# Description of Bot Tau

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## 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.

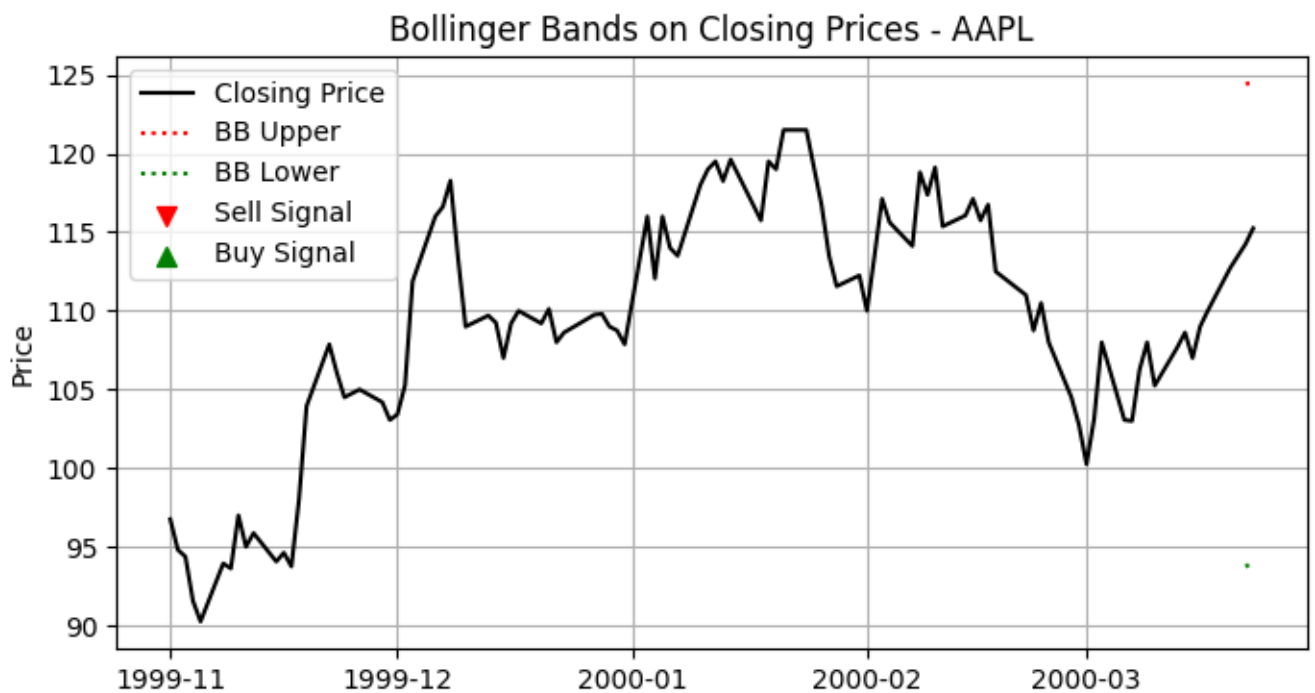| Assets | Currently undecided |
|---|---|
| Overnight? | We close positions at end of each trading day, because we don't want overnight exposure. |
| Number of trades per day | Currently undecided |
| Performance | <ul><li>Yearly return > ?</li><li>Sharp Ratio > ?</li><li>Calmar Ratio > ?</li></ul> |
| 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.
