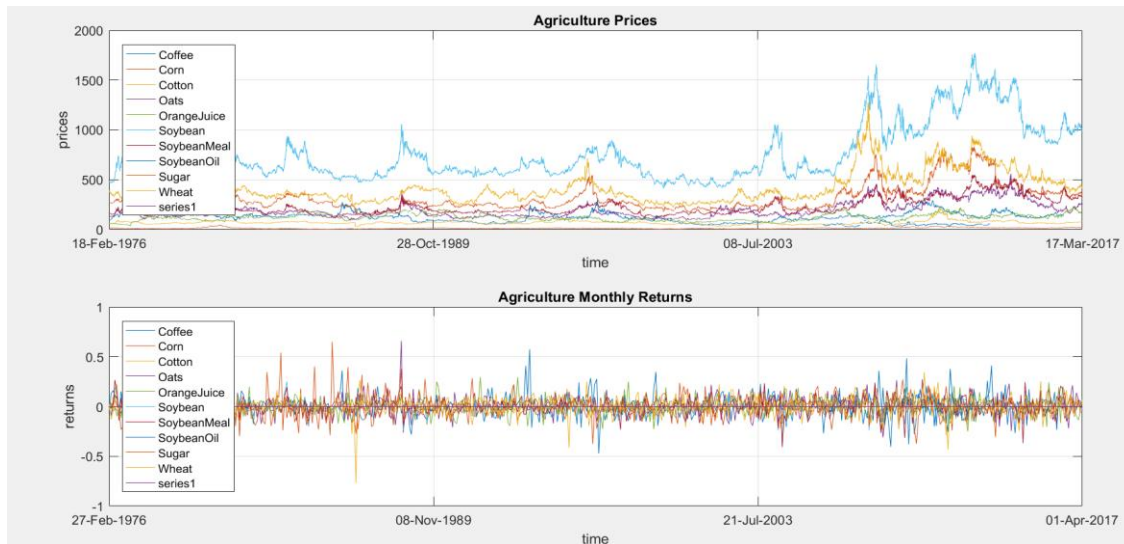


Momentum strategy for commodities

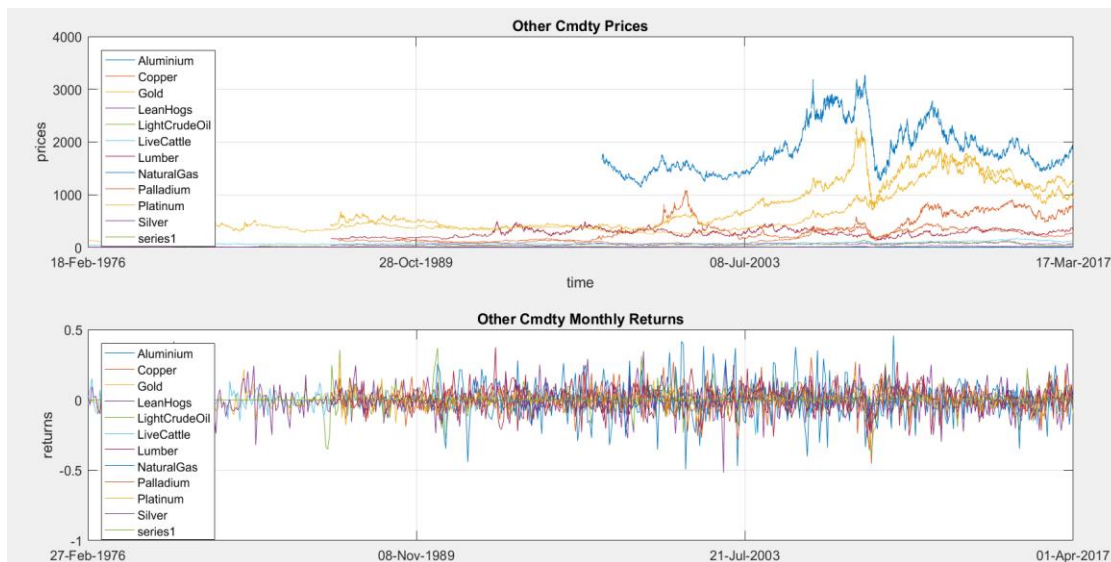
Data

As part of the strategy, we will take 10 agriculture commodities futures, which are coffee, corn, cotton, oats, orange juice, soybean, soybean meal, soybean oil, sugar and wheat. All information was taken out of the generic future class in Bloomberg.

The plot of prices and returns are as below.



We will also take other commodities futures (Aluminium, Copper, Gold, Lean Hogs, Light Crude Oil, Live Cattle, Lumber, Natural Gas, Palladium, Platinum, Silver) for this activity.



Methodology

The return was calculated using the difference between the log of settlement prices.

```
function [timeSeriesCol,timeSeriesCol_Ret] = CalculateMonthlyReturns(rawData)
    %Build time series using provided data
    timeSeriesCol = BuildTimeSeries(rawData);

    %diff of the logs are the returns
    timeSeriesCol_Ret = diff(log(timeSeriesCol));

    %convert to monthly data
    timeSeriesCol_Ret = tomonthly(timeSeriesCol_Ret,'CalcMethod','CumSum');
end
```

For the actual momentum calculation, we take in two parameters

- 1) *Holding Period* – how long should the resultant portfolio be held
- 2) *Ranking Period* – how far back should data be considered for ranking the assets

Given these two information, we can perform these steps

- 1) Find average return of all assets in the ranking period.
- 2) Sort the results and subset the first and last quintile (divided into 1/5 sub divisions).
- 3) Find the future returns for selected data based on the holding period, and average them
- 4) Momentum strategy return would be the combination of the long and short position.

