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QuantZ/QMIT

Master Class: The New Frontiers of Factor Investing

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QMIT
QUANTZ MACHINE INTELLIGENCE
TECHNOLOGIES

QMIT - IBKR MASTERCLASS -2021

Yesterday's Alpha is today's Beta

Alpha decay => Active ripe for disruption + migration to Passive

Disrupt traditional stock-picking & 2/20 model

DIY Smart Beta Investing

DATA IS THE FINAL FRONTIER

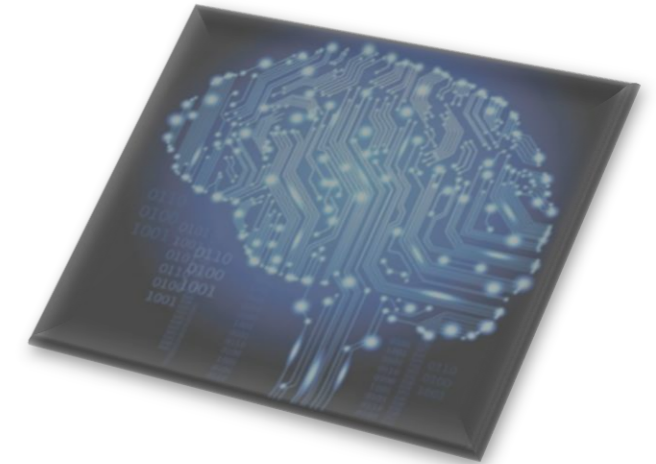
ML

+

Smart
Betas

=

Any Linear view
on Equities



- Over 600 factors including their sector neutralized versions
- ML-Enhanced Smart Betas: 18 Composites + 18 SN Composites
- Factors :=
 - [Long top 5% - Short bottom 5%] market-neutral performance spreads on ~125 x 125 stocks
 - Clear rationale grounded in trader intuition, fundamentals or technicals
- Enhanced Smart Betas via ensemble learners
- HF Signals as MFM combos of high octane ESBs



ENHANCED SMART BETAS

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 & TARGETS (ART)
9. GROWTH – HISTORICAL (GROH)
10. QUALITY - EARNINGS QUALITY (EQ)
11. QUALITY – LEVERAGE (LEV)
12. QUALITY – PROFITABILITY (PROF)
13. QUALITY – CAPITAL USAGE (CSU)
14. QUALITY – STABILITY (STAB)
15. QUALITY – EFFICIENCY (EFF)
16. SIZE
17. SHORT INTEREST (SIRF)
18. RISK (LOW VOL)

COMPOSITE SIGNALS

1. FAMOUS FIVE
2. SIZZLING SEVEN
3. FABULOUS FOURTEEN
4. ENTERPRISE EIGHTEEN
5. VALUE COMPOSITE
6. GROWTH MOMENTUM COMPOSITE
7. QUALITY COMPOSITE
8. VALUE MOMENTUM COMPOSITE
9. QUALITY MOMENTUM COMPOSITE
10. QUALITY VALUE COMPOSITE
11. Q+GARP
12. LBO TOP 100



ESBS – BEST FLAVOR (HIGHEST CUM % LTD – BETA-NEUTRAL AS OF 3-31-21)



	Spread Ann%	Vol	Sharpe	Sortino	MaxDD %	Hit Rate	Long Ann%	Long Sharpe
Quality - Profitability	20.77	16.81	1.24	3.50	18.42	67.58	11.77	0.65
Quality - Leverage	17.30	13.80	1.25	3.49	21.61	68.75	11.22	0.54
Relative Value	16.86	17.73	0.95	1.88	29.57	64.84	19.01	0.86
Deep Value	14.59	20.19	0.72	1.25	49.43	60.16	14.11	0.67
Quality – Capital Structure/ Usage	14.51	16.61	0.87	1.65	28.25	64.06	14.16	0.77
Safety/ Risk	11.85	9.63	1.23	2.12	28.43	69.92	12.34	1.18
Reversals	10.54	20.71	0.51	0.93	34.13	55.86	10.07	0.46
Growth	10.46	11.17	0.94	1.63	34.25	62.50	14.33	0.68
Quality - Stability	10.00	11.40	0.88	1.49	20.26	64.06	13.51	0.85
Size	9.68	12.08	0.80	1.61	45.29	55.86	13.85	0.69
Quality - Efficiency	8.87	19.29	0.46	0.84	51.05	56.25	10.01	0.48
Analyst Revisions	7.90	12.20	0.65	0.96	38.21	63.67	13.35	0.70
Analyst Ratings and Targets	7.82	12.18	0.64	0.96	29.37	63.67	14.01	0.75
Quality - Efficiency	5.68	9.96	0.57	1.05	23.20	53.13	7.38	0.34
Enhanced Momentum	5.61	18.88	0.30	0.48	44.27	56.25	9.29	0.46
Dividends	3.71	10.33	0.36	0.54	31.76	56.64	10.95	0.59
Short Interest	3.23	9.28	0.35	0.56	23.88	55.08	11.93	0.74
Price Momentum	3.03	23.40	0.13	0.19	63.01	54.30	4.38	0.18

NB – 19y monthly & 2.25y daily observations where the best flavor (not BFOM) highlighted is based on LTD monthly returns

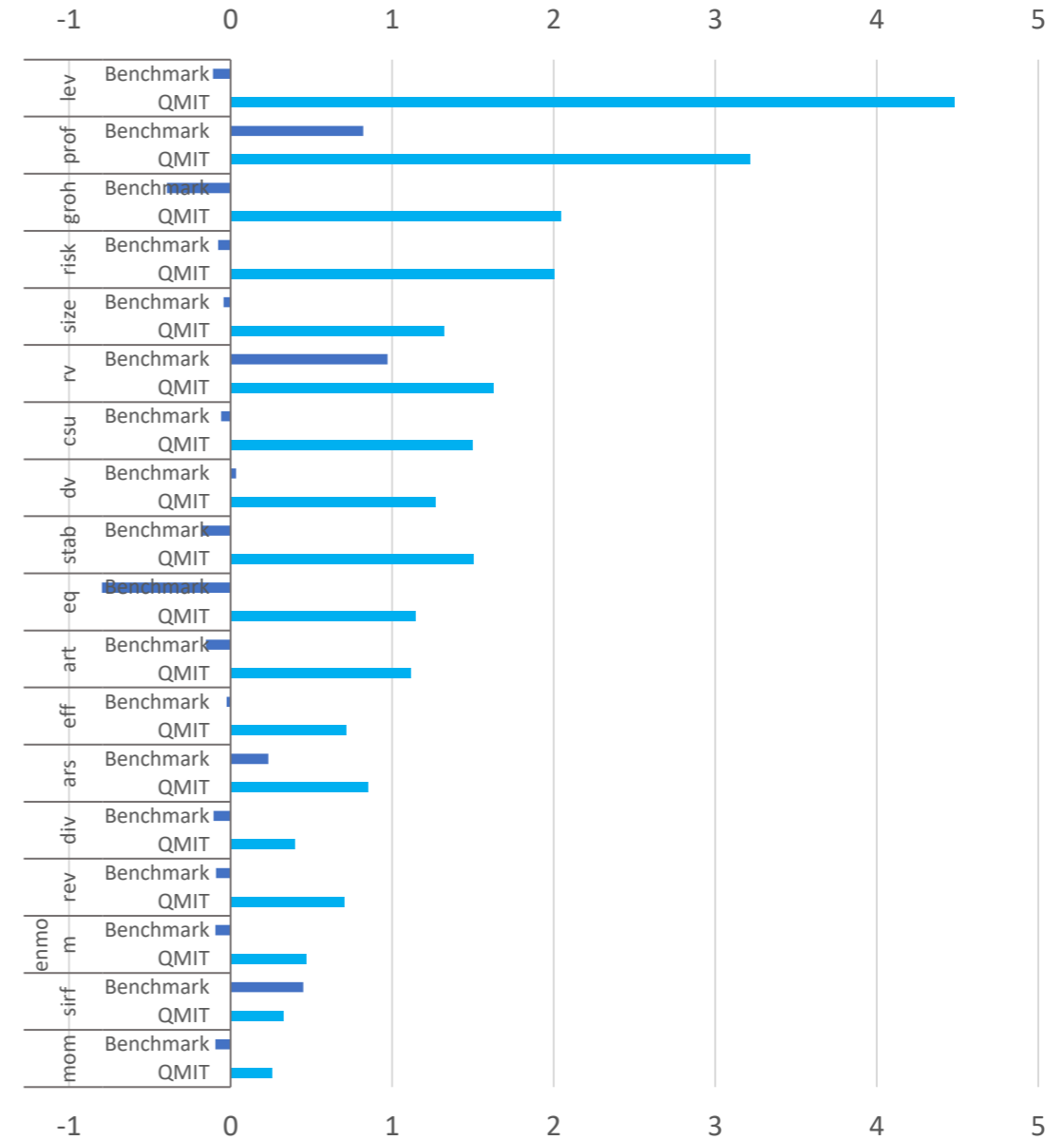
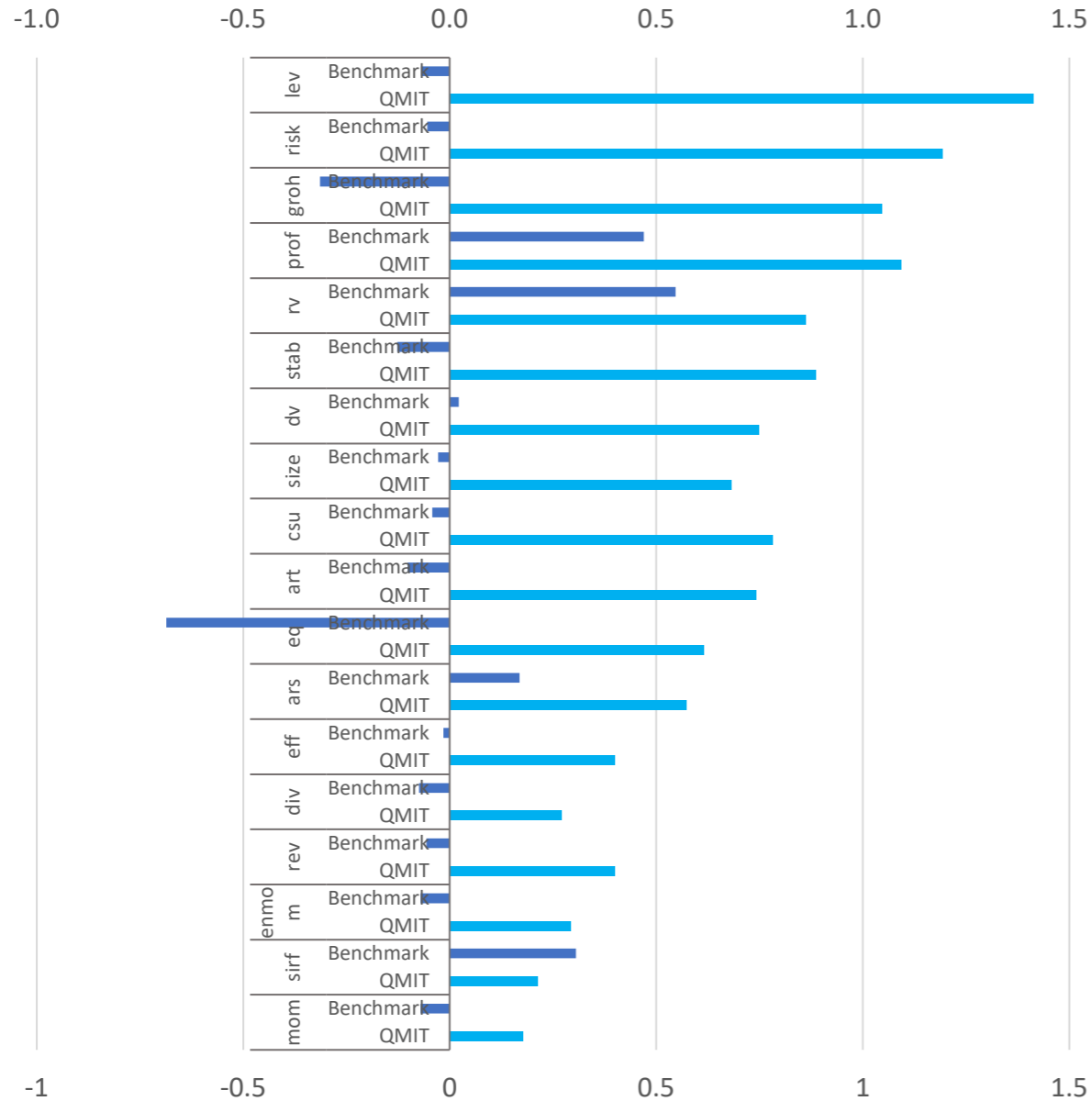


