

**From:** Esma Gregor  
**Sent:** Thursday, January 28, 2021 1:07 PM  
**To:** Milind Sharma  
**Subject:** [MARKETING] QMIT by QuantZ presents the daily Smart Beta Book - Circumnavigating a short squeeze via factor heatmaps

Hello Milind:

This note is to address the newsflow surrounding Reddit/ Robin-hooders potentially manipulating markets & launching populist short squeezes enabled by zero commissions, ample liquidity & cheap money not to mention stimulus checks being used for casino style betting ... most of us in the industry recognize that all of the "GameStonking" will end in tears. It also has disturbing ramifications for the smooth functioning of capital markets. Good news is that QMIT analytics & signals can help you address short squeezes on the fly.

The easiest way to track the extent of the short squeeze is to look at today's \$ neutral - Daily heatmap YTD. Call us if you'd like to discuss further.

- One can clearly see the short squeeze from the short side of ESBs which have the riskiest shorts eg Risk ESB [aka low vol] shorts are up 28% resulting in a -21% spread MTD.
- Similarly, the riskiest & most shorted names in our SIRF ESB are up 19.2% resulting in a -17.4% net spread MTD. That's the epicenter of the Reddit quake.
- Analogously, given the extent to which junk has been rallying we see the collateral damage in our Risk OFF defensive ESBs like the components of Quality viz., Profitability, Leverage & Stability are down -17.4 , -12.2 & -11%.
- SIZE at +22 makes sense given the huge run up in small caps YTD.
- As expected the Beta-neutral spreads are much better than \$ neutral spreads. NB – our Risk ESB [aka low vol] is flattish Beta-neutral instead of being down -21% \$ neutral. Similarly, SIRF is only -11% Beta-neutral. We have extensive studies on the divergences & how to better hedge in different markets.
- Bad news is that most quantamental signals logically have weights on SIRF & similar factors which would exacerbate the problem under the current market madness ... any quant model which has weights to "defensive" factors in the logical direction of quality vs junk is likely to suffer in this environment. Does that mean one should consider band aids solutions to this moment of madness or complete flip ones factor orientation?
- Good news is that one can easily circumnavigate these issues systematically since we have all the information in our combo signals & ESBs (smart betas) – let's discuss. Please message our CEO – Milind Sharma [Milind.Sharma@QuantZQMIT.com](mailto:Milind.Sharma@QuantZQMIT.com) & we will set up a call.

You can count on QuantZ/ QMIT for game changing factor investing insights based on our ESBs (Enhanced Smart Betas). Our heatmaps succinctly put your finger on the pulse of factors driving the market beneath the surface across multiple horizons. Indeed, for turnkey access to Hedge Fund alphas, look no further.

The Sector ranks table (based on bottom up aggregation of QMIT Enhanced Smart Betas within sectors) allows for sector rotation based on factors. The cross-sectional factor rank correlations tell us how correlated the factors are at this juncture vs recent 3y return correlations vs LTD (20y) return correlations. It's worth noting that cross sectional factor rank correlations are based on today's alphas across the entire universe while the historical return correlations are only based on the information in the tails (i.e., the 5%-tile spread returns). Further, as the astute may surmise, one can extract a risk model from our factor covariance matrix which should better align one's alphas with the risk optimization.

Please find below heatmaps with the DTD, MTD, YTD, 5 year, Post-07 & LTD returns for our ESBs as of last night's close. Stay tuned for more composite signals on our ESBs which will continue to be added. These spreads are based on the best methodology (defined as highest cumulative return LTD) out of five that are available to clients for each of the ESBs as regards aggregation of factors within the Smart Beta cohorts. Customized heatmaps may be available based on all five methodologies:

1. Equal Weighted
2. Max Sharpe Ratio optimization (on an expanding window to prevent look ahead bias)
3. Risk Parity optimization (on an expanding window to prevent look ahead bias)
4. Top 3 factors based on cumulative return but Equal Weighted (on an expanding window to prevent look ahead bias)
5. Top 3 factors based on Sharpe ratio but Equal Weighted (based on cumulative return on an expanding window to prevent look ahead bias)

