



## ARC Commodity Factor Risk Model Monthly Report November 2020

The Asset Risk Company (ARC) Commodity model is a cross-sectional commodity factor model. Factors including commodity sectors, sub-sectors, and styles are estimated daily. It provides a framework for managing risk and investment decisions. The model is presented in a nesting format allowing the decision maker to view the market from a macro lens of broad classes (metals, energy, agricultural) to finer product classifications, while preserving the attribution of risk between the style and non-style factors.

### YTD, MTD & Historical Styles Performance Report:

Factor	MTD Perf	YTD Perf	Historical Returns*	Volatility*
<b>Basis</b>	0.7%	7.1%	-4.7%	5.7%
<b>Open Interest</b>	2.2%	-4.3%	-1.1%	3.3%
<b>Momentum</b>	-2.8%	-4.8%	0.2%	4.8%
<b>ST Momentum</b>	-2.6%	-7.3%	-6.0%	5.0%
<b>Trading Activity</b>	-0.1%	0.6%	-0.2%	1.8%
<b>Volatility</b>	1.9%	13.2%	3.4%	5.7%
<b>ST Volatility</b>	-1.4%	-4.1%	-3.2%	5.3%

\* Annualized 2017-2020

The Volatility factor is still growing with a 2% return this month and 13% YTD. The Volatility exposures are calculated using 252 days. Futures with high betas to this factor (the most volatile this year) will get a performance boost compared to less volatile Futures. We found that after the crisis some managers stayed away from the front months contracts, because of their volatility. With the Volatility factor on a tear (See Graph1), it will cost performance vs the commodities indices as the indices tend to be more weighted towards front months. We note that both momentum factors experienced a large negative performance in november. In particular ST Momentum seems to go back to its longer term pattern, i.e.: a systematic negative

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performance, mean reversion). To wit, this could be taken advantage of, by selecting Futures with high negative exposures that underperformed in the last 30 days.



Graph1 : ARC Styles Cumulative Returns

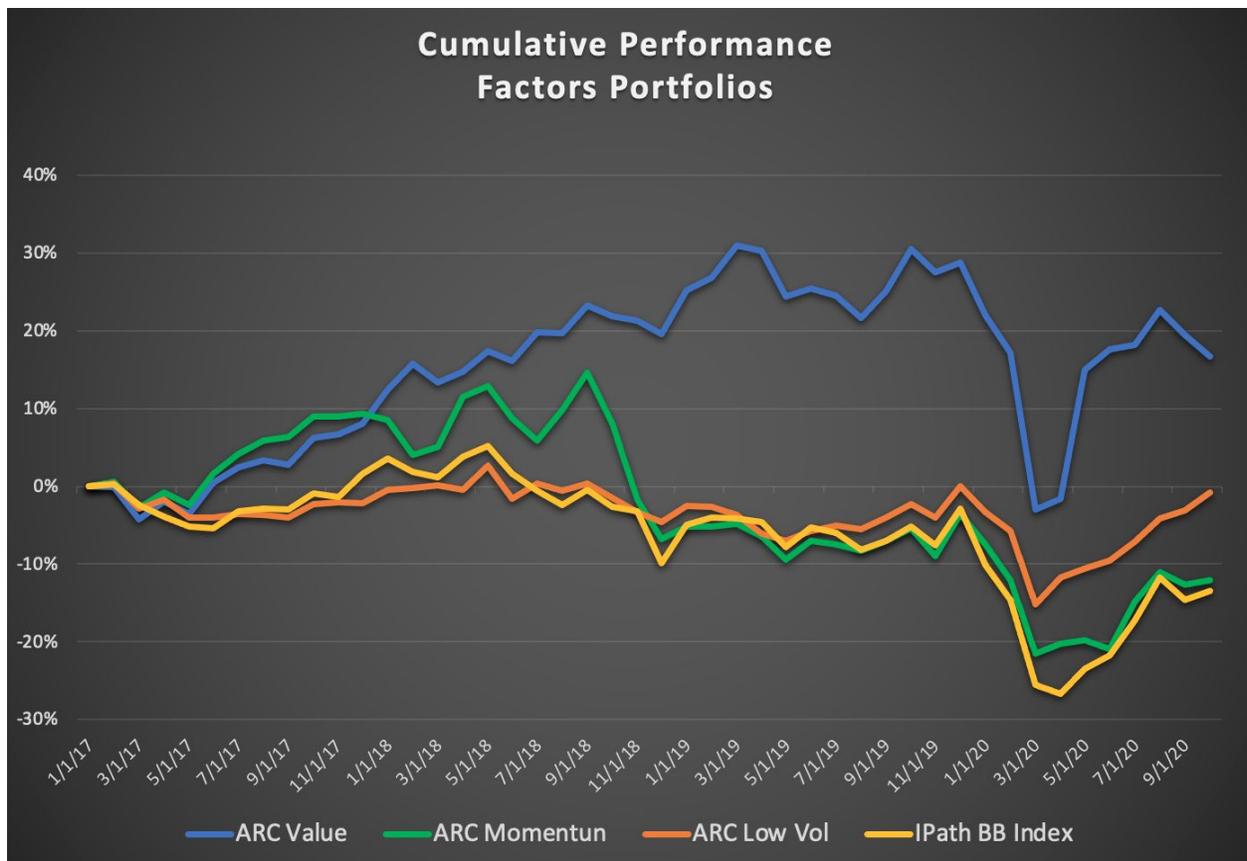
## Factor Tilted Portfolios Performance Report:

The Value tilted portfolio had a phenomenal month (8.4%). In this year of volatility, the Low Vol portfolio is behaving as expected by overperforming the index by more than 10% and being positive YTD.



