

Bridgeway Investment Performance and Risk Analysis

September 4, 2019

0.0.1 Risk Model

Below is a high-level return and holdings based risk model. I've generated the results for the BRAGX fund below. The time-series loadings are estimated using a Kalman filter. The Kalman filter performed comparably to a 2 year rolling OLS estimate, but has the advantage of not requiring a fixed window. The drawback to the kalman filter is it requires a 'burn-in' period if the specified priors are significantly different from the 'true' loadings. The holdings exposures were estimated with OLS to demonstrate a different technique and to show the consistency with the results of the Kalman filter estimates.

If you would like run the code yourself, please clone the repository (https://github.com/jwaggie14/bw_risk_model). I've provided the necessary .pkl files to generate the graphs without rerunning the calculation-intensive code. If you would like to recreate the analyses, uncomment the code and run from the beginning.

The return data was sourced from Yahoo Finance. Some of the Bridgeway funds did not return prices, so they are not included below. Further, some of the holdings symbols did not map to a Yahoo Finance symbol, particularly the options, and were excluded also. These represent a small minority of the holdings and should not materially impact the results.

The factors were pulled from Ken French's data library and the holding information was collected from Thomson Reuters Eikon.

```
[67]: fund = 'BRAGX'
      model = 'full'
      plot_exposure(fund,model)
      estimate_rolling(fund, model)
      return_attribution(fund, model)
```



