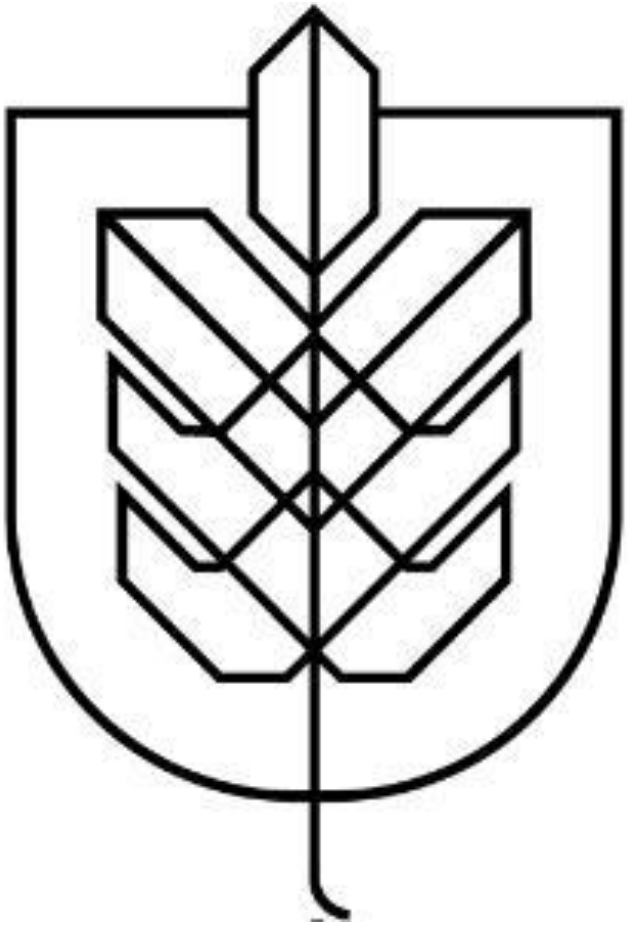


Edvard Tsymbala Kupchynskyy

Crypto Market Analysis Report

HULT International Business School

FIN-1008 AI in Finance: Data-Driven Investment Strategies with Python

Professor Silvia Sentis Ariza

This report delivers an in-depth analysis of the cryptocurrency market from 2013 to 2018. It includes descriptive statistics, visualizations, and advanced metrics to evaluate the behavior and performance of various cryptocurrencies. The dataset features daily records of multiple cryptocurrencies, covering aspects such as opening and closing prices, daily highs and lows, trading volumes, and market capitalization.

Key statistical measures from the dataset show a total of 942,297 records. The average closing price of cryptocurrencies is $346.10. The highest price recorded is $2,926,100.00, while the lowest is $0.00. The average market volume stands at $8,720,383, and the average market capitalization is $172,506,000. The distribution of closing prices for the top 10 symbols reveals that most cryptocurrencies have a high count of lower closing prices (1), with Bitcoin showing a broader distribution with higher prices. Market capitalization grew exponentially, particularly in 2017, but declined in 2018 (2). A strong positive correlation between trading volume and market capitalization indicates high liquidity for higher market cap coins. (3) The portfolio weights of the top 10 cryptocurrencies suggest a diversified investment strategy with equal distribution. (4) Returns of various cryptocurrencies in the portfolio vary over time, with some showing higher weighted returns. Trading volume is the most significant predictor of market movements, followed by market capitalization and day of the week. (5)

The chart clearly shows that trading volume is the most crucial factor in forecasting market movements, with an importance value over 0.6. (6) This highlights that the volume of cryptocurrency traded daily significantly impacts market trends and prices. High trading volume often indicates market liquidity and investor interest, making it a vital indicator of market behavior.

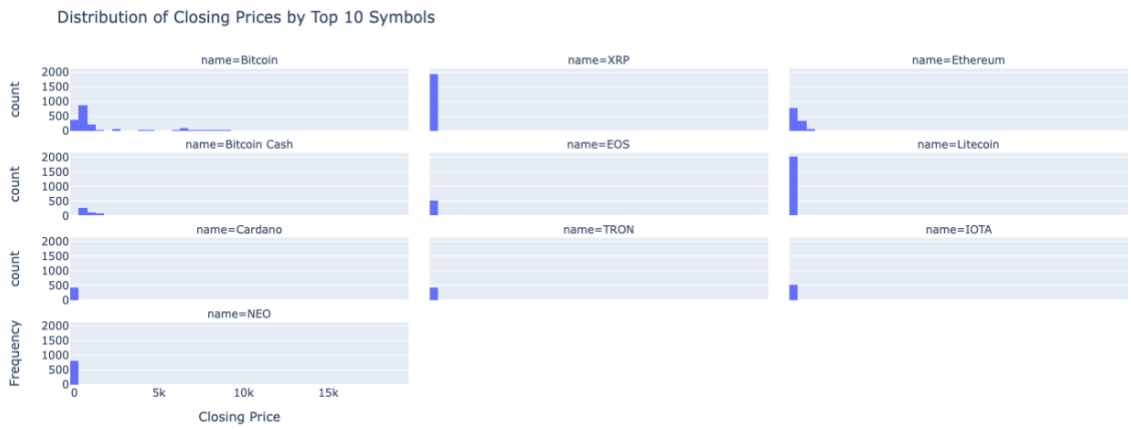
The key metrics derived from the analysis of the cryptocurrency market from 2013 to 2018 provide valuable insights into the performance and risk characteristics of the market. The mean return of the cryptocurrencies is 0.2407. This high average return suggests significant growth potential in the cryptocurrency market during these years. The standard deviation of returns is 0.5027, which measures the volatility of the cryptocurrency returns, it implies substantial fluctuations in the daily returns of cryptocurrencies. The Sortino ratio is 5.4798, in this case, it suggests that the cryptocurrencies provided high returns with relatively less downside risk. The skewness of returns is 2.4780, indicating a right-skewed distribution. This means the returns are more spread out on the right side of the mean, with a higher probability of large positive returns. The kurtosis of returns is 6.5286. High kurtosis implies that the returns have more frequent extreme values than a normal distribution.

