

CRYPTO QUANT PROJECT

1. DATA COLLECTION

After doing research and using multiple APIs to collect the data for Crypto assets, I finally selected **crypto compare API** for fetching the dynamic data of historic period.

For the Market data, I am using **Yahoo finance's** library to directly fetch the historic data.

I took the historical data from June-2019. (Approximately last 3 years)

A. Crypto Assets (All OHLCV Data)

- i. Bitcoin
- ii. Ethereum
- iii. LUNA
- iv. XRP
- v. BNB

B. Market Data (All OHLCV Data)

- i. SPY
- ii. NASDAQ
- iii. USD/EUR

2. DATA ANALYSIS

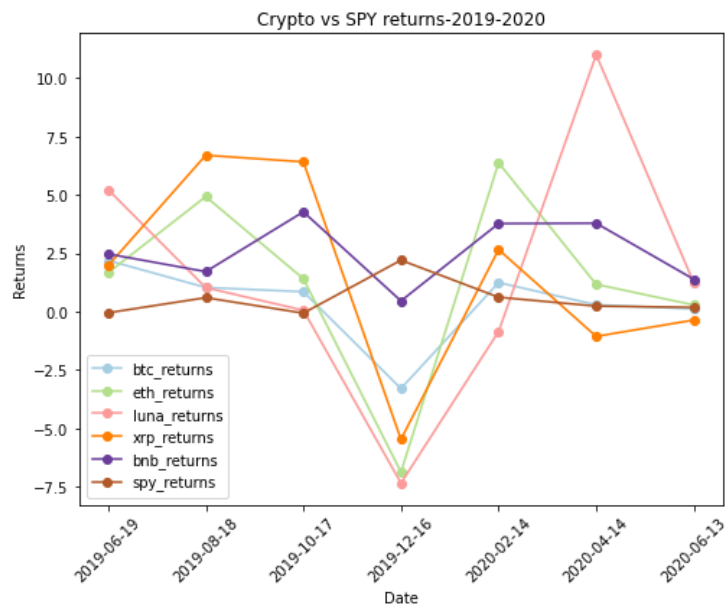
Calculated the returns of every asset and storing the returns in the data frame.

For better analysis, divided the returns in two different time frames for plotting the results and doing clear analysis.

Plotted the returns (both positive and negative) of every crypto asset with SPY, NASDAQ, and USD/EUR.

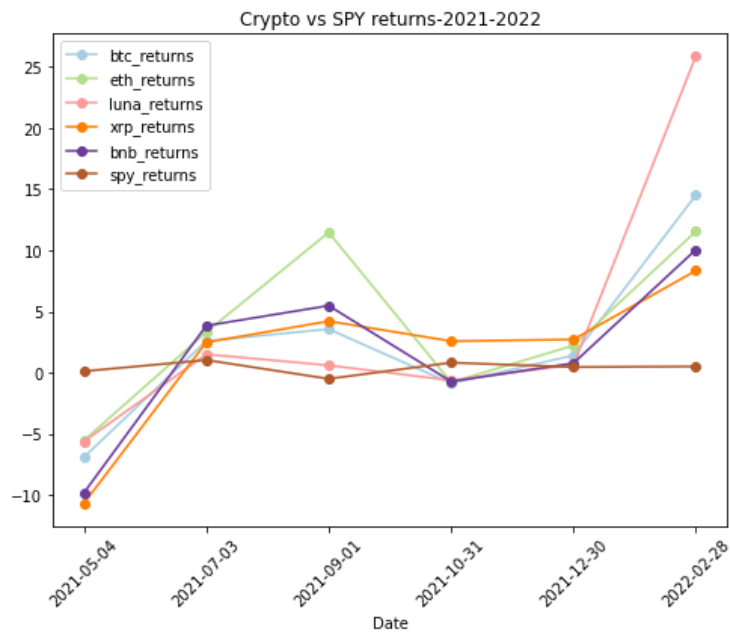
Showed Heatmaps of returns of every crypto asset with SPY, NASDAQ, and USD/EUR.

Showed Correlations of different rolling means period (1 month, 2 months, 6 months, and 1 year) of every crypto asset with SPY, NASDAQ, and USD/EUR.