**NB heatmaps below are as of 2021-01-27**

**Beta neutral - Daily heatmap YTD:**

	DTD Long	DTD Short	DTD Spread	MTD Long	MTD Short	MTD Spread	YTD Long	YTD Short	YTD Spread
Size	-2.95%	-3.15%	0.2%	13.29%	-2.22%	15.8%	13.29%	-2.22%	15.8%
DV	1.17%	-4.37%	5.54%	10.43%	9.72%	0.07%	10.43%	9.72%	0.07%
RV	-1.11%	1.56%	-2.66%	9.98%	14.68%	-4.16%	9.98%	14.68%	-4.16%
Profit	-2.08%	1.2%	-3.27%	3.24%	9.43%	-5.77%	3.24%	9.43%	-5.77%
CSU	-0.81%	-1.67%	0.86%	7.14%	10.03%	-2.73%	7.14%	10.03%	-2.73%
Reversals	-3.01%	0.38%	-3.39%	6.83%	6.75%	-0.15%	6.83%	6.75%	-0.15%
Leverage	-2.54%	-1.36%	-1.18%	1.48%	7.93%	-6.02%	1.48%	7.93%	-6.02%
Efficiency	0.49%	-3.25%	3.74%	13.23%	7.64%	4.9%	13.23%	7.64%	4.9%
EQ	3.2%	-2.91%	6.11%	15.14%	8.59%	5.79%	15.14%	8.59%	5.79%
Growth	-0.95%	3.33%	-4.28%	13.03%	10.29%	2.29%	13.03%	10.29%	2.29%
EnMOM	-1.23%	4.53%	-5.76%	5.45%	15.16%	-8.73%	5.45%	15.16%	-8.73%
ART	-2.88%	2.82%	-5.7%	2.82%	17.78%	-12.92%	2.82%	17.78%	-12.92%
ARS	-2.91%	0.89%	-3.8%	3.22%	11.69%	-7.68%	3.22%	11.69%	-7.68%
Stability	-2.0%	-1.39%	-0.62%	2.89%	7.52%	-4.36%	2.89%	7.52%	-4.36%
PMOM	-1.27%	4.63%	-5.91%	8.25%	13.7%	-5.13%	8.25%	13.7%	-5.13%
SIRF	-2.87%	0.51%	-3.37%	-1.01%	11.44%	-11.32%	-1.01%	11.44%	-11.32%
Risk	-1.5%	0.29%	-1.79%	2.22%	2.38%	-0.17%	2.22%	2.38%	-0.17%
Dividends	-2.34%	-0.98%	-1.36%	3.34%	7.79%	-4.09%	3.34%	7.79%	-4.09%

**\$ neutral - Daily heatmap YTD:**

	DTD Long	DTD Short	DTD Spread	MTD Long	MTD Short	MTD Spread	YTD Long	YTD Short	YTD Spread
Size	-3.74%	-3.15%	-0.59%	19.07%	-2.23%	21.76%	19.07%	-2.23%	21.76%
DV	1.39%	-4.37%	5.76%	13.82%	9.72%	3.21%	13.82%	9.72%	3.21%
RV	-1.11%	1.97%	-3.07%	9.97%	18.49%	-7.34%	9.97%	18.49%	-7.34%
Profit	-2.08%	2.84%	-4.92%	3.23%	23.75%	-17.4%	3.23%	23.75%	-17.4%
CSU	-0.81%	-2.33%	1.52%	7.14%	14.62%	-6.87%	7.14%	14.62%	-6.87%
Reversals	-3.01%	0.4%	-3.41%	8.69%	9.29%	-0.87%	8.69%	9.29%	-0.87%
Leverage	-2.54%	-2.71%	0.17%	1.49%	15.11%	-12.24%	1.49%	15.11%	-12.24%
Efficiency	0.54%	-3.25%	3.78%	14.52%	7.63%	6.1%	14.52%	7.63%	6.1%
EQ	4.09%	-2.91%	7.0%	20.28%	8.58%	10.58%	20.28%	8.58%	10.58%
Growth	-0.95%	4.05%	-5.0%	13.03%	12.35%	0.27%	13.03%	12.35%	0.27%
EnMOM	-2.75%	4.52%	-7.27%	16.13%	15.16%	0.64%	16.13%	15.16%	0.64%
ART	-3.96%	2.82%	-6.78%	1.71%	17.78%	-13.87%	1.71%	17.78%	-13.87%
ARS	-2.91%	0.98%	-3.89%	3.26%	12.79%	-8.58%	3.26%	12.79%	-8.58%
Stability	-2.01%	-2.72%	0.71%	2.87%	15.08%	-11.08%	2.87%	15.08%	-11.08%
PMOM	-2.84%	4.63%	-7.48%	21.68%	13.72%	6.8%	21.68%	13.72%	6.8%
SIRF	-2.87%	0.74%	-3.6%	-1.0%	19.21%	-17.38%	-1.0%	19.21%	-17.38%
Risk	-1.5%	2.84%	-4.33%	2.2%	27.96%	-21.25%	2.2%	27.96%	-21.25%
Dividends	-2.51%	-0.97%	-1.54%	4.22%	7.84%	-3.29%	4.22%	7.84%	-3.29%

