Description of Bot Tau

Frans Englich
fenglich@fastmail.fm

August 21, 2025

Contents

1 Introduction

This document describes the simulated in-sample performance of Bot Tau's trading strategy. It does not describe the strategy itself, which is proprietary.

2 Trading Plan

Table 1: Specifics of the trading plan.

Assets	Currently undecided
Overnight?	We close positions at end of each trading day, because we don't want overnight exposure.
Number of trades per day	Currently undecided
Performance	• Yearly return > ? • Sharp Ratio > ? • Calmar Ratio > ?
Over-fitting	How many times can the strategy be adjusted? How many back tests?

Risk management conditions:

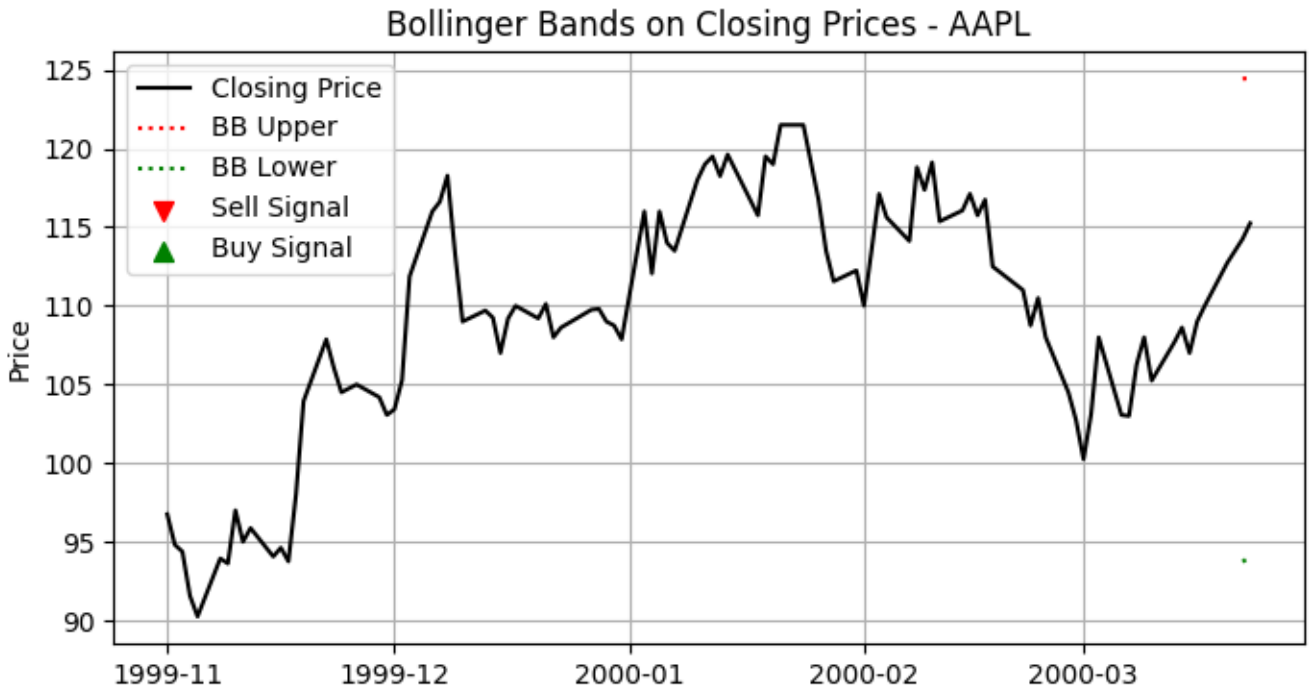
- If we have more than 3 losing trades per day, we stop the algorithm for the day.
- We stop the algorithm after X % loss in one month.
- We stop the algorithm if the drawdown in live trading becomes times higher than the drawdown in incubation.