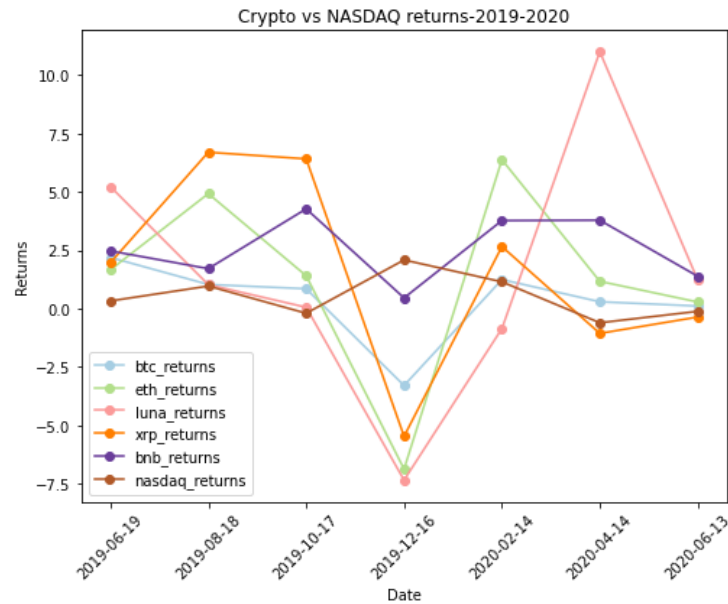
During 2019 Oct-Dec, when SPY increased, all the other Crypto assets returns got decreased.

SPY percentage return is not as volatile as Crypto returns.



All the crypto assets bounced back after May-2021, while the SPY returns were constant compared to crypto returns.

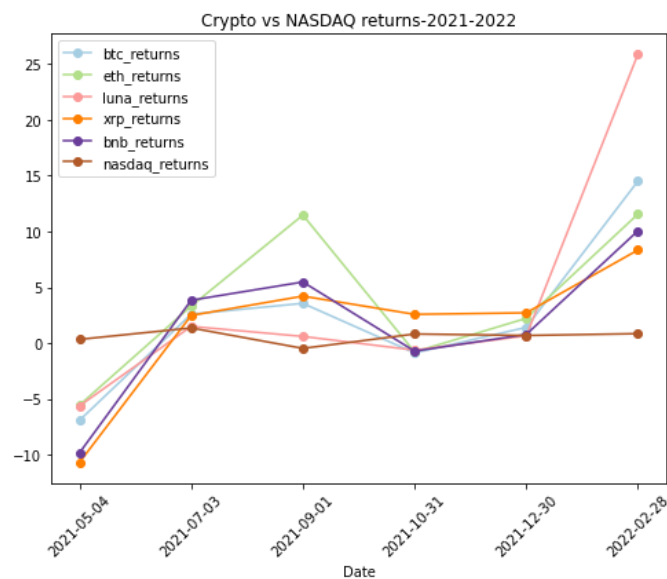
In Dec-2021 LUNA returns surged rapidly, while the SPY returns remained constant.



During 2019 Oct-Dec, when NASDAQ increased, all the other Crypto assets returns got decreased.

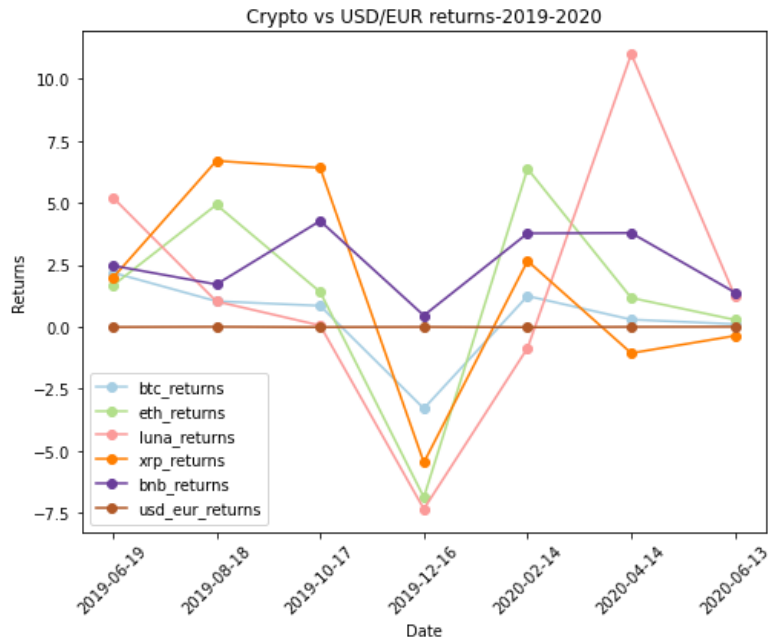
NASDAQ percentage return is not as volatile as Crypto returns.