**Beta-neutral - 19y Monthly + Daily (thereafter) heatmap LTD:**

	5Y Long	5Y Short	5Y Spread	Post-07 Long	Post-07 Short	Post-07 Spread	LTD Long	LTD Short	LTD Spread
Size	16.78%	20.0%	-3.24%	11.24%	6.83%	3.74%	13.88%	3.32%	9.93%
DV	13.32%	24.76%	-10.98%	9.22%	2.11%	5.23%	13.43%	-2.82%	13.61%
RV	18.16%	22.21%	-4.46%	11.42%	3.86%	5.94%	18.02%	-0.86%	16.27%
Profit	21.83%	5.38%	13.26%	10.76%	-5.12%	14.54%	11.71%	-10.92%	20.99%
CSU	16.99%	9.52%	5.45%	10.91%	0.86%	8.86%	13.58%	-2.72%	14.25%
Reversals	30.69%	6.85%	21.63%	12.25%	-0.04%	11.26%	9.86%	-1.74%	10.24%
Leverage	18.34%	16.5%	0.48%	10.51%	0.15%	8.8%	11.15%	-7.32%	17.23%
Efficiency	9.31%	22.34%	-11.57%	4.66%	5.97%	-1.8%	9.28%	-1.0%	7.67%
EQ	20.67%	16.41%	3.09%	8.11%	4.25%	3.12%	7.0%	0.46%	5.43%
Growth	17.16%	23.78%	-6.37%	10.89%	2.59%	6.48%	13.91%	1.59%	10.64%
EnMOM	22.68%	13.53%	6.34%	11.05%	3.02%	6.08%	9.23%	1.85%	5.75%
ART	17.35%	14.93%	0.8%	13.19%	2.92%	8.42%	13.59%	4.4%	7.62%
ARS	20.09%	9.95%	7.67%	12.93%	2.12%	9.1%	12.74%	3.51%	7.76%
Stability	14.76%	1.84%	11.09%	11.06%	0.31%	9.8%	13.07%	2.11%	9.83%
PMOM	19.12%	8.51%	6.34%	8.08%	-0.67%	6.0%	4.26%	-1.77%	3.43%
SIRF	15.48%	14.5%	0.81%	9.35%	4.91%	3.85%	11.51%	8.06%	2.75%
Risk	12.42%	2.77%	9.51%	9.89%	0.8%	9.1%	12.26%	0.4%	11.83%
Dividends	10.13%	16.34%	-4.87%	6.68%	6.42%	0.23%	10.11%	6.0%	3.48%

