

# **QMIT's Enhanced Smart Betas**

# QMIT Enhanced Smart Beta Overview

## Comprehensive Factor Research Framework

-  18 Enhanced Smart Betas (ESBs) developed from 25 years of extensive factor research.
-  BFOM Strategy prevents look-ahead bias by selecting best flavor based on T-1 performance .
-  Composite signals constructed from ESB BFOMs for advanced strategy deployment .
-  Covers approximately 2,500 US names with robust data preprocessing and factor ranking .

# ESBs and Composite Signals

## Enhanced Smart Betas (ESBs)

#	ESB Name
1	Deep Value (DV)
2	Relative Value (RV)
3	Dividends (DIVS)
4	Reversals (REVS)
5	Price Momentum (PMOM)
6	Enhanced Momentum (EnMom)
7	Analyst Revisions (ARS)
8	Analyst Ratings (ART)
9	Growth Historical (GROH)
10	Quality Earnings (EQ)
11	Quality Leverage (LEV)
12	Quality Profitability (PROF)
13	Quality Capital (CSU)
14	Quality Stability (STAB)
15-18	Efficiency, Size, SIFR, Risk

## Composite Signals

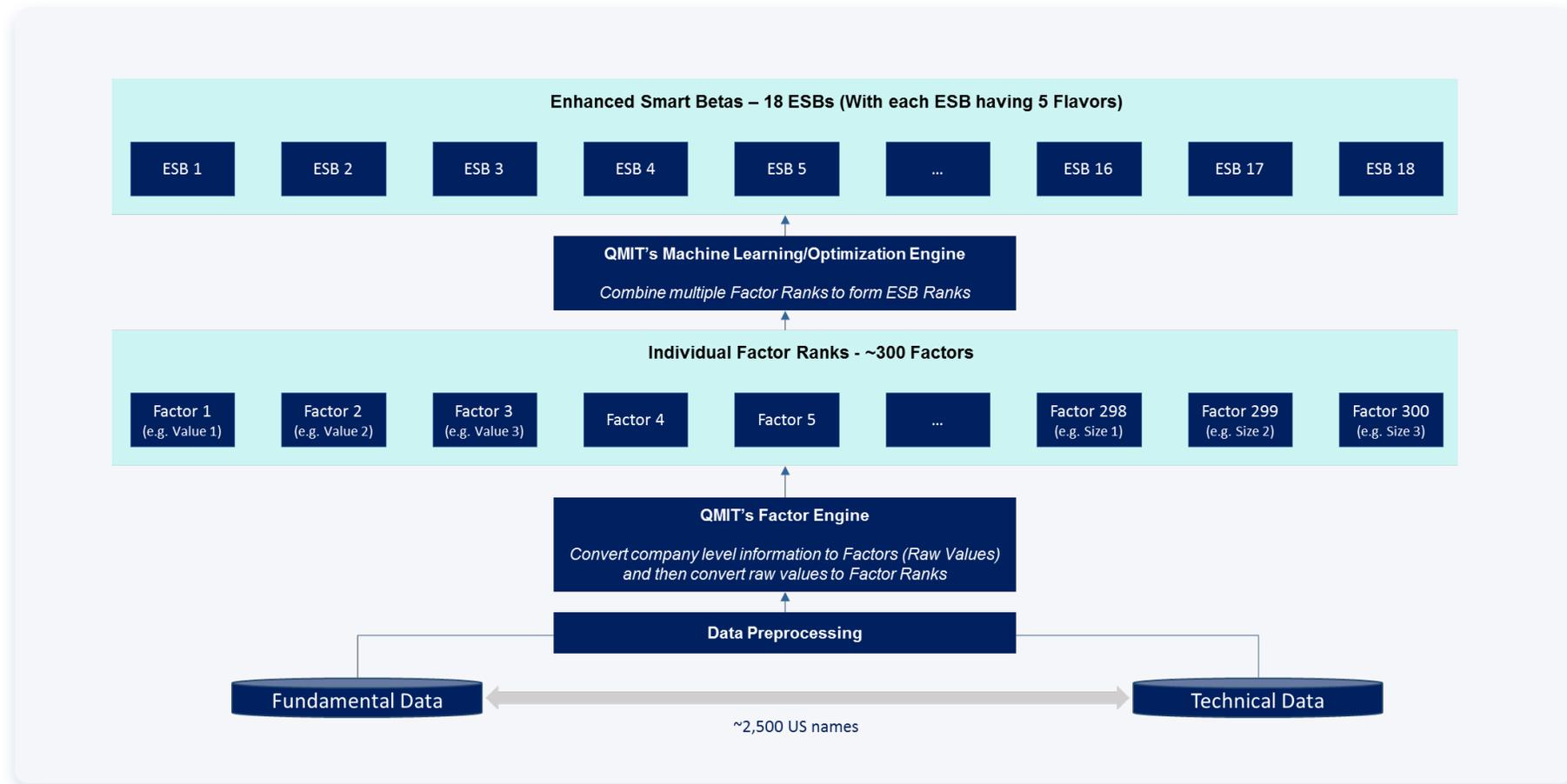
Composite Signal Name
Famous Five
Sizzling Seven
Fabulous 14
Enterprise 18
Value Composite
Growth Momentum Composite
Quality Composite
Value Momentum Composite
Quality Momentum Composite
Quality Value Composite

