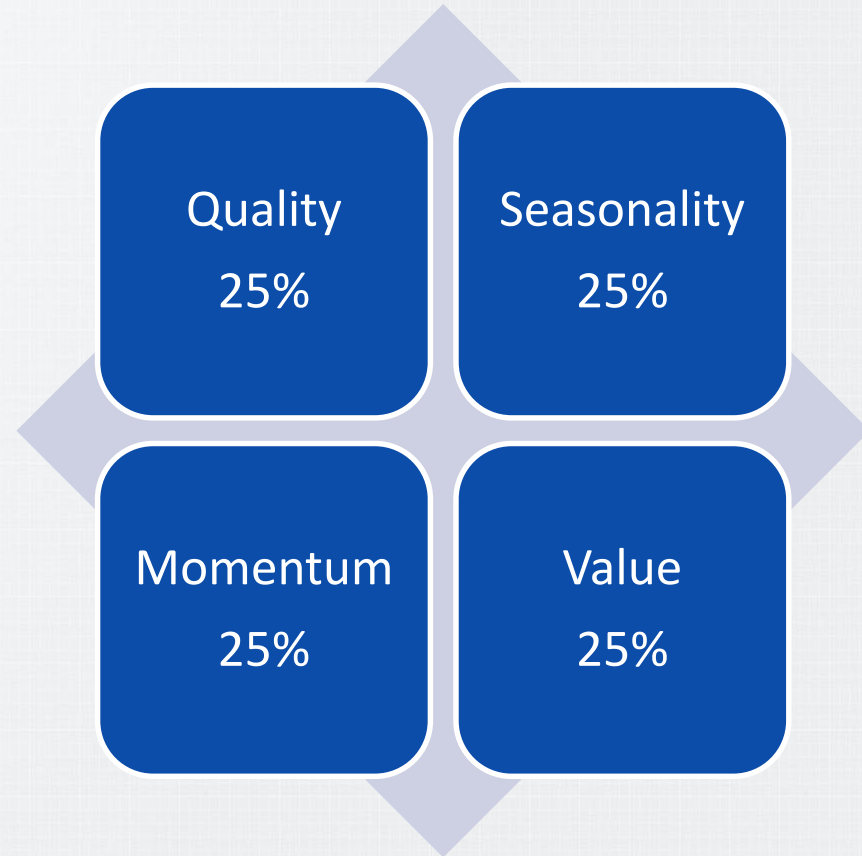
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ETFs in our portfolio, are overweighted or underweighted based on our ranking system.

Ranking

Factor-Based Model

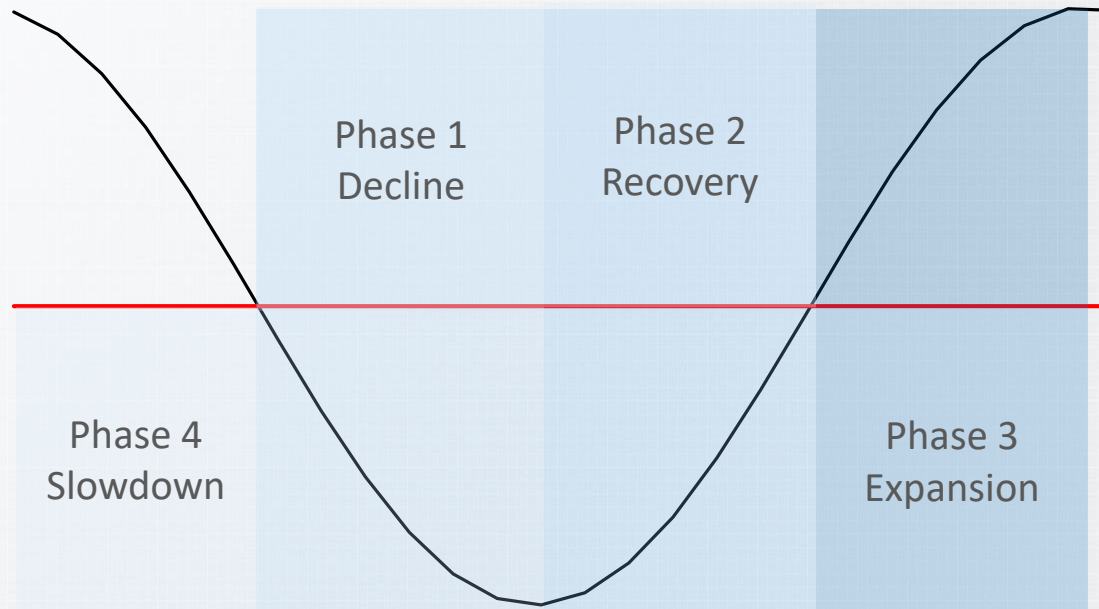
The ranking system is an equal weighted of the four factors. Each factor will be briefly explained hereafter.



