# Summary of Forum Project

This project is designed to scrape the information of CSI300 constituents from [Eastmoney](http://guba.eastmoney.com/) forum and investigate whether there are some relationships between the number of posts and stock prices.

### Strategy

#### Settings

1. Periods - from 2015-01-01 to 2019-07-31
2. Universe - CSI300 (490 tickers from 2015-01-01 to 2019-07-31)
3. Benchmark – Equal weighted and CSI Index
4. Transaction cost – 0.001 (0.1%)

#### Measurements

1. Holding period – 1, 3, 5, 10, 15, 20, 30 Days
2. Decile of signals – Decile 1 to Decile 10
3. Lookback Period (sum of previous posts) – Day 1 to Day 10

#### Methodology

1. Scraping all the posts of CSI300 constituents including those delisted tickers referred to [scraping\_table.py](file:///\\fileserver01\limdata\data\individual%20staff%20folders\andrew%20li\forum\codes\scraping_table.py)
2. Pre-processing the posts into signal matrix referred to [backtest.py](file:///\\fileserver01\limdata\data\individual%20staff%20folders\andrew%20li\forum\codes\backtest.py)
   1. Filtering out the IPO period (60 days)
   2. Filtering out the days when those stocks cannot trade (halted or price is locked at the limit for the whole day)
   3. Masking the signal matrix dynamically by only including the valid tickers in different period
3. Backtesting the strategy referred to [backtest.py](file:///\\fileserver01\limdata\data\individual%20staff%20folders\andrew%20li\forum\codes\backtest.py)
4. Plotting the heatmap referred to [plot\_heatmap.py](codes/plot_heatmap.py)
5. Some auxiliary functions referred to [aux\_func.py](codes/aux_func.py)
   1. Downloading the prices from JoinQuant
   2. NLP sentiment analysis
   3. Creating benchmark
   4. Reformatting the data type
   5. Retrieving the constituents of CSI300

### results

#### 3:00:00PM(Day t) – 8:59:59AM(Day t+1)

1. Sharpe ratio of **long** the ranking signal ([Original](sharpe_heatmaps_rank_long_ori.html) or [Excess](sharpe_heatmaps_rank_long.html) Return)
2. Sharpe ratio of **shorting** the ranking signal ([Original](sharpe_heatmaps_rank_short_ori.html) or [Excess](sharpe_heatmaps_rank_short.html) Return)
3. Sharpe ratio of **long** the ranking signal with positive sentiment score([Original](sharpe_heatmaps_rank_long_positive_ori.html) or [Excess](sharpe_heatmaps_rank_long_positive.html) Return)
4. Sharpe ratio of **shorting** the ranking signal with positive sentiment score([Original](sharpe_heatmaps_rank_short_positive_ori.html) or [Excess](sharpe_heatmaps_rank_short_positive.html) Return)
5. Sharpe ratio of **long** the ranking signal with negative sentiment score([Original](sharpe_heatmaps_rank_long_negative_ori.html) or [Excess](sharpe_heatmaps_rank_long_negative.html) Return)
6. Sharpe ratio of **shorting** the ranking signal with negative sentiment score([Original](sharpe_heatmaps_rank_short_negative_ori.html) or [Excess](sharpe_heatmaps_rank_short_negative.html) Return)
7. Daily return of outperforming groups data (CMC5) ([Original](original_return.xlsx) or [Excess](excess_return.csv) Return)
8. Cumulative return plot (CMC5) ([Original](#_3:00:00PM(Day_t)_–) or [Excess](#_3:00:00PM(Day_t)_–_1) Return)
9. Statistics(CMC5) ([Original](#_2015_–_2019) or [Excess](#_2015_-_2019) Return)
   1. 2015 ([Original](#_2015_return) or [Excess](#_2015_excess_return) Return)
   2. 2016 ([Original](#_2016_return) or [Excess](#_2016_excess_return) Return)
   3. 2017([Original](#_2017_return) or [Excess](#_2017_excess_return) Return)
   4. 2018([Original](#_2018_return) or [Excess](#_2018) Return)
   5. 2019([Original](#_2019_return) or [Excess](#_2019_excess_return) Return)

#### 3:00:00PM(Day t) – 2:29:59PM(Day t+1)

1. Sharpe ratio of **long** the ranking signal ([Original](sharpe_heatmaps_rank_long_3pm_ori.html) or [Excess](sharpe_heatmaps_rank_long_3pm.html) Return)
2. Sharpe ratio of **shorting** the ranking signal ([Original](sharpe_heatmaps_rank_short_3pm_ori.html) or [Excess](sharpe_heatmaps_rank_short_3pm.html) Return)
3. Sharpe ratio of **long** the ranking signal with positive sentiment score([Original](sharpe_heatmaps_rank_long_positive_3pm_ori.html) or [Excess](sharpe_heatmaps_rank_long_positive_3pm.html) Return)
4. Sharpe ratio of **shorting** the ranking signal with positive sentiment score([Original](sharpe_heatmaps_rank_short_positive_3pm_ori.html) or [Excess](sharpe_heatmaps_rank_short_positive_3pm.html) Return)
5. Sharpe ratio of **long** the ranking signal with negative sentiment score([Original](sharpe_heatmaps_rank_long_negative_3pm_ori.html) or [Excess](sharpe_heatmaps_rank_long_negative_3pm.html) Return)
6. Sharpe ratio of **shorting** the ranking signal with negative sentiment score([Original](sharpe_heatmaps_rank_short_negative_3pm_ori.html) or [Excess](sharpe_heatmaps_rank_short_negative_3pm.html) Return)
7. Daily return of outperforming groups data (CMC5) ([Original](original_return_3pm.xlsx) or [Excess](excess_return_3pm.xlsx) Return)
8. Cumulative return plot (CMC5) ([Original](#_3:00:00PM(Day_t)_) or [Excess](#_3:00:00PM(Day_t)__1) Return)
9. Statistics(CMC5) ([Original](#_2015_–_2019_1) or [Excess](#_2015_–_2019_2) Return)
   1. 2015 ([Original](#_2015_return_1) or [Excess](#_2015_excess_return_1) Return)
   2. 2016 ([Original](#_2016_return_1) or [Excess](#_2016_excess_return_1) Return)
   3. 2017([Original](#_2017_return_1) or [Excess](#_2017_excess_return_1) Return)
   4. 2018([Original](#_2018_return_1) or [Excess](#_2018_excess_return_1) Return)
   5. 2019([Original](#_2019_return_1) or [Excess](#_2019_excess_return_1) Return)

