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Summarised Paper of Solution

Strategy:

Pairs trading strategy:

- Checks for unit roots on exchange rates to confirm non-stationarity of series
- Searches for two cointegrated exchange rates satisfying p-value < 0.05 for stage 1 null hypothesis of no cointegration and p-value > 0.05 for stage 2 null hypothesis of at most 1 cointegrating equation
- Once cointegrating pairs have been identified, establishes spread using normalised series
- If last spread greater than pre-specified number of standard deviations (2 in back-test) based on rolling window for spread (30 days in back-test), simultaneously sells 1 week forward on overvalued currency and buys 1 week forward on undervalued currency
  - Quotes are based on USD___ where ___ is the foreign currency
- On the 7th day, reverses open positions by buying and selling overnight expiring forwards on overvalued and undervalued currencies respectively
- Iterate for length of back-test

Back-test parameters:

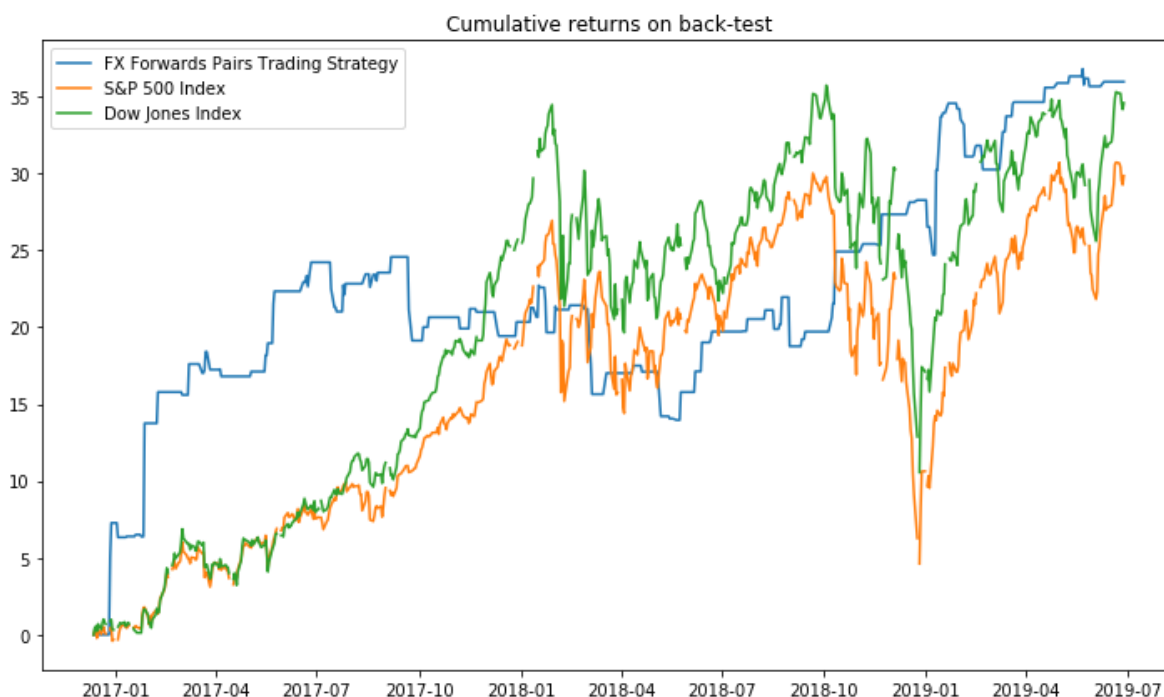| Back-test parameter	Value
Lookback/rolling period (number of days to test for currency pairs satisfying strategy)	30 days
Initial capital	$10000 USD
Trade size	2500 contracts
Number of standard deviations	2
T (back-test length)	694 days

Figure 1: Values for each back-test parameter

Back-test results:

Figure 2: Cumulative returns results on back-test for strategy against two indices

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Strategy vs. Benchmarks	Sharpe Ratio using US 3-month Treasury bills as risk-free benchmark
Pairs trading strategy	1.1476
S&P 500 index	1.0860
Dow Jones index	1.1035

Table 1: Sharpe ratios for strategy, S&P 500 and DJ indices based on US 3-month T-Bills

Performance Evaluation Metric	Value
Net profit	$3596.0813
Net profit %	35.9608%
Annual return	12.8201%
Total number of trades	560
Total number of winning trades	300
Win %	53.5714%
Average profit	$26.4694
Total number of losing trades	260
Loss %	46.4286%
Average loss	$23.6261
Expectancy ($\frac{total\ profit+total\ loss}{number\ of\ trades}$)	3.2108
Maximum drawdown	8.5148%

Table 2: Values for other performance evaluation metrics