Compared to SPY, NASDAQ's return fell more in feb-2020. So, the Negative returns of NASDAQ started in around feb-2020. (Because of COVID-19)

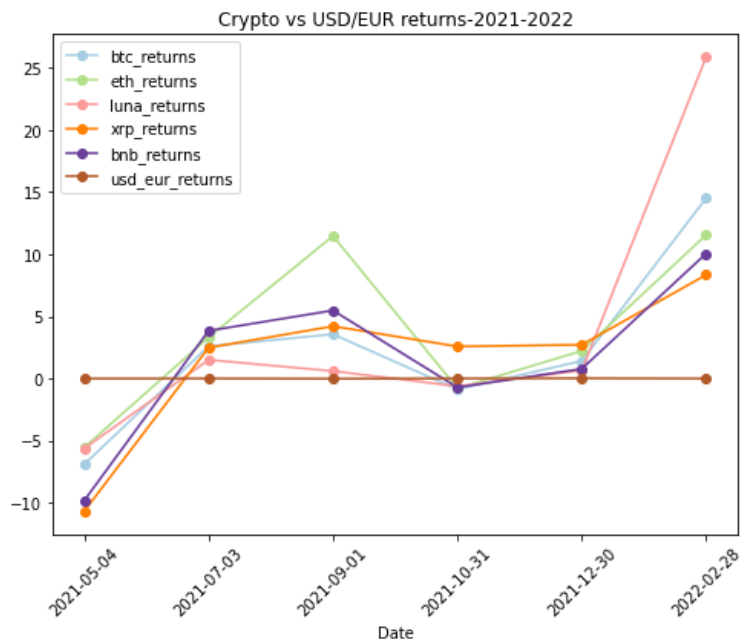


All the crypto assets bounced back after May-2021, while the NASDAQ returns were constant compared to crypto returns.

In Dec-2021 LUNA returns surged rapidly, while the NASDAQ returns remained constant.



After seeing the plot of Crypto returns against USD/EUR returns, we can conclude that returns of USD/EUR are very constant and non-volatile compared to Crypto returns.



Correlations of Crypto and SPY

The correlation between Bitcoin and SPY over 1 month rolling mean is **0.29532963**
The correlation between Ethereum and SPY over 1 month rolling mean is **0.3688459**
The correlation between Luna and SPY over 1 month rolling mean is **0.37942535949**
The correlation between XRP and SPY over 1 month rolling mean is **0.203606159541**
The correlation between BNB and SPY over 1 month rolling mean is **0.105201426979**

The correlation between Bitcoin and SPY over 2 months rolling mean is **0.3725582**
The correlation between Ethereum and SPY over 2 months rolling mean is **0.412197**
The correlation between Luna and SPY over 2 months rolling mean is **0.3087995855**
The correlation between XRP and SPY over 2 months rolling mean is **0.28950699748**
The correlation between BNB and SPY over 2 months rolling mean is **0.24104687562**

The correlation between Bitcoin and SPY over 6 months rolling mean is **0.2999770**
The correlation between Ethereum and SPY over 6 months rolling mean is **0.305709**
The correlation between Luna and SPY over 6 months rolling mean is **-0.008448920**
The correlation between XRP and SPY over 6 months rolling mean is **0.21398774546**
The correlation between BNB and SPY over 6 months rolling mean is **0.21362995996**

The correlation between Bitcoin and SPY over 1 year rolling mean is **0.221362264**
The correlation between Ethereum and SPY over 1 year rolling mean is **0.19490524**
The correlation between Luna and SPY over 1 year rolling mean is **-0.00589553180**
The correlation between XRP and SPY over 1 year rolling mean is **0.1348679057353**
The correlation between BNB and SPY over 1 year rolling mean is **0.1187118198040**

Correlations of Crypto and NASDAQ

The correlation between Bitcoin and NASDAQ over 1 month rolling mean is **0.39042**
The correlation between Ethereum and NASDAQ over 1 month rolling mean is **0.4379**
The correlation between Luna and NASDAQ over 1 month rolling mean is **0.43908856**
The correlation between XRP and NASDAQ over 1 month rolling mean is **0.221379664**
The correlation between BNB and NASDAQ over 1 month rolling mean is **0.174017071**