**\$ neutral - 19y Monthly + Daily (thereafter) heatmap LTD:**

	5Y Long	5Y Short	5Y Spread	Post-07 Long	Post-07 Short	Post-07 Spread	LTD Long	LTD Short	LTD Spread
Size	25.3%	20.14%	4.55%	17.21%	6.88%	10.31%	21.55%	2.99%	18.78%
DV	18.44%	24.73%	-5.42%	13.13%	1.66%	10.63%	16.34%	-6.92%	18.85%
RV	17.35%	24.26%	-5.77%	11.03%	4.13%	6.01%	17.79%	-5.51%	17.38%
Profit	21.85%	14.43%	0.55%	10.79%	-0.67%	6.36%	11.37%	-11.67%	15.47%
CSU	16.32%	12.4%	2.0%	10.61%	-0.41%	8.89%	13.36%	-7.47%	14.26%
Reversals	35.24%	8.39%	24.4%	12.72%	0.89%	11.64%	12.45%	-3.56%	15.95%
Leverage	18.82%	25.47%	-7.29%	10.74%	3.76%	3.62%	10.88%	-8.21%	13.97%
Efficiency	13.1%	22.23%	-7.4%	8.61%	5.5%	3.17%	12.07%	-4.87%	11.72%
EQ	25.27%	16.19%	7.73%	11.42%	2.9%	7.78%	10.12%	-2.67%	11.31%
Growth	18.21%	23.61%	-6.26%	11.33%	4.01%	4.86%	14.46%	1.46%	10.25%
EnMOM	24.59%	18.77%	1.96%	12.24%	4.33%	4.8%	11.37%	-0.18%	7.24%
ART	18.53%	19.29%	-5.04%	14.47%	2.69%	7.08%	15.08%	3.87%	7.12%
ARS	20.63%	12.95%	2.75%	13.35%	2.21%	7.3%	13.16%	3.63%	5.59%
Stability	14.78%	7.0%	3.92%	11.06%	2.7%	5.03%	13.07%	4.92%	3.39%
PMOM	23.4%	20.34%	-4.89%	10.78%	2.28%	0.96%	7.47%	-3.87%	1.71%
SIRF	16.07%	19.35%	-3.42%	9.14%	6.58%	2.02%	12.81%	8.9%	3.13%
Risk	12.42%	21.25%	-18.05%	9.89%	3.65%	-6.0%	12.26%	-9.06%	1.89%
Dividends	12.79%	14.28%	-1.12%	7.38%	7.37%	-1.05%	10.61%	6.93%	0.96%

**\$ neutral - Monthly heatmap YTD:**

	DTD Long	DTD Short	DTD Spread	MTD Long	MTD Short	MTD Spread	YTD Long	YTD Short	YTD Spread
Size	-2.53%	-3.18%	0.65%	19.28%	-2.04%	21.74%	19.28%	-2.04%	21.74%
DV	0.39%	-3.33%	3.72%	14.33%	9.41%	4.13%	14.33%	9.41%	4.13%
RV	-1.15%	-2.99%	1.84%	9.41%	10.82%	-1.4%	9.41%	10.82%	-1.4%
Profit	-2.06%	-1.39%	-0.67%	3.32%	18.52%	-13.51%	3.32%	18.52%	-13.51%
CSU	-0.94%	-2.42%	1.48%	6.85%	14.0%	-6.6%	6.85%	14.0%	-6.6%
Reversals	0.99%	-3.01%	4.0%	20.36%	-0.69%	20.95%	20.36%	-0.69%	20.95%
Leverage	-2.42%	-1.35%	-1.07%	1.51%	17.72%	-14.13%	1.51%	17.72%	-14.13%
Efficiency	0.63%	-3.25%	3.88%	14.1%	8.52%	4.91%	14.1%	8.52%	4.91%
EQ	-0.47%	-2.95%	2.49%	15.4%	9.01%	5.83%	15.4%	9.01%	5.83%
Growth	-0.57%	-1.15%	0.58%	13.19%	6.24%	6.39%	13.19%	6.24%	6.39%
EnMOM	-2.16%	-1.44%	-0.72%	16.32%	5.61%	10.32%	16.32%	5.61%	10.32%
ART	-3.35%	0.17%	-3.52%	3.17%	11.93%	-7.85%	3.17%	11.93%	-7.85%
ARS	-2.77%	-1.51%	-1.26%	3.97%	9.8%	-5.37%	3.97%	9.8%	-5.37%
Stability	-1.9%	-2.69%	0.8%	3.31%	15.72%	-11.19%	3.31%	15.72%	-11.19%
PMOM	-2.23%	-0.9%	-1.33%	22.26%	7.11%	14.32%	22.26%	7.11%	14.32%
SIRF	-2.96%	0.49%	-3.44%	-1.4%	19.44%	-17.85%	-1.4%	19.44%	-17.85%
Risk	-1.34%	-0.75%	-0.59%	2.72%	24.31%	-18.4%	2.72%	24.31%	-18.4%
Dividends	-2.67%	-1.28%	-1.39%	3.82%	5.96%	-1.92%	3.82%	5.96%	-1.92%

