Predictive Relationship: Rolling Change Regression

Contents

1 Trading Strategy Description

This trading rule computes portfolio allocation using the predicted price, standard error, and the Kelly Fraction. The price is predicted based on daily changes in the research series for a given number of prior time steps.

2 How to Trade

In order to trade with the rules InferTrade provides, we calculate allocations for each day. We then allocate that fraction of our total portfolio value (cash and securities) to the market we are trading - to do this we buy or sell securities to reach the target allocation.

(a) Market series data
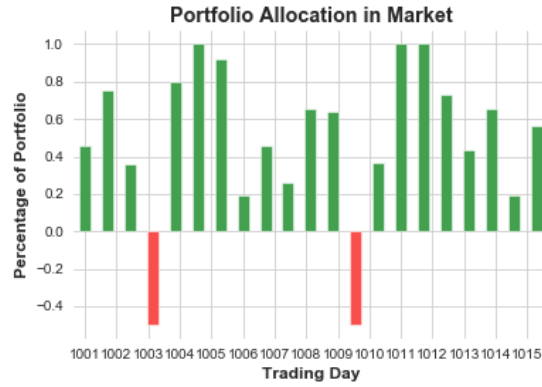
(c) Suggested volume to buy or sell

(b) Research series data

(d) Portfolio return

Figure 1: Graphical depiction of the Rolling Change Regression algorithm. 20 Days of trading data is visualized in the graphs (1a) A line chart showing changes in the market price for multiple trading days.(1b) A chart displaying the research series data. (1c)Positive values indicate that buying the security by x%. The negative values mean you are shorting the security by x% (1d)Chart showing the portfolio return when using the Rolling Change Regression as the trading rule.

How Allocation Determines Trade Size

The allocation is the fractional amount of the portfolios value used to determine the size of the trading position. For example, if the allocation for Microsoft (MSFT) shares is 50%, and we have \$100, we invest \$50 so that the value of held stock is the same as the value of held cash.

Rule Specific Trading Details

Given default parameter values, if the asset drift is 0.01 and the error is 0.05 (5% daily volatility), this rule will take a $0.01/(0.05)^2 = 4.0$ or 400% position (leveraged).

3 Rule Parameters

Below is a table summarizing the parameters specific to this trading rule.

Parameter Name	Default Value	Description	Symbol
Kelly fraction	1.0	Amplitude weighting. 1.0 is maximum growth if regression is exact. <1.0 scales down positions taken.	F
Regression length	50	This is the number of days used to estimate the regression coefficients.	L

4 Equation

Below are the equations which govern how this specific trading rule calculates a trading position.

$$y_t = \kappa\left(\frac{r_t}{r_{t-1}} - 1\right) + c \tag{1}$$

$$z_t = F\frac{y_t}{\varepsilon_{rms_t}^2 y} \tag{2}$$

where r is the value of the research series, y_t is the predicted price at time t, ε_{rms_t} is the root mean squared error computed using predicted price change and actual price change, F is the Kelly Fraction, and z is the resultant fractional portfolio investment.

5 Glossary

- **Bullish:** Positive outlook on the market. Expectation of positive returns.

- **Bearish:** Negative outlook on the market. Expectation of negative returns.

- **Allocation:** The allocation is the fractional amount of the portfolios value used to determine the size of the trading position.

- **Parameter:** Value used by the trading rule in the calculation for trading position

- **Trading Rule:** Strategy to determine when to buy, hold or sell a position.

Further Links

1. InferTrade: `https://www.infertrade.com`

2. Privacy Policy/Legal notice: `https://www.infertrade.com/privacy-policy`

3. InferStat Ltd: `https://www.inferstat.com`