Quality

Factor-Based Sub-Model

We use the Leading Economic Index (LEI) to define four business cycle phases.

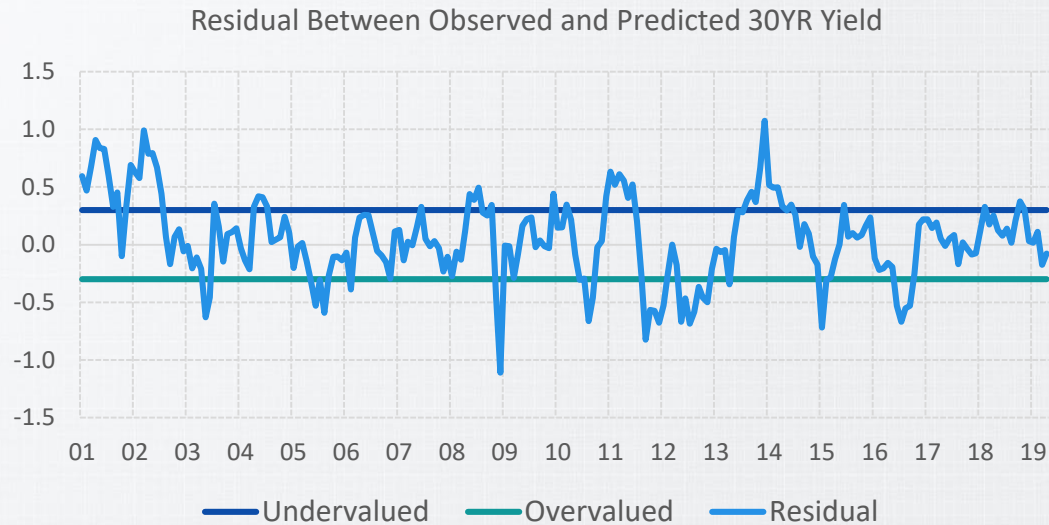


We overweight/underweight bonds of varying quality and maturity based on current Phase.

Value

Factor-Based Sub-Model

We calculate a regression using various macroeconomic variables: mortgage purchases, mortgage debt, free credit balance, commodities, food inflation, etc.

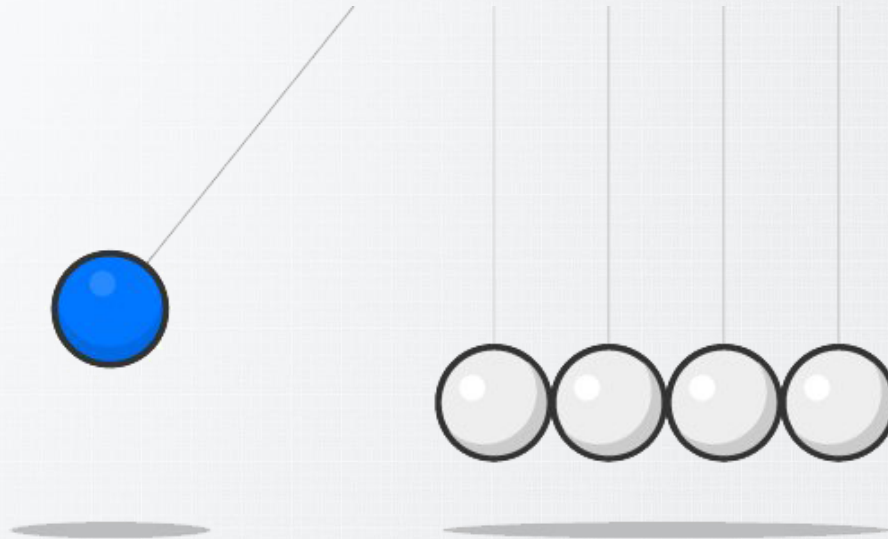


We overweight/underweight bonds of varying quality and maturity based on residual extreme levels.