ESB – BFOMS: 21Y BETA NEUTRAL (2000-20)



Sharpe Ratios

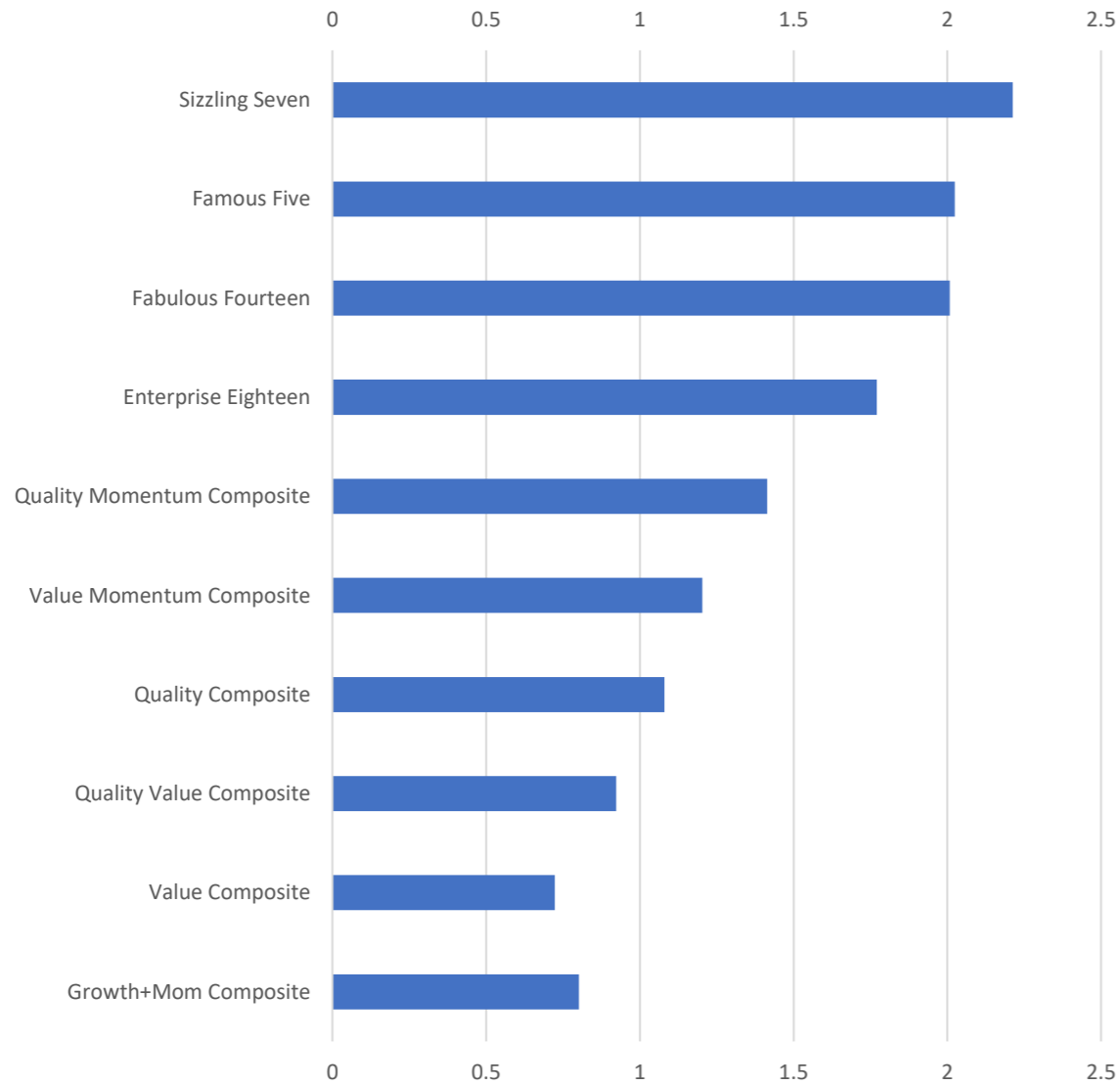
Sortino Ratios



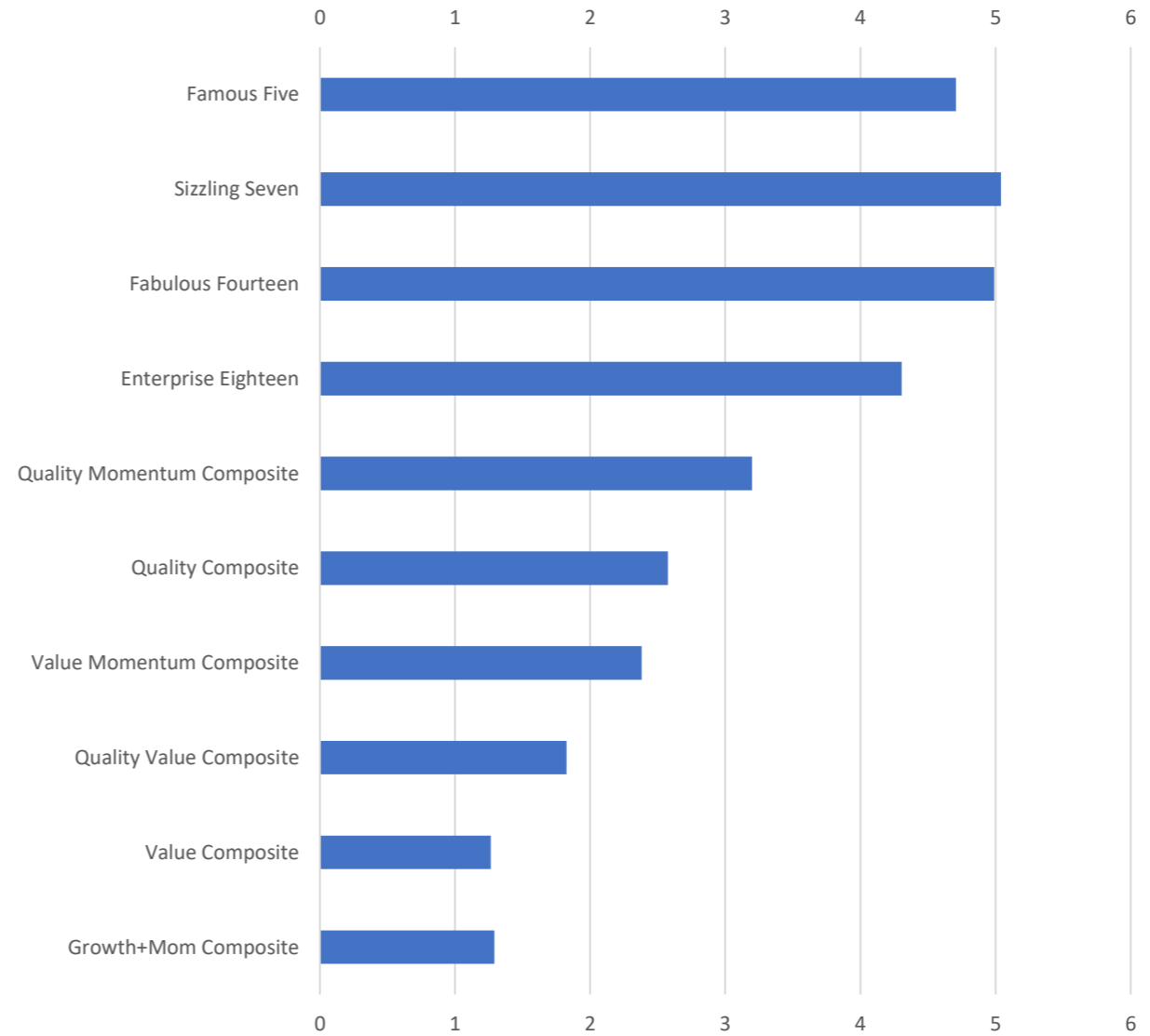
Benchmark factors are listed in the 1 pagers & the model handbook. All results are for BFOMs to avoid look ahead bias.



