Finance Homework 2

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1 Question 1

We use a Sentiment-Driven Momentum Trading Strategy. This strategy leverages sentiment analysis indicators alongside traditional momentum indicators to create a robust trading strategy. The stocks that we use is Microsoft (MSFT) and Amazon (AMZN). The sentiment indicators include BULL, BEAR, BBr, and PNlog, while the momentum indicator used is the Rate of Change (ROC). The ROC is the percentage change of the adjusted close price over a specified window. Finally, we use as window size for rolling analysis 254 (1 year) and 127 days (6 months).

1.1 Strategy Definition

1.1.1 Buy Signal

A buy signal is generated when:

- ROC > 0
- BBr $>$ bbr_threshold (default is 60)
- PNlog $>$ pnlog_threshold (default is 0)

1.1.2 Sell Signal

A sell signal is generated when:

- ROC < 0
- BBr $< 100 -$ bbr_threshold
- PNlog $< -$pnlog_threshold

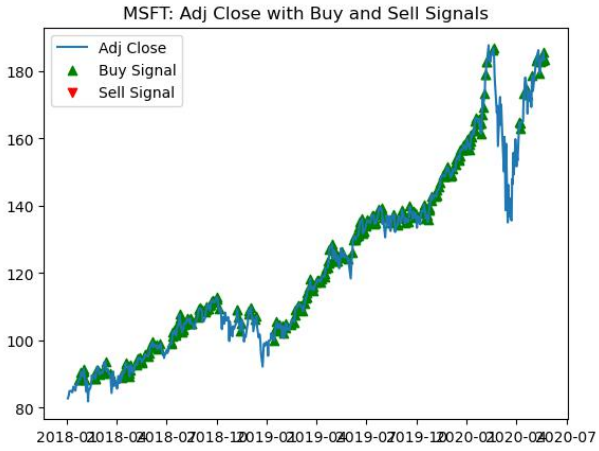
1.2 Results

The best parameters identified through grid search are applied to the strategy, and the performance metrics are calculated. The strategy performance is visualized through multiple plots including adjusted close prices with buy/sell signals, ROC, BBr, PNlog, and cumulative strategy returns. The main indicators are plotted in the figure 2.

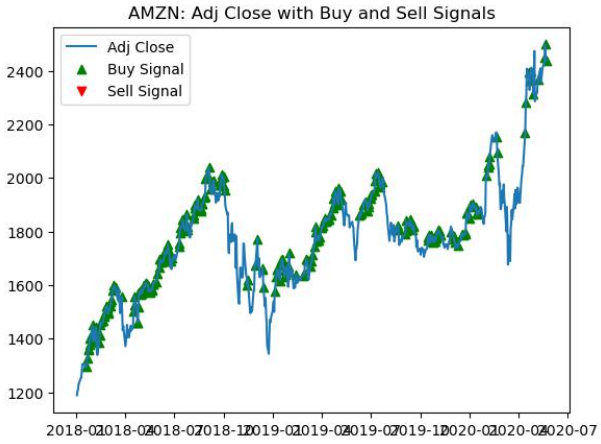
The best parameters when we tune the strategy are BBR=50, PNlog=-0.05, window size= 127, Long short = 0 (only long). The table 1 shows the metrics of the strategy. For both, in average there are 80 trades and 14% of annual return. The figure 1 plots the buy and sell signals and the cumulative returns.

Metric	MSFT	AMZN
Cumulative Return	0.408818	0.345036
Annual Return	0.154556	0.132344
Annualized Sharpe Ratio	266.538668	199.493584
Win %	0.577558	0.574144
Annualized Volatility	0.146126	0.167176
Maximum Drawdown	-0.526671	-0.365533
Max Length Drawdown	0.000000	0.000000
Number of Trades	85.5	76.5