Momentum

Factor-Based Sub-Model

Relative momentum measures how a bond class has performed relative to others. Absolute momentum measures whether a bond class has actually risen in value.



We overweight/underweight bonds of varying quality and maturity based on momentum.

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Seasonality

Factor-Based Sub-Model

We analyzed the performance of all bond classes over the last few decades.



We overweight/underweight bonds of varying quality and maturity based on current quarter.



Simulation

Our Portfolio Rules and Filters

G General Rules

- The portfolio is long only and without any leverage whatsoever.
- 10 ETFs representing each a different bond class are held.
- Transactions are recorded at the average high | low of trade day.
- Rebalancing frequency is quarterly and sent before market open.
- Variable slippage (average daily \$ traded) is taken into account.

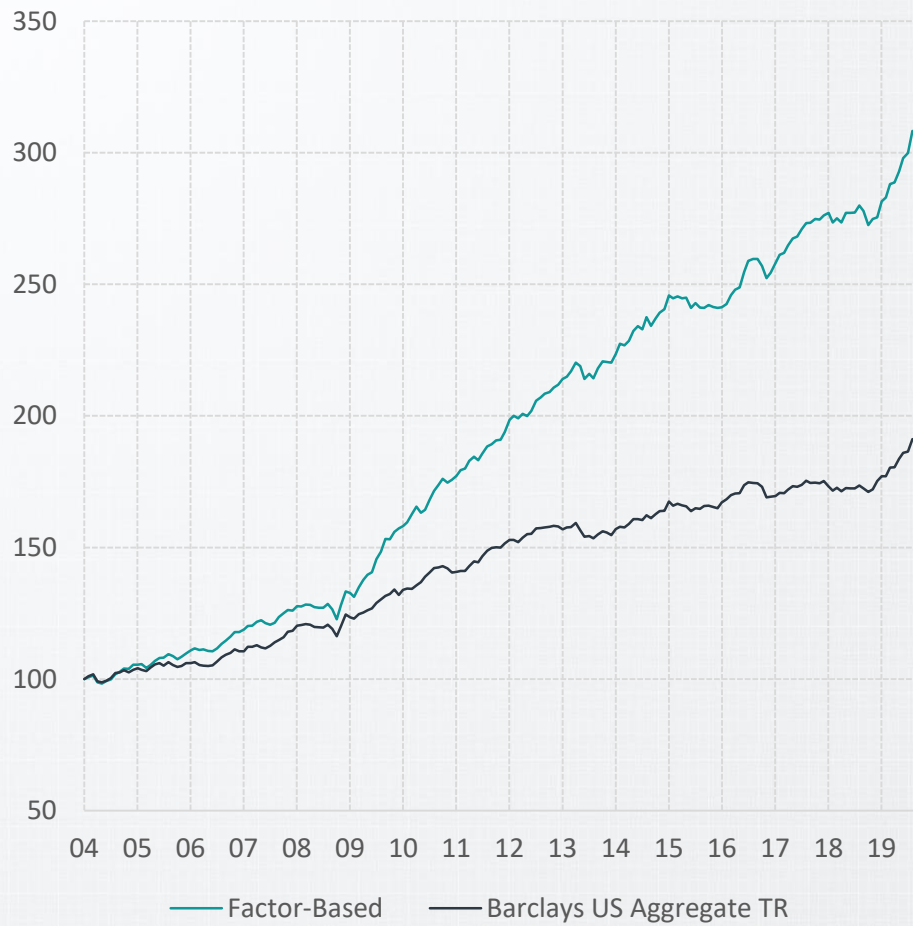
B Rebalancing Rules

- The 10 ETFs must be held at all times, only the weighting of each position is adjusted.



