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BIG DATA IN FINANCE

CONTEMPORANEOUS

VARIABLE RELATIONSHIPS

Direct relationship (positive (+) correlation):

- Interest differential
  - ↑ forward exchange rate = ↑ future spot rate
  - more attractive to save money in currency with higher interest rate
- IP differential
  - higher demand for goods and services = ↑ production
    = stronger economy = ↑ value of currency

Indirect relationship (negative (−) correlation):

- Inflation differential
  - ↑ inflation = more money buys fewer goods = ↓ value of currency
- MS differential
  - all else equal, ↑ supply with constant demand = ↓ spot rate

MODEL

PARA-METERS

Hyper-parameters tuned via cross-validation:

- Random forest: minimum leaf size
- Bayesian ridge regression: lambda
- Elastic net: L1 ratio and alpha

WINDOW SIZE

60 months (5 years)

- Long enough to avoid over-sensitivity to recent events
- Short enough to contain relevant information

COEFFICIENTS

- Changes according to model
- Changes with every iteration

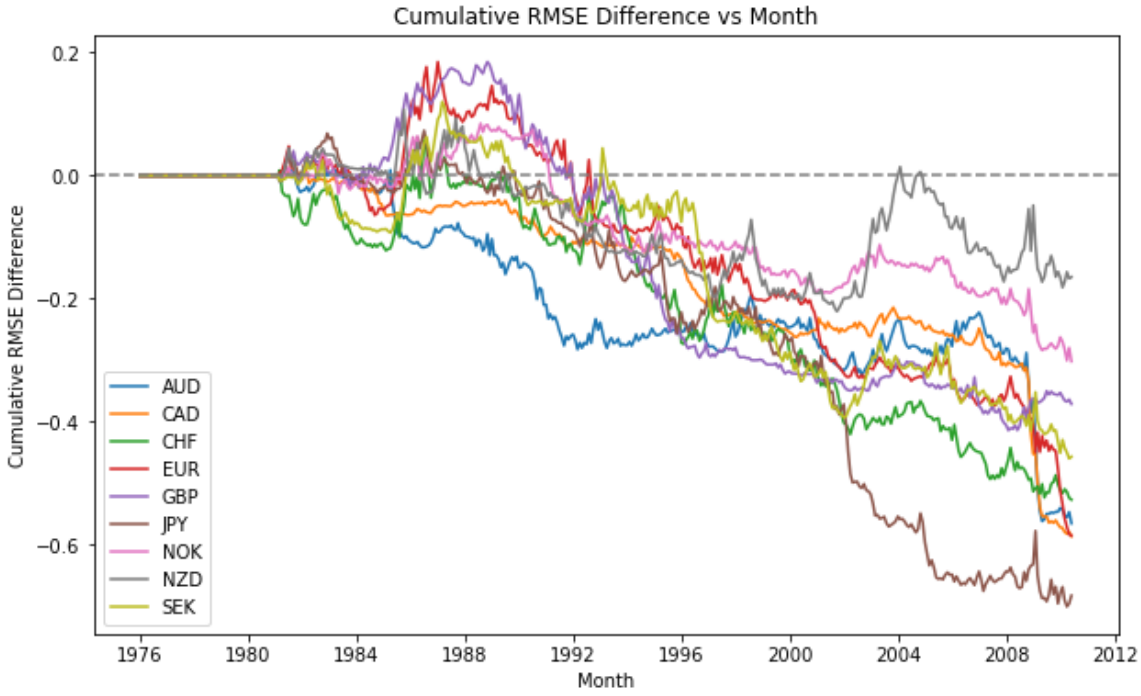
PERFORMANCE

LINEAR REGRESSION

Maximum drawdown
- AUD: 0.593
- CAD: 0.605
- CHF: 0.584
- EUR: 0.770
- GBP: 0.599
- JPY: 0.773
- NOK: 0.386
- NZD: 0.328
- SEK: 0.580

