



# Predictive Relationship: Rolling Difference Regression

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# 1 Trading Strategy Description

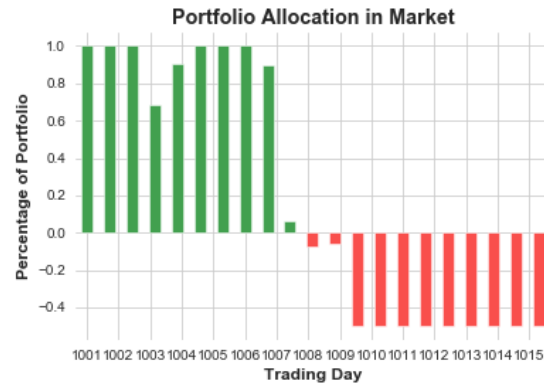
Regresses the one-day price changes against the % gap between the research value and the price value. Assuming the regression gives a positive relationship the strategy takes bigger positions when the research is higher than the price series.

## 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 Difference 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 Difference 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

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.

# 3 Rule Parameters

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

Parameter Name	Default Value	Description	Symbol
Kelly Fraction	0.1	Amplitude weighting. 1.0 is maximum growth if regression is exact. <1.0 scales down positions taken.	Symbol
Regression Length	50	This is the number of days used to estimate the regression coefficients.	Symbol

# 4 Equation

The following equations describe the rolling level rule:

$$y_t = \kappa(r_t - P_t) + c \quad (1)$$

$$z_t = F \frac{y_t}{\varepsilon_{rms_{ty}}^2} \quad (2)$$

where

$r_t$ : is the value of the research series.

$y_t$ : is the predicted price at time  $t$

$\varepsilon_{rms_{ty}}$ : is the standard error.

$F$ : is the Kelly Fraction.

$z$ : 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>