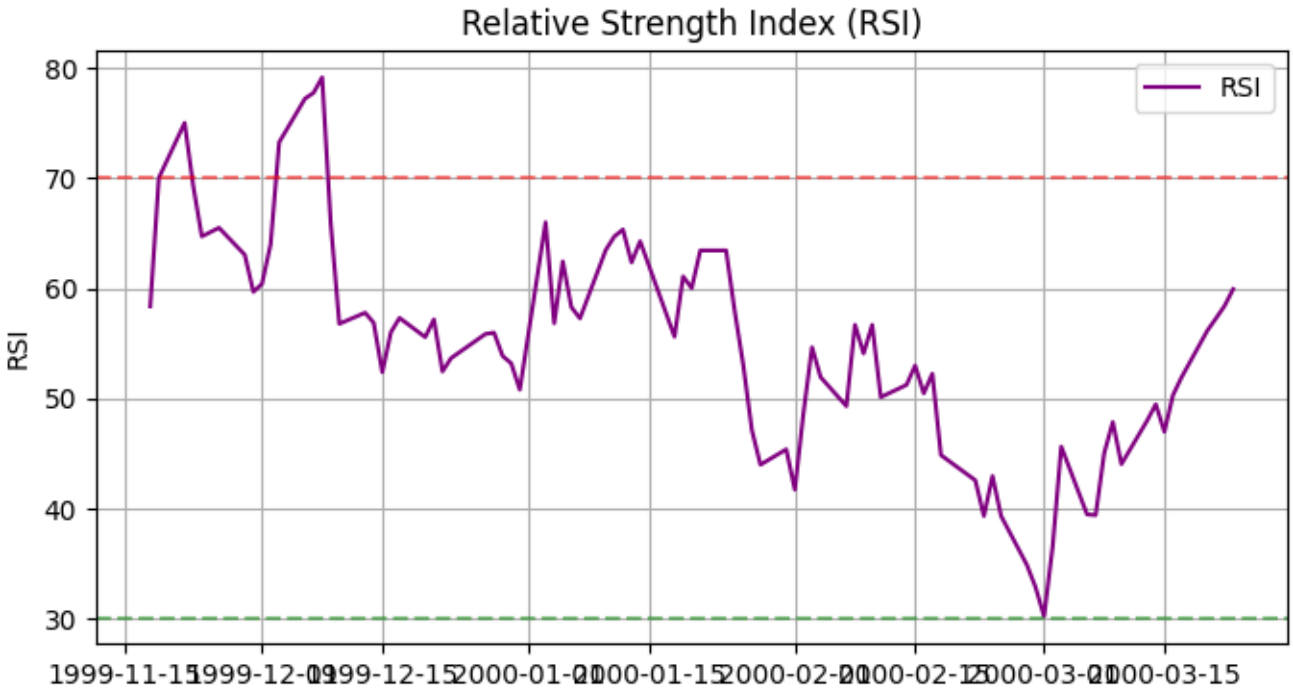
3 The Dataset

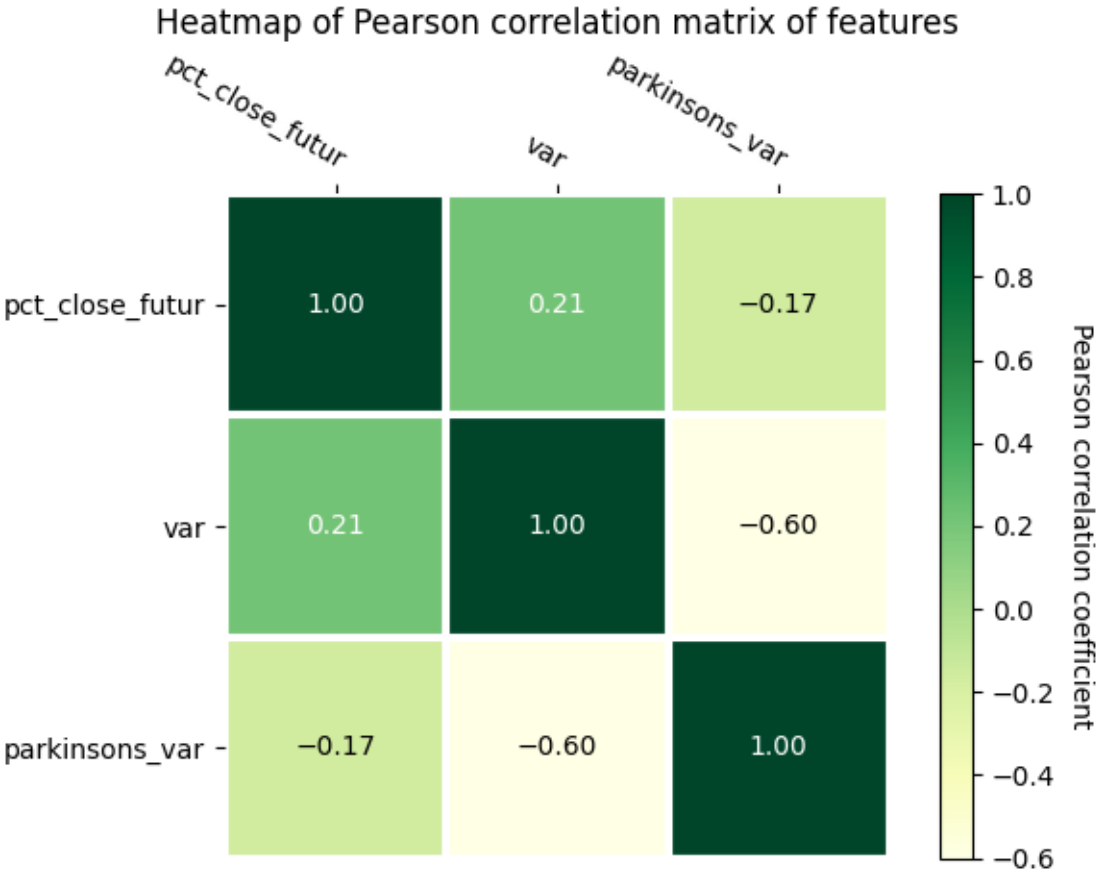
The dataset stretches from 1999-11-01 00:00:00 to 2000-03-23 00:00:00.