R^2_{00S} = −0.1394

Economic significance =
−1161.72 %



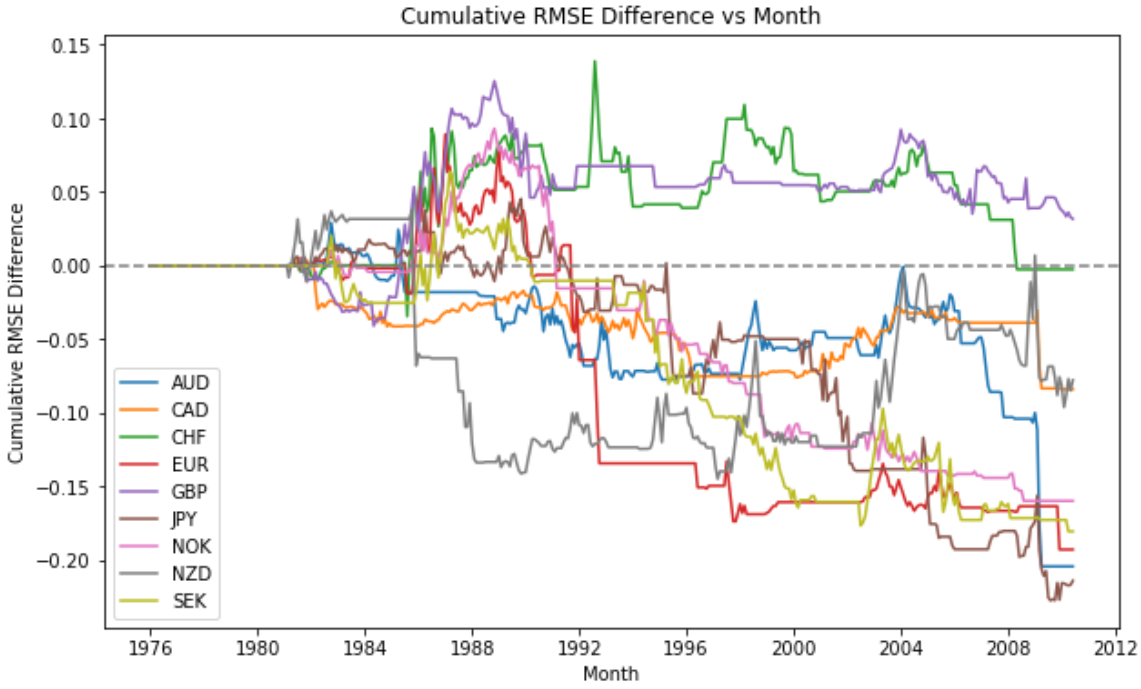
PERFORMANCE

LASSO REGRESSION

Maximum drawdown
- AUD: 0.233
- CAD: 0.089
- CHF: 0.141
- EUR: 0.282
- GBP: 0.094
- JPY: 0.273
- NOK: 0.253
- NZD: 0.182
- SEK: 0.244