### Key findings

1. The ranking signal is more informative than the ranking change signal.
2. 5 days holding period is the best choice for both directions (long and short)
3. The group with the highest decile values of ranking signal and 10-days lookback period might exist some shorting opportunities
4. The group with the lowest decile values of ranking signal and 1-day lookback period might exist some long opportunities
5. Sentiment information may not be able to drive the performance in the majority of situations only except the scenario where the overwhelming negative posts for the lowest decile group is observed. (See Group CMC.5.Long.Decile.1.Lookback.1.Negative click [here](sharpe_heatmaps_rank_long_negative.html))
6. CMC1 is a good signal for 2:30PM to 2:30PM strategy which may have a Sharpe over 2

### Cumulative exccess return

#### 3:00:00PM(Day t) – 8:59:59AM(Day t+1)

#### 3:00:00PM(Day t) – 2:29:59PM(Day t+1)

### Cumulative Return

#### 3:00:00PM(Day t) – 8:59:59AM(Day t+1)

#### 3:00:00PM(Day t) – 2:29:59PM (Day t+1)

### Statistics for 3:00:00PM-8:59:59AM

#### 2015 – 2019 Excess Return

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* |
| Periods | 1075 | 1075 | 1075 | 1075 | 1075 | 1075 |
| Return | 0.590 | 0.447 | 0.697 | 0.977 | 0.614 | 0.621 |
| Daily\_Max | 0.067 | 0.088 | 0.077 | 0.031 | 0.034 | 0.031 |
| Daily\_Min | -0.029 | -0.021 | -0.026 | -0.026 | -0.032 | -0.035 |
| Annual\_Return | 0.116 | 0.091 | 0.134 | 0.175 | 0.120 | 0.121 |
| Volatility | 0.094 | 0.094 | 0.094 | 0.104 | 0.103 | 0.103 |
| SemiDeviation | 0.058 | 0.053 | 0.056 | 0.073 | 0.072 | 0.075 |
| MaxDrawdown | 0.123 | 0.139 | 0.108 | 0.150 | 0.107 | 0.148 |
| Sharpe | 1.236 | 0.971 | 1.424 | 1.690 | 1.169 | 1.175 |
| Sortino | 2.016 | 1.714 | 2.384 | 2.390 | 1.662 | 1.623 |
| Calmar | 0.948 | 0.659 | 1.231 | 1.172 | 1.127 | 0.818 |
| Skewness | 2.108 | 4.039 | 2.871 | -0.006 | -0.015 | -0.323 |

#### 2015 – 2019 Return

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* |
| Periods | 1075.000 | 1075.000 | 1075.000 | 1075.000 | 1075.000 | 1075.000 |
| Return | 0.473 | 0.328 | 0.564 | 0.473 | 0.203 | 0.220 |
| Daily\_Max | 0.100 | 0.100 | 0.100 | 0.097 | 0.099 | 0.096 |
| Daily\_Min | -0.099 | -0.098 | -0.099 | -0.085 | -0.084 | -0.082 |
| Annual\_Return | 0.096 | 0.070 | 0.112 | 0.096 | 0.045 | 0.048 |
| Volatility | 0.300 | 0.307 | 0.304 | 0.325 | 0.325 | 0.317 |
| SemiDeviation | 0.219 | 0.225 | 0.223 | 0.213 | 0.212 | 0.209 |
| MaxDrawdown | 0.425 | 0.461 | 0.402 | 0.429 | 0.403 | 0.426 |
| Sharpe | 0.320 | 0.227 | 0.368 | 0.296 | 0.138 | 0.152 |
| Sortino | 0.438 | 0.310 | 0.502 | 0.452 | 0.211 | 0.232 |
| Calmar | 0.226 | 0.151 | 0.278 | 0.224 | 0.111 | 0.113 |
| Skewness | -0.336 | -0.334 | -0.355 | 0.726 | 0.742 | 0.721 |