Sharpe Ratios



Sortino Ratios



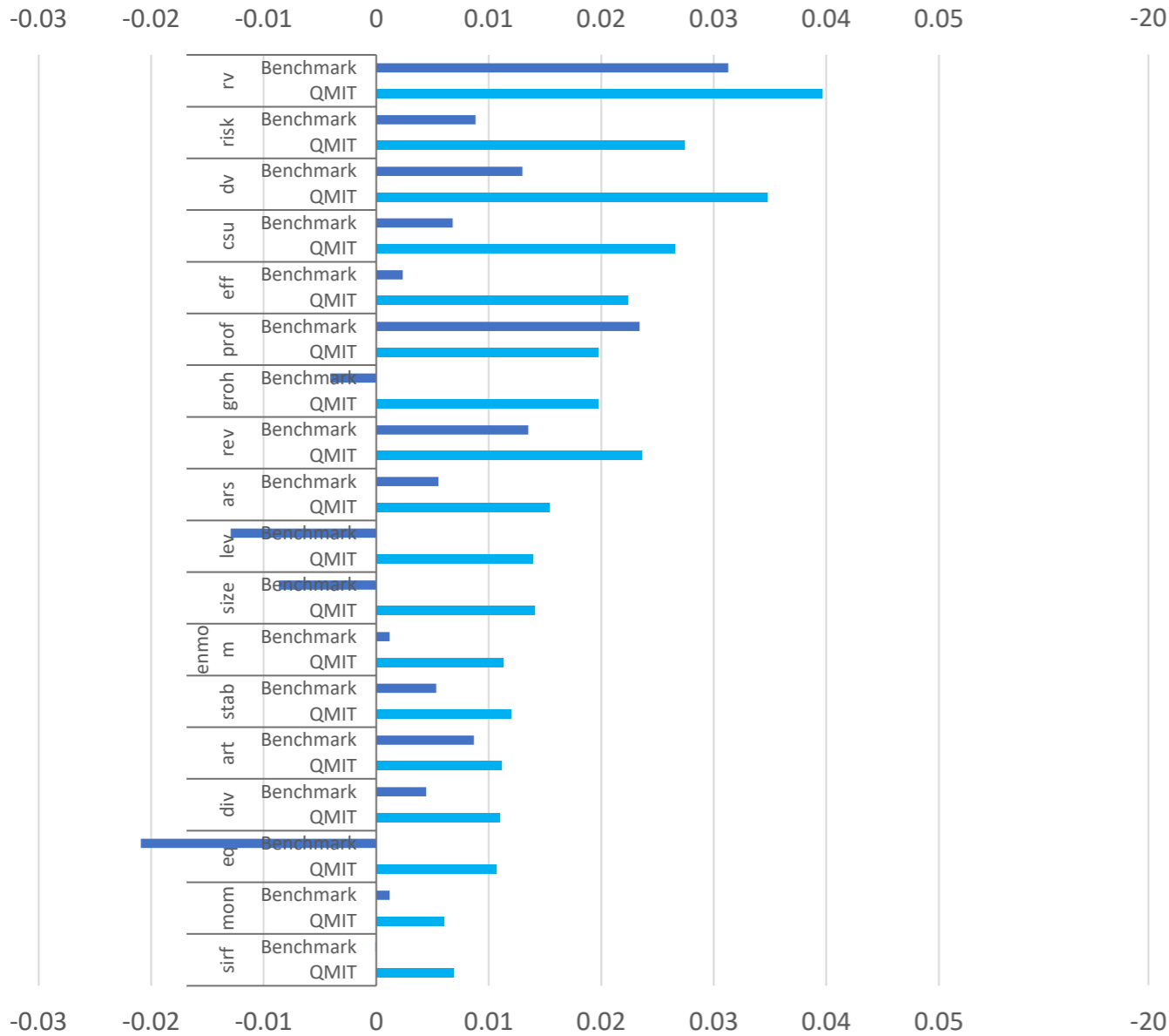
* Monthly re-optimization of factor weights within ESB BFOMs which constitute the combos but with DAILY chain-linked returns & ESB factor re-rankings



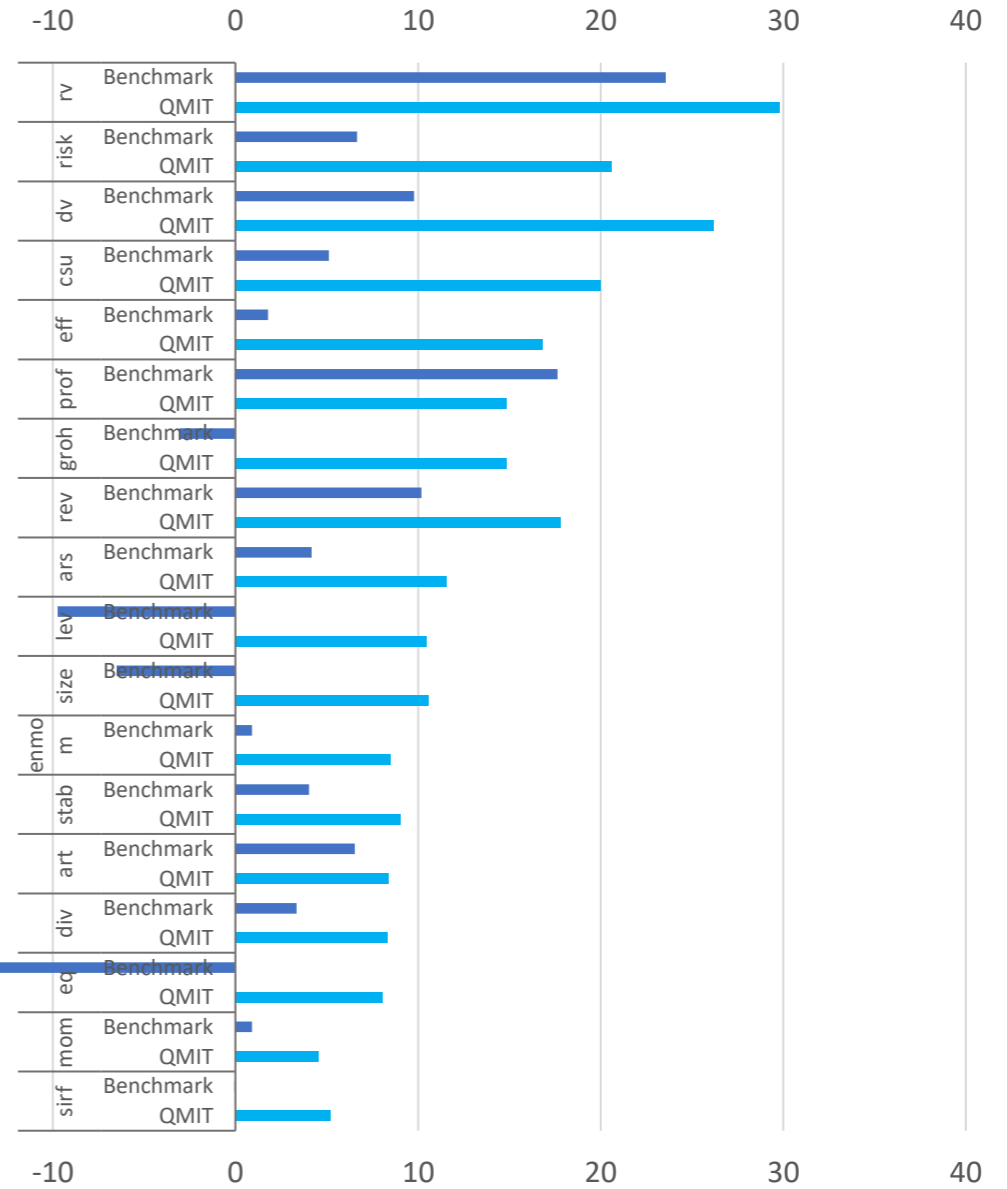
ESB - BFOMS: 21Y BETA NEUTRAL (2000-20)



Pooled Information Coefficients



IC t-stats



Benchmark factors are listed in the 1 pages & the model handbook. All results are for BFOMs to avoid look ahead bias.



ESB HEATMAPS - 2021 YTD (12-03-21, DAILY RE-BALANCED, \$-NEUTRAL)



	DTD Long	DTD Short	DTD Spread	MTD Long	MTD Short	MTD Spread	YTD Long	YTD Short	YTD Spread
DV	-0.82%	-3.92%	3.1%	0.59%	-7.43%	8.43%	46.81%	-27.2%	88.17%
RV	-1.54%	-4.05%	2.51%	-0.5%	-6.54%	6.22%	57.01%	-4.23%	58.63%
Size	-4.18%	-1.82%	-2.35%	-6.29%	-2.36%	-3.94%	-1.78%	12.19%	-12.01%
Profit	-2.15%	-4.8%	2.66%	-2.41%	-8.58%	6.39%	15.59%	2.57%	3.99%
CSU	-1.52%	-5.05%	3.52%	0.59%	-9.12%	10.24%	30.16%	-6.43%	29.18%
Leverage	-1.75%	-5.24%	3.49%	-1.65%	-9.65%	8.48%	13.47%	-27.17%	43.5%
Efficiency	-1.36%	-5.34%	3.98%	-0.32%	-9.41%	9.67%	47.43%	-32.36%	108.25%
Reversals	-2.37%	-1.82%	-0.55%	-2.48%	-3.44%	1.02%	2.75%	10.35%	-8.66%
EQ	-4.25%	-3.03%	-1.22%	-6.83%	-5.56%	-1.28%	14.4%	-10.62%	27.08%
Growth	-2.16%	-2.0%	-0.15%	-1.99%	-2.21%	0.22%	42.17%	22.07%	15.1%
EnMOM	-2.53%	-2.21%	-0.32%	-2.95%	-3.28%	0.35%	6.91%	1.49%	4.87%
ART	-2.3%	-2.31%	0.01%	-2.19%	-3.98%	1.82%	23.77%	7.41%	14.4%
ARS	-1.91%	-2.58%	0.67%	-1.34%	-4.36%	3.1%	35.33%	3.05%	28.8%
Stability	-0.23%	-3.8%	3.56%	1.35%	-6.05%	7.59%	22.8%	-7.49%	22.63%
PMOM	-3.47%	-4.16%	0.69%	-5.02%	-7.29%	2.38%	12.14%	-2.63%	14.54%
SIRF	-0.95%	-2.65%	1.7%	1.02%	-3.83%	4.92%	16.94%	10.86%	2.49%
Risk	0.56%	-5.28%	5.84%	1.16%	-8.5%	9.96%	10.86%	6.99%	-11.1%
Dividends	-0.73%	-1.55%	0.82%	0.44%	-0.98%	1.34%	33.96%	26.29%	4.78%
RiskOn	-1.91%	-3.09%	1.18%	-1.42%	-5.03%	3.79%	30.19%	-1.19%	36.0%
RiskOff	-1.85%	-3.48%	1.62%	-1.72%	-5.77%	4.19%	20.59%	2.06%	13.92%
RORO Spread	-0.06%	0.39%	-0.44%	0.3%	0.74%	-0.4%	9.6%	-3.25%	22.08%

*Monthly re-optimization of factor weights within ESBs (best flavor not BFOM) & DAILY chain-linked returns for month end factor rankings



ESB HEATMAPS - 2020 YTD (12-31-20, DAILY* RE-RANKED, BETA-NEUTRAL)