Portfolio

Historical Performance



Key Portfolio Statistics

Annualized Return (%)
(Barclays US Aggregate TR = 4.1) **7.3**

Standard Deviation (%)
(Barclays US Aggregate TR = 3.2) **3.8**

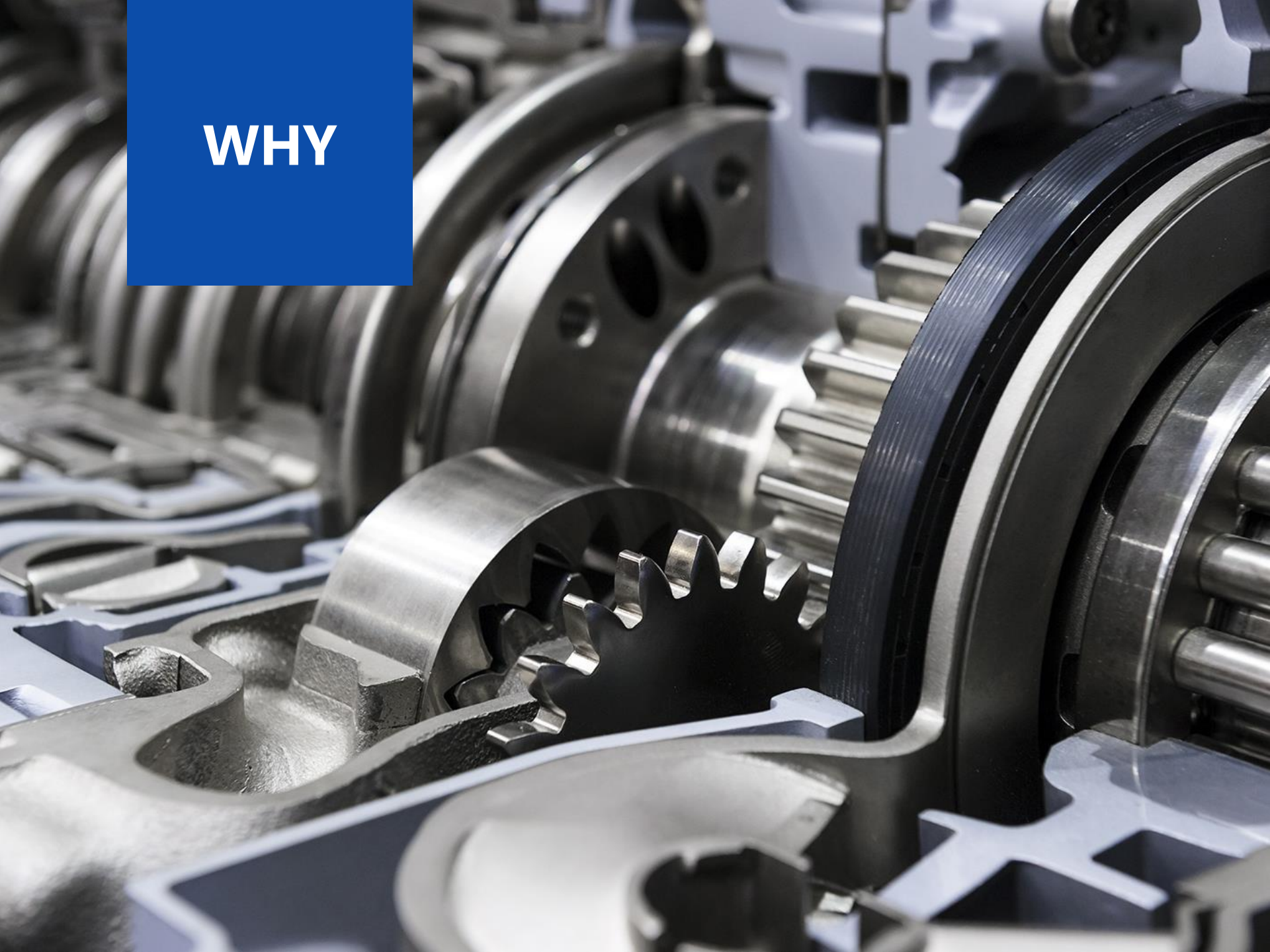
Maximum Drawdown (%)
(Barclays US Aggregate TR = -3.8) **-4.6**

Index Correlation
(Barclays US Aggregate TR = 1.00) **0.79**

Sharpe Ratio
(Barclays US Aggregate TR = 0.87) **1.53**

Since Inception (January 1st, 2004)

WHY



Statistics

Calendar Performance

Yearly

Calendar Returns	2004	2005	2006	2007	2008	2009	2010	2011
Factor-Based	5.4	4.0	7.5	6.9	5.8	18.0	11.7	10.3
Barclays US Aggregate TR	5.2	5.9	6.5	7.8	4.2	-2.0	6.0	0.5
Difference	0.2	-1.9	0.9	-1.0	1.6	20.0	5.8	9.8

Calendar Returns	2012	2013	2014	2015	2016	2017	2018	YTD
Factor-Based	9.3	4.0	9.3	0.2	5.6	8.5	-0.2	11.9
Barclays US Aggregate TR	4.2	-2.0	6.0	0.5	2.6	3.5	0.0	8.8
Difference	5.1	6.0	3.3	-0.4	2.9	5.0	-0.2	3.1