#### 

#### 2015 excess return

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* |
| Periods | 203.000 | 203.000 | 203.000 | 203.000 | 203.000 | 203.000 |
| Return | 0.547 | 0.505 | 0.567 | 0.202 | 0.202 | 0.144 |
| Daily\_Max | 0.067 | 0.088 | 0.077 | 0.031 | 0.034 | 0.025 |
| Daily\_Min | -0.029 | -0.021 | -0.026 | -0.026 | -0.032 | -0.035 |
| Annual\_Return | 0.725 | 0.666 | 0.753 | 0.258 | 0.258 | 0.183 |
| Volatility | 0.170 | 0.180 | 0.174 | 0.137 | 0.139 | 0.148 |
| SemiDeviation | 0.103 | 0.100 | 0.104 | 0.100 | 0.102 | .0.114 |
| MaxDrawdown | 0.056 | 0.059 | 0.070 | 0.150 | 0.107 | 0.148 |
| Sharpe | 4.266 | 3.703 | 4.318 | 1.892 | 1.865 | 1.236 |
| Sortino | 7.033 | 6.640 | 7.222 | 2.581 | 2.523 | 1.599 |
| Calmar | 13.052 | 11.293 | 10.766 | 1.728 | 2.424 | 1.231 |
| Skewness | 1.452 | 2.629 | 1.906 | -0.271 | -0.415 | -0.905 |

#### 2015 return

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* |
| Periods | 203.000 | 203.000 | 203.000 | 203.000 | 203.000 | 203.000 |
| Return | 0.783 | 0.730 | 0.803 | -0.136 | -0.137 | -0.173 |
| Daily\_Max | 0.100 | 0.100 | 0.100 | 0.097 | 0.099 | 0.096 |
| Daily\_Min | -0.099 | -0.098 | -0.099 | -0.085 | -0.084 | -0.082 |
| Annual\_Return | 1.060 | 0.984 | 1.089 | -0.167 | -0.168 | -0.211 |
| Volatility | 0.522 | 0.532 | 0.528 | 0.497 | 0.500 | 0.484 |
| SemiDeviation | 0.386 | 0.392 | 0.392 | 0.321 | 0.324 | 0.314 |
| MaxDrawdown | 0.385 | 0.395 | 0.402 | 0.429 | 0.403 | 0.426 |
| Sharpe | 2.030 | 1.850 | 2.063 | -0.336 | -0.336 | -0.436 |
| Sortino | 2.747 | 2.509 | 2.781 | -0.519 | -0.517 | -0.672 |
| Calmar | 2.753 | 2.487 | 2.705 | -0.388 | -0.416 | -0.495 |
| Skewness | -0.265 | -0.236 | -0.289 | 0.582 | 0.554 | 0.597 |

#### 2016 excess return

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* |
| Periods | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 |
| Return | 0.053 | 0.024 | 0.046 | 0.138 | 0.127 | 0.089 |
| Daily\_Max | 0.016 | 0.015 | 0.013 | 0.018 | 0.022 | 0.015 |
| Daily\_Min | -0.014 | -0.010 | -0.012 | -0.014 | -0.011 | -0.010 |
| Annual\_Return | 0.056 | 0.025 | 0.048 | 0.145 | 0.133 | 0.093 |
| Volatility | 0.056 | 0.051 | 0.055 | 0.082 | 0.080 | 0.073 |
| SemiDeviation | 0.039 | 0.035 | 0.038 | 0.056 | 0.056 | 0.050 |
| MaxDrawdown | 0.047 | 0.025 | 0.042 | 0.056 | 0.069 | 0.051 |
| Sharpe | 0.985 | 0.491 | 0.884 | 1.781 | 1.651 | 1.277 |
| Sortino | 1.421 | 0.716 | 1.265 | 2.573 | 2.392 | 1.854 |
| Calmar | 1.188 | 1.008 | 1.145 | 2.590 | 1.929 | 1.835 |
| Skewness | 0.220 | 0.331 | 0.133 | 0.172 | 0.258 | 0.191 |

#### 2016 return

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* |
| Periods | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 |
| Return | -0.092 | -0.123 | -0.099 | 0.227 | 0.215 | 0.177 |
| Daily\_Max | 0.046 | 0.052 | 0.044 | 0.090 | 0.092 | 0.091 |
| Daily\_Min | -0.080 | -0.082 | -0.078 | -0.050 | -0.048 | -0.053 |
| Annual\_Return | -0.096 | -0.128 | -0.104 | 0.239 | 0.226 | 0.185 |
| Volatility | 0.258 | 0.278 | 0.262 | 0.313 | 0.311 | 0.302 |
| SemiDeviation | 0.205 | 0.221 | 0.210 | 0.190 | 0.188 | 0.184 |
| MaxDrawdown | 0.263 | 0.280 | 0.263 | 0.219 | 0.225 | 0.245 |
| Sharpe | -0.374 | -0.459 | -0.396 | 0.762 | 0.725 | 0.613 |
| Sortino | -0.470 | -0.579 | -0.493 | 1.257 | 1.204 | 1.009 |
| Calmar | -0.366 | -0.456 | -0.393 | 1.088 | 1.005 | 0.756 |
| Skewness | -1.567 | -1.504 | -1.670 | 1.300 | 1.373 | 1.342 |

