Predictive Relationship: Static Change Regression

Contents

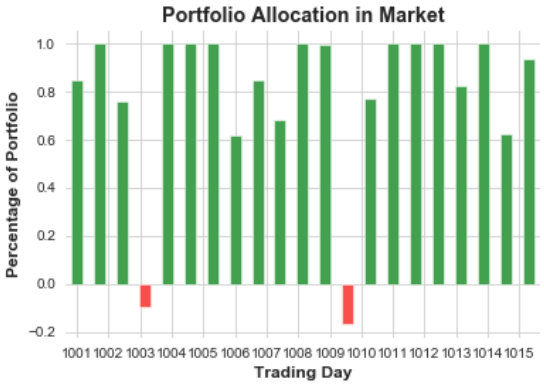
1 Trading Strategy Description

Regresses the one-day price changes against the lagged level one-day change of the signal for the specified number of days, using coefficients estimated from the start of the data.

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 Static 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 Static 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 trading rule determines a trading position.

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

The equation (1) predicts the value of the price y_t at time t using the ratio of the research value at time t at r_t and the research value at time $t-1$. Since we are using a static approach the amplitude coefficient κ remains constant. In order to calculate the resultant fractional portfolio allocation z_t we use the Kelly fraction to obtain the maximum results for the long run.

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

where
r: is the value of the research series.
y_t: is the predicted price at time.t.
$\varepsilon_{rms_t y}$: is the standard error.
F: is the Kelly Fraction.
z: is the resultant fractional portfolio investment.
The standard error $\varepsilon_{rms_t y}$ is calculated and included in equation (2) to normalize the predicted price.

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`