R^2_{00S} = −0.0375

Economic significance = −312.68%



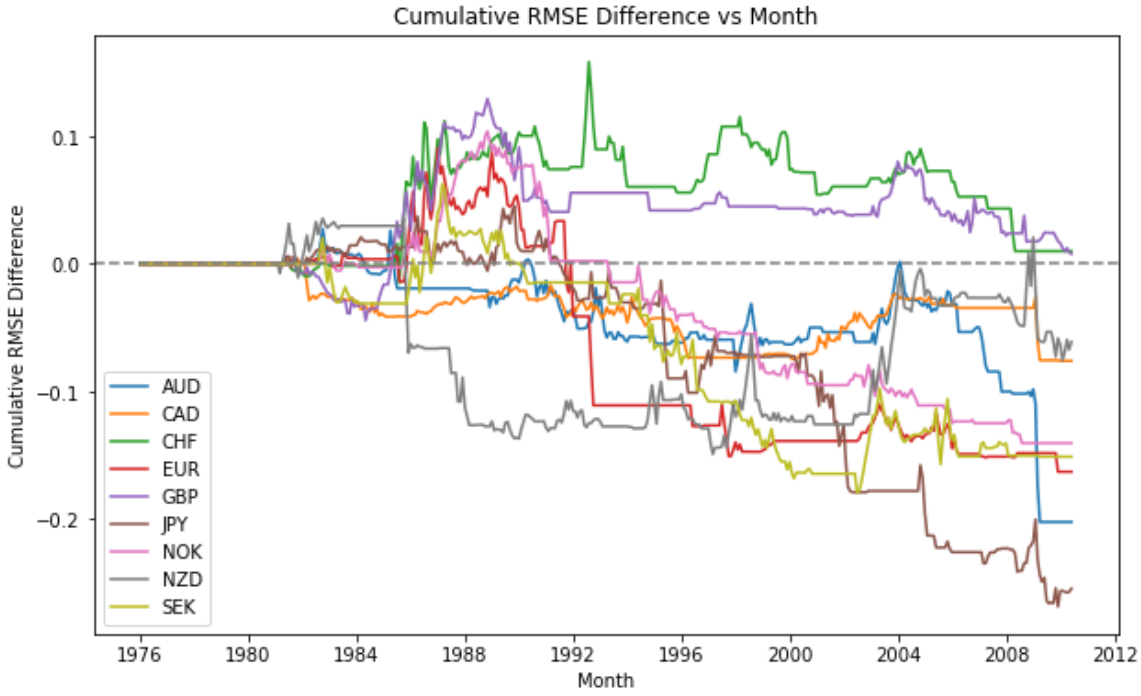
PERFORMANCE

ELASTIC NET

Maximum drawdown
- AUD: 0.230
- CAD: 0.081
- CHF: 0.148
- EUR: 0.254
- GBP: 0.122
- JPY: 0.314
- NOK: 0.244
- NZD: 0.185
- SEK: 0.242