#### 2017 excess return

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* |
| Periods | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 |
| Return | -0.014 | -0.009 | 0.032 | 0.076 | -0.026 | 0.010 |
| Daily\_Max | 0.011 | 0.011 | 0.008 | 0.029 | 0.027 | 0.031 |
| Daily\_Min | -0.012 | -0.009 | -0.009 | -0.026 | -0.025 | -0.018 |
| Annual\_Return | -0.015 | -0.009 | 0.033 | 0.079 | -0.027 | 0.011 |
| Volatility | 0.060 | 0.049 | 0.051 | 0.106 | 0.101 | 0.100 |
| SemiDeviation | 0.042 | 0.035 | 0.036 | 0.075 | 0.069 | 0.068 |
| MaxDrawdown | 0.057 | 0.046 | 0.038 | 0.051 | 0.080 | 0.073 |
| Sharpe | -0.252 | -0.182 | 0.653 | 0.745 | -0.267 | 0.109 |
| Sortino | -0.357 | -0.253 | 0.924 | 1.061 | -0.393 | 0.159 |
| Calmar | -0.263 | -0.196 | 0.880 | 1.569 | -0.337 | 0.149 |
| Skewness | 0.003 | -0.079 | -0.014 | 0.076 | 0.274 | 0.471 |

#### 2017 return

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* |
| Periods | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 |
| Return | 0.050 | 0.057 | 0.100 | -0.007 | -0.100 | -0.067 |
| Daily\_Max | 0.023 | 0.026 | 0.025 | 0.039 | 0.037 | 0.041 |
| Daily\_Min | -0.038 | -0.029 | -0.029 | -0.034 | -0.033 | -0.031 |
| Annual\_Return | 0.052 | 0.059 | 0.104 | -0.007 | -0.104 | -0.070 |
| Volatility | 0.123 | 0.116 | 0.115 | 0.184 | 0.179 | 0.180 |
| SemiDeviation | 0.090 | 0.083 | 0.082 | 0.124 | 0.120 | 0.120 |
| MaxDrawdown | 0.094 | 0.079 | 0.079 | 0.157 | 0.195 | 0.185 |
| Sharpe | 0.425 | 0.510 | 0.906 | -0.038 | -0.584 | -0.388 |
| Sortino | 0.583 | 0.714 | 1.280 | -0.056 | -0.873 | -0.583 |
| Calmar | 0.560 | 0.749 | 1.326 | -0.045 | -0.535 | -0.378 |
| Skewness | -0.511 | -0.146 | -0.089 | 0.350 | 0.381 | 0.531 |

#### 2018 excess return

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* |
| Periods | 242.000 | 242.000 | 242.000 | 242.000 | 242.000 | 242.000 |
| Return | -0.024 | -0.057 | -0.066 | 0.214 | 0.134 | 0.187 |
| Daily\_Max | 0.011 | 0.016 | 0.016 | 0.016 | 0.016 | 0.019 |
| Daily\_Min | -0.014 | -0.014 | -0.015 | -0.018 | -0.015 | -0.017 |
| Annual\_Return | -0.025 | -0.060 | -0.069 | 0.226 | 0.141 | 0.197 |
| Volatility | 0.070 | 0.062 | 0.070 | 0.090 | 0.092 | 0.087 |
| SemiDeviation | 0.049 | 0.043 | 0.048 | 0.064 | 0.064 | 0.063 |
| MaxDrawdown | 0.081 | 0.090 | 0.103 | 0.051 | 0.061 | 0.038 |
| Sharpe | -0.361 | -0.978 | -0.993 | 2.513 | 1.533 | 2.277 |
| Sortino | -0.510 | -1.412 | -1.427 | 3.529 | 2.190 | 3.147 |
| Calmar | -0.309 | -0.665 | -0.673 | 4.436 | 2.315 | 5.190 |
| Skewness | -0.083 | 0.156 | 0.109 | -0.043 | 0.067 | -0.111 |

#### 2018 return

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* |
| Periods | 242.000 | 242.000 | 242.000 | 242.000 | 242.000 | 242.000 |
| Return | -0.303 | -0.328 | -0.334 | 0.609 | 0.503 | 0.575 |
| Daily\_Max | 0.046 | 0.048 | 0.046 | 0.067 | 0.068 | 0.064 |
| Daily\_Min | -0.066 | -0.064 | -0.065 | -0.052 | -0.053 | -0.050 |
| Annual\_Return | -0.315 | -0.341 | -0.348 | 0.647 | 0.533 | 0.610 |
| Volatility | 0.231 | 0.238 | 0.241 | 0.272 | 0.273 | 0.267 |
| SemiDeviation | 0.169 | 0.175 | 0.174 | 0.184 | 0.183 | 0.183 |
| MaxDrawdown | 0.366 | 0.375 | 0.364 | 0.106 | 0.104 | 0.106 |
| Sharpe | -1.362 | -1.433 | -1.442 | 2.380 | 1.957 | 2.289 |
| Sortino | -1.866 | -1.955 | -1.996 | 3.519 | 2.918 | 3.342 |
| Calmar | -0.861 | -0.910 | -0.954 | 6.118 | 5.138 | 5.739 |
| Skewness | -0.374 | -0.382 | -0.301 | 0.389 | 0.419 | 0.292 |