**\$ neutral - Monthly heatmap LTD:**

	5Y Long	5Y Short	5Y Spread	Post-07 Long	Post-07 Short	Post-07 Spread	LTD Long	LTD Short	LTD Spread
Size	20.61%	17.53%	2.9%	16.76%	7.46%	9.74%	21.84%	2.94%	19.1%
DV	14.54%	17.79%	-3.33%	12.62%	1.44%	10.93%	16.27%	-6.99%	18.83%
RV	11.93%	14.89%	-3.34%	10.08%	2.7%	6.59%	17.48%	-6.01%	17.61%
Profit	18.66%	8.71%	2.84%	10.32%	-2.0%	7.08%	11.41%	-11.57%	15.39%
CSU	12.42%	5.34%	4.87%	9.99%	-1.8%	9.69%	13.31%	-7.7%	14.47%
Reversals	25.91%	8.46%	16.74%	10.78%	3.29%	8.53%	11.38%	-2.7%	14.05%
Leverage	15.82%	20.03%	-5.96%	10.27%	2.7%	3.79%	10.91%	-7.89%	13.57%
Efficiency	12.37%	15.91%	-3.2%	9.07%	5.09%	4.5%	12.67%	-5.08%	12.53%
EQ	20.44%	12.8%	6.66%	10.8%	3.18%	7.27%	10.14%	-2.33%	10.95%
Growth	13.84%	17.35%	-4.76%	10.91%	3.9%	5.1%	14.45%	1.35%	10.39%
EnMOM	20.59%	7.16%	9.59%	11.6%	2.32%	6.89%	11.28%	-1.58%	8.74%
ART	18.89%	14.6%	-0.62%	15.3%	1.32%	8.86%	16.14%	3.85%	8.23%
ARS	18.38%	9.27%	4.41%	13.28%	1.5%	7.83%	13.42%	3.74%	5.77%
Stability	13.39%	3.76%	5.62%	11.01%	2.21%	5.44%	13.19%	5.33%	3.08%
PMOM	20.82%	10.72%	1.69%	10.7%	1.4%	2.68%	7.84%	-4.61%	2.97%
SIRF	13.43%	16.95%	-3.76%	8.8%	5.3%	2.41%	12.84%	9.29%	2.77%
Risk	11.88%	16.93%	-14.99%	9.77%	2.78%	-5.11%	12.39%	-8.56%	1.67%
Dividends	9.73%	12.09%	-1.94%	7.17%	6.96%	-1.17%	10.85%	7.13%	0.98%