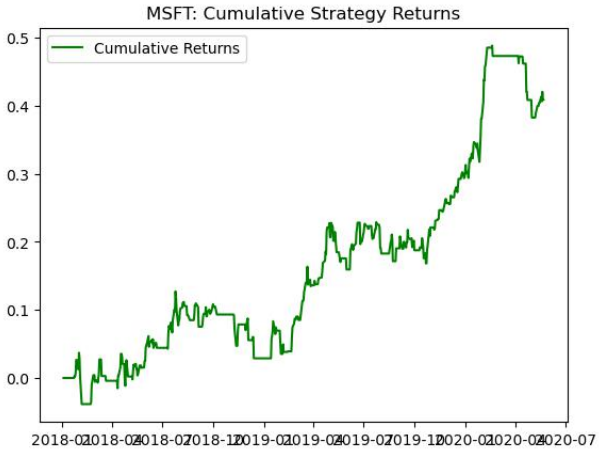
Table 1: Best Sentiment Momentum Strategy Performance



(a) MSFT: Adj Close with Buy and Sell Signals



(b) AMZN: Adj Close with Buy and Sell Signals



(c) MSFT: Cumulative Strategy Returns

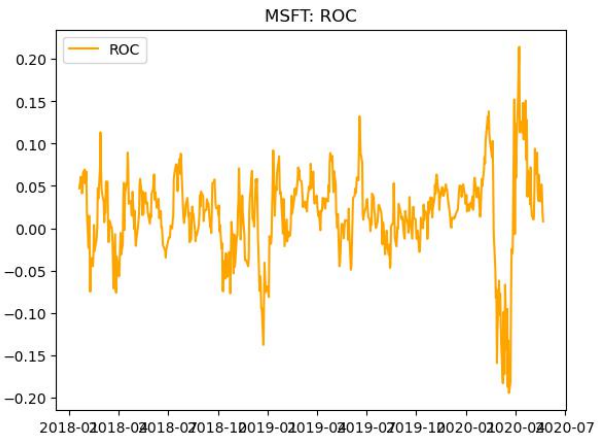
(d) AMZN: Cumulative Strategy Returns

Figure 1: Performance for MSFT and AMZN

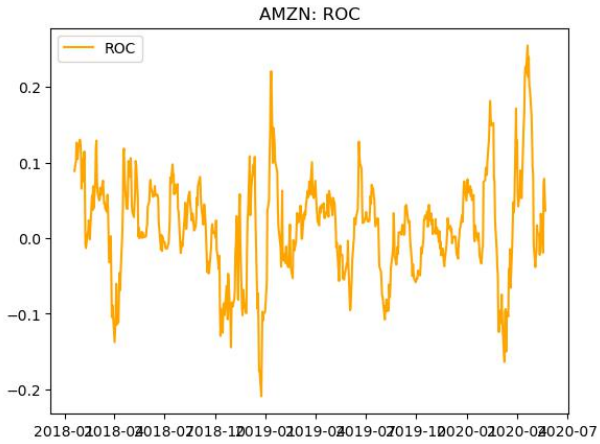
2 Question 2

We use the 2 year period starting from 2015-2017. We use the following 9 stocks: AAPL, ABBV, AMZN, DB, DIS, FB, GOOG, HAL, HSBC.

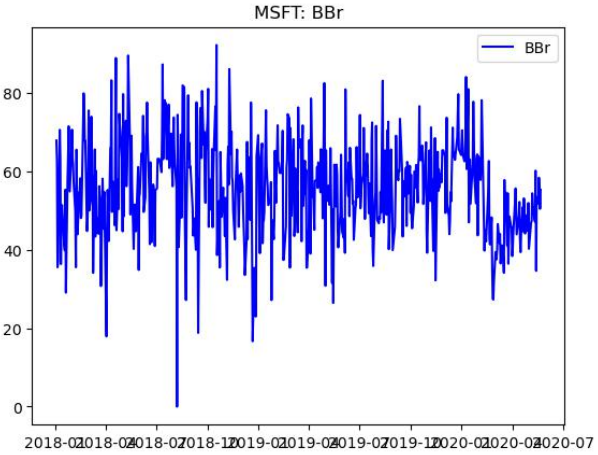
From the bar charts, we can see that a higher kappa spreads the portfolio over more stocks, and reduces



