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INTRODUCTION

/Introduction

- ❑ The project consists of the creation of a portfolio on the time series of the past five years of given index, following the principles of the Capital Asset Pricing Model.
- ❑ The goal of the project is to understand the factors underlying the performance of a specific portfolio, so we need build real portfolios on specific level and type of risk.
- ❑ The portfolios were created following the steps of Modern Portfolio Theory (MPT) this is is a practical method for selecting investments in order to maximize their overall returns within an acceptable level of risk.

/Index Market: Nasdaq 100

- ❑ The Nasdaq 100 Index is a basket of the 100 largest, most actively traded U.S companies listed on the Nasdaq stock exchange. The index includes companies from various industries except for the financial industry, These non-financial sectors include retail, biotechnology, industrial, technology, health care, and others and to become part of this index stocks must have daily trading volume of 200000 pieces.
- ❑ The index is constructed on a modified capitalization methodology, this modified method uses individual weights of included items according to their market capitalization. Weighting allows constraints to limit the influence of the largest companies and balance the index with all members.
- ❑ The index undergoes quarterly reviews (March, June, September and December) and becomes effective with the closing values on third Friday of the day.

DATA ACQUISITION &

PRE-PROCESSING

/Data Acquisition

- ❑ The data was obtained from the FactSet platform which collects economic-financial data from around the world, we have downloaded the historical data for the past 5 years, precisely from 07/07/2017 to 08/07/2022.
- ❑ Considering the data from when the company actually appeared in the index, we took the third Friday of December as the reference day for entering and leaving the index. Due to MA, delisting, etc., some companies although they have been present within the index for the past 5 years are now no longer listed.



/Pre-Processing

- ☐ Data exploration: value and stock control, data summary and null counting.
- ☐ Drop stocks that did not have enough observation to perform the Rolling Regression, the total number of stocks was reduced from 137 to 120.
- ☐ Calculated daily log returns.
- ☐ Calculated the weekly log returns.

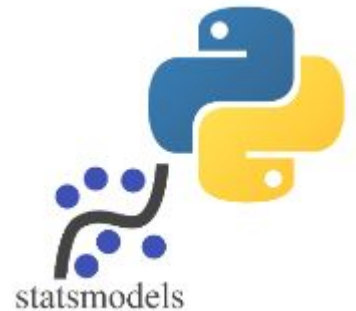
ROLLING REGRESSION

/Rolling Regression

- ❑ Rolling regressions are one of the simplest models for analysing changing relationships among variables overtime , the model estimate parameters using a fixed window of time over the entire dataset.
- ❑ We used 180 days as sample (thus losing the first 180 observations) and we applied the rolling regression on each security.
- ❑ The results (filtered weekly) have been obtained through the python library statmodels.

- ❑ Regression formula used:

$$r_i = \alpha_i + \beta_i(R_M) + \varepsilon_i$$



BUILDING PORTFOLIOS

/Selection of parameters

☐ The

/Building of portfolios

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ANALYSIS OF PORTFOLIOS

/Portfolios weekly returns

Weekly Portfolios Returns

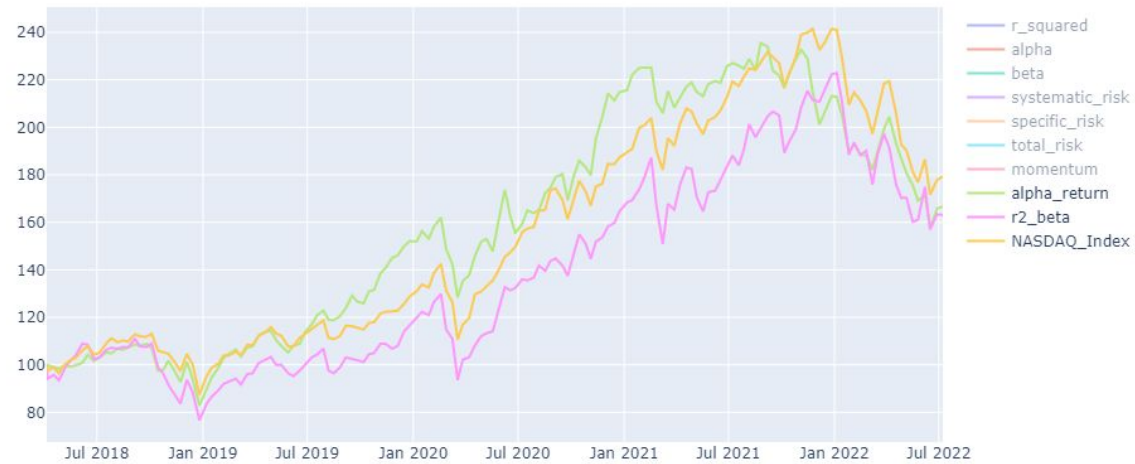


Weekly Portfolios Returns



/Portfolios weekly returns

Weekly Portfolios Returns

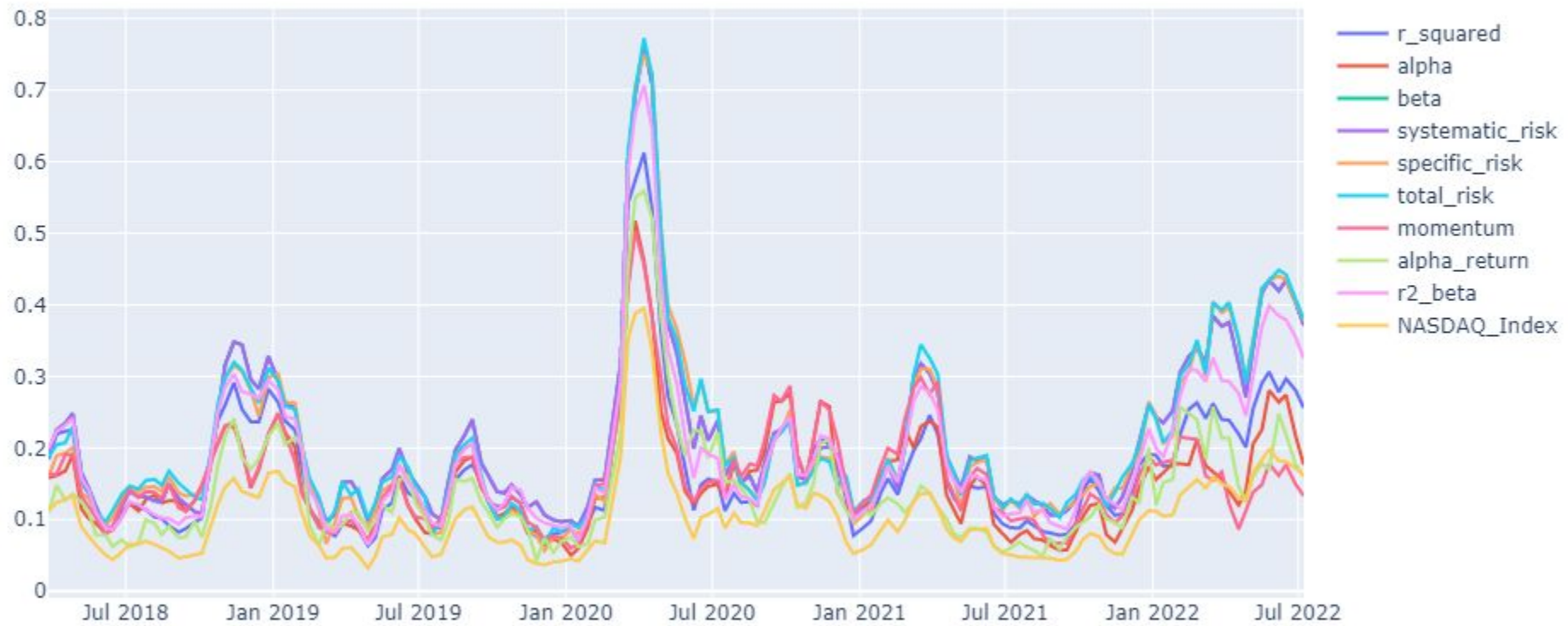


Weekly Portfolios Returns

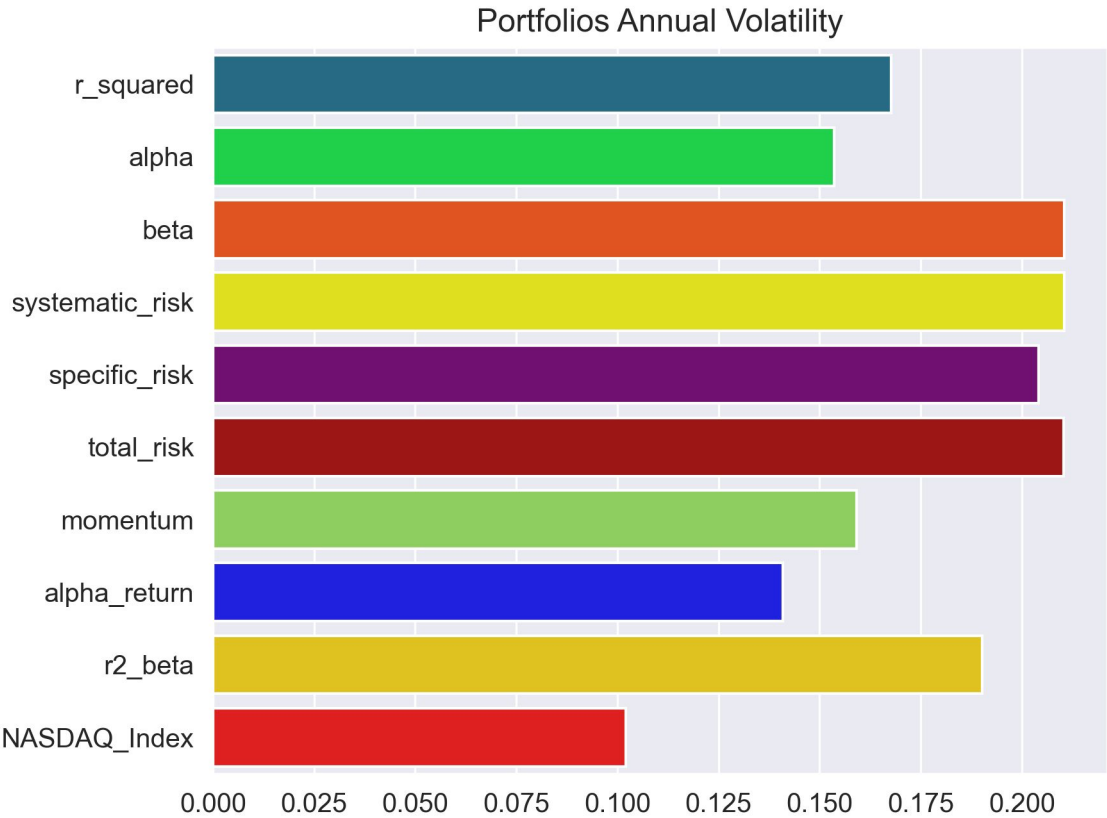
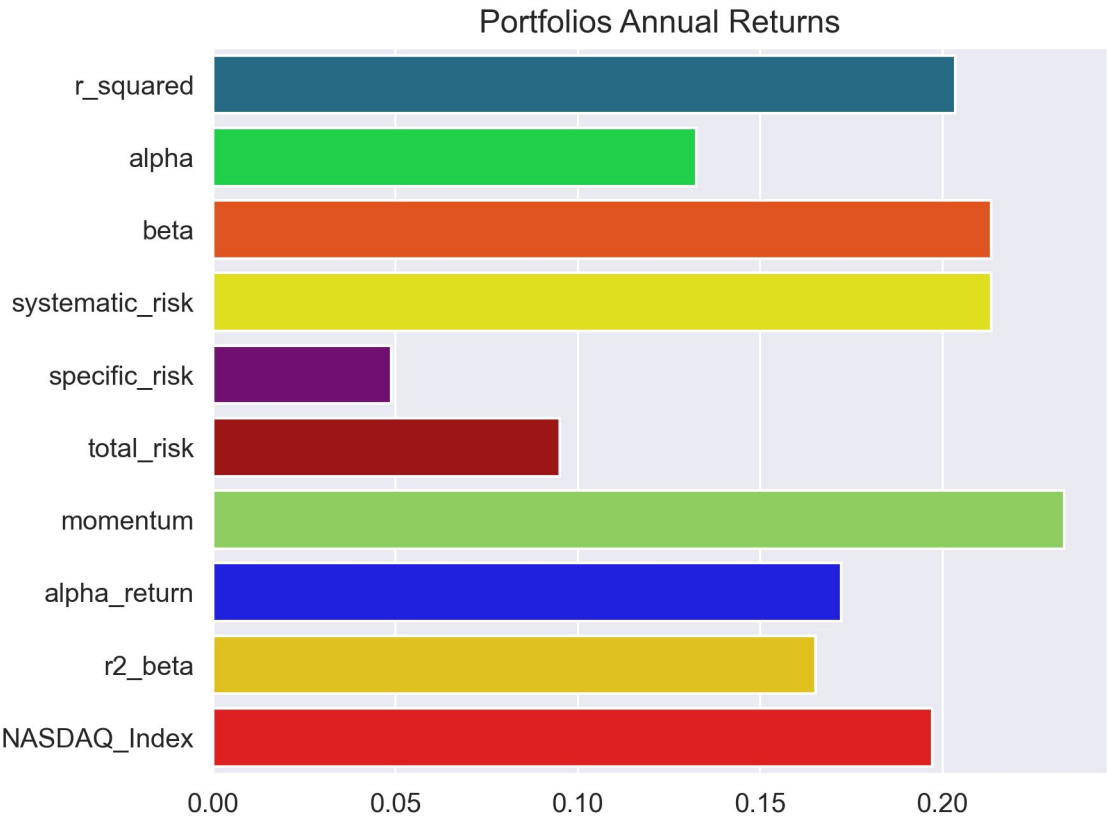


/Portfolios weekly volatility

Portfolios Volatility



/Annual average returns & volatility



/Portfolios comparison

Portfolio	Annual Returns	Annual Volatility
R^2	20.35%	16.77%
α	13.25%	15.35%
β	21.33%	20.05%
Systematic risk ($\beta^2 \sigma_M^2$)	21.33%	21.05%
Specific risk (σ_{ei}^2)	4.89%	20.41%
Total risk (σ_i^2)	9.51%	21.03%
Momentum	23.35%	15.90%
α/r	17.23%	14.09%
$R^2 \beta$	16.51%	19.02%
Nasdaq-100	19.71%	10.21%



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**THANKS FOR
ATTENTIONS**