#### 2019 excess return

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* |
| Periods | 140.000 | 140.000 | 140.000 | 140.000 | 140.000 | 140.000 |
| Return | 0.015 | 0.005 | 0.074 | 0.107 | 0.079 | 0.085 |
| Daily\_Max | 0.012 | 0.012 | 0.014 | 0.021 | 0.021 | 0.023 |
| Daily\_Min | -0.010 | -0.011 | -0.007 | -0.013 | -0.012 | -0.016 |
| Annual\_Return | 0.026 | 0.009 | 0.139 | 0.201 | 0.147 | 0.160 |
| Volatility | 0.066 | 0.067 | 0.062 | 0.102 | 0.098 | 0.103 |
| SemiDeviation | 0.046 | 0.045 | 0.039 | 0.067 | 0.065 | 0.068 |
| MaxDrawdown | 0.047 | 0.048 | 0.021 | 0.101 | 0.104 | 0.109 |
| Sharpe | 0.403 | 0.132 | 2.239 | 1.974 | 1.508 | 1.556 |
| Sortino | 0.581 | 0.194 | 3.547 | 3.006 | 2.254 | 2.338 |
| Calmar | 0.558 | 0.185 | 6.653 | 1.999 | 1.421 | 1.464 |
| Skewness | 0.113 | 0.252 | 0.684 | 0.514 | 0.425 | 0.449 |

#### 2019 return

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* |
| Periods | 140.000 | 140.000 | 140.000 | 140.000 | 140.000 | 140.000 |
| Return | 0.243 | 0.233 | 0.316 | -0.131 | -0.152 | -0.147 |
| Daily\_Max | 0.055 | 0.054 | 0.060 | 0.086 | 0.086 | 0.083 |
| Daily\_Min | -0.066 | -0.062 | -0.064 | -0.062 | -0.061 | -0.064 |
| Annual\_Return | 0.482 | 0.460 | 0.643 | -0.224 | -0.258 | -0.250 |
| Volatility | 0.239 | 0.231 | 0.241 | 0.310 | 0.308 | 0.306 |
| SemiDeviation | 0.167 | 0.159 | 0.165 | 0.214 | 0.214 | 0.213 |
| MaxDrawdown | 0.146 | 0.147 | 0.130 | 0.347 | 0.348 | 0.350 |
| Sharpe | 2.017 | 1.994 | 2.664 | -0.722 | -0.839 | -0.817 |
| Sortino | 2.882 | 2.899 | 3.897 | -1.045 | -1.208 | -1.173 |
| Calmar | 3.312 | 3.126 | 4.928 | -0.646 | -0.743 | -0.714 |
| Skewness | -0.190 | -0.033 | 0.057 | 0.361 | 0.353 | 0.292 |

### Statistics for 3:00:00PM-2:29:59pm

#### 2015 – 2019 Excess Return

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* | *CMC.1*  *Short*  *Decile.10*  *Lookback.8*  *Negative* |
| Periods | 1075.000 | 1075.000 | 1075.000 | 1075.000 | 1075.000 | 1075.000 | 1075.000 |
| Return | 0.699 | 0.557 | 0.998 | 0.881 | 0.676 | 1.026 | 1.315 |
| Daily\_Max | 0.077 | 0.080 | 0.077 | 0.030 | 0.028 | 0.028 | 0.028 |
| Daily\_Min | -0.033 | -0.025 | -0.026 | -0.027 | -0.028 | -0.033 | -0.028 |
| Annual\_Return | 0.134 | 0.111 | 0.178 | 0.162 | 0.130 | 0.182 | 0.220 |
| Volatility | 0.096 | 0.095 | 0.098 | 0.105 | 0.104 | 0.106 | 0.109 |
| SemiDeviation | 0.058 | 0.057 | 0.058 | 0.074 | 0.073 | 0.075 | 0.077 |
| MaxDrawdown | 0.122 | 0.154 | 0.091 | 0.151 | 0.163 | 0.166 | 0.137 |
| Sharpe | 1.387 | 1.171 | 1.816 | 1.538 | 1.256 | 1.717 | 2.011 |
| Sortino | 2.307 | 1.949 | 3.063 | 2.187 | 1.787 | 2.421 | 2.868 |
| Calmar | 1.094 | 0.718 | 1.962 | 1.068 | 0.799 | 1.096 | 1.609 |
| Skewness | 2.717 | 3.034 | 2.716 | -0.002 | 0.002 | -0.087 | 0.002 |

#### 2015 – 2019 Return

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* | *CMC.1*  *Short*  *Decile.10*  *Lookback.8*  *Negative* |
| Periods | 1075.000 | 1075.000 | 1075.000 | 1075.000 | 1075.000 | 1075.000 | 1075.000 |
| Return | 0.585 | 0.446 | 0.862 | 0.395 | 0.244 | 0.499 | 0.723 |
| Daily\_Max | 0.100 | 0.100 | 0.100 | 0.097 | 0.097 | 0.097 | 0.096 |
| Daily\_Min | -0.098 | -0.099 | -0.099 | -0.085 | -0.085 | -0.088 | -0.083 |
| Annual\_Return | 0.115 | 0.091 | 0.159 | 0.082 | 0.053 | 0.101 | 0.138 |
| Volatility | 0.295 | 0.299 | 0.297 | 0.329 | 0.328 | 0.331 | 0.328 |
| SemiDeviation | 0.216 | 0.218 | 0.215 | 0.215 | 0.215 | 0.218 | 0.215 |
| MaxDrawdown | 0.398 | 0.402 | 0.373 | 0.439 | 0.439 | 0.446 | 0.424 |
| Sharpe | 0.390 | 0.306 | 0.534 | 0.250 | 0.162 | 0.304 | 0.419 |
| Sortino | 0.534 | 0.419 | 0.737 | 0.381 | 0.247 | 0.463 | 0.640 |
| Calmar | 0.290 | 0.227 | 0.426 | 0.187 | 0.121 | 0.226 | 0.325 |
| Skewness | -0.331 | -0.315 | -0.256 | 0.712 | 0.727 | 0.689 | 0.714 |