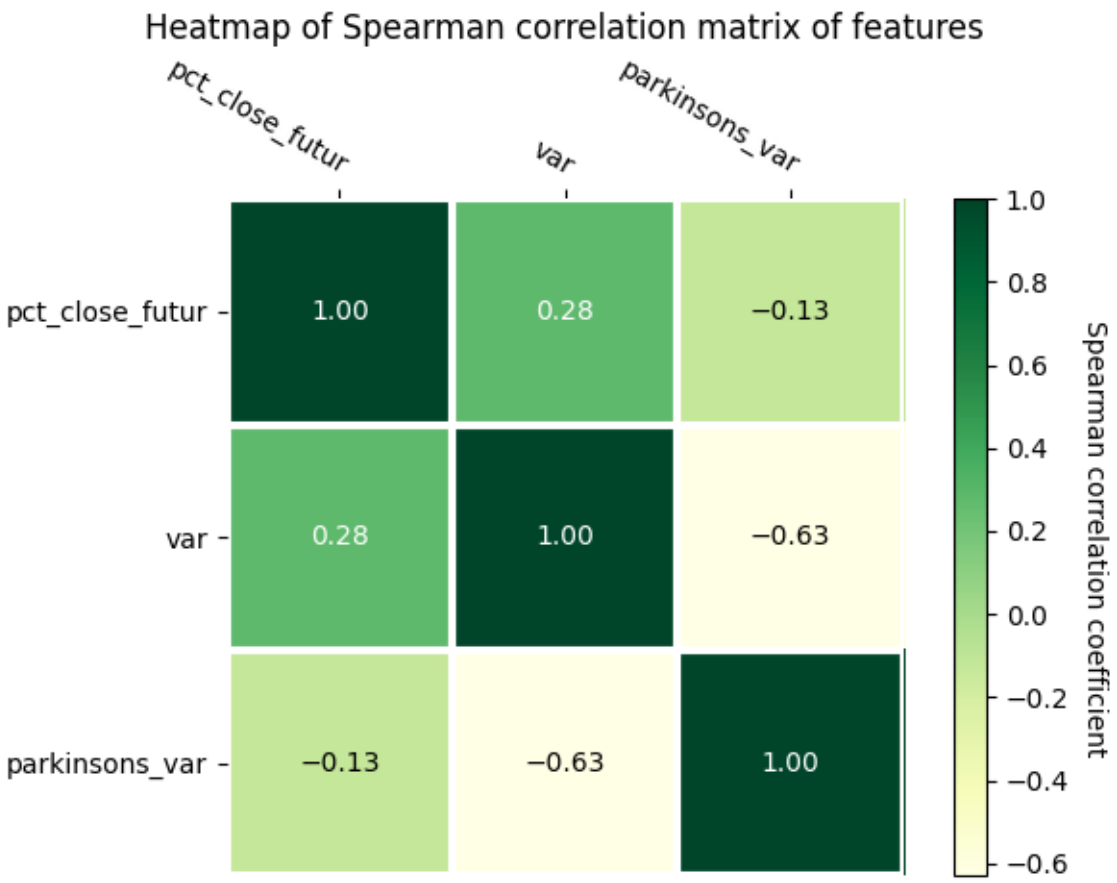
4 Features

Some form of property, typically derived from the OLHCV. An example is volatility. The features used are as follows.




Relative Strength Index (RSI)
RSI
80
70
60
50
40
30
1999-11-15
1999-12-01
1999-12-15
2000-01-01
2000-01-15
2000-02-01
2000-02-15
2000-03-01
2000-03-15


Heatmap of Pearson correlation matrix of features
pct_close_futur
var
parkinsons_var
1.00
0.21
−0.17
0.21
1.00
−0.60
−0.17
−0.60
1.00
Pearson correlation coefficient
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6



4.1 Multicollinearity

See:

- `https://www.geeksforgeeks.org/python/detecting-multicollinearity-with-vif-python/`
- `https://en.wikipedia.org/wiki/Variance_inflation_factor`

Interpretation:

- Values near 1 mean predictors are independent.
- Values between 1 and 5 shows moderate correlation which is sometime acceptable.
- Values above 10 signal problematic multicollinearity requiring action.

Table 2: Variance Inflation Factors (VIF).