	DTD Long	DTD Short	DTD Spread	MTD Long	MTD Short	MTD Spread	YTD Long	YTD Short	YTD Spread
DV	0.18%	-2.3%	2.48%	6.07%	15.04%	-8.62%	22.05%	72.15%	-32.84%
Size	-0.5%	0.86%	-1.36%	11.64%	2.84%	8.54%	21.53%	41.09%	-15.17%
RV	0.72%	-0.75%	1.47%	7.96%	8.42%	-0.5%	30.34%	66.72%	-23.27%
Profit	0.37%	-0.39%	0.76%	7.62%	5.6%	1.87%	27.89%	-1.09%	24.37%
CSU	0.5%	-0.06%	0.56%	8.59%	10.05%	-1.47%	24.1%	21.87%	-1.22%
Leverage	0.53%	-0.26%	0.79%	7.83%	5.68%	1.98%	27.42%	41.79%	-11.03%
Reversals	-0.83%	0.45%	-1.28%	6.86%	5.2%	1.42%	104.86%	-4.36%	108.56%
Efficiency	-0.11%	-1.29%	1.18%	5.23%	9.22%	-3.99%	7.34%	62.26%	-35.93%
EQ	-0.18%	-0.41%	0.22%	7.39%	11.61%	-3.89%	17.62%	41.53%	-18.55%
Growth	-0.47%	-0.06%	-0.41%	6.55%	8.75%	-2.21%	24.07%	52.12%	-20.64%
ART	-0.05%	-0.12%	0.07%	9.66%	7.0%	2.4%	8.07%	12.24%	-5.94%
EnMOM	-0.09%	-0.09%	-0.0%	5.76%	8.84%	-3.08%	57.31%	7.8%	39.55%
ARS	-0.04%	-0.3%	0.26%	7.22%	8.66%	-1.44%	27.9%	12.64%	10.31%
SIRF	0.74%	-0.82%	1.55%	6.23%	6.69%	-0.56%	9.31%	19.16%	-7.58%
Stability	0.41%	-0.61%	1.02%	3.58%	6.96%	-3.27%	15.71%	-7.42%	21.62%
Risk	0.71%	-0.16%	0.87%	3.75%	1.18%	2.52%	6.32%	5.01%	1.86%
PMOM	-0.51%	0.13%	-0.64%	7.45%	10.28%	-2.97%	32.04%	7.83%	13.07%
Dividends	0.63%	0.28%	0.36%	7.02%	7.73%	-0.65%	-6.51%	26.71%	-24.26%

*Monthly re-optimization of factor weights within ESBs (best flavor not BFOM) but DAILY chain-linked returns & factor re-rankings



ESB HEATMAPS - LTD (12-31-20, 19Y MO & 2Y DAILY*, \$-NEUTRAL)



	5Y Long	5Y Short	5Y Spread	Post-07 Long	Post-07 Short	Post-07 Spread	LTD Long	LTD Short	LTD Spread
DV	13.26%	18.34%	-4.8%	12.17%	0.99%	10.44%	15.69%	-7.36%	18.75%
Size	18.05%	19.05%	-0.52%	15.87%	7.09%	8.83%	20.63%	3.11%	17.74%
RV	12.71%	15.34%	-2.79%	10.35%	2.9%	6.62%	17.33%	-6.29%	17.87%
Profit	19.51%	5.86%	6.45%	10.6%	-2.17%	7.86%	11.25%	-12.6%	16.58%
CSU	12.83%	5.72%	5.0%	10.13%	-1.38%	9.5%	13.04%	-8.09%	14.7%
Leverage	17.06%	17.31%	-2.67%	10.69%	2.74%	4.61%	10.85%	-8.85%	14.73%
Reversals	30.26%	4.28%	24.63%	12.13%	0.26%	11.78%	12.05%	-3.98%	16.06%
Efficiency	8.23%	17.23%	-7.67%	7.61%	4.98%	2.75%	11.39%	-5.21%	11.45%
EQ	18.12%	11.51%	5.86%	10.03%	2.31%	7.06%	9.19%	-3.06%	10.82%
Growth	12.46%	17.36%	-6.04%	10.43%	3.17%	4.87%	13.85%	0.9%	10.27%
ART	16.39%	12.43%	-1.16%	14.42%	1.51%	8.27%	15.05%	3.08%	7.91%
EnMOM	19.16%	12.69%	2.7%	11.12%	3.31%	4.78%	10.62%	-0.85%	7.23%
ARS	18.09%	7.88%	5.26%	13.18%	1.35%	8.04%	13.03%	3.05%	6.06%
SIRF	14.81%	13.29%	0.71%	9.28%	5.29%	3.43%	12.91%	8.03%	4.08%
Stability	13.08%	1.19%	8.13%	10.9%	1.69%	5.94%	12.97%	4.24%	3.98%
Risk	11.93%	10.98%	-11.18%	9.78%	1.86%	-4.42%	12.19%	-10.15%	3.06%
PMOM	16.61%	13.77%	-5.06%	9.3%	1.36%	0.49%	6.49%	-4.47%	1.4%
Dividends	9.54%	10.94%	-1.05%	7.11%	6.84%	-0.82%	10.43%	6.57%	1.12%

*Monthly re-optimization of factor weights within ESBs (best flavor not BFOM) but DAILY chain-linked returns & factor re-rankings in last 2y vs monthly prior 19y



COMPOSITE SIGNALS - YTD (12-03-21), MONTHLY RE-BALANCED*, \$-NEUTRAL



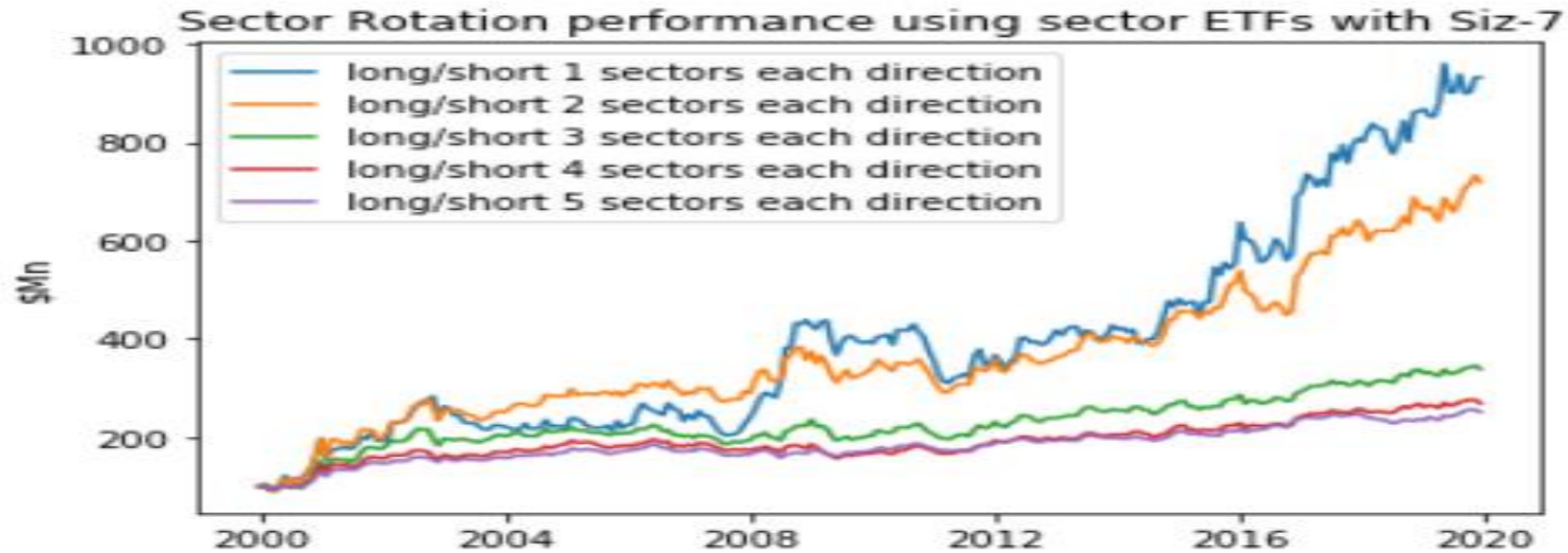
	DTD Long	DTD Short	DTD Spread	MTD Long	MTD Short	MTD Spread	YTD Long	YTD Short	YTD Spread
Fabulous Fourteen	-1.81%	-5.38%	3.57%	-0.65%	-10.14%	10.1%	38.15%	-32.66%	93.18%
Sizzling Seven	-0.97%	-5.54%	4.57%	1.07%	-10.19%	12.0%	30.2%	-28.34%	70.23%
Famous Five	-1.05%	-5.26%	4.22%	0.51%	-8.82%	9.74%	28.82%	-25.81%	62.66%
Enterprise Eighteen	-1.44%	-5.72%	4.27%	0.1%	-10.7%	11.51%	39.79%	-31.59%	90.35%
Value Momentum Composite	-1.36%	-4.84%	3.48%	-0.57%	-8.7%	8.57%	49.25%	-29.55%	101.48%
Q-GARP	-1.59%	-4.91%	3.32%	-0.1%	-8.54%	8.87%	42.19%	-12.38%	54.07%
Value Composite	-0.98%	-5.25%	4.27%	0.54%	-9.26%	10.39%	48.03%	-31.43%	96.03%
Quality Momentum Composite	-1.69%	-4.58%	2.89%	-0.4%	-8.6%	8.61%	35.6%	-26.44%	75.87%
Quality Value Composite	-0.83%	-5.59%	4.76%	0.83%	-10.41%	11.97%	33.8%	-26.8%	63.79%
Quality Composite	-1.17%	-5.01%	3.84%	0.25%	-9.09%	9.84%	29.51%	-20.97%	49.44%
Growth+Mom Composite	-2.23%	-2.22%	-0.01%	-2.1%	-3.36%	1.27%	33.52%	-5.64%	39.99%

*Monthly re-optimization of factor weights within ESBs with DAILY chain-linked returns for month end factor rankings. ESBs are equal weighted within signals

Sectors	Long	%	Short	%	L-S Spread	%
Consumer Discretionary	12.90	42.14%	1.61	14.98%	14.52	35.06%
Industrials	4.83	15.76%	2.86	26.48%	7.68	18.55%
Health Care	2.35	7.66%	4.57	42.42%	6.92	16.71%
Information Technology	2.69	8.79%	2.99	27.73%	5.68	13.72%
Financials	4.70	15.33%	-0.21	-1.95%	4.49	10.83%
Consumer Staples	1.50	4.89%	0.48	4.48%	1.98	4.78%
Utilities	0.06	0.20%	0.77	7.17%	0.84	2.02%
Communication Services	0.66	2.16%	-0.03	-0.31%	0.63	1.51%
Materials	0.97	3.16%	-1.06	-9.87%	-0.10	-0.24%
Energy	-0.03	-0.09%	-1.20	-11.14%	-1.23	-2.97%
Arithmetic Return	30.63	100.00%	10.78	100.00%	41.41	100.00%
Geometric Return	34.40		10.35		44.45	

	Sizzling Seven	ARS	ART	CSU	Dividends	DV	Efficiency	EnMOM	EQ	Growth	Leverage	PMOM	Profit	Reversals	Risk	RV	SIRF	Size	Stability
Financials	1	1	2	1	2	8	7	2	2	3	1	2	1	5	3	2	4	2	9
Energy	2	7	1	9	4	1	2	1	1	1	9	1	10	1	10	1	6	1	10
Consumer Staples	3	3	8	4	3	2	3	10	8	9	5	10	3	9	2	7	2	9	1
Communication Services	4	10	7	6	6	4	6	6	5	6	7	7	4	3	5	3	3	5	6
Industrials	5	4	3	3	7	7	4	7	7	7	2	3	7	6	6	6	5	6	2
Health Care	6	8	5	7	9	9	9	4	4	8	8	8	9	2	4	9	7	4	7
Materials	7	9	6	8	5	3	5	8	9	5	4	4	5	10	7	5	8	3	4
Consumer Discretionary	8	5	9	2	8	5	1	9	3	2	3	6	2	7	9	4	10	7	5
Utilities	9	6	10	10	1	6	10	5	10	10	10	9	6	8	1	10	1	10	3
Information Technology	10	2	4	5	10	10	8	3	6	4	6	5	8	4	8	8	9	8	8