Returns	ARC Value	ARC Momentum	ARC Low Vol	IPath BB Index
YTD	-1.8%	-6.5%	2.8%	-7.7%
November	8.4%	2.5%	3.7%	3.5%
Annualized*	6.2%	-2.6%	0.7%	-2.8%
Volatility*	15.5%	13.2%	8.6%	12.6%

\*2017/2020





## Sectors, Subsectors MTD, YTD & Historical Report

ARC sectors and subsectors returns are estimated from the statistical model and not from preset weightings of commodities. All three sectors are up this month, with Agriculture posting a huge month (8%) driven by Lumber (30.5%) and Grain & Oilseed (10%). The news of efficient vaccines that could put an end to the Covid-19 pandemic certainly drove Lumber as the market expects a recovery next year. Base Metals jumped as well significantly this month (9%) based on this news.

Factor	MTD Perf	YTD Perf	Historical Returns*	Volatility*
<b>Agriculture</b>	<b>8.4%</b>	<b>18.4%</b>	<b>4.3%</b>	<b>9.2%</b>
Grain And Oilseed	10.2%	24.1%	5.7%	11.2%
Lumber And Pulp	30.5%	90.9%	26.0%	38.8%
Proteins	1.5%	2.1%	2.9%	9.6%
Softs	8.4%	17.1%	0.6%	10.6%
<b>Energy</b>	<b>2.2%</b>	<b>-19.2%</b>	<b>-8.9%</b>	<b>13.2%</b>
Biofuels	-0.6%	-9.6%	-3.2%	17.7%
Coal	4.8%	-6.8%	1.6%	14.2%
Crude Oil	3.2%	-27.4%	-9.2%	16.3%
Natural Gas	-1.1%	-14.0%	-10.1%	10.1%
Petrochemicals	1.0%	-4.9%	-10.3%	17.2%
Refined Products	7.8%	-29.9%	-8.9%	19.7%
<b>Metals</b>	<b>7.0%</b>	<b>22.1%</b>	<b>13.1%</b>	<b>14.8%</b>
Base	9.4%	19.7%	11.5%	16.1%
Precious	3.5%	31.5%	16.2%	17.6%

\* 2017-2020

### Factors Correlations:

As market volatility decreases, short term correlations have come down. Long term correlations between Styles Factors are low.



Correlations	Agriculture	Energy	Metals	Basis	Open Interest	Momentum	ST Momentum	Trading Activity	Volatility	ST Volatility
<b>Agriculture</b>	1.00	0.55	0.49	0.21	0.17	(0.29)	(0.37)	(0.11)	0.30	0.29
<b>Energy</b>	0.55	1.00	0.43	(0.33)	0.35	(0.34)	(0.43)	(0.08)	0.18	0.29
<b>Metals</b>	0.08	0.22	1.00	0.10	0.12	(0.18)	(0.34)	(0.11)	0.09	0.30
<b>Basis</b>	0.50	0.29	(0.17)	1.00	0.06	(0.00)	0.07	(0.10)	0.14	(0.10)
<b>Open Interest</b>	0.37	0.60	0.23	0.37	1.00	(0.21)	(0.22)	(0.32)	0.02	0.01
<b>Momentum</b>	(0.57)	(0.38)	0.07	(0.49)	(0.49)	1.00	0.33	0.02	(0.12)	(0.13)
<b>ST Momentum</b>	(0.57)	(0.50)	(0.21)	(0.46)	(0.33)	0.59	1.00	0.03	(0.20)	(0.04)
<b>Trading Activity</b>	0.03	0.16	0.38	(0.21)	(0.06)	0.17	0.06	1.00	0.02	(0.06)
<b>Volatility</b>	0.50	0.47	0.03	0.26	0.03	(0.11)	(0.49)	(0.02)	1.00	(0.59)
<b>ST Volatility</b>	0.12	0.02	(0.23)	0.06	(0.12)	(0.01)	0.33	0.00	(0.36)	1.00

1 yr correlations on the right (above the diagonal), 30 days on left (below the diagonal).

## Commodity Indices Risk Decomposition

We look at the risk factor decomposition of the main indices through the prism of the ARC short term model as of 11/30/2020. Bloomberg Commodity index is currently overweight in metals and S&P GSCI in energy, which the model captures. Both have significant exposure to Open Interest, reflecting a bias towards the front of the curve (short maturity contracts are more volatile). The Volatility factor contribution is significant for GSCI. Sectors contribute to 51% and 66% of the total volatility respectively for BB COM and S&P GSCI.

Index	BB COM	GSCI	BB COM Contribution	GSCI Contribution
<b>Total Volatility</b>	14.6%	20.6%	100%	100%
<b>Agriculture</b>	2.7%	2.2%	18.7%	10.6%
<b>Energy</b>	2.5%	6.9%	17.1%	33.5%
<b>Metals</b>	4.5%	1.4%	30.6%	7.0%
<b>Basis</b>	0.2%	0.1%	1.1%	0.7%
<b>Open Interest</b>	3.2%	4.5%	21.6%	21.9%
<b>Momentum</b>	-0.2%	0.5%	-1.7%	2.6%
<b>ST Momentum</b>	-0.4%	-1.1%	-2.7%	-5.2%
<b>Trading Activity</b>	0.8%	0.3%	5.8%	1.5%
<b>Volatility</b>	0.6%	4.6%	4.3%	22.5%
<b>ST Volatility</b>	0.2%	0.6%	1.7%	3.0%
<b>Specific Risk</b>	3.9%	4.1%	26.4%	19.6%