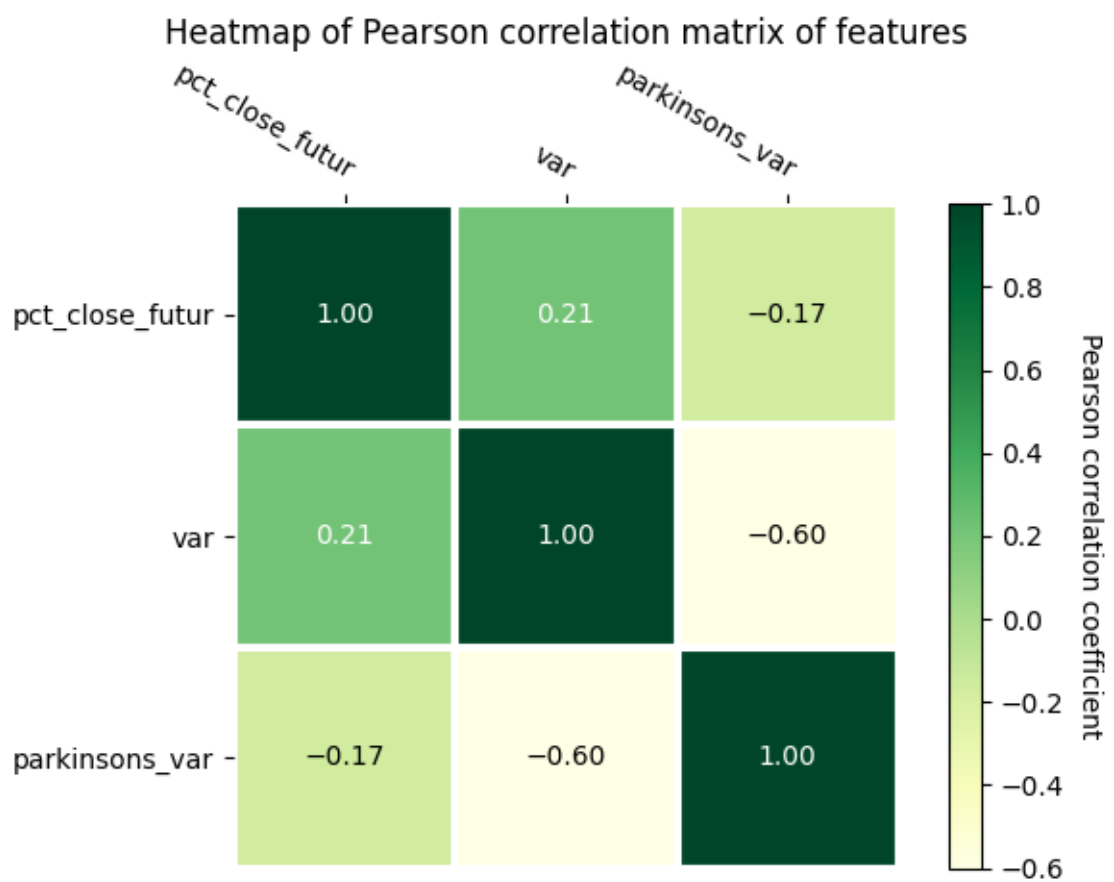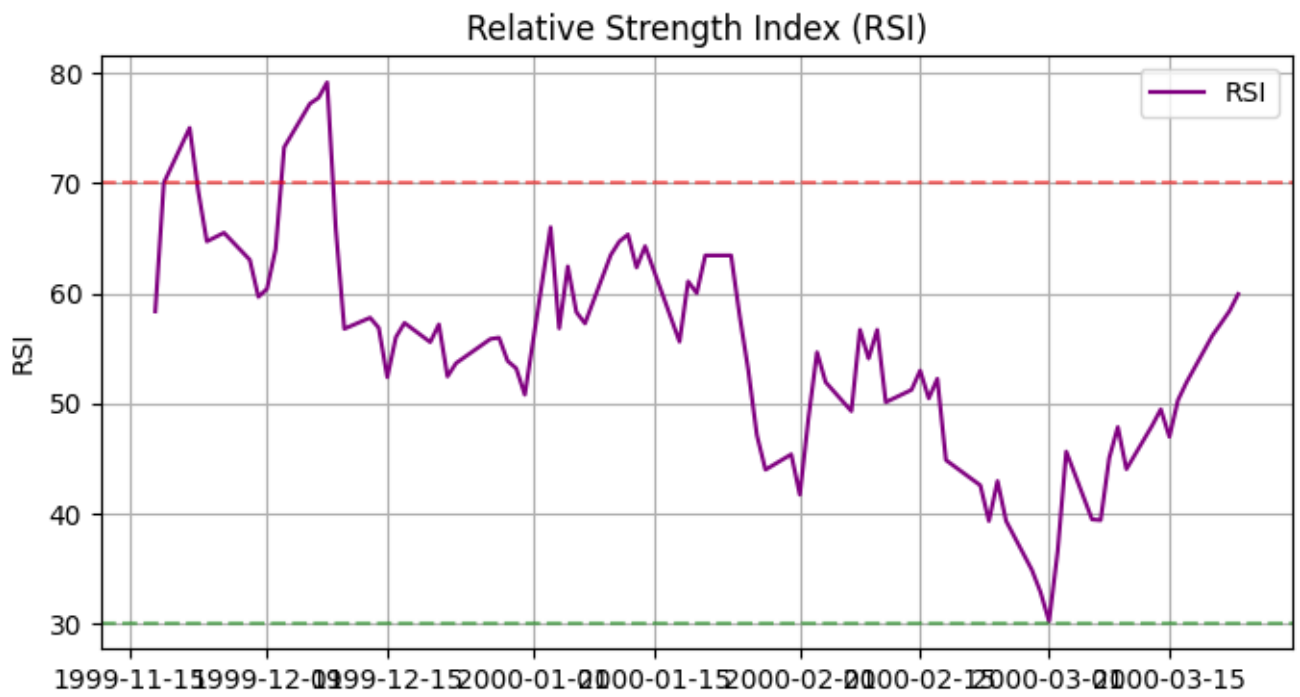
# 3 The Dataset

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.
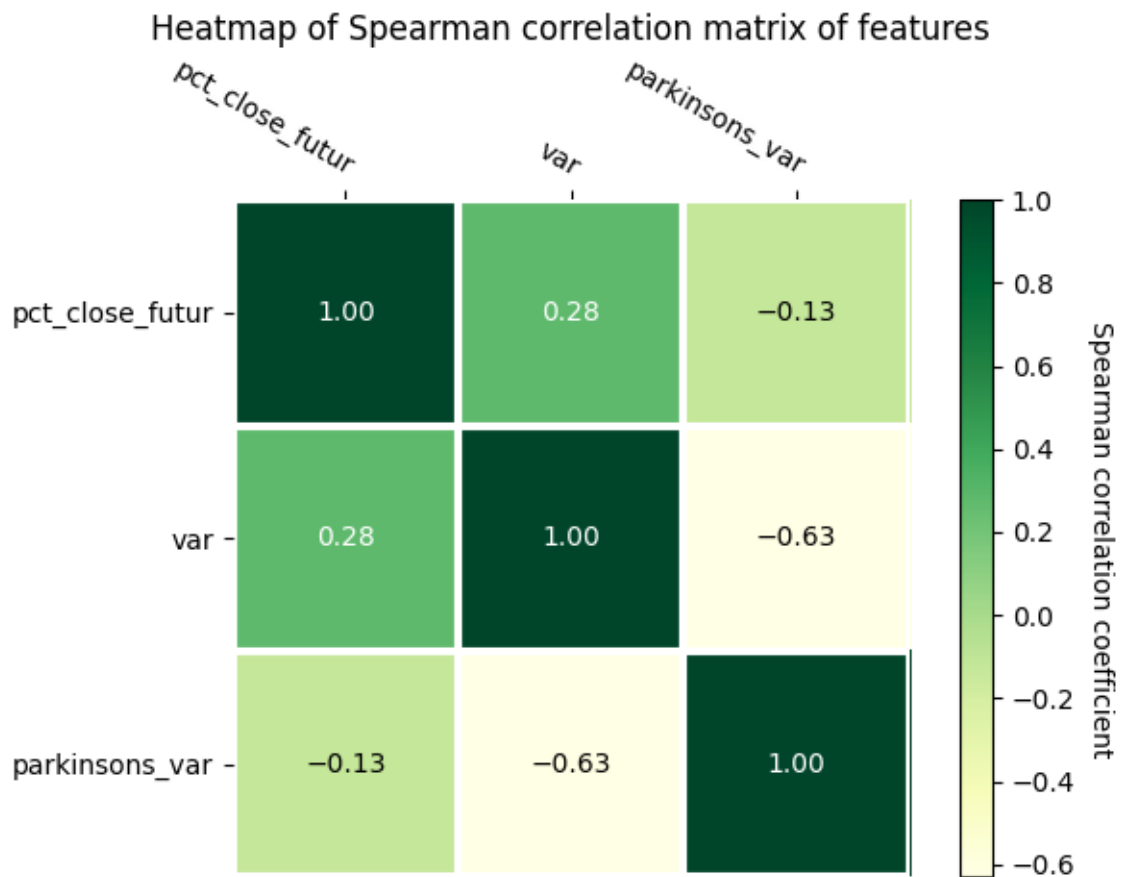
## Relative Strength Index (RSI)



## Heatmap of Pearson correlation matrix of features

Heatmap of Spearman correlation matrix of features

Table 2: Variance Inflation Factors (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:                         Sat, 16 Aug 2025   Prob (F-statistic):          nan
Time:                                 14:00:24   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.
