Predictive Relationship: Static Level Regression

Contents

1 Trading Strategy Description

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

2 How to Trade

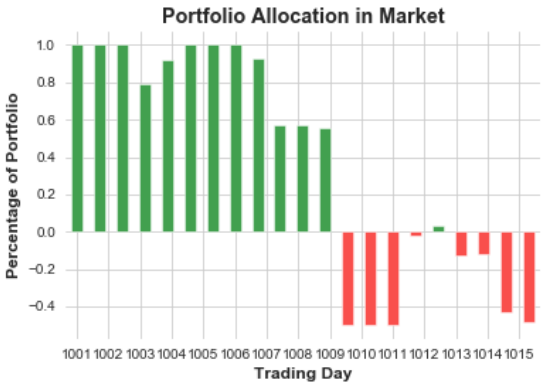
In order to trade with the rules InferTrade provides, we calculate allocations for each day. We then allocate that fraction of our total portfolio value (cash and securities) to the market we are trading - to do this we buy or sell securities to reach the target allocation. Given default parameter values, if the asset drift is 0.001 and the error is 0.02 (2% daily volatility), this rule will take a $0.001/(0.02)^2 = 2.5$ or 250% position (leveraged).

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

(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 Level 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 Level Regression as the trading rule.

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

The following equations describe the static level regression rule:

$$y_t = \kappa r_t + c \tag{1}$$

Using the equation (1), it is possible to calculate the predicted price y_t at time t. Here the values of the research series r_t and the c are fitted from the data. In order to calculate the resultant fractional portfolio allocation z_t we use Kelly fraction to obtain the maximum results for the long run.

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

r : is the value of the research series.
y_t : is the predicted price at time t.
ε_{rms_t} : is the standard error between predicted and ground truth prices.
F : is the Kelly Fraction.
z : is the resultant fractional portfolio allocation.
ditionally, 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`