

Mid term Exam for Financial Econometrics with Python

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November 8, 2024

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1 Introduction

For the midterm assignment, we composed a group of 4 with Gavini Charles; Fournier Justin; Prat Paul and Blanc Mathieu. This document contains all the results of our assignment, including tables, figures, and calculations. It is composed by 1 parts, first, importing the good python libraries, then initialising variables to separate the differents datas (daily, monthly, ..., returns, logreturns,...)

2 Preliminary

2.1 AMAZON

The choosen stock is Amazon, because it is higly related in the current actuality, and we are intrested by such a major company that Amazon has become with time The ticker from yahoo finance is "AMZN" on the Nasdaq stock exchange [AMAZON on Yahoo Finance](#) First, importing the Amazon stock with yfinance, then display the pandas table

2.2 Data Table

The data printed here, is the preview of the Amazon stock extraction from yahoo fiannce:

Date	Open	High	Low	Close	Adj Close	Volume
1999-01-22	0.043750	0.048828	0.038802	0.041016	0.037618	2714688000
1999-01-25	0.044271	0.045833	0.041016	0.045313	0.041559	510480000
1999-01-26	0.045833	0.046745	0.041146	0.041797	0.038334	343200000
1999-01-27	0.041927	0.042969	0.039583	0.041667	0.038215	244368000
1999-01-28	0.041667	0.041927	0.041276	0.041536	0.038095	227520000

Table 1: Preview of Amazon Stock Data from Yahoo Finance

2.3 Checking the 25 year range condition

We have to check that the data is correctly displayed over a 25years range, hopefully, the introduction from Amazon is from january 1999, so it we should be able to find a 25 year range of data of the Amazon stock. To check that we can compute a python code to count the gaps and visualize the dates of gaps in order to see for any huge gap that would be problematic for analyzing data.

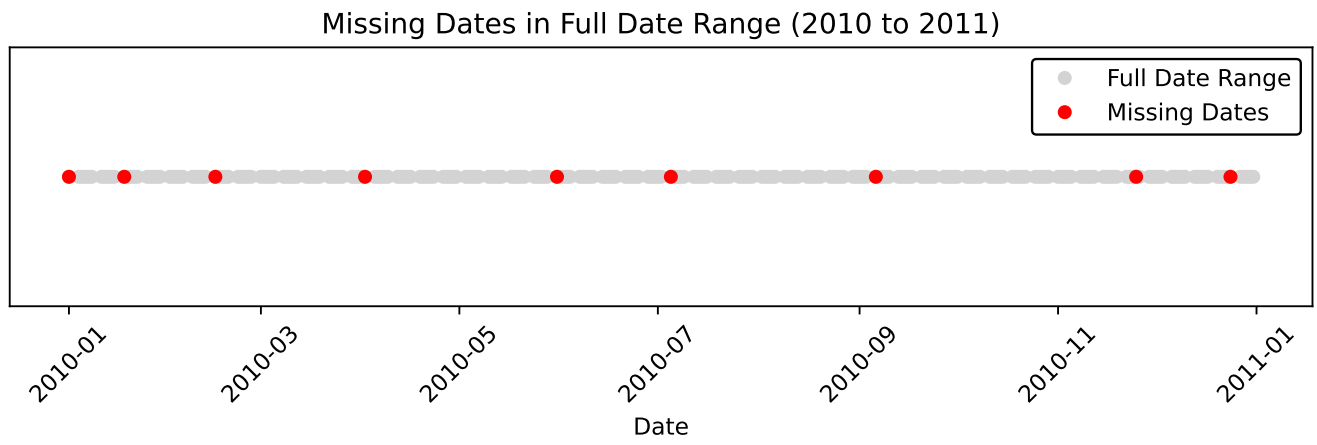


Figure 1: Missing Dates in Full Date Range (2010 to 2011)

2.4 Prices evolutions

Then, plotting the prices evolution:

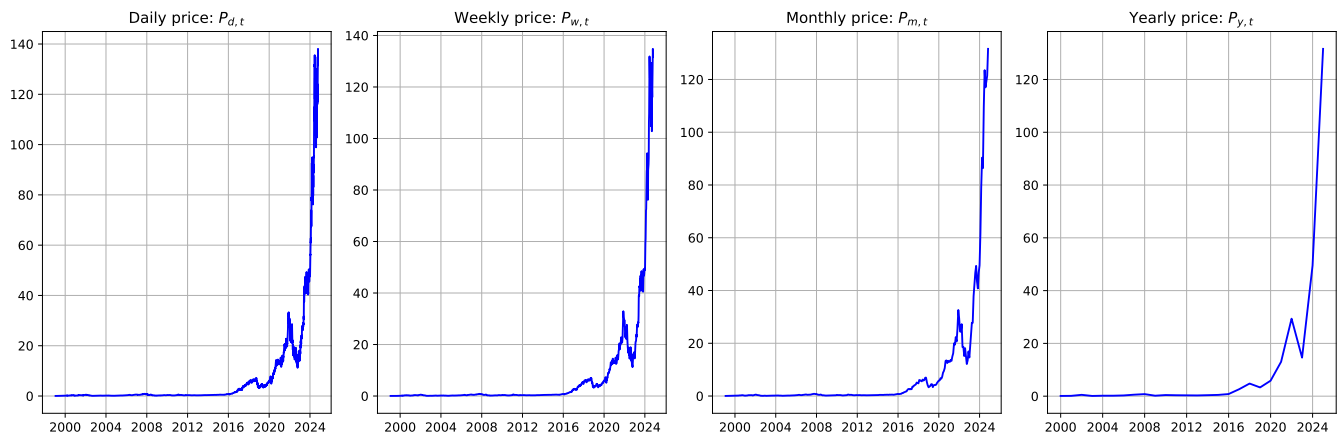


Figure 2: Prices over time by frequency

2.5 Calculating returns



Figure 3: Prices, returns and log returns

2.6 Squared returns

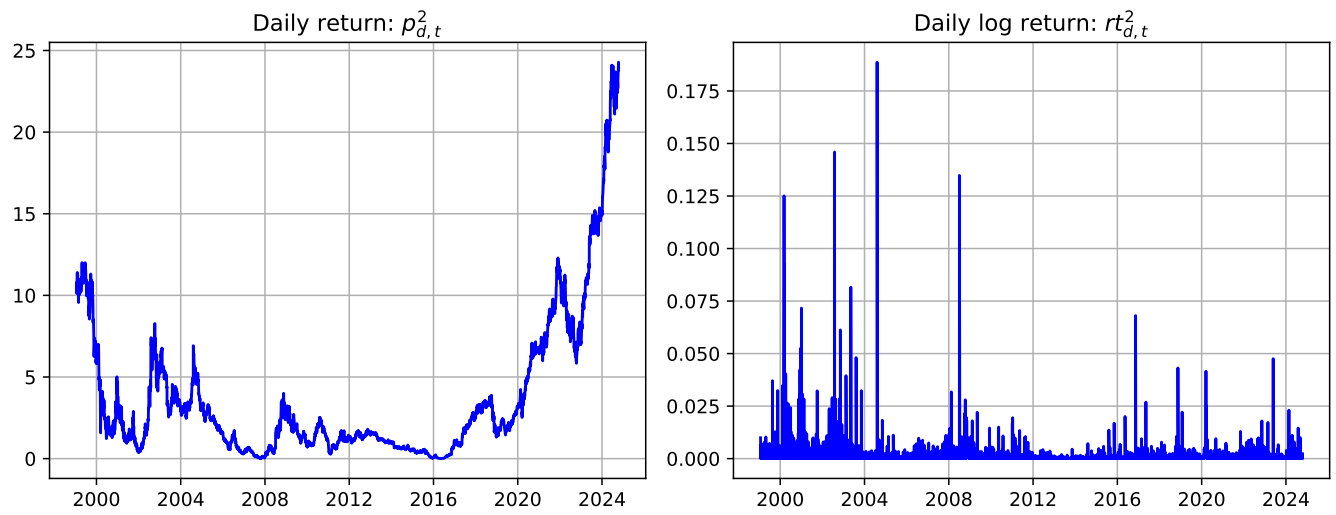


Figure 4: Squared daily returns and daily log returns

A Appendix: Python Code

Below is the Python code used in this analysis.

```
1  # Python code example
2  import numpy as np
3  import pandas as pd
4
5  def analyze_data(data):
6      mean = np.mean(data)
7      std_dev = np.std(data)
8      return mean, std_dev
9
10 data = [1, 2, 3, 4, 5]
11 mean, std_dev = analyze_data(data)
12 print(f"Mean: {mean}, Standard Deviation: {std_dev}")
```

Listing 1: Python Code for Analysis