**Sector ranks based on QMIT Enhanced Smart Betas:**

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

**C-S Rank correlations for QMIT Enhanced Smart Betas:**

	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

**3y Return correlations for QMIT Enhanced Smart Betas:**

	ARS	ART	CSU	DV	Dividends	EQ	Efficiency	EnMOM	Growth	Leverage	PMOM	Profit	RV	Reversals	Risk	SIRF	Size	Stability
ARS	1.0	0.78	0.44	-0.66	-0.36	0.03	-0.64	0.3	0.69	0.51	0.74	0.8	-0.28	-0.7	0.73	0.39	-0.74	0.7
ART	0.78	1.0	0.33	-0.69	-0.22	-0.0	-0.62	0.33	0.48	0.43	0.77	0.69	-0.32	-0.71	0.76	0.44	-0.59	0.56
CSU	0.44	0.33	1.0	0.02	0.1	0.28	0.03	-0.29	0.3	0.7	0.07	0.69	0.37	-0.43	0.65	0.59	-0.49	0.74
DV	-0.66	-0.69	0.02	1.0	0.3	0.13	0.87	-0.5	-0.33	0.01	-0.72	-0.47	0.75	0.47	-0.44	-0.07	0.49	-0.31
Dividends	-0.36	-0.22	0.1	0.3	1.0	0.43	0.38	-0.17	-0.28	0.04	-0.29	-0.22	0.24	0.3	-0.0	0.05	0.4	-0.19
EQ	0.03	-0.0	0.28	0.13	0.43	1.0	0.23	0.04	-0.08	0.08	-0.0	-0.01	0.15	0.0	0.11	0.13	0.11	0.13
Efficiency	-0.64	-0.62	0.03	0.87	0.38	0.23	1.0	-0.42	-0.38	-0.12	-0.63	-0.48	0.66	0.48	-0.41	-0.12	0.52	-0.23
EnMOM	0.3	0.33	-0.29	-0.5	-0.17	0.04	-0.42	1.0	0.27	-0.12	0.74	0.13	-0.45	0.12	0.16	-0.09	-0.28	0.13
Growth	0.69	0.48	0.3	-0.33	-0.28	-0.08	-0.38	0.27	1.0	0.55	0.59	0.64	0.1	-0.38	0.54	0.34	-0.53	0.45
Leverage	0.51	0.43	0.7	0.01	0.04	0.08	-0.12	-0.12	0.55	1.0	0.25	0.78	0.45	-0.47	0.77	0.78	-0.57	0.63
PMOM	0.74	0.77	0.07	-0.72	-0.29	-0.0	-0.63	0.74	0.59	0.25	1.0	0.56	-0.4	-0.46	0.6	0.28	-0.62	0.49
Profit	0.8	0.69	0.69	-0.47	-0.22	-0.01	-0.48	0.13	0.64	0.78	0.56	1.0	0.02	-0.6	0.85	0.66	-0.76	0.84
RV	-0.28	-0.32	0.37	0.75	0.24	0.15	0.66	-0.45	0.1	0.45	-0.4	0.02	1.0	0.13	0.02	0.36	0.17	0.01
Reversals	-0.7	-0.71	-0.43	0.47	0.3	0.0	0.48	0.12	-0.38	-0.47	-0.46	-0.6	0.13	1.0	-0.71	-0.47	0.56	-0.56
Risk	0.73	0.76	0.65	-0.44	-0.0	0.11	-0.41	0.16	0.54	0.77	0.6	0.85	0.02	-0.71	1.0	0.74	-0.66	0.77
SIRF	0.39	0.44	0.59	-0.07	0.05	0.13	-0.12	-0.09	0.34	0.78	0.28	0.66	0.36	-0.47	0.74	1.0	-0.51	0.56
Size	-0.74	-0.59	-0.49	0.49	0.4	0.11	0.52	-0.28	-0.53	-0.57	-0.62	-0.76	0.17	0.56	-0.66	-0.51	1.0	-0.79
Stability	0.7	0.56	0.74	-0.31	-0.19	0.13	-0.23	0.13	0.45	0.63	0.49	0.84	0.01	-0.56	0.77	0.56	-0.79	1.0