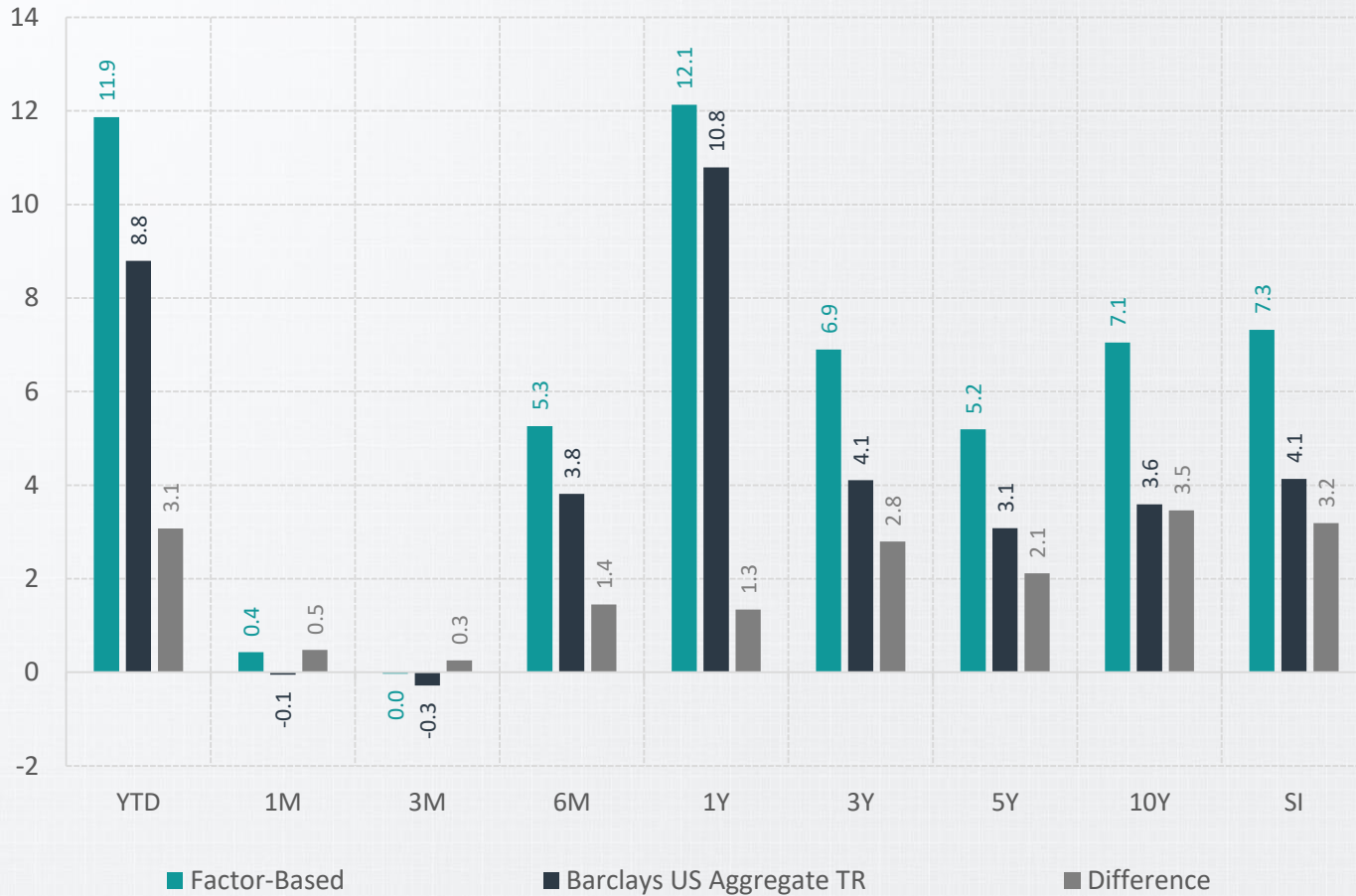
Monthly

Calendar Returns	12-18	01-19	02-19	03-19	04-19	05-19	06-19	07-19	08-19	09-19	10-19	11-19
Factor-Based	0.2	2.2	0.6	1.8	0.2	1.4	1.8	0.7	2.8	-0.8	0.3	0.4
Barclays US Aggregate TR	1.8	1.1	-0.1	1.9	0.0	1.8	1.3	0.2	2.6	-0.5	0.3	-0.1
Difference	-1.6	1.1	0.6	-0.1	0.2	-0.4	0.5	0.4	0.2	-0.2	0.0	0.5