```
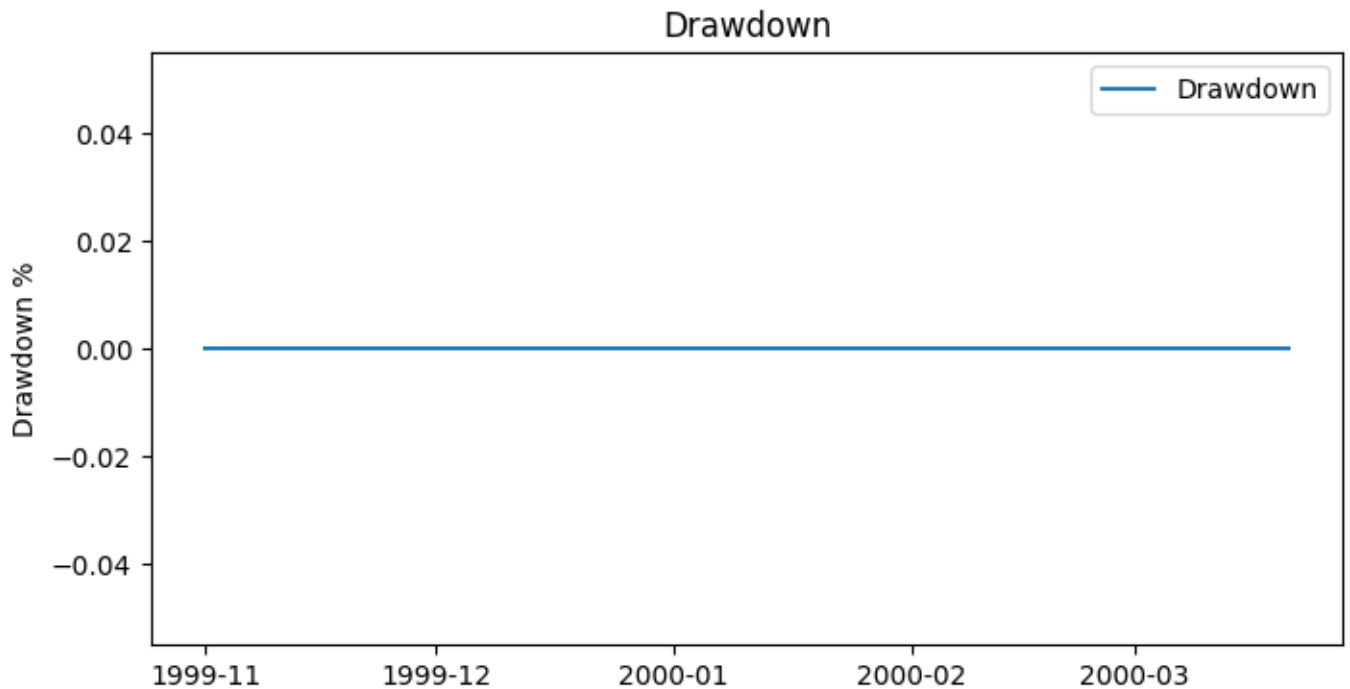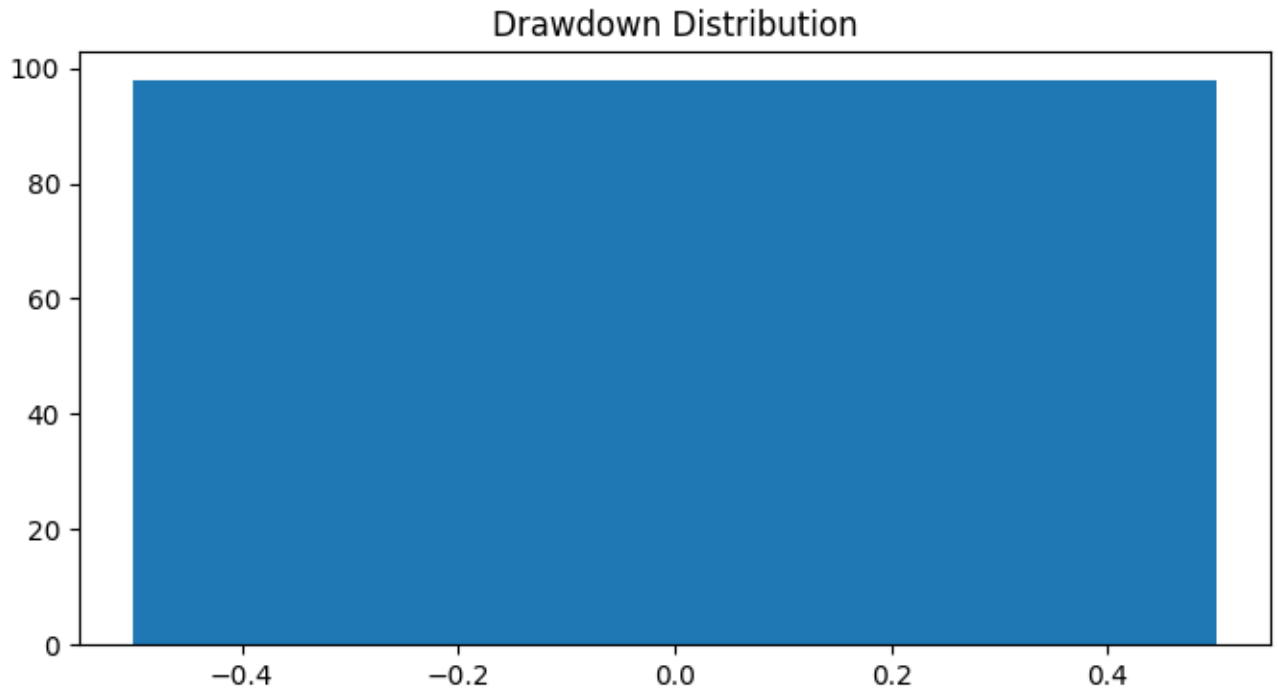
# 7  Back Test

## 7.1  Drawdown