#### 2015 excess return

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* | *CMC.1*  *Short*  *Decile.10*  *Lookback.8*  *Negative* |
| Periods | 203.000 | 203.000 | 203.000 | 203.000 | 203.000 | 203.000 | 203.000 |
| Return | 0.450 | 0.484 | 0.690 | 0.207 | 0.207 | 0.241 | 0.387 |
| Daily\_Max | 0.077 | 0.080 | 0.077 | 0.030 | 0.028 | 0.028 | 0.025 |
| Daily\_Min | -0.033 | -0.025 | -0.026 | -0.027 | -0.028 | -0.033 | -0.028 |
| Annual\_Return | 0.592 | 0.638 | 0.926 | 0.266 | 0.266 | 0.309 | 0.505 |
| Volatility | 0.180 | 0.175 | 0.181 | 0.136 | 0.137 | 0.138 | 0.145 |
| SemiDeviation | 0.107 | 0.102 | 0.107 | 0.100 | 0.100 | 0.102 | 0.106 |
| MaxDrawdown | 0.055 | 0.049 | 0.053 | 0.151 | 0.163 | 0.166 | 0.137 |
| Sharpe | 3.289 | 3.642 | 5.126 | 1.957 | 1.939 | 2.246 | 3.491 |
| Sortino | 5.519 | 6.229 | 8.635 | 2.661 | 2.665 | 3.030 | 4.744 |
| Calmar | 10.686 | 12.984 | 17.510 | 1.756 | 1.630 | 1.861 | 3.691 |
| Skewness | 1.848 | 2.151 | 1.811 | -0.357 | -0.282 | -0.481 | -0.394 |

#### 2015 return

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* | *CMC.1*  *Short*  *Decile.10*  *Lookback.8*  *Negative* |
| Periods | 203.000 | 203.000 | 203.000 | 203.000 | 203.000 | 203.000 | 203.000 |
| Return | 0.673 | 0.707 | 0.946 | -0.133 | -0.134 | -0.112 | -0.003 |
| Daily\_Max | 0.100 | 0.100 | 0.100 | 0.097 | 0.097 | 0.097 | 0.096 |
| Daily\_Min | -0.098 | -0.099 | -0.099 | -0.085 | -0.085 | -0.088 | -0.083 |
| Annual\_Return | 0.903 | 0.952 | 1.299 | -0.163 | -0.164 | -0.137 | -0.004 |
| Volatility | 0.523 | 0.528 | 0.527 | 0.499 | 0.502 | 0.508 | 0.501 |
| SemiDeviation | 0.386 | 0.390 | 0.388 | 0.323 | 0.324 | 0.328 | 0.325 |
| MaxDrawdown | 0.398 | 0.394 | 0.373 | 0.439 | 0.439 | 0.446 | 0.424 |
| Sharpe | 1.724 | 1.802 | 2.463 | -0.327 | -0.327 | -0.271 | -0.008 |
| Sortino | 2.336 | 2.442 | 3.350 | -0.505 | -0.506 | -0.419 | -0.012 |
| Calmar | 2.271 | 2.418 | 3.485 | -0.372 | -0.374 | -0.308 | -0.009 |
| Skewness | -0.257 | -0.256 | -0.245 | 0.564 | 0.574 | 0.557 | 0.552 |

#### 2016 excess return

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* | *CMC.1*  *Short*  *Decile.10*  *Lookback.8*  *Negative* |
| Periods | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 |
| Return | 0.140 | 0.120 | 0.092 | 0.116 | 0.090 | 0.115 | 0.203 |
| Daily\_Max | 0.019 | 0.015 | 0.014 | 0.015 | 0.016 | 0.013 | 0.018 |
| Daily\_Min | -0.012 | -0.011 | -0.013 | -0.014 | -0.014 | -0.013 | -0.014 |
| Annual\_Return | 0.147 | 0.126 | 0.097 | 0.121 | 0.094 | 0.121 | 0.213 |
| Volatility | 0.068 | 0.062 | 0.067 | 0.082 | 0.081 | 0.084 | 0.085 |
| SemiDeviation | 0.045 | 0.042 | 0.045 | 0.058 | 0.057 | 0.060 | 0.060 |
| MaxDrawdown | 0.042 | 0.039 | 0.040 | 0.054 | 0.045 | 0.039 | 0.032 |
| Sharpe | 2.160 | 2.030 | 1.450 | 1.479 | 1.160 | 1.435 | 2.504 |
| Sortino | 3.240 | 3.018 | 2.170 | 2.104 | 1.649 | 2.016 | 3.572 |
| Calmar | 3.503 | 3.208 | 2.441 | 2.243 | 2.084 | 3.075 | 6.631 |
| Skewness | 0.483 | 0.288 | 0.317 | 0.043 | 0.038 | -0.057 | 0.067 |