**20y Return correlations for QMIT Enhanced Smart Betas:**

	ARS	ART	CSU	DV	Dividends	EQ	Efficiency	EnMOM	Growth	Leverage	PMOM	Profit	RV	Reversals	Risk	SIRF	Size	Stability
ARS	1.0	0.82	0.18	-0.36	0.03	-0.21	-0.13	0.57	0.53	0.28	0.7	0.49	-0.02	-0.46	0.5	0.19	-0.56	0.35
ART	0.82	1.0	0.11	-0.35	-0.05	-0.23	-0.15	0.61	0.53	0.29	0.74	0.42	-0.05	-0.36	0.47	0.19	-0.45	0.29
CSU	0.18	0.11	1.0	0.69	0.73	0.47	0.81	-0.05	0.42	0.69	0.03	0.74	0.86	-0.2	0.78	-0.2	-0.37	0.8
DV	-0.36	-0.35	0.69	1.0	0.59	0.5	0.88	-0.46	0.09	0.34	-0.46	0.29	0.79	0.18	0.33	-0.32	0.04	0.45
Dividends	0.03	-0.05	0.73	0.59	1.0	0.44	0.65	-0.22	0.28	0.45	-0.13	0.54	0.69	-0.11	0.65	-0.29	-0.3	0.58
EQ	-0.21	-0.23	0.47	0.5	0.44	1.0	0.54	-0.13	-0.11	0.17	-0.11	0.12	0.42	0.06	0.2	-0.21	0.1	0.28
Efficiency	-0.13	-0.15	0.81	0.88	0.65	0.54	1.0	-0.2	0.19	0.44	-0.17	0.44	0.85	-0.01	0.51	-0.28	-0.08	0.56
EnMOM	0.57	0.61	-0.05	-0.46	-0.22	-0.13	-0.2	1.0	0.22	0.1	0.9	0.14	-0.16	-0.25	0.2	0.31	-0.21	0.04
Growth	0.53	0.53	0.42	0.09	0.28	-0.11	0.19	0.22	1.0	0.6	0.39	0.66	0.46	-0.23	0.57	0.06	-0.43	0.4
Leverage	0.28	0.29	0.69	0.34	0.45	0.17	0.44	0.1	0.6	1.0	0.21	0.86	0.68	-0.29	0.74	0.02	-0.46	0.62
PMOM	0.7	0.74	0.03	-0.46	-0.13	-0.11	-0.17	0.9	0.39	0.21	1.0	0.3	-0.09	-0.42	0.35	0.31	-0.38	0.16
Profit	0.49	0.42	0.74	0.29	0.54	0.12	0.44	0.14	0.66	0.86	0.3	1.0	0.66	-0.32	0.85	-0.05	-0.62	0.74
RV	-0.02	-0.05	0.86	0.79	0.69	0.42	0.85	-0.16	0.46	0.68	-0.09	0.66	1.0	-0.07	0.63	-0.18	-0.23	0.61
Reversals	-0.46	-0.36	-0.2	0.18	-0.11	0.06	-0.01	-0.25	-0.23	-0.29	-0.42	-0.32	-0.07	1.0	-0.39	-0.16	0.45	-0.32
Risk	0.5	0.47	0.78	0.33	0.65	0.2	0.51	0.2	0.57	0.74	0.35	0.85	0.63	-0.39	1.0	-0.06	-0.64	0.8
SIRF	0.19	0.19	-0.2	-0.32	-0.29	-0.21	-0.28	0.31	0.06	0.02	0.31	-0.05	-0.18	-0.16	-0.06	1.0	0.05	-0.14
Size	-0.56	-0.45	-0.37	0.04	-0.3	0.1	-0.08	-0.21	-0.43	-0.46	-0.38	-0.62	-0.23	0.45	-0.64	0.05	1.0	-0.52
Stability	0.35	0.29	0.8	0.45	0.58	0.28	0.56	0.04	0.4	0.62	0.16	0.74	0.61	-0.32	0.8	-0.14	-0.52	1.0

**EXPLANATORY FOOTNOTES:**

- Sector Ranks are aggregated bottom up average ranks for each of the ESBs. Enhanced Smart Beta (ESB).

- ESB portfolios are not sector neutral.
- Generated weekly as of previous trading day's close, this report shows the DTD, MTD, YTD and LTD spread returns for our ESBs.
- ESB spreads are long-short based on top vs bottom 5%-tile (~125x125) of the largest liquid US traded stocks (usually ~2,500 depending upon market capitalization & minimum \$ price criterion for stocks listed on NYSE & Nasdaq).
- Certain industries like Biotech and REITs are excluded due to event risk or because a generic quant model is not appropriate for those industries.
- Daily vs Monthly rebalancing - Our Monthly Heatmaps are based on a T-1 month end optimization to solve for the optimal factor weights. While we use optimal factor weights based on month end optimization, in Daily Heatmaps, we refresh individual Factor Ranks on a daily basis therefore resulting in an intra-month varying Long/Short Portfolio. The optimal factor weights & selection of the "Best Flavor of the Month" is still static intra-month in order to prevent excessive turnover & unnecessarily noisy ESBs.
- Dollar neutral vs Beta Neutral - Beta-neutrality implies daily de-levering of the higher beta side of the Long/Short factor portfolio. Indeed, the beta neutrality has to be enforced via daily rebalance since the factor ranks (& top/ bottom portfolios) are being refreshed daily.
- MTD spread returns are geometrically chain-linked DTD spread returns where both are based on ESB portfolios formed at the prior month end close in the case of Monthly Heatmaps and formed at the prior trading day's close in the case of Daily Heatmaps.
- YTD & LTD returns are based on geometric chain-linking of monthlies without transaction costs or fees as is customary in the factor literature.
- Multi-period spread returns are not the difference of cumulative top vs bottom returns. Instead, they represent the daily geometrically compounded rebalancing of the market neutral "active return" differential of the top vs bottom portfolios which is a more realistic representation.
- Both Max Sharpe & Risk Parity optimization routines are based on a Hybrid methodology where we 1] find the optimal factor mix within the Smart Beta cohort based on signal blending/ "mixing" but 2] subsequently run the combined ESB spreads outsample on a fully "integrated" basis not just as the linear combination of factor returns.
- Since liquid equity commissions are now de minimus for both the institutional & even the retail world and market impact is really a function of the investor's AUM we simply leave out the impact of TCs as is customary in factor research.
- LTD data commences January 2000.