	Sizzling Seven	Enterprise Eighteen	Fabulous Fourteen	Famous Five	Growth+Mom Composite	Q-GARP	Quality Composite	Quality Momentum Composite	Quality Value Composite	Value Composite	Value Momentum Composite
Financials	1	1	1	1	2	2	3	1	5	7	2
Consumer Staples	2	2	4	2	9	4	1	4	1	4	6
Communication Services	3	7	5	3	8	7	6	9	3	2	4
Materials	4	6	6	5	7	5	5	7	4	3	5
Energy	5	3	2	4	1	1	9	6	6	1	1
Industrials	6	4	7	6	5	6	4	3	7	6	7
Consumer Discretionary	7	5	3	7	6	3	2	2	2	5	3
Health Care	8	9	9	8	4	9	8	8	9	10	9
Information Technology	9	8	8	9	3	8	7	5	8	9	8
Utilities	10	10	10	10	10	10	10	10	10	8	10

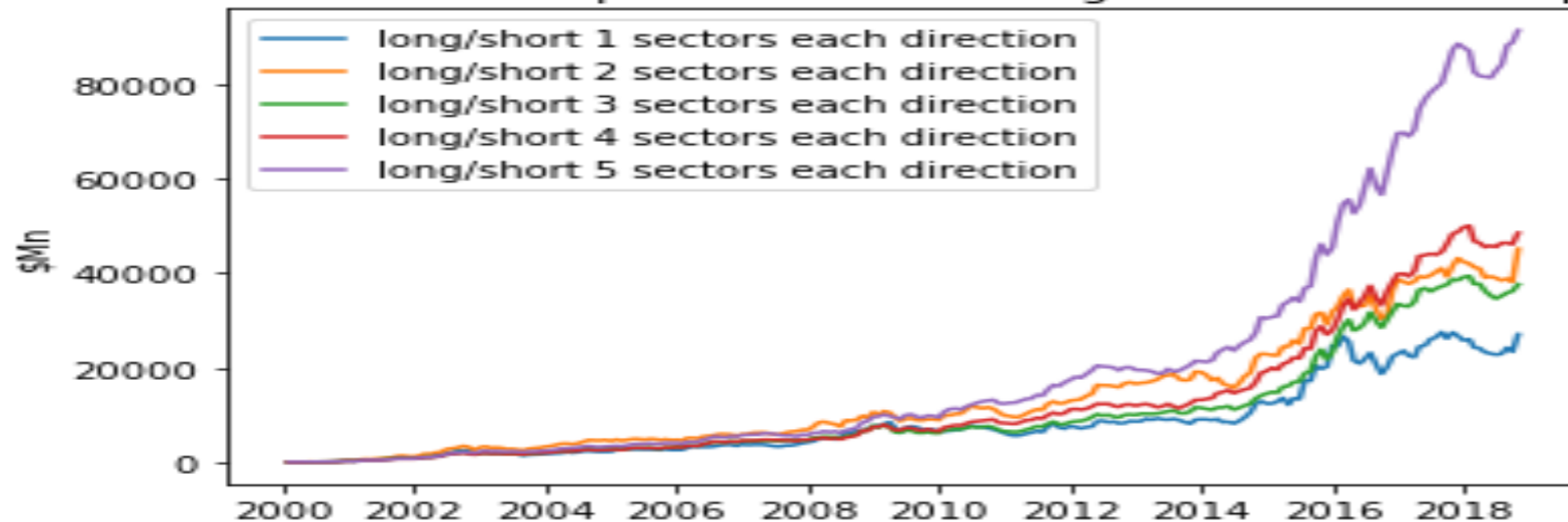


Siz 7 Data Summary

	Annual Ret.	Annual Vol.	Hit Rate	Sharpe	Sortino	Drawdown
1	11.51	19.57	52.24	0.66	1.23	29.1
2	10.09	16.45	51.02	0.67	1.25	24.07
3	6.08	12.2	54.29	0.55	0.96	18.2
4	4.87	9.39	52.24	0.56	0.98	19.83
5	4.54	8.03	53.06	0.6	1.09	14.76



Sector rotation - cum performance via single stocks - Siz7 top decile



Siz7 summary, top decile

	Annual Ret.	Annual Vol.	Hit Rate	Sharpe	Sortino	Drawdown	Weighted siz7
1	34.29	31.88	59.47	1.05	2.21	41.87	72.64
2	37.66	30.06	61.23	1.14	2.93	26.34	84.8
3	36.45	25.22	63.88	1.29	3.24	23.09	89.41
4	38.47	23.26	64.76	1.44	3.91	22.74	91.71
5	43.56	22.23	67.84	1.63	5.33	18.09	92.68

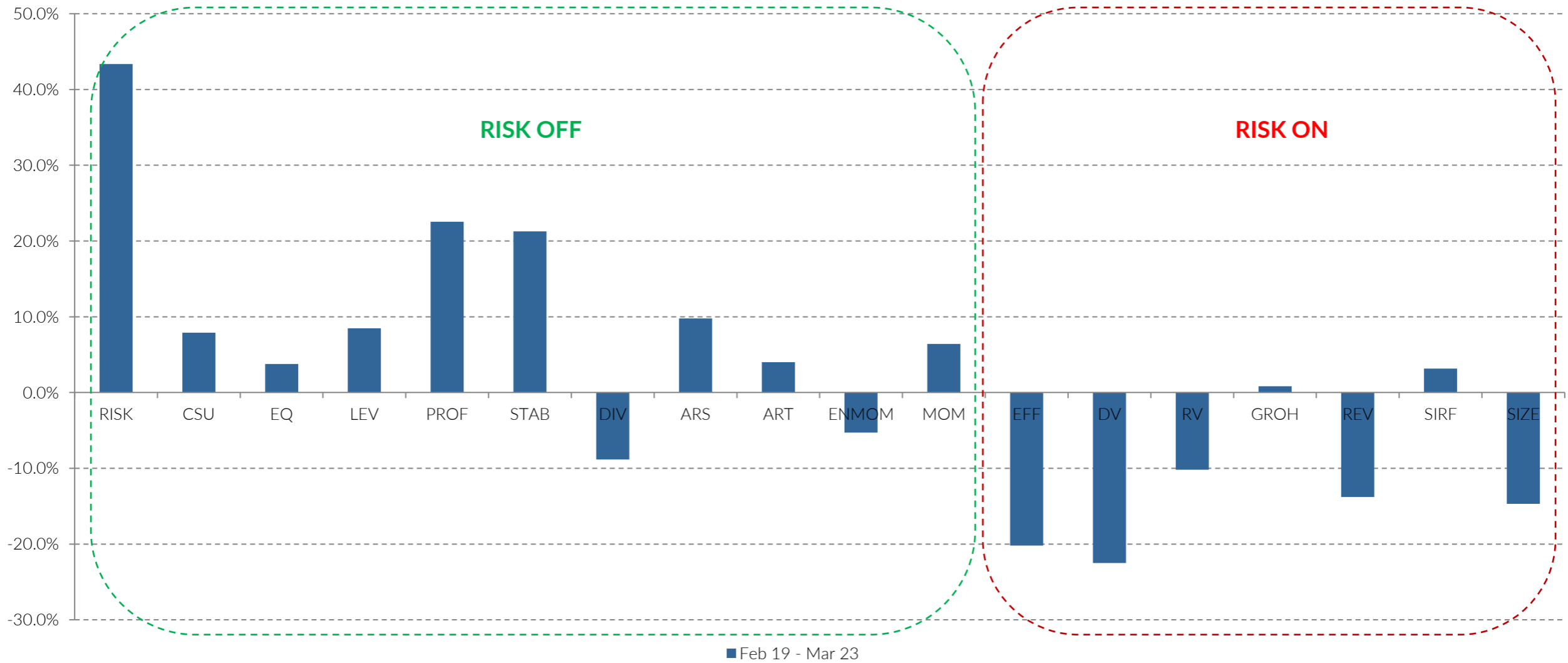
	ARS	ART	CSU	DV	Dividends	EQ	Efficiency	EnMOM	Growth	Leverage	PMOM	Profit	RV	Reversals	Risk	SIRF	Size	Stability
ARS	1.0	0.42	0.19	-0.14	-0.05	-0.04	-0.06	0.18	0.33	0.26	0.38	0.29	0.07	-0.31	0.14	0.07	-0.28	0.12
ART	0.42	1.0	0.09	-0.19	-0.08	-0.04	-0.09	0.21	0.17	0.11	0.39	0.11	-0.06	-0.21	0.11	0.04	-0.21	0.08
CSU	0.19	0.09	1.0	0.18	0.14	0.22	0.15	-0.08	0.3	0.39	-0.05	0.37	0.6	-0.03	0.1	0.14	-0.09	0.26
DV	-0.14	-0.19	0.18	1.0	0.19	0.27	0.67	-0.34	-0.01	-0.11	-0.4	-0.16	0.46	0.12	-0.2	0.13	0.18	0.33
Dividends	-0.05	-0.08	0.14	0.19	1.0	-0.0	0.08	-0.21	-0.07	0.08	-0.27	0.18	0.23	0.12	0.08	0.21	0.0	0.08
EQ	-0.04	-0.04	0.22	0.27	-0.0	1.0	0.13	-0.08	0.01	-0.08	-0.12	-0.17	0.23	0.04	-0.17	0.03	0.09	0.04
Efficiency	-0.06	-0.09	0.15	0.67	0.08	0.13	1.0	-0.21	0.03	-0.12	-0.24	-0.13	0.3	0.07	-0.14	0.07	0.13	0.44
EnMOM	0.18	0.21	-0.08	-0.34	-0.21	-0.08	-0.21	1.0	0.16	0.11	0.81	0.07	-0.22	0.11	0.12	-0.15	-0.16	-0.09
Growth	0.33	0.17	0.3	-0.01	-0.07	0.01	0.03	0.16	1.0	0.3	0.25	0.31	0.43	-0.13	0.09	0.05	-0.1	0.04
Leverage	0.26	0.11	0.39	-0.11	0.08	-0.08	-0.12	0.11	0.3	1.0	0.2	0.67	0.3	-0.07	0.32	0.15	-0.32	0.26
PMOM	0.38	0.39	-0.05	-0.4	-0.27	-0.12	-0.24	0.81	0.25	0.2	1.0	0.19	-0.27	-0.24	0.32	-0.09	-0.38	0.01
Profit	0.29	0.11	0.37	-0.16	0.18	-0.17	-0.13	0.07	0.31	0.67	0.19	1.0	0.25	-0.11	0.37	0.19	-0.37	0.17
RV	0.07	-0.06	0.6	0.46	0.23	0.23	0.3	-0.22	0.43	0.3	-0.27	0.25	1.0	0.09	-0.07	0.13	0.12	0.23
Reversals	-0.31	-0.21	-0.03	0.12	0.12	0.04	0.07	0.11	-0.13	-0.07	-0.24	-0.11	0.09	1.0	-0.06	-0.0	0.22	-0.03
Risk	0.14	0.11	0.1	-0.2	0.08	-0.17	-0.14	0.12	0.09	0.32	0.32	0.37	-0.07	-0.06	1.0	0.26	-0.4	0.26
SIRF	0.07	0.04	0.14	0.13	0.21	0.03	0.07	-0.15	0.05	0.15	-0.09	0.19	0.13	-0.0	0.26	1.0	-0.16	0.19
Size	-0.28	-0.21	-0.09	0.18	0.0	0.09	0.13	-0.16	-0.1	-0.32	-0.38	-0.37	0.12	0.22	-0.4	-0.16	1.0	-0.24
Stability	0.12	0.08	0.26	0.33	0.08	0.04	0.44	-0.09	0.04	0.26	0.01	0.17	0.23	-0.03	0.26	0.19	-0.24	1.0