#### 2016 return

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* | *CMC.1*  *Short*  *Decile.10*  *Lookback.8*  *Negative* |
| Periods | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 |
| Return | -0.014 | -0.033 | -0.055 | 0.202 | 0.174 | 0.201 | 0.297 |
| Daily\_Max | 0.041 | 0.046 | 0.042 | 0.091 | 0.092 | 0.092 | 0.094 |
| Daily\_Min | -0.078 | -0.077 | -0.076 | -0.051 | -0.050 | -0.054 | -0.052 |
| Annual\_Return | -0.015 | -0.034 | -0.057 | 0.212 | 0.183 | 0.211 | 0.312 |
| Volatility | 0.248 | 0.253 | 0.245 | 0.315 | 0.313 | 0.316 | 0.315 |
| SemiDeviation | 0.197 | 0.200 | 0.195 | 0.192 | 0.192 | 0.195 | 0.192 |
| MaxDrawdown | 0.240 | 0.248 | 0.231 | 0.231 | 0.239 | 0.221 | 0.173 |
| Sharpe | -0.061 | -0.136 | -0.234 | 0.672 | 0.584 | 0.668 | 0.990 |
| Sortino | -0.076 | -0.171 | -0.294 | 1.105 | 0.953 | 1.080 | 1.622 |
| Calmar | -0.063 | -0.138 | -0.248 | 0.918 | 0.765 | 0.956 | 1.803 |
| Skewness | -1.660 | -1.524 | -1.629 | 1.294 | 1.267 | 1.199 | 1.292 |

#### 2017 excess return

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* | *CMC.1*  *Short*  *Decile.10*  *Lookback.8*  *Negative* |
| Periods | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 |
| Return | 0.035 | 0.005 | 0.056 | 0.033 | -0.015 | 0.052 | 0.021 |
| Daily\_Max | 0.011 | 0.010 | 0.010 | 0.023 | 0.023 | 0.024 | 0.028 |
| Daily\_Min | -0.009 | -0.009 | -0.011 | -0.018 | -0.024 | -0.018 | -0.021 |
| Annual\_Return | 0.036 | 0.005 | 0.059 | 0.035 | -0.015 | 0.055 | 0.022 |
| Volatility | 0.050 | 0.051 | 0.054 | 0.105 | 0.103 | 0.105 | 0.111 |
| SemiDeviation | 0.035 | 0.036 | 0.039 | 0.073 | 0.072 | 0.074 | 0.076 |
| MaxDrawdown | 0.028 | 0.046 | 0.042 | 0.069 | 0.085 | 0.064 | 0.064 |
| Sharpe | 0.728 | 0.102 | 1.086 | 0.331 | -0.149 | 0.519 | 0.197 |
| Sortino | 1.025 | 0.142 | 1.522 | 0.475 | -0.215 | 0.736 | 0.287 |
| Calmar | 1.281 | 0.113 | 1.400 | 0.506 | -0.181 | 0.857 | 0.343 |
| Skewness | -0.063 | -0.064 | -0.092 | 0.124 | 0.118 | 0.061 | 0.249 |

#### 2017 return

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* | *CMC.1*  *Short*  *Decile.10*  *Lookback.8*  *Negative* |
| Periods | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 | 243.000 |
| Return | 0.104 | 0.072 | 0.127 | -0.046 | -0.090 | -0.029 | -0.057 |
| Daily\_Max | 0.022 | 0.024 | 0.019 | 0.041 | 0.039 | 0.041 | 0.042 |
| Daily\_Min | -0.026 | -0.033 | -0.027 | -0.034 | -0.032 | -0.034 | -0.033 |
| Annual\_Return | 0.109 | 0.075 | 0.133 | -0.048 | -0.094 | -0.030 | -0.060 |
| Volatility | 0.108 | 0.110 | 0.107 | 0.184 | 0.182 | 0.184 | 0.188 |
| SemiDeviation | 0.077 | 0.079 | 0.076 | 0.124 | 0.122 | 0.125 | 0.125 |
| MaxDrawdown | 0.076 | 0.085 | 0.091 | 0.168 | 0.196 | 0.161 | 0.161 |
| Sharpe | 1.008 | 0.684 | 1.248 | -0.261 | -0.516 | -0.162 | -0.320 |
| Sortino | 1.418 | 0.954 | 1.757 | -0.388 | -0.769 | -0.239 | -0.481 |
| Calmar | 1.433 | 0.889 | 1.465 | -0.286 | -0.480 | -0.185 | -0.372 |
| Skewness | -0.126 | -0.302 | -0.182 | 0.395 | 0.395 | 0.356 | 0.476 |

#### 2018 excess return

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* | *CMC.1*  *Short*  *Decile.10*  *Lookback.8*  *Negative* |
| Periods | 242.000 | 242.000 | 242.000 | 242.000 | 242.000 | 242.000 | 242.000 |
| Return | -0.039 | -0.069 | 0.001 | 0.232 | 0.172 | 0.251 | 0.210 |
| Daily\_Max | 0.012 | 0.014 | 0.012 | 0.022 | 0.017 | 0.018 | 0.017 |
| Daily\_Min | -0.014 | -0.014 | -0.014 | -0.022 | -0.019 | -0.024 | -0.022 |
| Annual\_Return | -0.041 | -0.072 | 0.001 | 0.245 | 0.182 | 0.265 | 0.221 |
| Volatility | 0.061 | 0.063 | 0.064 | 0.095 | 0.092 | 0.094 | 0.092 |
| SemiDeviation | 0.041 | 0.045 | 0.045 | 0.065 | 0.064 | 0.065 | 0.063 |
| MaxDrawdown | 0.077 | 0.093 | 0.060 | 0.047 | 0.050 | 0.045 | 0.043 |
| Sharpe | -0.684 | -1.147 | 0.013 | 2.585 | 1.985 | 2.822 | 2.408 |
| Sortino | -0.999 | -1.609 | 0.018 | 3.751 | 2.850 | 4.066 | 3.484 |
| Calmar | -0.534 | -0.775 | 0.013 | 5.170 | 3.616 | 5.870 | 5.111 |
| Skewness | 0.141 | -0.120 | -0.070 | 0.144 | 0.060 | 0.050 | 0.101 |