# Data Mining Prevention

## Robust Factor Selection Methodology

- ⚠ Data mining concern: Factor formulations tweaked for best in-sample performance .
- 🛡 Prevention strategy: Only factors with extensive research validation and economic rationale .
- 🚫 Exclusion criteria: Clearly contrived formulations rejected in favor of proven factors .
- 📈 Out-of-sample focus: Ensuring comparable performance beyond historical data .

# ESB Construction Process



*Comprehensive data pipeline transforming ~2,500 US names through factor engine and machine learning optimization to produce 18 Enhanced Smart Betas, each with 5 distinct flavors*

# ESB Flavors and Weighting Schemas

## Multiple Proprietary Weighting Methodologies

-  Intra-cohort weighting: Monthly optimization using expanding window LTD data.
-  Performance measurement: Top 5% vs bottom 5% spread returns.
-  Perverse factor exclusion: Negative LTD returns AND IC excluded.

Maximum weight: 1/3 limit per factor within ESB cohort.

**Key Advantage:** Ensemble learners adapt to market conditions while maintaining factor diversification.

# Portfolio Construction Rules

## Top 5% vs Bottom 5% Portfolio Construction

- 📄 Standard Rule: If total stocks  $\geq 500$ , take top/bottom 5% for long-short portfolio construction.
- 📄 Medium Universe: If  $100 \leq \text{stocks} < 500$ , take top/bottom 25 stocks each for portfolio formation.
- ⚠️ Small Universe: If stocks  $< 100$ , set fractile differential return to 0% due to insufficient universe size.
- ⚖️ Tie-breaker Logic: Include all stocks at threshold rank to handle situations with identical factor scores.

## Rebalancing Discipline

- 📅 Monthly Rebalancing: Recommended for investors concerned about transaction costs and excessive turnover.
- 🕒 Daily Rebalancing: Available from January 2019 onwards with live daily data; historical data on month-end basis.
- 💰 Dollar-Neutral Basis: All portfolios tracked on dollar-neutral basis with optional beta-neutral performance reporting.

**Practical Focus:** The 5%-tile approach corresponds to approximately 150 stocks, aligning with typical quantamental manager attention bandwidth and operational capacity.

# Bias Mitigation Strategies

## Comprehensive Bias Prevention Framework

- ☠ **Survivorship Bias** eliminated by including both live and dead companies at each historical point in time.
- 🗞 **Look-ahead Bias** prevented through conservatively lagged fundamentals and T-1 data availability constraints.
- 🔍 **Data Mining** minimized by focusing only on factors with extensive academic validation and clear economic rationale.
- 💰 **Liquidity Bias** addressed by including only stocks with minimum \$250 million market cap for institutional tradability.
- 🕒 **Hindsight Bias** avoided through BFOM strategy using only ex-ante information through T-1.

### Additional Safeguards

- 🛡️ Reject purely statistical approaches that result in compelling but contrived back-tests failing out-of-sample.
- 🧠 Focus on factors supported by research and trader intuition rather than data-mined accounting ratios.

**Critical Foundation:** Rigorous bias mitigation ensures factor performance represents genuine alpha generation rather than statistical artifacts or data quality issues.