ESB – 20Y RETURN CORRELATIONS (03-31-21)

	ARS	ART	CSU	DV	Dividends	EQ	Efficiency	EnMOM	Growth	Leverage	PMOM	Profit	RV	Reversals	Risk	SIRF	Size	Stability
ARS	1.0	0.81	0.18	-0.36	0.03	-0.21	-0.13	0.56	0.52	0.29	0.69	0.49	-0.02	-0.47	0.51	0.19	-0.55	0.35
ART	0.81	1.0	0.11	-0.34	-0.04	-0.24	-0.14	0.59	0.5	0.29	0.72	0.41	-0.05	-0.35	0.46	0.21	-0.45	0.29
CSU	0.18	0.11	1.0	0.69	0.72	0.46	0.8	-0.06	0.41	0.69	0.02	0.74	0.86	-0.21	0.78	-0.16	-0.38	0.8
DV	-0.36	-0.34	0.69	1.0	0.59	0.5	0.88	-0.45	0.08	0.33	-0.45	0.28	0.79	0.18	0.32	-0.3	0.04	0.44
Dividends	0.03	-0.04	0.72	0.59	1.0	0.43	0.65	-0.22	0.27	0.44	-0.13	0.53	0.69	-0.11	0.64	-0.25	-0.29	0.57
EQ	-0.21	-0.24	0.46	0.5	0.43	1.0	0.53	-0.12	-0.1	0.15	-0.1	0.11	0.41	0.07	0.19	-0.22	0.11	0.26
Efficiency	-0.13	-0.14	0.8	0.88	0.65	0.53	1.0	-0.19	0.18	0.42	-0.17	0.41	0.84	-0.0	0.5	-0.26	-0.07	0.53
EnMOM	0.56	0.59	-0.06	-0.45	-0.22	-0.12	-0.19	1.0	0.22	0.08	0.9	0.12	-0.16	-0.23	0.18	0.25	-0.17	0.02
Growth	0.52	0.5	0.41	0.08	0.27	-0.1	0.18	0.22	1.0	0.57	0.39	0.65	0.45	-0.22	0.56	0.01	-0.38	0.38
Leverage	0.29	0.29	0.69	0.33	0.44	0.15	0.42	0.08	0.57	1.0	0.19	0.86	0.67	-0.31	0.75	0.07	-0.48	0.63
PMOM	0.69	0.72	0.02	-0.45	-0.13	-0.1	-0.17	0.9	0.39	0.19	1.0	0.28	-0.09	-0.39	0.34	0.24	-0.33	0.14
Profit	0.49	0.41	0.74	0.28	0.53	0.11	0.41	0.12	0.65	0.86	0.28	1.0	0.66	-0.34	0.86	-0.01	-0.63	0.75
RV	-0.02	-0.05	0.86	0.79	0.69	0.41	0.84	-0.16	0.45	0.67	-0.09	0.66	1.0	-0.07	0.63	-0.16	-0.23	0.6
Reversals	-0.47	-0.35	-0.21	0.18	-0.11	0.07	-0.0	-0.23	-0.22	-0.31	-0.39	-0.34	-0.07	1.0	-0.41	-0.19	0.46	-0.34
Risk	0.51	0.46	0.78	0.32	0.64	0.19	0.5	0.18	0.56	0.75	0.34	0.86	0.63	-0.41	1.0	-0.03	-0.64	0.81
SIRF	0.19	0.21	-0.16	-0.3	-0.25	-0.22	-0.26	0.25	0.01	0.07	0.24	-0.01	-0.16	-0.19	-0.03	1.0	-0.05	-0.07
Size	-0.55	-0.45	-0.38	0.04	-0.29	0.11	-0.07	-0.17	-0.38	-0.48	-0.33	-0.63	-0.23	0.46	-0.64	-0.05	1.0	-0.53
Stability	0.35	0.29	0.8	0.44	0.57	0.26	0.53	0.02	0.38	0.63	0.14	0.75	0.6	-0.34	0.81	-0.07	-0.53	1.0



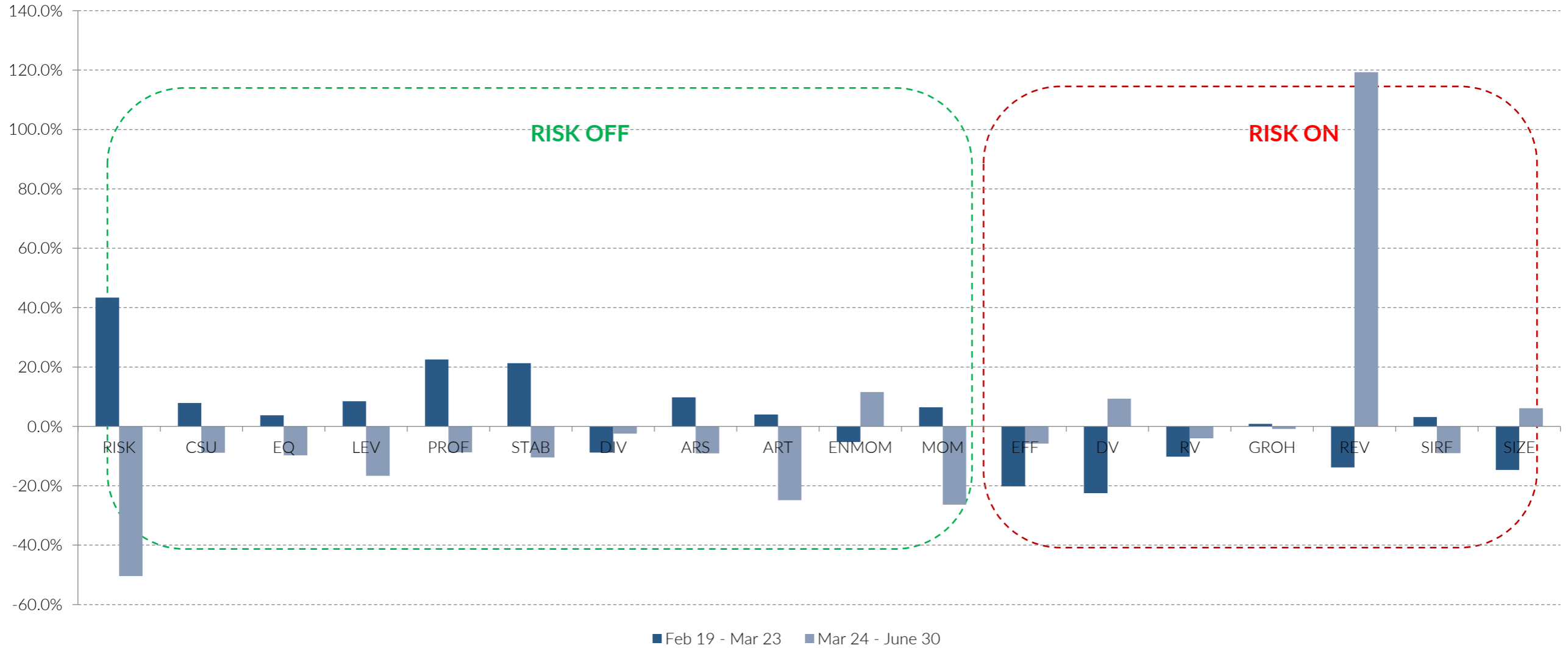
Covid crash ~ +23% RORO spread



*Monthly re-optimization of factor weights within ESBs with DAILY chain-linked returns & ESB factor re-rankings for \$ neutral smart betas



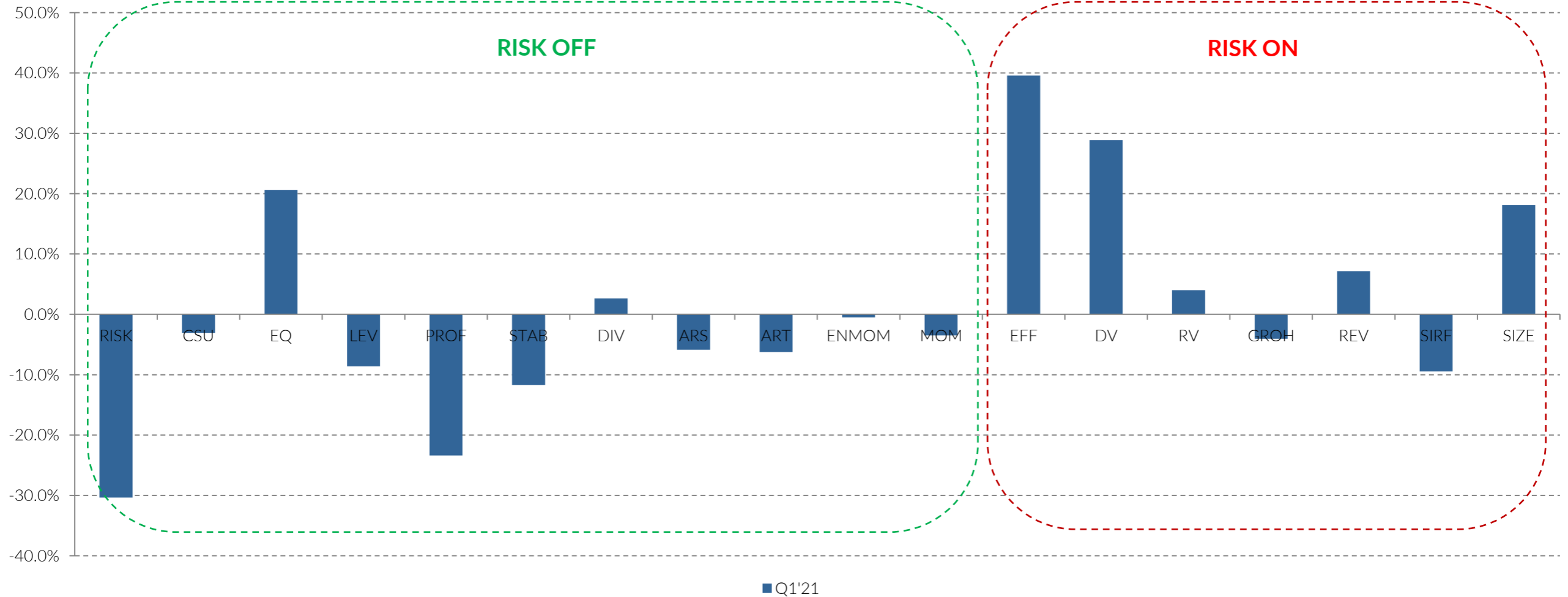
Covid Crash vs Rebound



*Monthly re-optimization of factor weights within ESBs with DAILY chain-linked returns & ESB factor re-rankings for \$ neutral smart betas