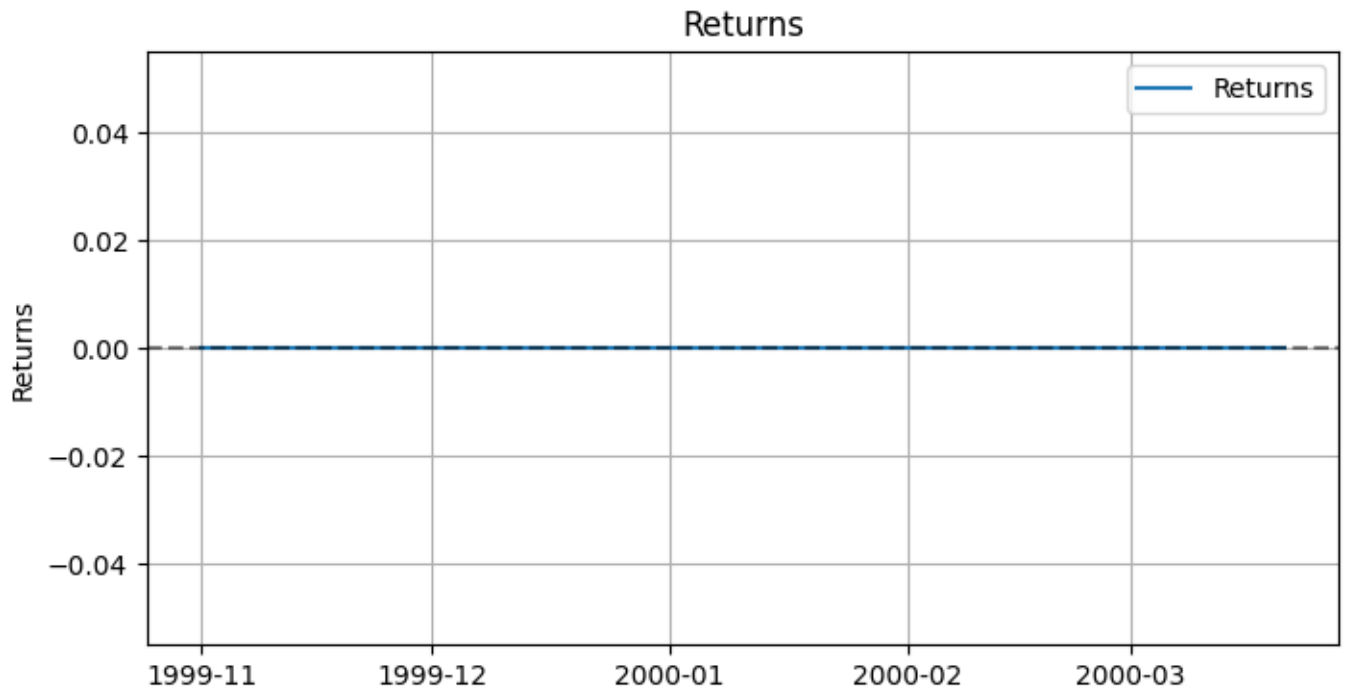Maximum drawdown is 0.0%. We consider 20% an acceptable maximum.