#### 2018 return

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* | *CMC.1*  *Short*  *Decile.10*  *Lookback.8*  *Negative* |
| Periods | 242.000 | 242.000 | 242.000 | 242.000 | 242.000 | 242.000 | 242.000 |
| Return | -0.314 | -0.335 | -0.286 | 0.630 | 0.551 | 0.656 | 0.602 |
| Daily\_Max | 0.049 | 0.046 | 0.048 | 0.072 | 0.073 | 0.072 | 0.066 |
| Daily\_Min | -0.062 | -0.062 | -0.064 | -0.055 | -0.052 | -0.057 | -0.055 |
| Annual\_Return | -0.327 | -0.348 | -0.297 | 0.670 | 0.585 | 0.698 | 0.640 |
| Volatility | 0.231 | 0.231 | 0.233 | 0.281 | 0.278 | 0.278 | 0.275 |
| SemiDeviation | 0.169 | 0.169 | 0.170 | 0.189 | 0.188 | 0.188 | 0.186 |
| MaxDrawdown | 0.351 | 0.369 | 0.329 | 0.115 | 0.112 | 0.115 | 0.109 |
| Sharpe | -1.414 | -1.506 | -1.276 | 2.388 | 2.104 | 2.506 | 2.330 |
| Sortino | -1.932 | -2.056 | -1.754 | 3.543 | 3.110 | 3.707 | 3.440 |
| Calmar | -0.931 | -0.945 | -0.905 | 5.832 | 5.217 | 6.047 | 5.850 |
| Skewness | -0.350 | -0.368 | -0.345 | 0.418 | 0.402 | 0.395 | 0.371 |

#### 2019 excess return

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* | *CMC.1*  *Short*  *Decile.10*  *Lookback.8*  *Negative* |
| Periods | 140.000 | 140.000 | 140.000 | 140.000 | 140.000 | 140.000 | 140.000 |
| Return | 0.034 | 0.001 | 0.024 | 0.097 | 0.103 | 0.112 | 0.124 |
| Daily\_Max | 0.012 | 0.012 | 0.017 | 0.022 | 0.023 | 0.022 | 0.023 |
| Daily\_Min | -0.012 | -0.012 | -0.010 | -0.015 | -0.014 | -0.015 | -0.019 |
| Annual\_Return | 0.062 | 0.001 | 0.044 | 0.182 | 0.194 | 0.212 | 0.235 |
| Volatility | 0.070 | 0.070 | 0.070 | 0.107 | 0.104 | 0.109 | 0.113 |
| SemiDeviation | 0.048 | 0.050 | 0.047 | 0.071 | 0.070 | 0.072 | 0.076 |
| MaxDrawdown | 0.067 | 0.071 | 0.060 | 0.106 | 0.104 | 0.106 | 0.120 |
| Sharpe | 0.891 | 0.021 | 0.626 | 1.693 | 1.872 | 1.946 | 2.078 |
| Sortino | 1.294 | 0.030 | 0.946 | 2.569 | 2.796 | 2.938 | 3.094 |
| Calmar | 0.930 | 0.021 | 0.736 | 1.719 | 1.874 | 1.998 | 1.960 |
| Skewness | 0.180 | -0.138 | 0.570 | 0.470 | 0.409 | 0.494 | 0.300 |

#### 2019 return

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| . | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *All* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Positive* | *CMC.5*  *Long*  *Decile.1*  *Lookback.1*  *Negative* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *All* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Positive* | *CMC.5*  *Short*  *Decile.10*  *Lookback.10*  *Negative* | *CMC.1*  *Short*  *Decile.10*  *Lookback.8*  *Negative* |
| Periods | 140.000 | 140.000 | 140.000 | 140.000 | 140.000 | 140.000 | 140.000 |
| Return | 0.270 | 0.229 | 0.257 | -0.139 | -0.134 | -0.127 | -0.117 |
| Daily\_Max | 0.057 | 0.054 | 0.058 | 0.085 | 0.087 | 0.086 | 0.079 |
| Daily\_Min | -0.057 | -0.062 | -0.057 | -0.063 | -0.063 | -0.064 | -0.065 |
| Annual\_Return | 0.541 | 0.451 | 0.513 | -0.237 | -0.229 | -0.218 | -0.202 |
| Volatility | 0.222 | 0.226 | 0.226 | 0.315 | 0.314 | 0.315 | 0.313 |
| SemiDeviation | 0.150 | 0.156 | 0.153 | 0.220 | 0.218 | 0.220 | 0.220 |
| MaxDrawdown | 0.115 | 0.137 | 0.118 | 0.332 | 0.338 | 0.335 | 0.322 |
| Sharpe | 2.435 | 1.993 | 2.266 | -0.753 | -0.728 | -0.691 | -0.645 |
| Sortino | 3.599 | 2.897 | 3.357 | -1.080 | -1.052 | -0.988 | -0.920 |
| Calmar | 4.700 | 3.298 | 4.343 | -0.715 | -0.678 | -0.649 | -0.627 |
| Skewness | 0.140 | -0.043 | 0.174 | 0.299 | 0.371 | 0.292 | 0.177 |