R^2_{00S} = −0.0351

Economic significance = −292.13%



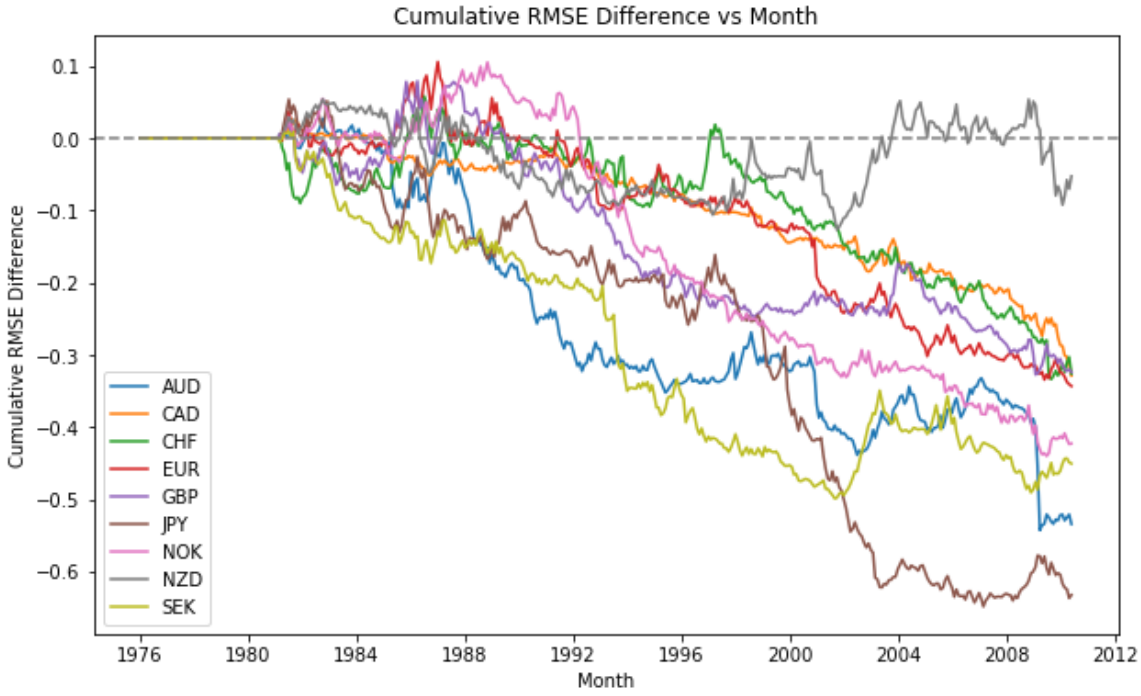
PERFORMANCE

RANDOM FOREST

Maximum drawdown
- AUD: 0.570
- CAD: 0.356
- CHF: 0.392
- EUR: 0.449
- GBP: 0.407
- JPY: 0.703
- NOK: 0.545
- NZD: 0.181
- SEK: 0.508

R^2_{00S} = −0.0981

Economic significance = −817.77%



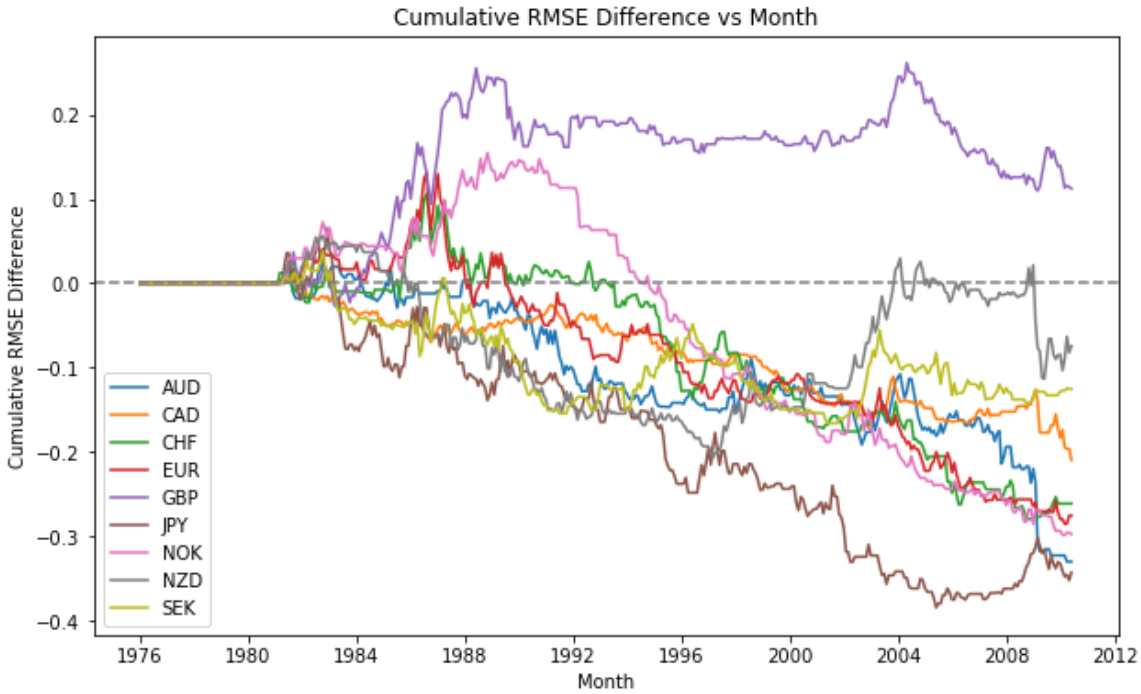
PERFORMANCE

RANDOM FOREST WITH LASSO

Maximum drawdown
- AUD: 0.355
- CAD: 0.221
- CHF: 0.385
- EUR: 0.415
- GBP: 0.151
- JPY: 0.450
- NOK: 0.452
- NZD: 0.263
- SEK: 0.204