The Value at Risk (VaR) at a 95% confidence level is -0.0680. there is a 95% probability that the maximum daily loss will not exceed 6.80%

In conclusion, the cryptocurrency market exhibited significant volatility and growth from 2013 to 2018. Key insights include exponential growth in market capitalization during 2017, a strong correlation between trading volume and market capitalization, and the critical role of trading volume in predicting market movements. The analysis underscores both the potential high returns and substantial risks of crypto investments.

Appendix

1



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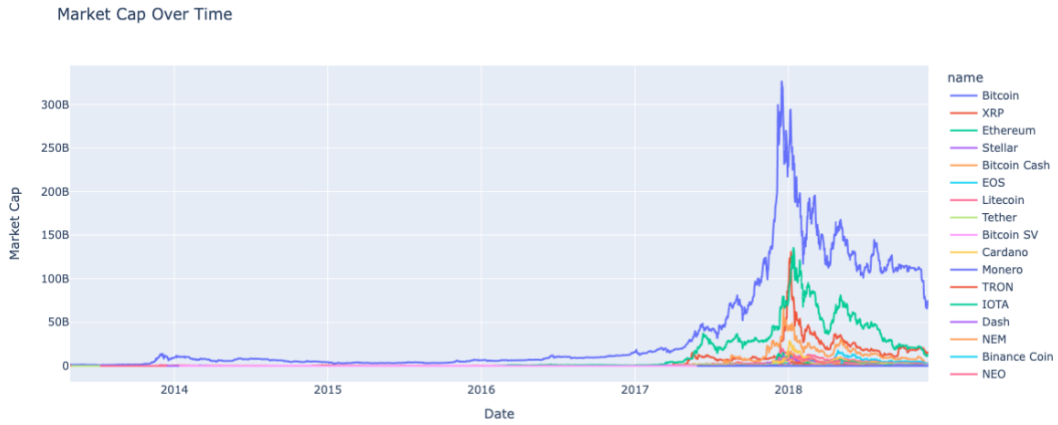

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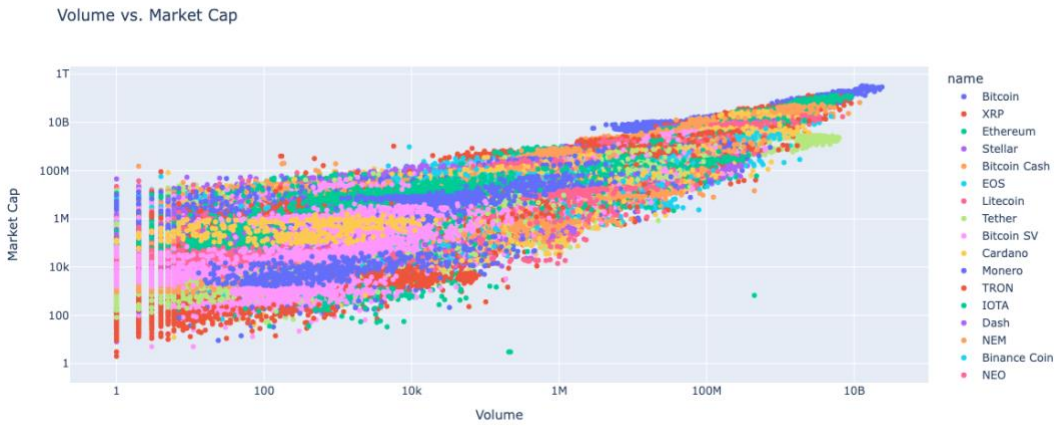