Statistics

Trailing Performance



Statistics

Return & Risk Measurements

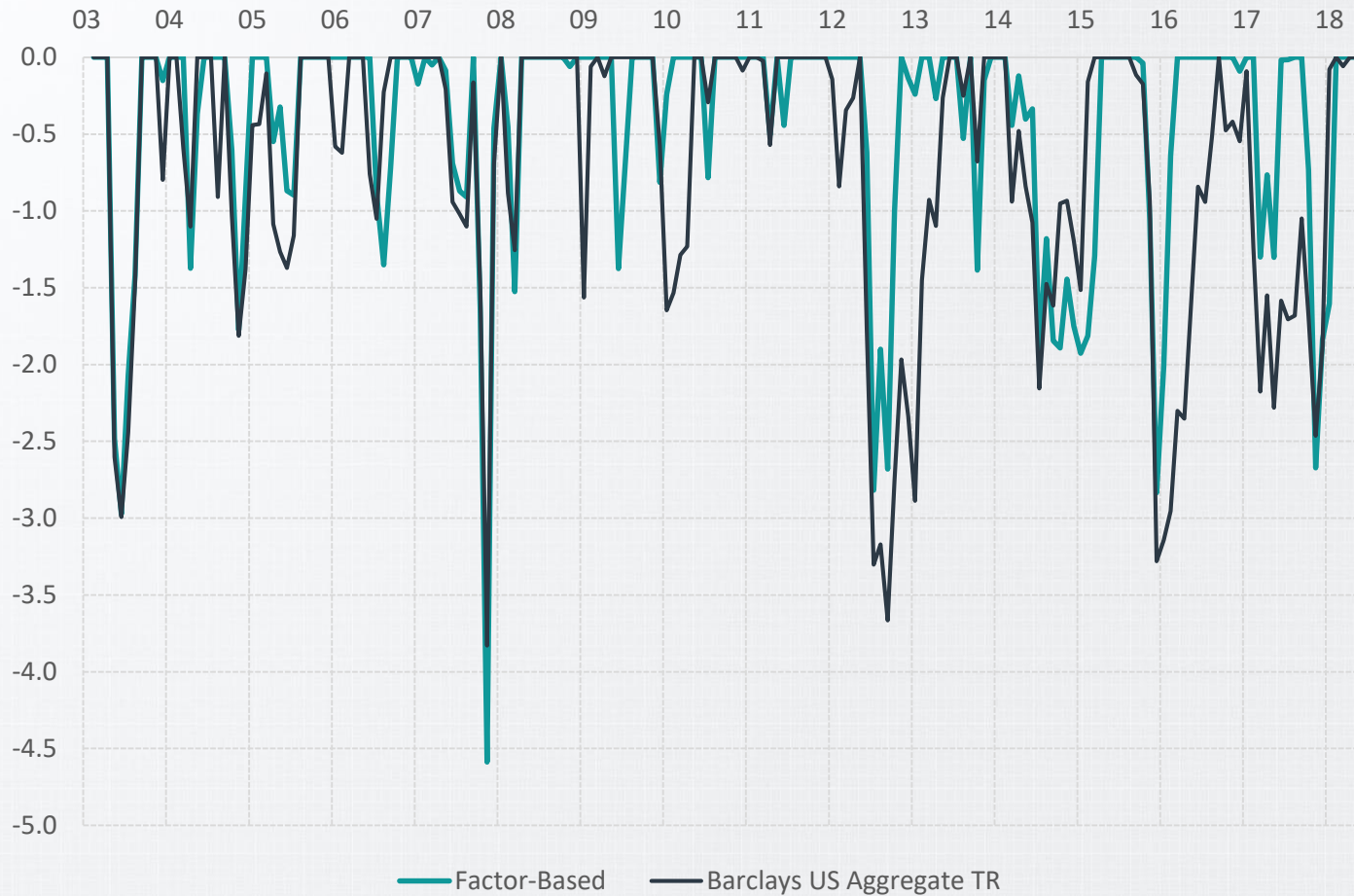
Trailing 3 Year	Factor-Based	Barclays US Aggregate TR	Difference
Ann. Return (%)	6.9	4.1	2.8
Standard Dev. (%)	3.4	3.3	0.2
Max Drawdown (%)	-2.8	-3.3	0.4
Sharpe Ratio	1.3	0.5	0.8
Sortino Ratio	1.60	0.68	0.93
Index Correlation	0.83	1.00	-0.17
Upside Capture	1.31	0.00	1.31
Downside Capture	0.64	0.00	0.64
Portfolio Beta	0.88	1.00	-0.12
Portfolio Alpha (%)	2.79	0.00	2.79