# BFOM Investable Strategies

## Best Flavor of the Month Framework

- ↔ 18 BFOM strategies systematically switch between alternate ESB flavors to prevent look-ahead bias.
- 📊 Ensemble learners operate on expanding windows, re-optimizing monthly using only T-1 data.
- 📈 Selection criteria based on cumulative risk and return profile through T-1, ex ante.
- 🛡️ Bias prevention ensures no hindsight advantage in factor weight optimization process.

**Implementation:** BFOM represents the investable equivalent from ensemble learners, avoiding hindsight bias in ESB performance representation.

# Cross-Sectional Rank Correlations

	ARS	ART	CSU	DV	Dividends	EQ	Efficiency	EnMOM	Growth	Leverage	PMOM	Profit	RV	Reversals	Risk	SIRF	Size	Stability
ARS	1.0	0.3	0.17	-0.21	-0.11	-0.01	-0.04	0.3	0.25	0.16	0.34	0.19	-0.04	0.01	0.03	-0.07	-0.25	0.09
ART	0.3	1.0	0.04	-0.23	0.03	-0.05	-0.07	0.46	0.08	0.01	0.53	0.03	-0.08	0.0	0.05	0.01	-0.08	-0.02
CSU	0.17	0.04	1.0	0.05	0.09	0.17	0.33	0.12	0.23	0.37	0.04	0.36	0.52	0.1	0.25	0.07	-0.25	0.28
DV	-0.21	-0.23	0.05	1.0	0.16	0.07	0.48	-0.2	-0.08	-0.15	-0.27	-0.19	0.33	0.05	0.05	0.08	0.14	0.24
Dividends	-0.11	0.03	0.09	0.16	1.0	-0.08	0.04	0.15	-0.21	0.11	-0.03	0.27	0.25	0.08	0.52	0.09	-0.17	0.21
EQ	-0.01	-0.05	0.17	0.07	-0.08	1.0	0.3	-0.02	0.05	-0.15	-0.01	-0.29	0.11	-0.03	-0.11	0.04	0.16	-0.09
Efficiency	-0.04	-0.07	0.33	0.48	0.04	0.3	1.0	-0.07	0.01	-0.15	-0.08	-0.17	0.34	0.06	-0.07	0.08	0.22	0.26
EnMOM	0.3	0.46	0.12	-0.2	0.15	-0.02	-0.07	1.0	0.12	0.05	0.86	0.11	-0.04	0.16	0.22	-0.05	-0.25	0.08
Growth	0.25	0.08	0.23	-0.08	-0.21	0.05	0.01	0.12	1.0	0.23	0.2	0.21	0.29	-0.01	-0.02	-0.02	-0.1	0.02
Leverage	0.16	0.01	0.37	-0.15	0.11	-0.15	-0.15	0.05	0.23	1.0	0.03	0.64	0.29	0.09	0.27	-0.0	-0.4	0.21
PMOM	0.34	0.53	0.04	-0.27	-0.03	-0.01	-0.08	0.86	0.2	0.03	1.0	0.05	-0.1	-0.03	-0.03	-0.11	-0.14	-0.07
Profit	0.19	0.03	0.36	-0.19	0.27	-0.29	-0.17	0.11	0.21	0.64	0.05	1.0	0.29	0.07	0.39	0.02	-0.48	0.19
RV	-0.04	-0.08	0.52	0.33	0.25	0.11	0.34	-0.04	0.29	0.29	-0.1	0.29	1.0	0.02	0.25	0.1	0.0	0.17
Reversals	0.01	0.0	0.1	0.05	0.08	-0.03	0.06	0.16	-0.01	0.09	-0.03	0.07	0.02	1.0	0.07	0.06	-0.15	0.21
Risk	0.03	0.05	0.25	0.05	0.52	-0.11	-0.07	0.22	-0.02	0.27	-0.03	0.39	0.25	0.07	1.0	0.11	-0.45	0.41
SIRF	-0.07	0.01	0.07	0.08	0.09	0.04	0.08	-0.05	-0.02	-0.0	-0.11	0.02	0.1	0.06	0.11	1.0	0.07	0.02
Size	-0.25	-0.08	-0.25	0.14	-0.17	0.16	0.22	-0.25	-0.1	-0.4	-0.14	-0.48	0.0	-0.15	-0.45	0.07	1.0	-0.36
Stability	0.09	-0.02	0.28	0.24	0.21	-0.09	0.26	0.08	0.02	0.21	-0.07	0.19	0.17	0.21	0.41	0.02	-0.36	1.0

## ESB Rank Relationships (12-31-24)

- 🔄 Strong correlations between EnMOM-PMOM (0.86) and momentum factors.
- ⚖️ Quality factors show moderate interconnections across metrics.
- 📖 Cross-sectional analysis based on latest ranks across universe.
- ✚️ Orthogonal factors like SIRF and REV show low correlation.