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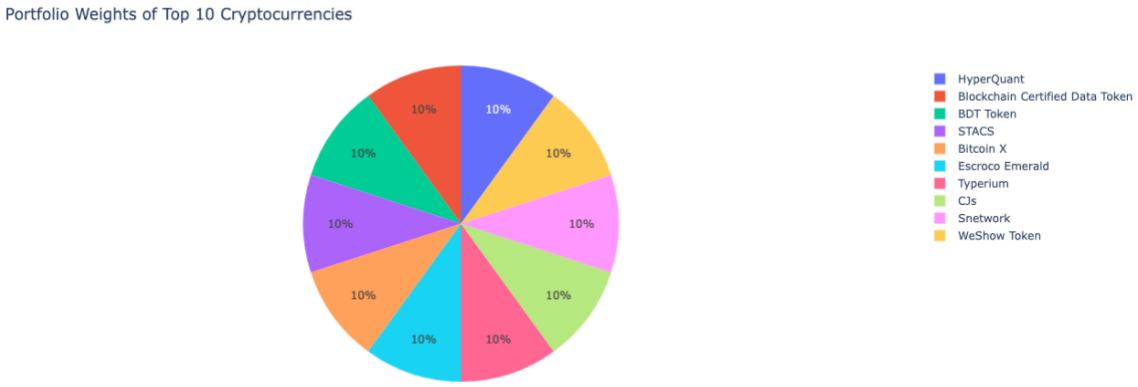
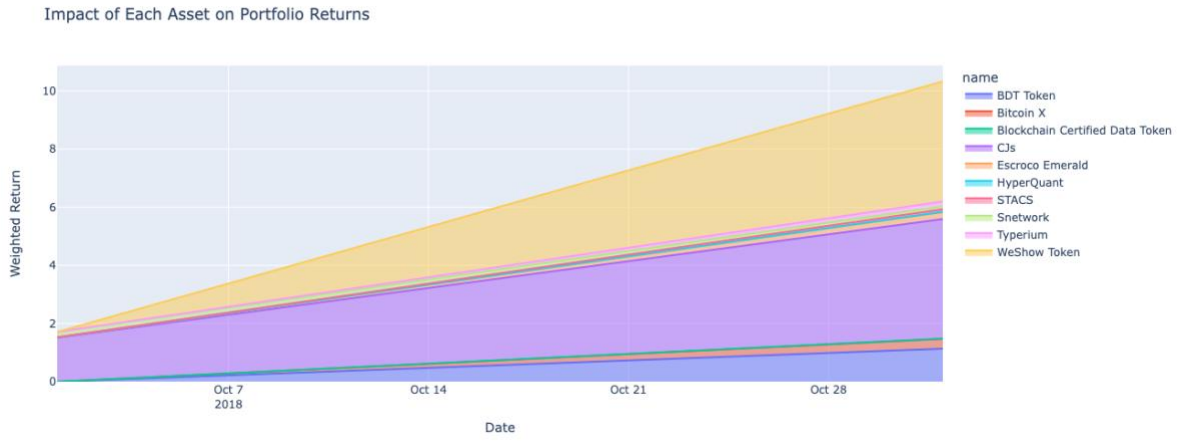
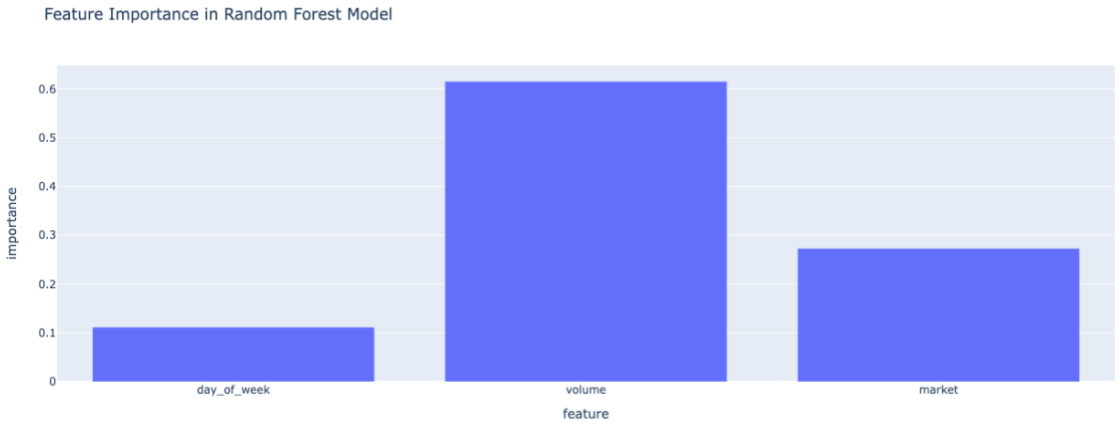

Portfolio Weights of Top 10 Cryptocurrencies
10%
10%
10%
10%
10%
10%
10%
10%
10%
10%
HyperQuant
Blockchain Certified Data Token
BDT Token
STACS
Bitcoin X
Escroco Emerald
Typerium
CJs
Snetwork
WeShow Token

5


Impact of Each Asset on Portfolio Returns
Weighted Return
0
2
4
6
8
10
Oct 7
2018
Oct 14
Oct 21
Oct 28
Date
name
BDT Token
Bitcoin X
Blockchain Certified Data Token
CJs
Escroco Emerald
HyperQuant
STACS
Snetwork
Typerium
WeShow Token

6


Feature Importance in Random Forest Model
importance
0
0.1
0.2
0.3
0.4
0.5
0.6
day_of_week
volume
market
feature