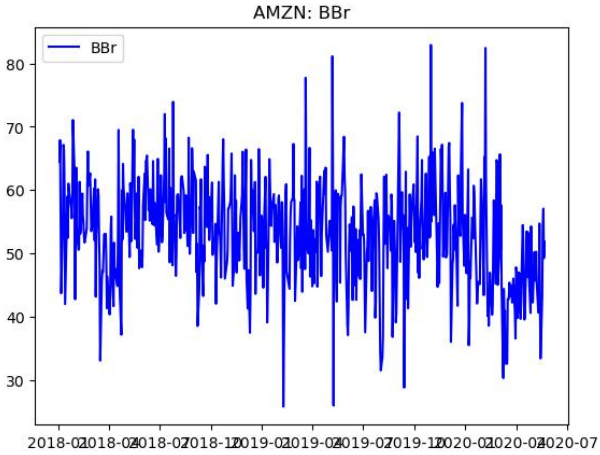
(a) MSFT: ROC



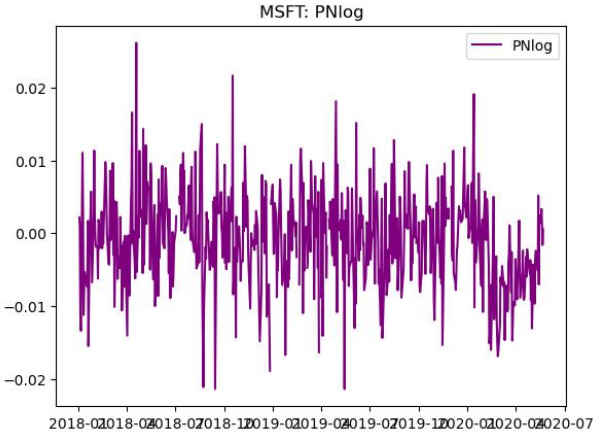
(b) AMZN: ROC



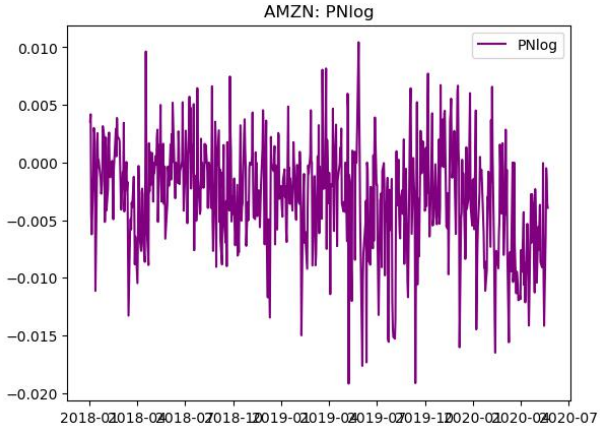
(c) MSFT: BBr



(d) AMZN: BBr

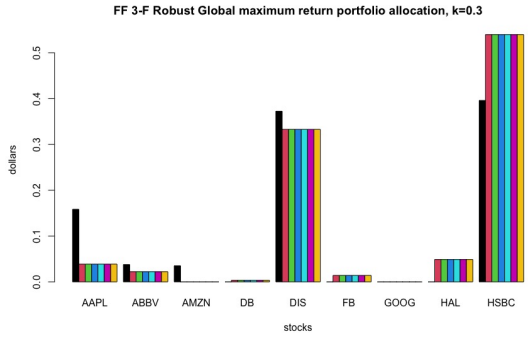


(e) MSFT: PNlog

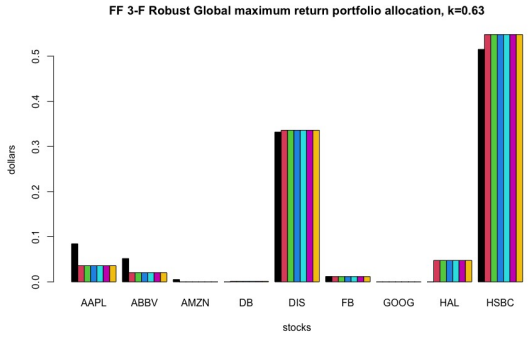


(f) AMZN: PNlog

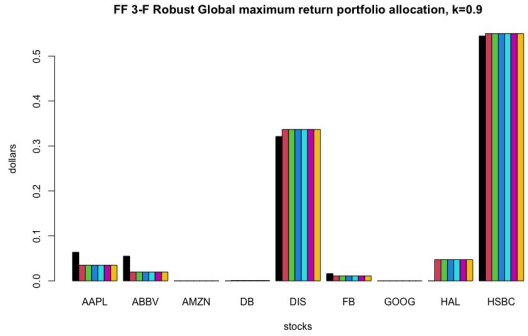
Figure 2: Indicators for MSFT and AMZN



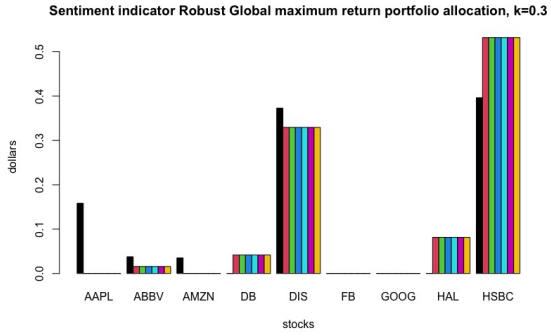
(a) FF-3 Factor , $\kappa = 0.3$



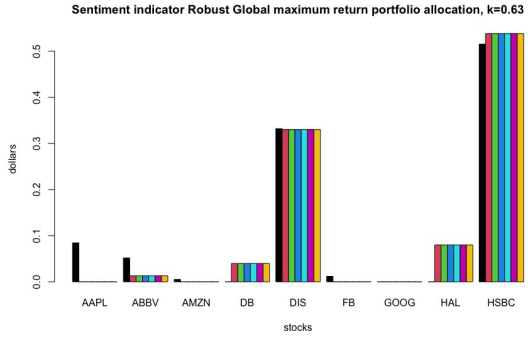
(b) FF-3 Factor , $\kappa = 0.63$