Since Inception	Factor-Based	Barclays US Aggregate TR	Difference
Ann. Return (%)	7.3	4.1	3.2
Standard Dev. (%)	3.8	3.2	0.6
Max Drawdown (%)	-4.6	-3.8	-0.8
Sharpe Ratio	1.5	0.9	0.7
Sortino Ratio	2.14	1.23	0.91
Index Correlation	0.79	1.00	-0.21
Upside Capture	1.32	0.00	1.32
Downside Capture	0.63	0.00	0.63
Portfolio Beta	0.94	1.00	-0.06
Portfolio Alpha (%)	3.19	0.00	3.19



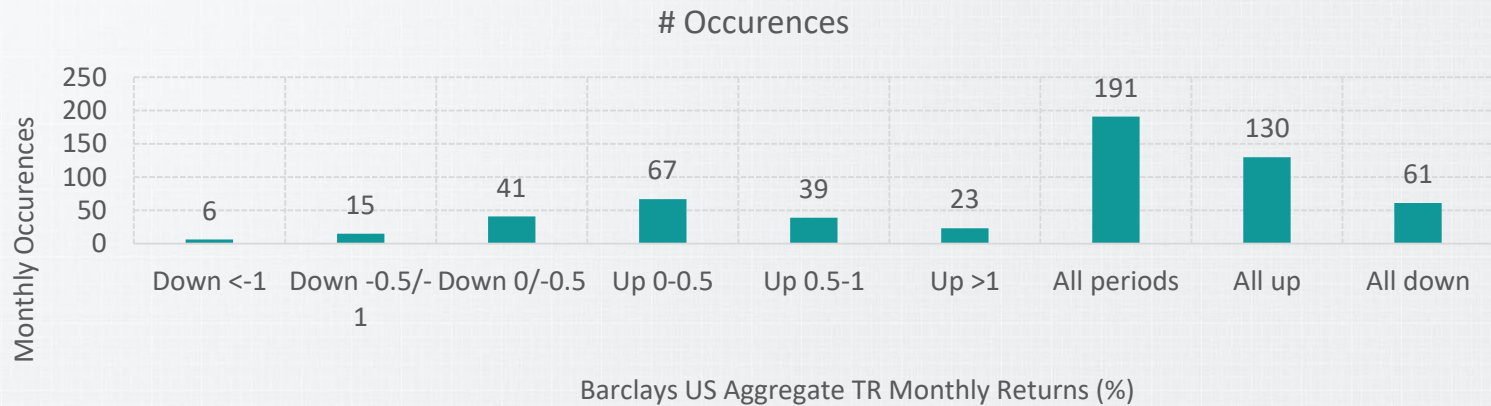
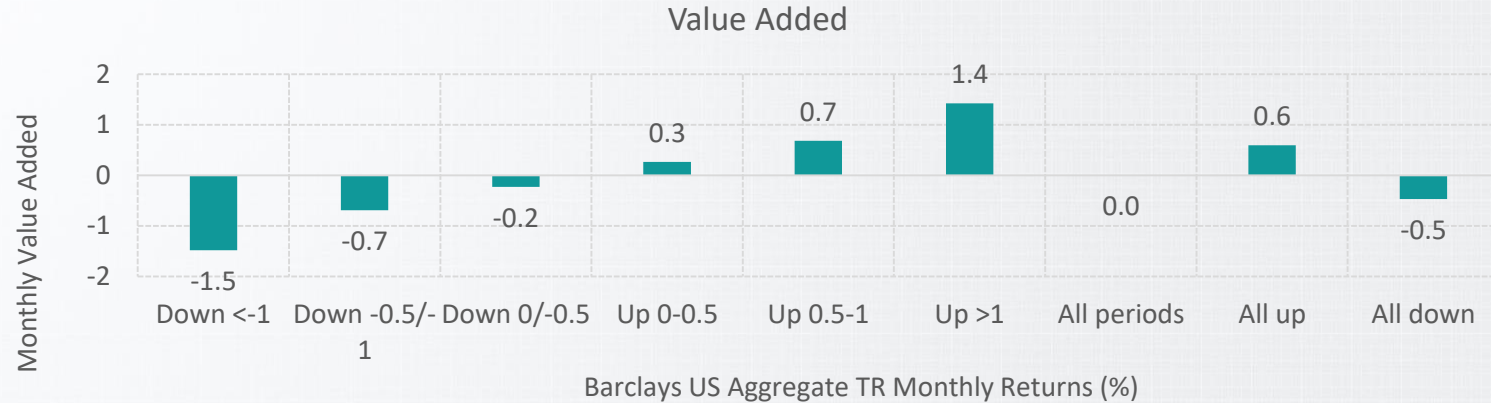
Statistics