Feature	VIF
pct_close_futur	1.08
var	7.76
parkinsons_var	7.6

5 Targets

6 Model

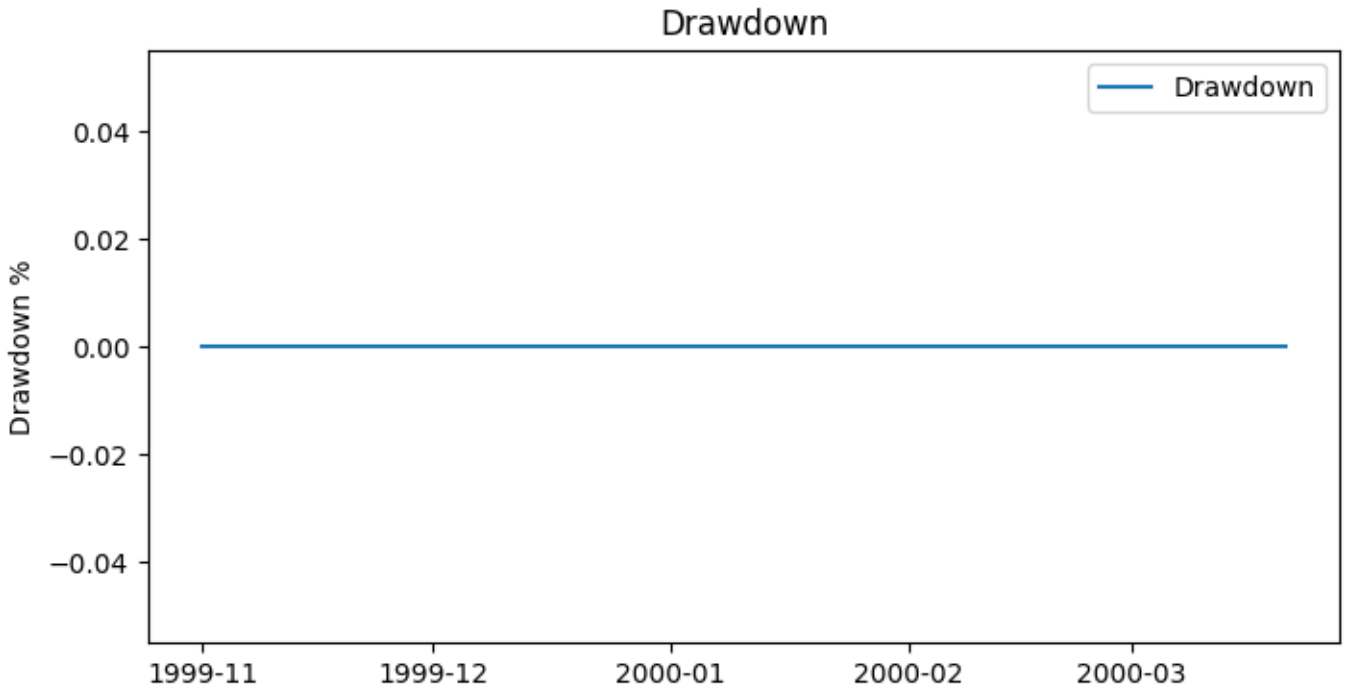
```
                            OLS Regression Results
==============================================================================
```

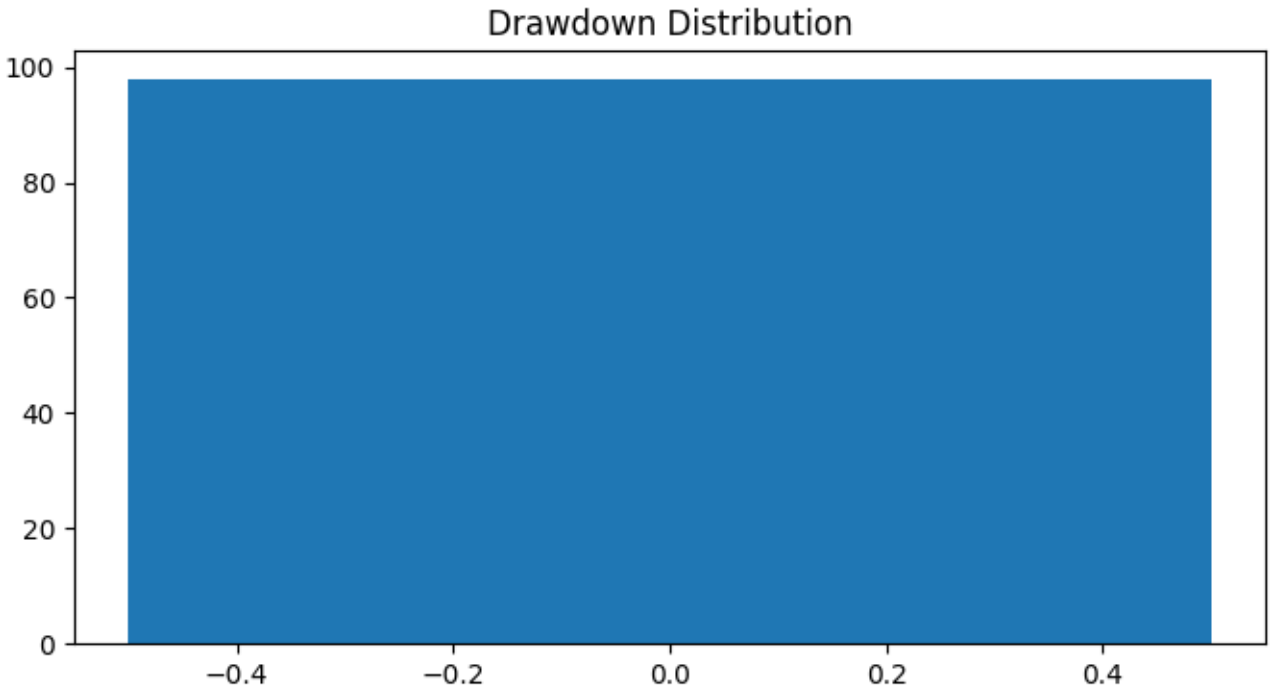
```
Dep. Variable:     target_future_returns_sign   R-squared:                      -0.000
Model:                                    OLS   Adj. R-squared:                 -0.000
Method:                         Least Squares   F-statistic:                       nan
Date:                        Thu, 21 Aug 2025   Prob (F-statistic):               nan
Time:                                11:18:48   Log-Likelihood:                -72.399
No. Observations:                         100   AIC:                             146.8
Df Residuals:                              99   BIC:                             149.4
Df Model:                                   0
Covariance Type:                    nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const          0.5300      0.050     10.566      0.000       0.430       0.630
signal              0          0        nan        nan           0           0
==============================================================================
Omnibus:                      814.468   Durbin-Watson:                   0.562
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               16.668
Skew:                          -0.120   Prob(JB):                     0.000240
Kurtosis:                       1.014   Cond. No.                          inf
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The smallest eigenvalue is      0. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
```