Q1 2021: +18.2% RORO spread



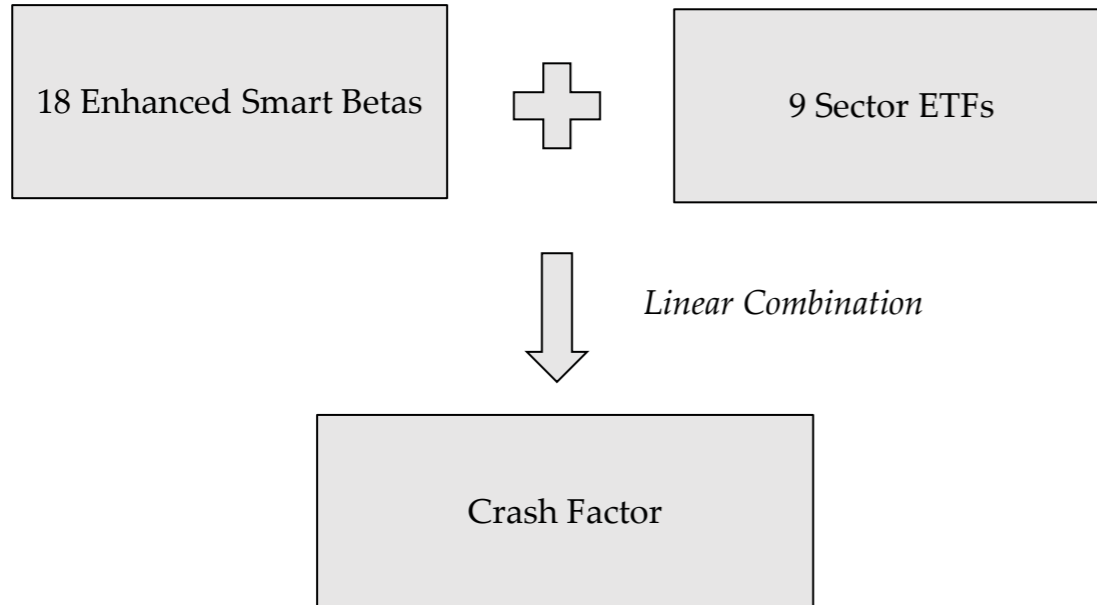
*Monthly re-optimization of factor weights within ESBs with DAILY chain-linked returns & ESB factor re-rankings for \$ neutral smart betas



QMIT		<i>Intra-day %</i>			
	Long	Short	\$Neutral L-S	Beta N L-S	Risk ON/OFF
ESB					
Deep Value	8.4%	0.0%	8.4%	8.4%	ON
Relative Value	5.3%	7.1%	-1.9%	0.9%	ON
Analyst Revisions	0.2%	10.3%	-10.0%	-8.1%	OFF
Analyst Ratings	0.6%	10.0%	-9.4%	-9.0%	OFF
Enhanced Momentum	-6.6%	11.2%	-17.8%	-14.5%	OFF
Momentum	-6.8%	17.4%	-24.2%	-23.1%	OFF
Growth	-0.7%	14.1%	-14.8%	-11.1%	ON
Capital Structure & Usage	6.6%	4.9%	1.6%	2.0%	OFF
Efficiency	4.0%	-0.1%	4.1%	4.1%	ON
Earnings Quality	5.2%	2.4%	2.7%	3.2%	OFF
Leverage	1.1%	3.9%	-2.8%	-0.6%	OFF
Stability	3.5%	4.8%	-1.3%	0.4%	OFF
Profitability	-0.2%	9.4%	-9.7%	-4.6%	OFF
Risk [Low Vol]	-0.2%	7.7%	-7.8%	-5.5%	OFF
Short Interest	3.5%	-0.1%	3.6%	3.6%	ON
Dividend	12.4%	4.1%	8.3%	6.4%	OFF
Reversal	2.3%	4.5%	-2.2%	-1.2%	ON
Size	5.4%	-1.5%	6.9%	3.7%	ON
ESB Risk ON/OFF Classification					
ON	4.0%	3.4%	0.6%	1.5%	ON
OFF	1.4%	7.8%	-6.4%	-4.5%	OFF
		Risk On vs OFF	7.0%		

Risk OFF > Risk ON
by +1.13% in a
defensive tape

QMIT	Intra-day %				Risk ON/OFF
	Long	Short	\$Neutral L-S	Beta N L-S	
ESB					
Deep Value	-2.7%	-2.9%	0.2%	1.0%	ON
Relative Value	-2.8%	-3.8%	1.0%	1.1%	ON
Analyst Revisions	-2.3%	-3.5%	1.2%	1.2%	OFF
Analyst Ratings	-2.7%	-3.1%	0.4%	0.7%	OFF
Enhanced Momentum	-2.8%	-3.1%	0.2%	0.1%	OFF
Momentum	-4.3%	-4.0%	-0.3%	0.6%	OFF
Growth	-2.9%	-2.3%	-0.6%	-0.3%	ON
Capital Structure & Usage	-2.1%	-5.1%	2.9%	1.6%	OFF
Efficiency	-2.3%	-4.7%	2.4%	2.7%	ON
Earnings Quality	-3.6%	-3.4%	-0.2%	-0.2%	OFF
Leverage	-1.9%	-5.0%	3.0%	1.9%	OFF
Stability	-1.3%	-4.3%	3.0%	1.6%	OFF
Profitability	-2.5%	-4.5%	2.0%	0.8%	OFF
Risk [Low Vol]	-0.4%	-5.2%	4.8%	1.3%	OFF
Short Interest	-1.7%	-2.6%	0.9%	0.3%	ON
Dividend	-2.0%	-2.4%	0.4%	-0.1%	OFF
Reversal	-2.1%	-3.5%	1.4%	0.9%	ON
Size	-4.0%	-1.7%	-2.3%	-1.9%	ON
Composite Signals					
Sizzling 7	-1.8%	-4.7%	2.9%	1.2%	
Fabulous 14	-2.1%	-4.6%	2.5%	1.3%	
Famous 5	-1.7%	-4.2%	2.5%	1.3%	
Enterprise 18	-1.8%	-4.7%	2.9%	1.7%	
Val + Mo	-2.8%	-4.5%	1.7%	1.6%	
Qual + Val	-1.9%	-5.2%	3.3%	2.0%	
Value composite	-2.5%	-5.1%	2.6%	2.1%	
Qual + Mo	-1.8%	-4.3%	2.5%	1.8%	
Quality composite	-1.4%	-5.0%	3.6%	1.9%	
Momentum composite	-2.4%	-3.3%	0.9%	1.0%	
ESB Risk ON/OFF Classification					
ON	-2.6%	-3.1%	0.4%	0.6%	ON
OFF	-2.4%	-3.9%	1.6%	0.9%	OFF
		On vs OFF	-1.13%		



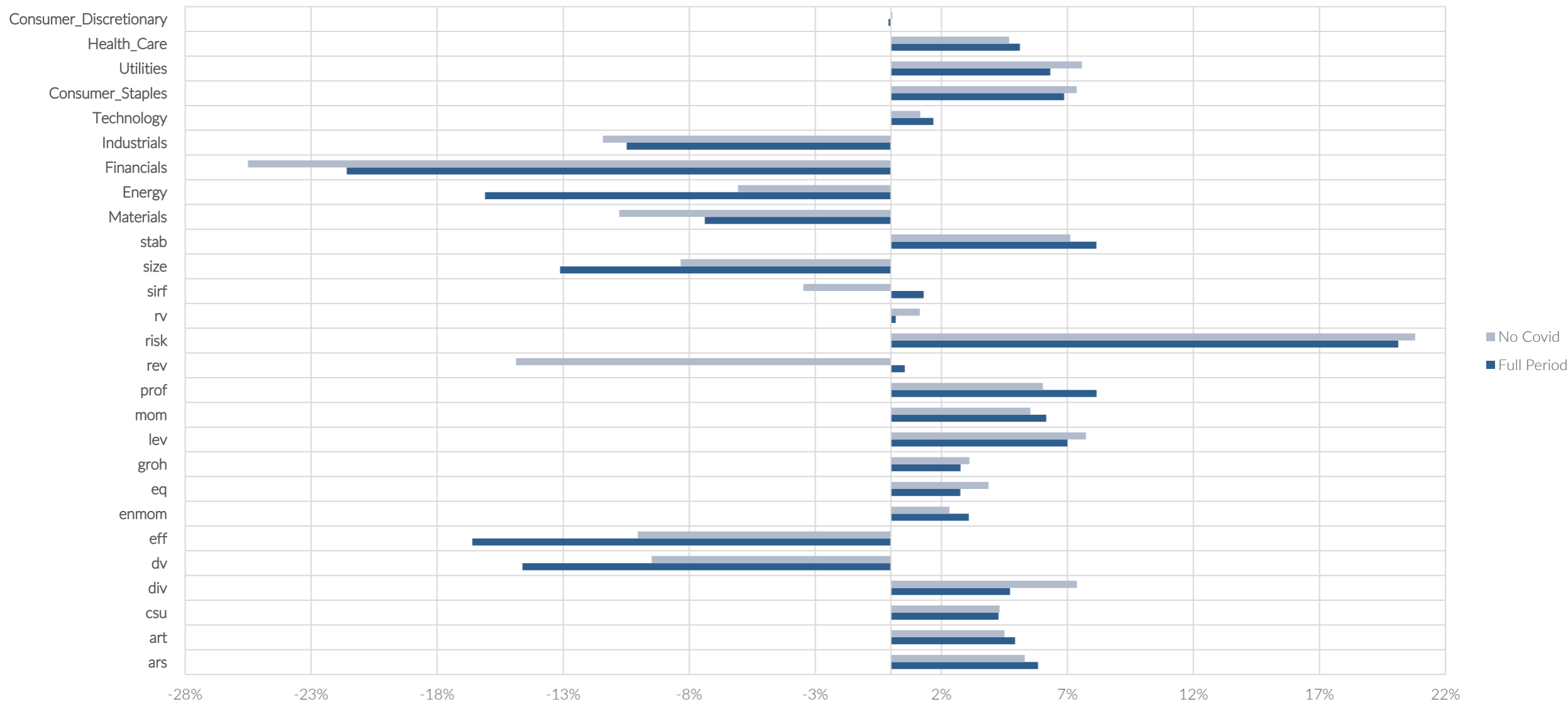
Historical Crash Periods

- Apr 2000 - Oct 2002 (Nasdaq Crash)
- Oct 2007 - Feb 2009 (2008 Financial Crisis)
- May 2011 - Oct 2011 (US Debt-Ceiling Crisis)
- Sep 2018 - Dec 2018 (2018 Stock Market Crash)
- Feb 2020 - Mar 2020 (Covid Crash)
- 30 months excl Nasdaq; 28 mos excl Covid
- Daily data – 24 TDs for Covid Crash