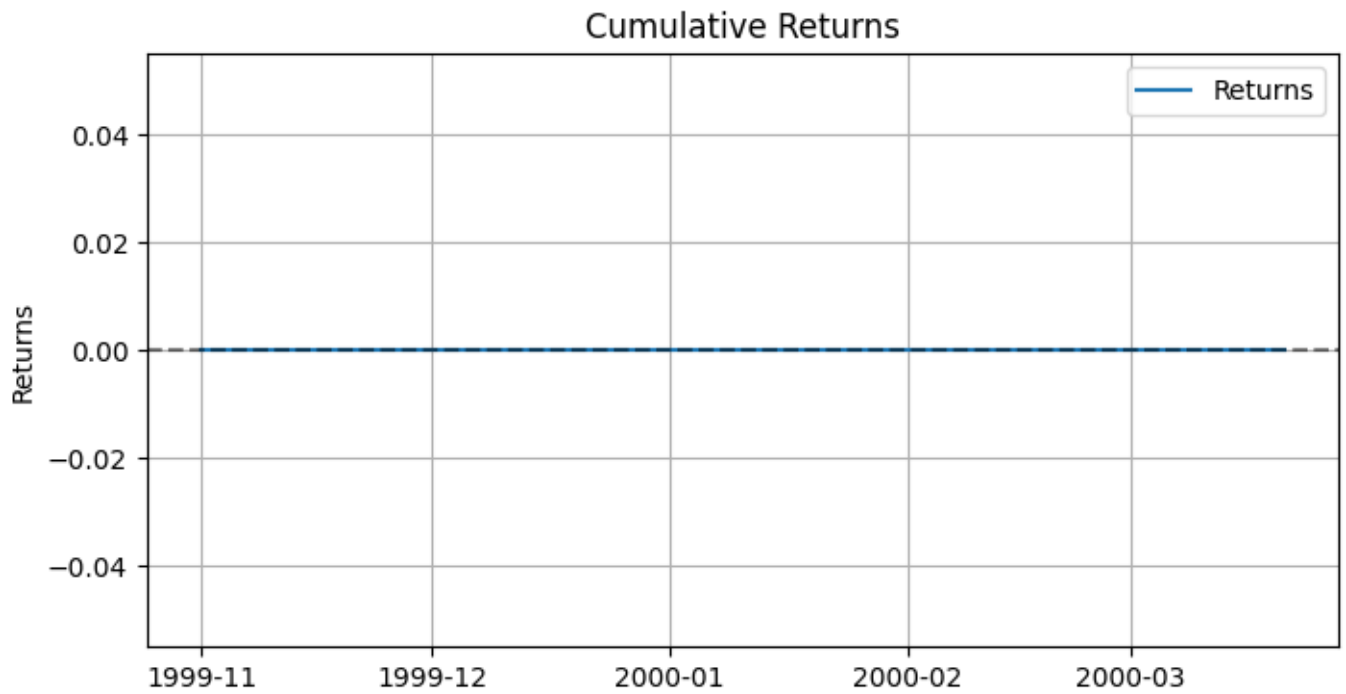
Drawdown Distribution

## 7.2 Returns

This is the returns of our trading stategy.

