**Senior Capstone Project**

Evaluating Success of Technical Analysis Investment Strategies

Chapter 3: Relative Strength Index



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**Background**

Relative Strength Index is another popular technique in technical analysis. Similar to bollinger bands it looks to identify when there is an opportunity to enter the market when equities have been overbought or oversold. The RSI is a moving oscillator and falls between a value of 0 and 100. It is typically plotted below the line of an equity to get an overview of the movement of the stock. An asset is overbought when the value is greater than 70 which implies a sell signal and an asset is oversold when the value is less than 30 which implies a buy signal.

The following method is followed to create RSI values

1. Difference the data

2. Track average gain/loss where gain is the positive movement from day to day and loss is the negative movement

3. Create the RS via the average gain/average loss

4. Create the RSI value by 100 - (100/(1+RS))

A graph of stock market

Description automatically generated with medium confidence

**Stochastic Modeling**

As there are multiple buy and sell signals these are algorithmically created actions that will not change per day. For example in *table 1* there is a buy signal on 2008-11-21 which will never change but the time period in which the investments can take place will. This allows for stochastic modeling during different time periods to get a distribution of expected returns. The purchases and sales will pull from the cash balance and stock balance respectively. This allows for an accurate representation of what investing with that particular method could see return.

**Amount to buy/sell**

The amount to buy/sell will be standard across technical analysis techniques. There will be a 20% purchase of the cash balance and a 20% sale of the stock balance when there is a respective buy/sell action. This should allow for multiple buy and sell periods in a row without creating a very small cash balance or a ver small stock balance. The downside is that it puts a greater emphasis on the beginning days of the investment period. However, with the stochastic modeling of different days it should reduce the impact of this on understanding technical analysis techniques.

**Cash Balance**

This balance is going to be set at $100 for the investment period. Whenever there is a buy signal it will pull from this amount. A sell signal will add cash to the balance this relationship should allow for a true representation of stock investing.

**Stock Balance**

This is set at $0, representing investing in stocks purely based on the signals of the technical analysis. There will be times where incorporating the initial balance of stocks can used in testing as it will represent a buy/hold with a technical analysis strategy.

**Distribution of Data**

A distribution of the returns from the 1000 iterations of modeling is created for each stock during each macroeconomic cycle. This is done for testing to further understand how different models perform with different sector ETF’s rather than letting individual stock performance influence the results of the investigation.

A graph of a graph showing the return on investment

Description automatically generated

**Base Model**

Use n days for the time period where you are looking at average gain/average loss. It is typical to use 14 days as recommended by J. Welles Wilder but longer and shorter time periods are also utilized.

A table of numbers with different colored numbers

Description automatically generated

Parameter optimized

A table of numbers with different colored numbers

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