UCF Hedging portfolios

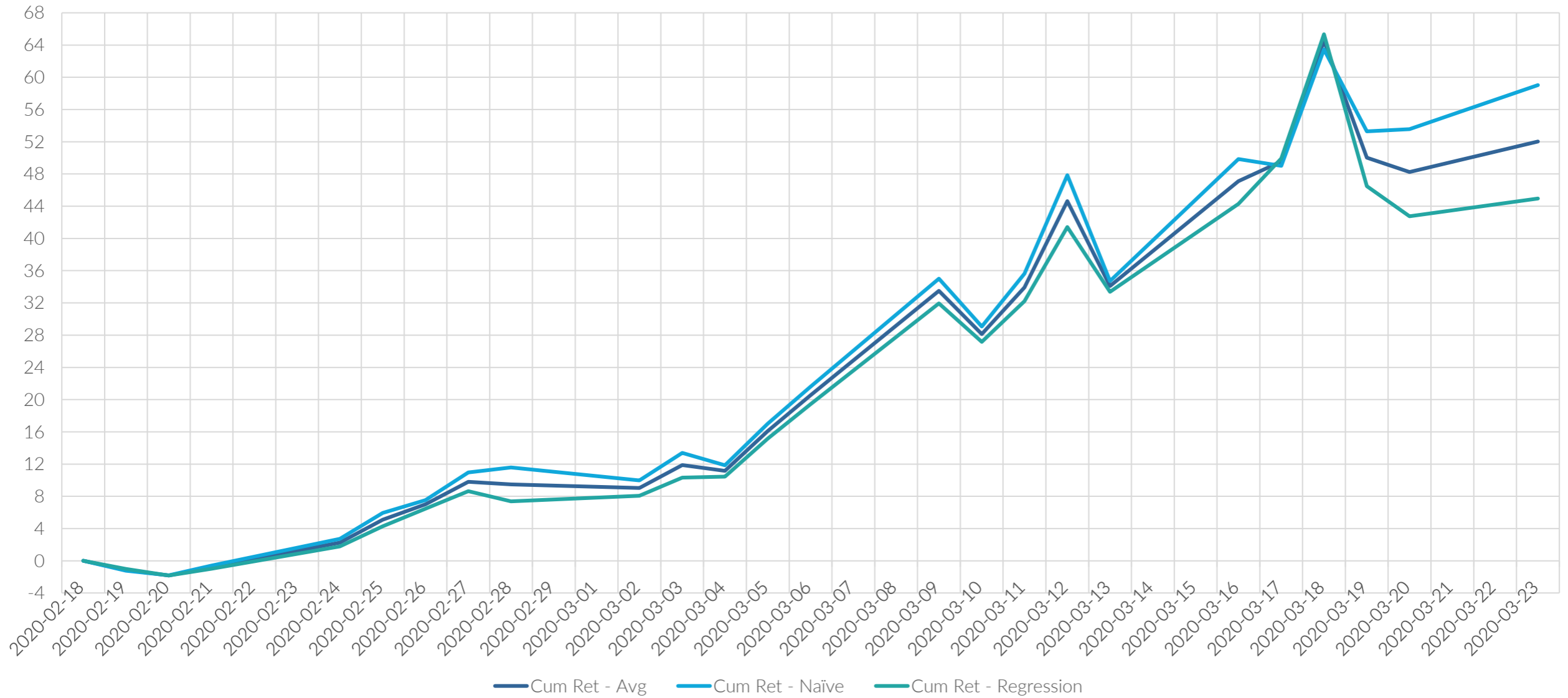
- Long Only
- Market Neutral

Crash Beta weights





UCF HEDGE OUTSAMPLE - COVID CRASH - EMN





EXTENSION OF SHARPE '92 STYLE ANALYSIS VIA ESBS

SAMPLE LARGE CAP VALUE FUND [JAN 2000 – MAY 2021]

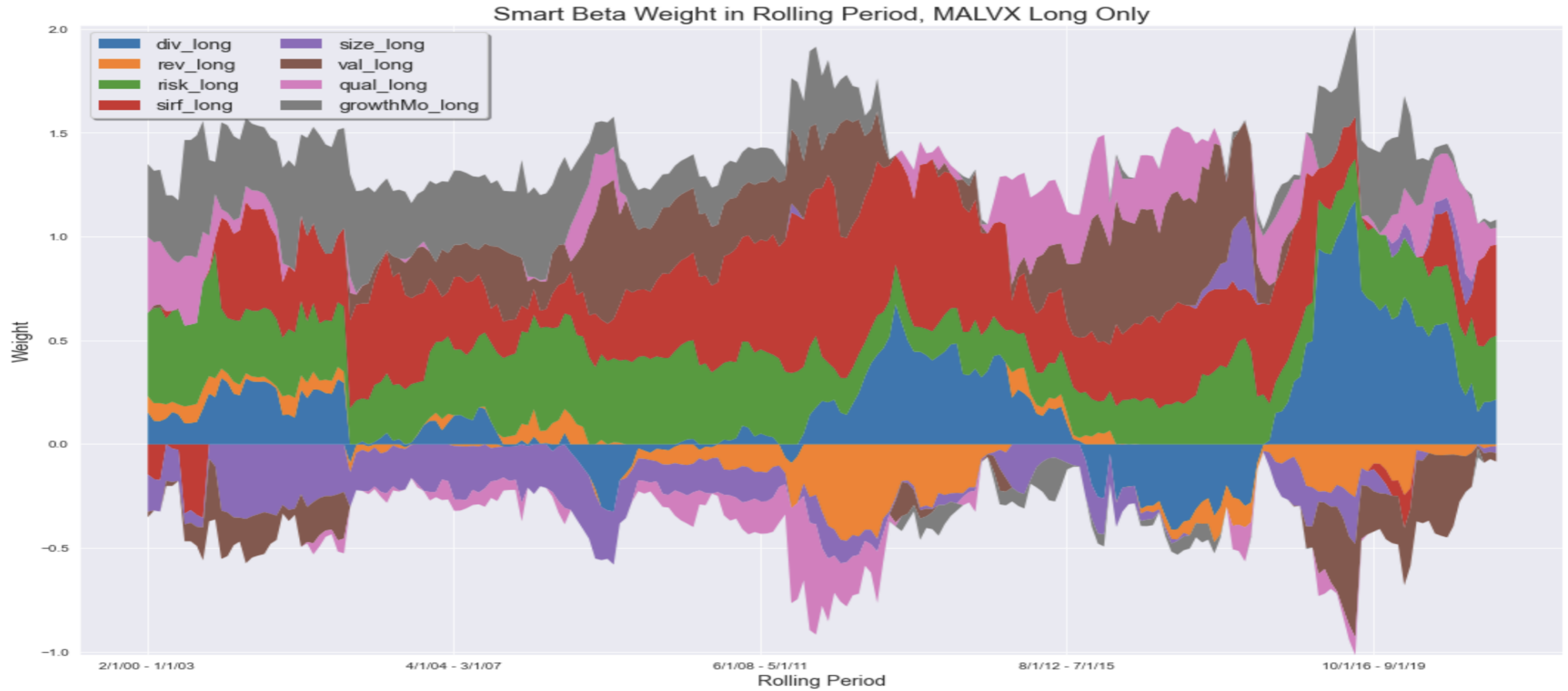
MALVX	Unconstrained Regression (t-stat)	Constrained Regression
Long, no div		
rev	1.36% (0.57)	1.61%
risk	21.03% (4.12)	29.04%
sirf	25.05% (4.04)	27.83%
size	-15.77% (-4.09)	-15.91%
val	27.99% (6.31)	23.27%
qual	12.73% (1.71)	17.86%
growthMo	18.44% (4.34)	16.30%
Total	90.84%	100.00%
R-Squared	87.66%	87.04%
Adj R-Squared	86.96%	86.62%

MALVX - SPY	Unconstrained Regression (t-stat)	Constrained Regression
Market Neutral		
div	2.96% (0.76)	28.42%
rev	-3.96% (-2.33)	1.00%
risk	-1.23% (-0.57)	-4.64%
sirf	-4.52% (-1.21)	20.24%
size	9.12% (3.12)	24.19%
val	12.23% (4.39)	9.45%
qual	-3.31% (-0.83)	-3.32%
growthMo	14.67% (5.27)	24.67%
Total	25.96%	100.00%
R-Squared	29.63%	25.31%
Adj R-Squared	27.24%	23.20%



STYLE ANALYSIS VIA ESBS

SAMPLE LARGE CAP VALUE FUND – LONG ONLY ROLLING EXPOSURES



MILIND SHARMA, CEO & FOUNDER

MILIND SHARMA'S 25 YEARS OF MARKET EXPERIENCE SPAN RUNNING PROP DESKS AT RBC & DEUTSCHE BANK (SABA UNIT) AS WELL AS HEDGE FUNDS (QUANTZ) & MUTUAL FUNDS (MLIM). HIS FUNDS HAVE WON MANY AWARDS OVER THE YEARS INCLUDING THOSE FROM MORNINGSTAR, LIPPER, WSJ, BATTLE OF THE QUANTS & BATTLEFIN. HE WAS ALSO A CO-FOUNDER OF QUANT STRATEGIES AT MLIM (NOW BLACKROCK) & MANAGER OF THE RISK ANALYTICS AND RESEARCH GROUP AT ERNST & YOUNG WHERE HE WAS CO-ARCHITECT OF RAVEN TM. HE ALSO CREATED THE AIRAP METHODOLOGY FOR HEDGE FUNDS.

HIS PUBLICATIONS HAVE APPEARED IN THE JOURNAL OF INVESTMENT MANAGEMENT, RISK, ELSEVIER, WORLD SCIENTIFIC, WILEY ETC. HIS EDUCATIONAL BACKGROUND INCLUDES OXFORD, VASSAR, CARNEGIE MELLON & WHARTON. HE HAS DUAL MS DEGREES FROM CARNEGIE MELLON WHERE HE WAS IN THE PHD CANDIDATE IN LOGIC/ AI. HE HAS GUEST LECTURED OR TAUGHT CAPSTONE COURSES AT COLUMBIA, CARNEGIE MELLON, GEORGIA TECH, JOHNS HOPKINS, NYU, UCSD, UCLA ETC. HE IS FOUNDER & PRESIDENT OF THE QUANT SOCIETY <QWAFAXNEW> (THE SOCIETY FORMERLY KNOWN AS QWAFAFEW).



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