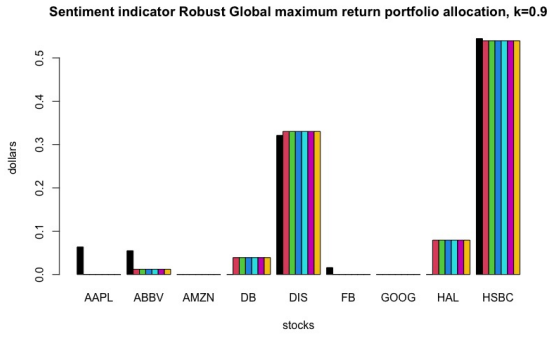
(c) FF-3 Factor , $\kappa = 0.9$



(d) Sentiment Factor , $\kappa = 0.3$

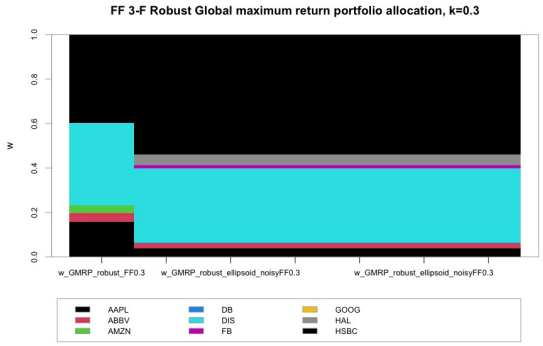


(e) Sentiment Factor , $\kappa = 0.63$

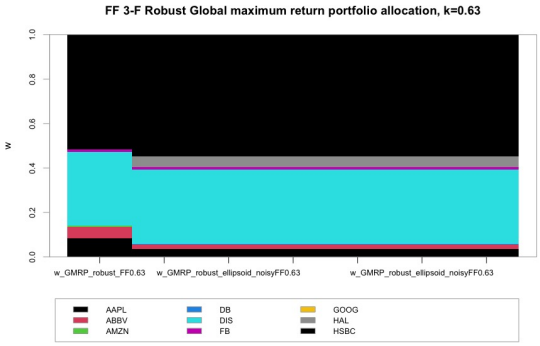


(f) Sentiment Factor , $\kappa = 0.9$

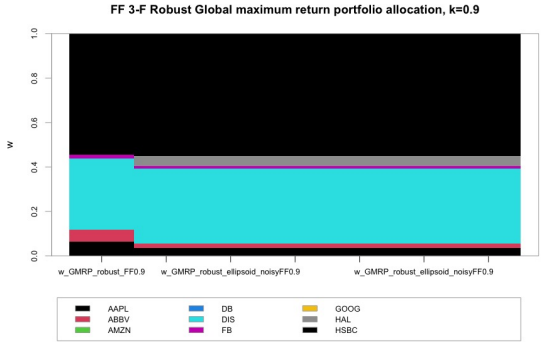
Figure 3: Portolio Bar Plots



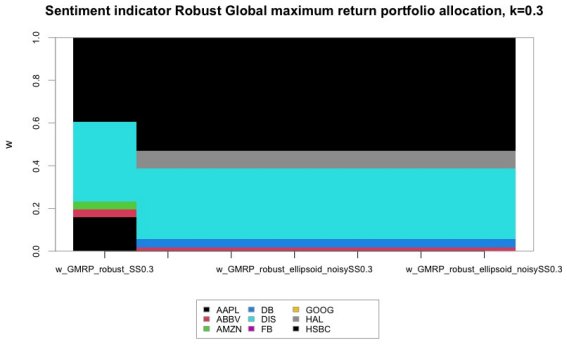
(a) FF-3 Factor , $\kappa = 0.3$



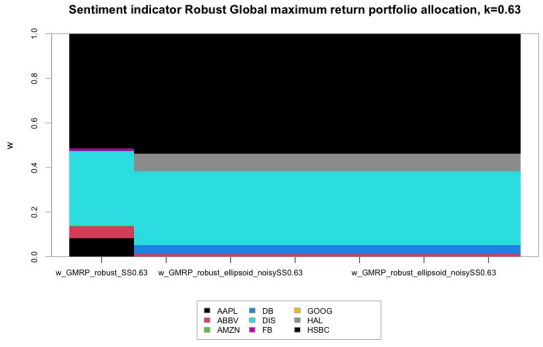
(b) FF-3 Factor , $\kappa = 0.63$



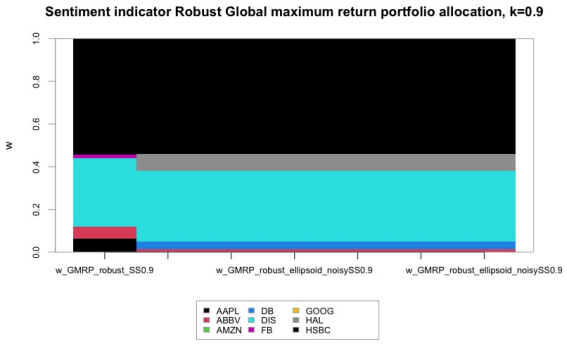
(c) FF-3 Factor , $\kappa = 0.9$



(d) Sentiment Factor , $\kappa = 0.3$



(e) Sentiment Factor , $\kappa = 0.63$



(f) Sentiment Factor , $\kappa = 0.9$

Figure 4: Portolio Chart Plots

risks. With a lower kappa more of the portfolio is put into less stocks.

Both portfolios appear to be quite similar for both models, with both models favouring HSBC and DIS. There is differences however. The Sentiment indicator PNlog factor model doesn't put much weight at all in AAPL, while the Fama-French 3 factor model does. The Fama French model also puts less weight in DB.