$R^2_{00S} = -0.0617$

Economic significance = −514.45%



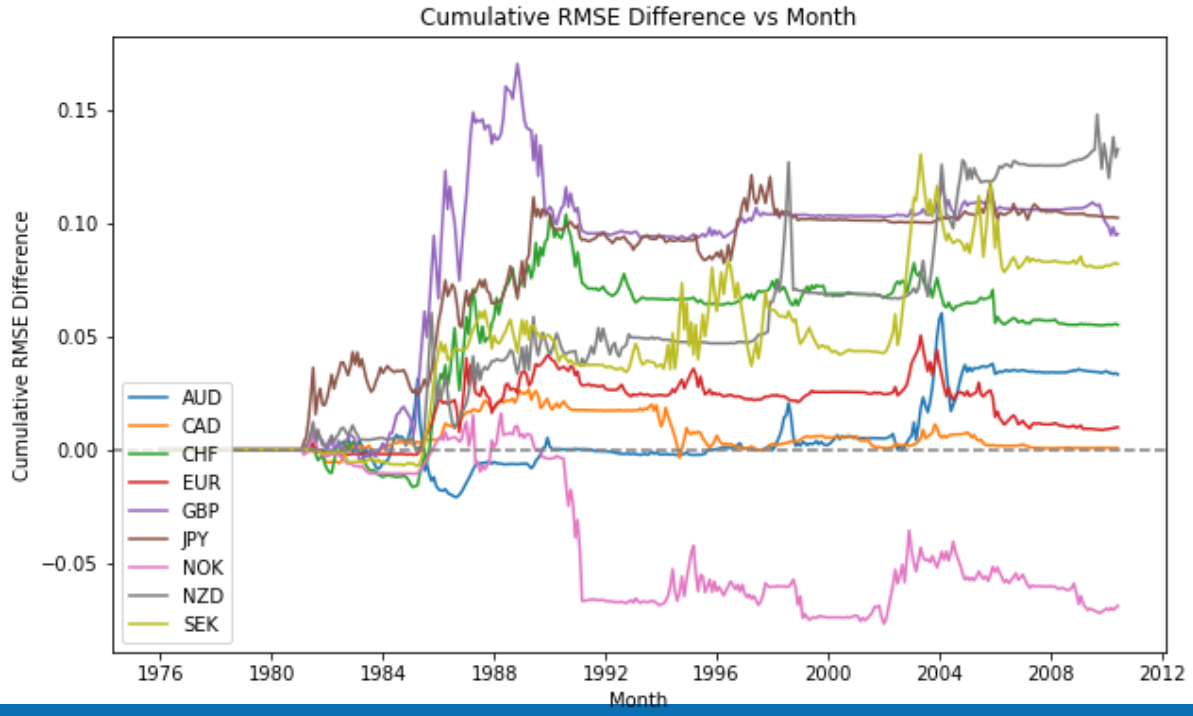
PERFORMANCE

BAYESIAN RIDGE REGRESSION

Maximum drawdown
- AUD: 0.052
- CAD: 0.030
- CHF: 0.049
- EUR: 0.042
- GBP: 0.077
- JPY: 0.029
- NOK: 0.093
- NZD: 0.060
- SEK: 0.052

R^2_{00S} = 0.0056

Economic significance = 46.50%



UNDERSTANDING

PERFORMANCE

Consistency:

- Consistent performance with limited downside risk
- Long periods of performance similar to the mean
- Short bursts when model outperforms and delivers abnormal returns

Economic forces:

- Structural change in the currency itself to dislodge Bayesian estimators (monetary policy, inflation, interest rate etc.)