7 Back Test

7.1 Drawdown

Maximum drawdown is 0.0%. We consider 20% an acceptable maximum.



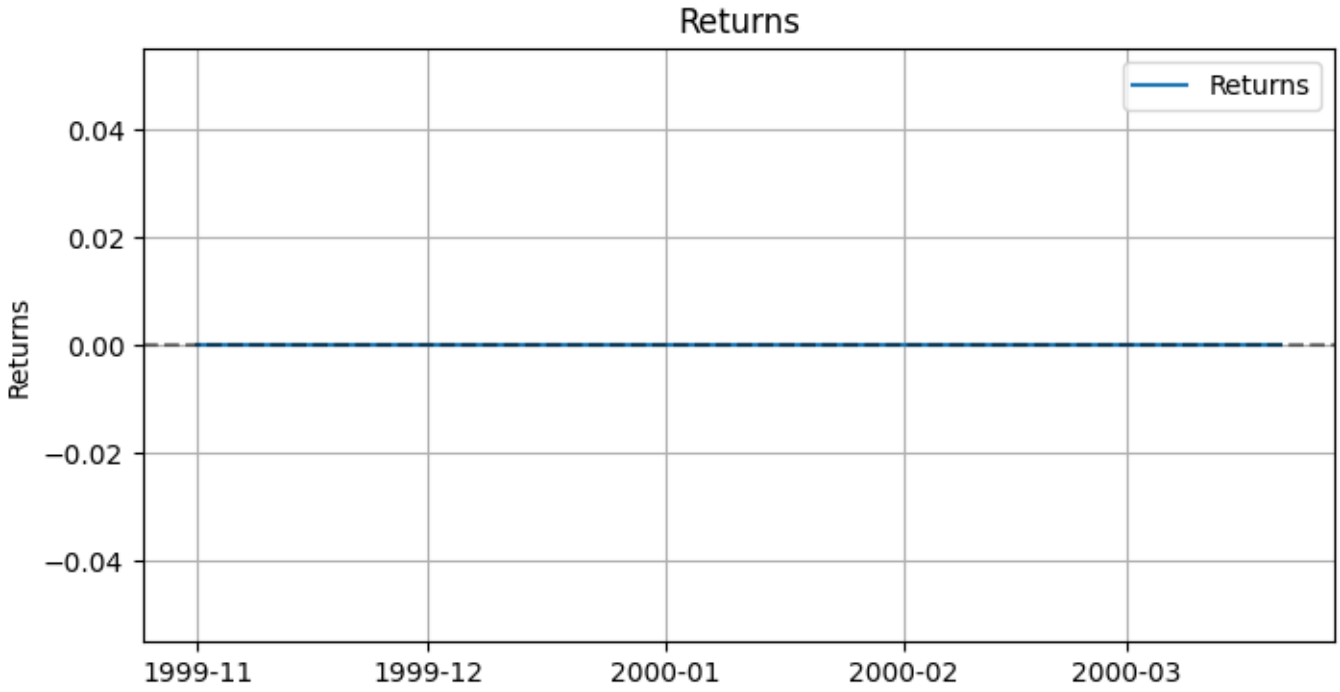


7.2 Returns

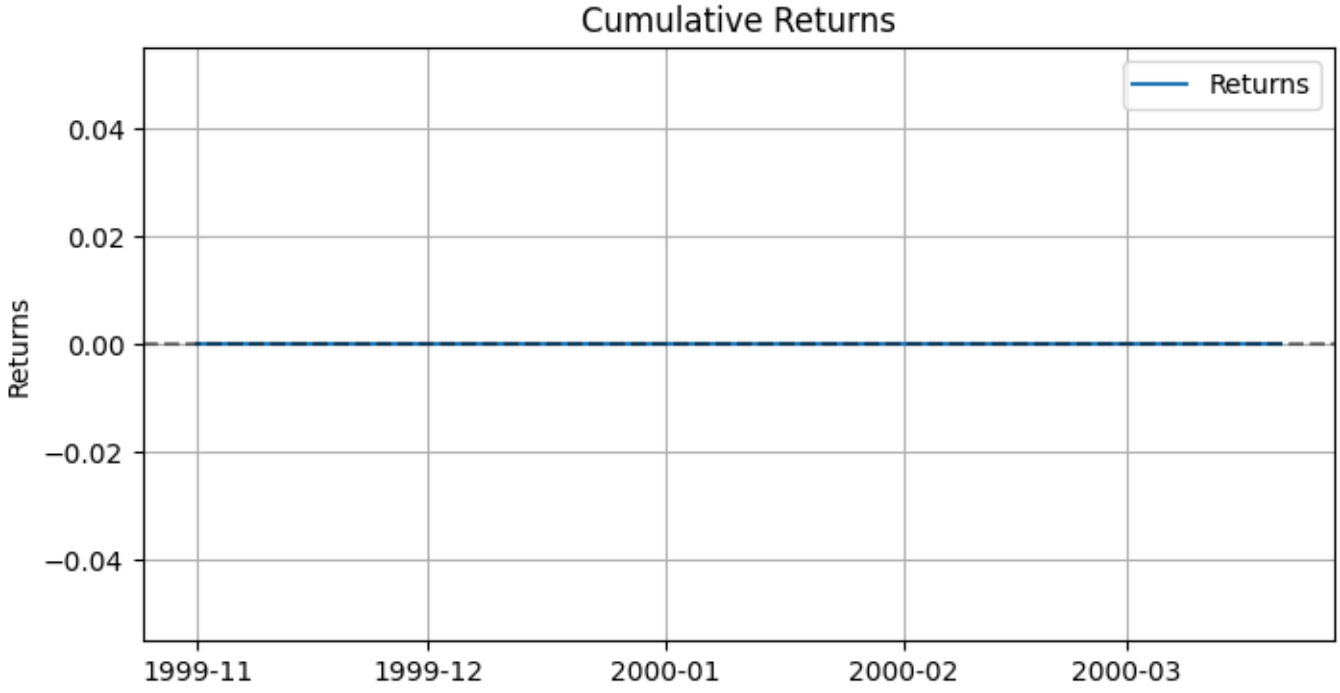
This is the returns of our trading strategy.