### **Enhanced Smart Beta Definitions**

**ARS:** This smart beta composite shows our **Analyst Revisions** cohort based on measures of estimate revisions, dispersion, Standardized Unexpected Earnings surprise (SUE score) & consensus change in both earnings as well as revenues which can outperform traditional metrics like a 1mo consensus change.

**ART:** This smart beta composite shows our **Analyst Ratings & Targets** cohort based on measures of analyst recommendations, target price, changes & diffusion which can outperform traditional metrics like a 1mo consensus change.

**CSU:** This smart beta composite shows our **Capital Structure/Usage** cohort based on measures including Buybacks, Total yield, Capex, capital usage ratios etc which can outperform traditional metrics like Cash/MC.

**Dividends:** This smart beta composite shows our **Dividends** related cohort based on measures including Yield, payout, growth, forward yield etc which can outperform traditional metrics like Dividend Yield.

**DV:** This smart beta composite shows our **Deep Value** (or intrinsic value) cohort based on measures including tangible book & sales which can outperform traditional Book yield.

**Efficiency:** This smart beta composite shows our **Efficiency** cohort based on measures including Asset Turnover, Current Liabilities, Receivables etc which can outperform traditional metrics like Asset Turnover.

**EnMOM:** This smart beta composite shows our **Enhanced Momentum** cohort which can outperform traditional 12 month price momentum in both return & risk adjusted terms particularly at market inflection points.

**EQ:** This smart beta composite shows our **Earnings Quality** cohort based on a variety of Accrual measures which can outperform traditional metrics like Total Accruals.

**Growth:** This smart beta composite shows our **Historical Growth** cohort based on a variety of Earnings, Sales, Margins & CF related growth measures which can outperform traditional metrics like 3yr Sales growth.

**Leverage:** This smart beta composite shows our **Leverage** related cohort based on measures of Balance Sheet leverage which can outperform traditional metrics like Debt To Equity.

**PMOM:** This smart beta composite shows our **PMOM** related cohort which can outperform traditional 12 month price momentum using a variety of traditional momentum factors.

**Profit:** This smart beta composite shows our **Profitability** cohort based on measures like ROA, ROE, ROCE, ROTC, Margins etc which can outperform traditional metrics like ROE.

**RV:** This smart beta composite shows our **Relative Value** cohort based on measures of EPS, CFO, EBITDA etc which can outperform traditional Earnings yield.

**Reversals:** This smart beta composite shows our **Reversals** cohort which is comprised of metrics like short term reversals, RSI, DMA & other technical factors which can outperform traditional metrics like a 1 month total return.

**Risk:** This smart beta composite shows our **Risk/ Low Vol** cohort which is comprised of metrics like Beta, Low volatility etc.

**SIRF:** This smart beta composite shows our **Short Interest** cohort which is comprised of metrics related to Short Interest and its normalization by Float, trading volume etc.

**Size:** This smart beta composite shows our **Size** cohort which is comprised of metrics related to firm size including market capitalization.

**Stability:** This smart beta composite shows our **Stability** cohort which is comprised of metrics like Dispersion of EPS/ SPS estimates as well as the stability of Margins, EPS & CFs etc.

Best Regards,

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