**Key Insight:** Matrix reveals diversification opportunities and multicollinearity concerns.

# Return Correlations Analysis

	ARS	ART	CSU	DV	Dividends	EQ	Efficiency	EnMOM	Growth	Leverage	PMOM	Profit	RV	Reversals	Risk	SIRF	Size	Stability
ARS	1.0	0.73	0.37	-0.04	0.1	-0.18	0.14	0.7	0.6	0.5	0.58	0.62	0.31	-0.09	0.61	0.27	-0.61	0.62
ART	0.73	1.0	0.49	0.07	0.33	-0.16	0.31	0.66	0.7	0.54	0.79	0.66	0.53	-0.36	0.69	0.28	-0.53	0.62
CSU	0.37	0.49	1.0	0.68	0.56	-0.03	0.85	0.17	0.37	0.87	0.47	0.81	0.87	-0.18	0.71	0.63	-0.13	0.82
DV	-0.04	0.07	0.68	1.0	0.39	-0.1	0.78	-0.2	0.14	0.62	0.11	0.42	0.71	-0.27	0.29	0.57	0.38	0.43
Dividends	0.1	0.33	0.56	0.39	1.0	0.11	0.42	-0.03	0.2	0.65	0.2	0.58	0.65	-0.53	0.63	0.63	-0.02	0.56
EQ	-0.18	-0.16	-0.03	-0.1	0.11	1.0	0.0	-0.19	-0.39	-0.16	-0.11	-0.21	-0.19	-0.16	0.06	0.02	0.34	-0.06
Efficiency	0.14	0.31	0.85	0.78	0.42	0.0	1.0	-0.03	0.18	0.7	0.31	0.61	0.79	-0.19	0.5	0.55	0.14	0.66
EnMOM	0.7	0.66	0.17	-0.2	-0.03	-0.19	-0.03	1.0	0.7	0.22	0.8	0.33	0.19	0.04	0.31	-0.04	-0.46	0.4
Growth	0.6	0.7	0.37	0.14	0.2	-0.39	0.18	0.7	1.0	0.49	0.78	0.51	0.54	-0.24	0.45	0.2	-0.39	0.47
Leverage	0.5	0.54	0.87	0.62	0.65	-0.16	0.7	0.22	0.49	1.0	0.48	0.88	0.89	-0.23	0.81	0.76	-0.23	0.87
PMOM	0.58	0.79	0.47	0.11	0.2	-0.11	0.31	0.8	0.78	0.48	1.0	0.48	0.53	-0.22	0.5	0.08	-0.31	0.52
Profit	0.62	0.66	0.81	0.42	0.58	-0.21	0.61	0.33	0.51	0.88	0.48	1.0	0.8	-0.27	0.87	0.7	-0.46	0.9
RV	0.31	0.53	0.87	0.71	0.65	-0.19	0.79	0.19	0.54	0.89	0.53	0.8	1.0	-0.35	0.72	0.65	-0.06	0.78
Reversals	-0.09	-0.36	-0.18	-0.27	-0.53	-0.16	-0.19	0.04	-0.24	-0.23	-0.22	-0.27	-0.35	1.0	-0.37	-0.35	-0.02	-0.18
Risk	0.61	0.69	0.71	0.29	0.63	0.06	0.5	0.31	0.45	0.81	0.5	0.87	0.72	-0.37	1.0	0.72	-0.46	0.88
SIRF	0.27	0.28	0.63	0.57	0.63	0.02	0.55	-0.04	0.2	0.76	0.08	0.7	0.65	-0.35	0.72	1.0	-0.17	0.75
Size	-0.61	-0.53	-0.13	0.38	-0.02	0.34	0.14	-0.46	-0.39	-0.23	-0.31	-0.46	-0.06	-0.02	-0.46	-0.17	1.0	-0.39
Stability	0.62	0.62	0.82	0.43	0.56	-0.06	0.66	0.4	0.47	0.87	0.52	0.9	0.78	-0.18	0.88	0.75	-0.39	1.0

## 3-Year Return Correlations (12-31- 24)

Recent correlation patterns with notable relationships like EnMOM-PMOM (0.86) and quality factor interconnections.