Table 3: Statistics of returns.

Mean returns	0.0%
Standard deviation (SD)	0.0
Sharpe Ratio (SR)	nan
Calmar Ratio (CR)	nan

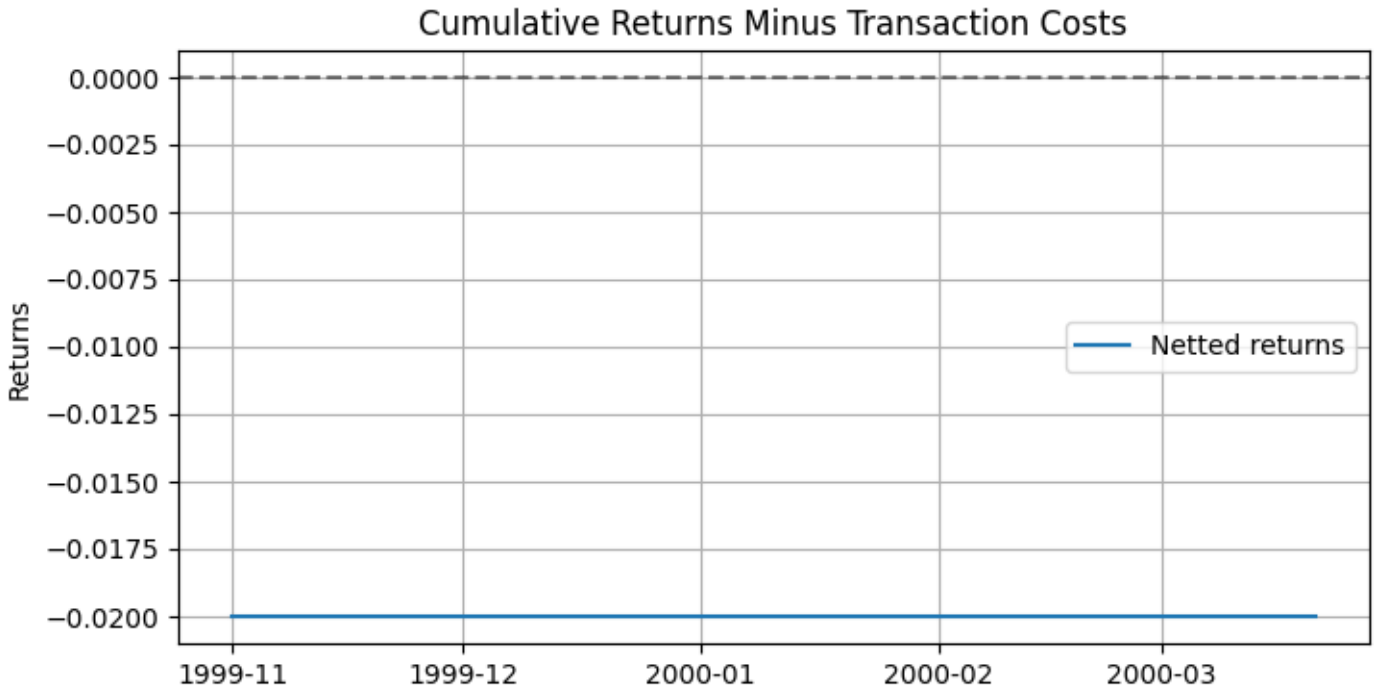


The cumulative returns are not compounding, while the annualized returns are. However, we close the position, meaning compounding isn't relevant.



The transaction cost, C, is calculated using the formula, where t is the trade amount:

$$C = 0.02 * t + spread/2 \tag{1}$$



8 Live Performance

The plan is to paper trade in a one month incubation period.

TODO compare return dist to back test return using Kolmogorov statistical test.

8.1 Performance Report

(Copy Discord report.)

8.2 Trading Journal

No trading have taken place, so nothing here yet.