Results

The returns, standard deviation and sharpe ratio of the momentum strategy are retrieved for ranking period of 1, 3 and 6 months and holding period of 1, 6, 12, 24 and 36 months.

Returns

	1 mo	6 mo	12 mo	24 mo	36 mo
1 mo	1.83%	-1.38%	-0.45%	-0.85%	-0.44%
3 mo	-1.16%	-3.45%	-1.59%	-1.72%	-1.07%
6 mo	-3.62%	-2.59%	-2.65%	-2.36%	-1.53%

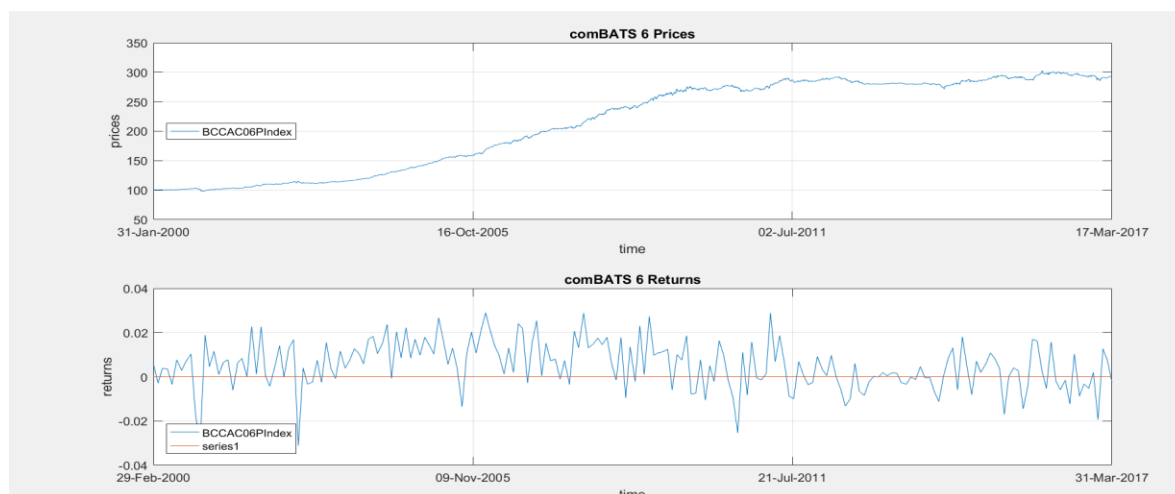
The 1 month holding – 1 month ranking momentum strategy matches what was generated by the report, but the others don't match. This might be due to different in handling prices

Standard Deviation

	1 mo	6 mo	12 mo	24 mo	36 mo
1 mo	32.43%	12.19%	8.51%	5.24%	3.71%
3 mo	31.62%	12.16%	8.3%	5.06%	3.65%
6 mo	12.67%	12.67%	8.78%	5.26%	3.79%

Barclays COMBATS 6

The Barclays Capital Commodities Based Alpha Trading Strategy 6 (CombATS 6) reflects the performance of an market neutral alpha strategy that aims to exploit the commodity curve shape based on the Barclays Capital Momentum Alpha strategy.



The aim is to make the commodities futures momentum strategy to atleast be on par with this combATS 6 index.

Matlab Code

```
function [ret,stdev,shpRat] =  
CalculateMomentumReturns(Complete_Returns,holdingPeriod,rankingPeriod)  
  
    totalMonths = size(Complete_Returns,1);  
    totalAssets = size(Complete_Returns,2);  
  
    rolling_returns = zeros(totalMonths-holdingPeriod-rankingPeriod,1);  
    Com_returns_mat = fts2mat(Complete_Returns);  
  
    for count = 1+rankingPeriod : totalMonths-holdingPeriod  
  
        %Get all data corresponding to the ranking period.  
        %Find the average for every asset  
        ranking_returns = Complete_Returns(count-rankingPeriod:count-1);  
        ranking_ftsMat = fts2mat(ranking_returns);  
        ranking_avg = mean(ranking_ftsMat,1);  
  
        %Isolate the top and bottom quintile returns  
        ranking_sort = sort(ranking_avg);  
        longassets = ranking_sort(floor(4*totalAssets/5):end);  
        shortassets = ranking_sort(1:floor(totalAssets/5));  
  
        %Identify the assets for the quintile data  
        %and find future returns based on holding period  
        longassetsPos = find(ismember(ranking_avg,longassets));  
        shortassetsPos = find(ismember(ranking_avg,shortassets));  
  
        longAssetRet_holding = Com_returns_mat(count+1:count+holdingPeriod,longassetsPos);  
        shortAssetRet_holding = Com_returns_mat(count+1:count+holdingPeriod,shortassetsPos);  
  
        %Average the returns over the holding period  
        %Perform sum(long_avg) - sum(short_Avg)  
        rolling_returns(count-rankingPeriod) = sum(mean(longAssetRet_holding,1)) -  
        sum(mean(shortAssetRet_holding,1));  
  
    end  
    ret = mean(rolling_returns);  
    stdev = std(rolling_returns)/sqrt(size(rolling_returns,1));  
    shpRat = ret/stdev;  
end
```