	ARS	ART	CSU	DV	Dividends	EQ	Efficiency	EnMOM	Growth	Leverage	PMOM	Profit	RV	Reversals	Risk	SIRF	Size	Stability
ARS	1.0	0.78	0.29	-0.28	0.03	-0.25	-0.05	0.58	0.56	0.37	0.66	0.49	0.07	-0.44	0.55	0.21	-0.49	0.46
ART	0.78	1.0	0.2	-0.28	-0.07	-0.24	-0.08	0.57	0.53	0.32	0.68	0.38	0.01	-0.33	0.45	0.23	-0.36	0.33
CSU	0.29	0.2	1.0	0.64	0.69	0.39	0.78	-0.02	0.47	0.69	0.1	0.76	0.8	-0.22	0.76	-0.05	-0.3	0.77
DV	-0.28	-0.28	0.64	1.0	0.6	0.42	0.86	-0.43	0.09	0.36	-0.4	0.33	0.79	0.13	0.31	-0.15	0.08	0.43
Dividends	0.03	-0.07	0.69	0.6	1.0	0.36	0.64	-0.2	0.25	0.49	-0.12	0.55	0.69	-0.13	0.67	-0.14	-0.28	0.57
EQ	-0.25	-0.24	0.39	0.42	0.36	1.0	0.49	-0.14	-0.17	0.1	-0.1	0.05	0.28	0.05	0.16	-0.25	0.13	0.17
Efficiency	-0.05	-0.08	0.78	0.86	0.64	0.49	1.0	-0.2	0.19	0.44	-0.14	0.46	0.81	-0.01	0.48	-0.14	-0.02	0.53
EnMOM	0.58	0.57	-0.02	-0.43	-0.2	-0.14	-0.2	1.0	0.29	0.08	0.9	0.14	-0.14	-0.21	0.19	0.22	-0.14	0.07
Growth	0.56	0.53	0.47	0.09	0.25	-0.17	0.19	0.29	1.0	0.58	0.43	0.65	0.45	-0.24	0.57	0.07	-0.34	0.44
Leverage	0.37	0.32	0.69	0.36	0.49	0.1	0.44	0.08	0.58	1.0	0.2	0.84	0.7	-0.3	0.75	0.18	-0.41	0.68
PMOM	0.66	0.68	0.1	-0.4	-0.12	-0.1	-0.14	0.9	0.43	0.2	1.0	0.27	-0.06	-0.38	0.34	0.23	-0.25	0.19
Profit	0.49	0.38	0.76	0.33	0.55	0.05	0.46	0.14	0.65	0.84	0.27	1.0	0.7	-0.3	0.82	0.13	-0.52	0.74
RV	0.07	0.01	0.8	0.79	0.69	0.28	0.81	-0.14	0.45	0.7	-0.06	0.7	1.0	-0.09	0.62	-0.01	-0.16	0.62
Reversals	-0.44	-0.33	-0.22	0.13	-0.13	0.05	-0.01	-0.21	-0.24	-0.3	-0.38	-0.3	-0.09	1.0	-0.39	-0.21	0.35	-0.31
Risk	0.55	0.45	0.76	0.31	0.67	0.16	0.48	0.19	0.57	0.75	0.34	0.82	0.62	-0.39	1.0	0.08	-0.54	0.81
SIRF	0.21	0.23	-0.05	-0.15	-0.14	-0.25	-0.14	0.22	0.07	0.18	0.23	0.13	-0.01	-0.21	0.08	1.0	-0.14	0.06
Size	-0.49	-0.36	-0.3	0.08	-0.28	0.13	-0.02	-0.14	-0.34	-0.41	-0.25	-0.52	-0.16	0.35	-0.54	-0.14	1.0	-0.49
Stability	0.46	0.33	0.77	0.43	0.57	0.17	0.53	0.07	0.44	0.68	0.19	0.74	0.62	-0.31	0.81	0.06	-0.49	1.0

## 20-Year Return Correlations (12- 31-24)

Long-term stability with consistent factor relationships and structural persistence across market cycles.