Rolling Maximum Drawdown



Statistics

Outperformance in Different Market Conditions





Characteristics

Top Ten Holdings & Characteristics

Ticker	Bond Class	Weight (%)
TLT	US Long Term Govt	4.3
MUB	Municipal Bonds	12.4
CWB	Convertible Bonds	20.1
HYG	US High Yield	22.6
MBB	Mortgage Backed	12.4
LQD	US Corporate	20.1
EMB	Emerging Market	1.6
IEF	US Inter. Term Govt	2.5
SHY	US Short Term Govt	2.5
IHY	Global Aggregate	1.6

Median	Factor-Based	Barclays US Aggregate TR
Equity Beta	0.19	-0.01
Standard Dev.	5.33%	2.98%
Distribution Yield	3.32%	2.72%
12m Trailing Yield	2.70%	2.74%
30 Day SEC Yield	3.01%	2.78%
Avg. Yield to Maturity	3.97%	3.32%
Weighted Avg. Coupon	723.35%	778.00%
Weighted Avg. Maturity	0.24	0.00
Effective Duration	5.16	5.38
Avg. Management Fee	0.22%	0.05%



Allocation

Sector Weights & Benchmark Deviations

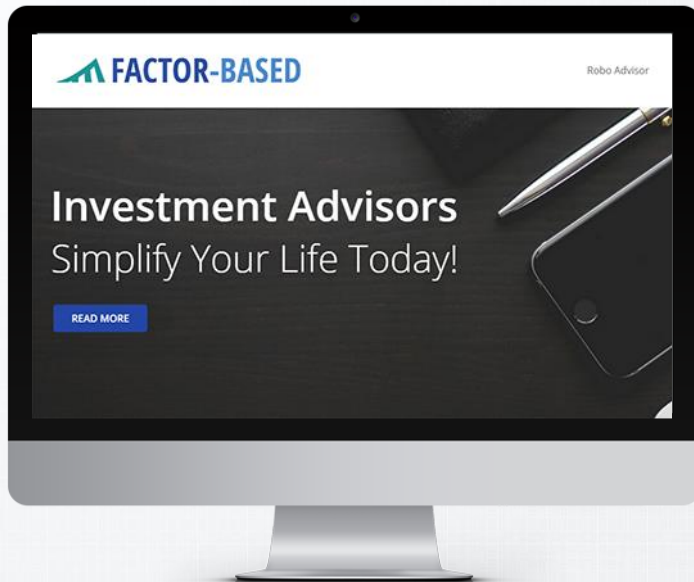
Weights	Factor-Based	Barclays US Aggregate TR	Deviations
US High Yield	17.8	3.5	14.4
Convertible Bonds	13.9	0.3	13.6
US Long Term Govt	18.5	7.8	10.7
Municipal Bonds	14.6	5.6	9.0
Emerging Market	1.6	0.0	1.6
Global Aggregate	1.6	0.0	1.6
US Short Term Govt	3.0	7.2	-4.2
US Corporate	11.5	21.7	-10.2
Mortgage Backed	14.6	29.1	-14.5
US Inter. Term Govt	3.0	24.9	-21.9

WHO



Who We Are

Factor-Based (FB)



IN A NUTSHELL...

Factor-Based (FB) is a financial research firm that specializes in equities and bonds for investment advisors and institutional clients. We are dedicated to produce exceptional risk adjusted returns for our investors by strictly adhering to factor-based investing methods.

Disclosures

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