Table 3: Statistics of returns.

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

## Returns



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

## Cumulative Returns



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

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

Cumulative Returns Minus Transaction Costs
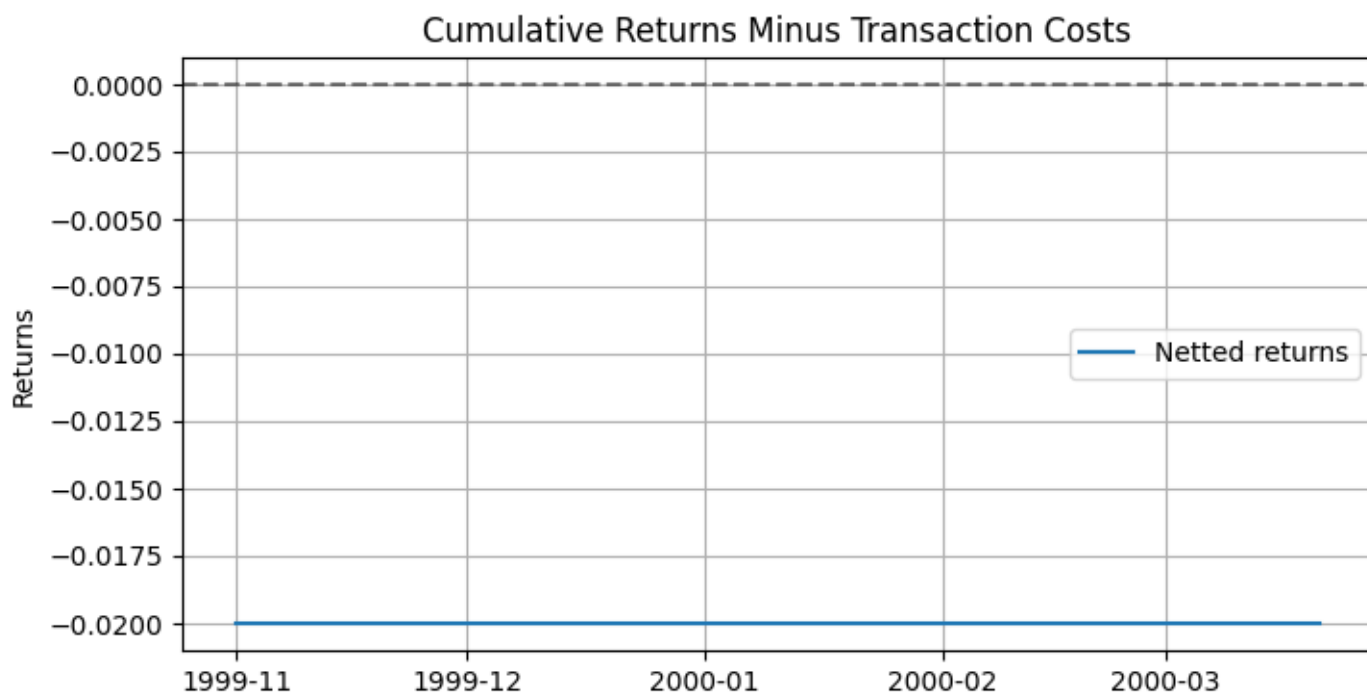
# 8 Live Performance

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.