The correlation between Bitcoin and NASDAQ over 2 months rolling mean is **0.4263**
The correlation between Ethereum and NASDAQ over 2 months rolling mean is **0.434**
The correlation between Luna and NASDAQ over 2 months rolling mean is **0.3552141**
The correlation between XRP and NASDAQ over 2 months rolling mean is **0.30182767**
The correlation between BNB and NASDAQ over 2 months rolling mean is **0.26420208**

The correlation between Bitcoin and NASDAQ over 6 months rolling mean is **0.3343**
The correlation between Ethereum and NASDAQ over 6 months rolling mean is **0.334**
The correlation between Luna and NASDAQ over 6 months rolling mean is **-0.007517**
The correlation between XRP and NASDAQ over 6 months rolling mean is **0.21939919**
The correlation between BNB and NASDAQ over 6 months rolling mean is **0.22415003**

The correlation between Bitcoin and NASDAQ over 1 year rolling mean is **0.243514**
The correlation between Ethereum and NASDAQ over 1 year rolling mean is **0.21177**
The correlation between Luna and NASDAQ over 1 year rolling mean is **-0.00594355**
The correlation between XRP and NASDAQ over 1 year rolling mean is **0.1338763349**
The correlation between BNB and NASDAQ over 1 year rolling mean is **0.1403731628**

Correlations of Crypto and USD/EUR

The correlation between Bitcoin and USD/EUR Rates over 1 month rolling mean is **0.12574141799804878**

The correlation between Ethereum and USD/EUR Rates over 1 month rolling mean is **0.128913636927345**

The correlation between Luna and USD/EUR Rates over 1 month rolling mean is **0.18580975100677616**

The correlation between XRP and USD/EUR Rates over 1 month rolling mean is **0.06644337748482167**

The correlation between BNB and USD/EUR Rates over 1 month rolling mean is **0.08910896648675967**

The correlation between Bitcoin and USD/EUR Rates over 2 months rolling mean is **0.07972686180570411**

The correlation between Ethereum and USD/EUR Rates over 2 months rolling mean is **0.070465921890836**

The correlation between Luna and USD/EUR Rates over 2 months rolling mean is **0.11795597621199266**

The correlation between XRP and USD/EUR Rates over 2 months rolling mean is **0.045095066860323794**

The correlation between BNB and USD/EUR Rates over 2 months rolling mean is **0.059619443875509916**

The correlation between Bitcoin and USD/EUR Rates over 6 months rolling mean is **0.09121789203850426**

The correlation between Ethereum and USD/EUR Rates over 6 months rolling mean is **0.11314452198241468**

The correlation between Luna and USD/EUR Rates over 6 months rolling mean is **0.005482706308302131**

The correlation between XRP and USD/EUR Rates over 6 months rolling mean is **0.041212508997737596**

The correlation between BNB and USD/EUR Rates over 6 months rolling mean is **0.1250428989609289**

The correlation between Bitcoin and USD/EUR Rates over 1 year rolling mean is **0.05819421827290295**

The correlation between Ethereum and USD/EUR Rates over 1 year rolling mean is **0.07860028898887855**

The correlation between Luna and USD/EUR Rates over 1 year rolling mean is **0.008194003102916013**

The correlation between XRP and USD/EUR Rates over 1 year rolling mean is **-0.014449148347119252**

The correlation between BNB and USD/EUR Rates over 1 year rolling mean is **0.05050997808243878**

Conclusions For Correlations with SPY:

With one month rolling mean correlation, both ETH, and LUNA are showing positive correlation with SPY, which is around 0.37.

With two months rolling mean correlation, ETH and SPY are most correlated with about 0.41 positive correlation between them.

With six months rolling mean correlation, both BTC, and ETH are showing positive correlation with SPY, which is around 0.30. LUNA and SPY are negatively correlated.

With one year rolling mean correlation, both BTC, and ETH are showing positive correlation with SPY, which is around 0.21. LUNA and SPY are negatively correlated.

Conclusions For Correlations with NASDAQ

With one month rolling mean correlation, both LUNA, and ETH are showing positive correlation with NASDAQ, which is around 0.44. BTC is also showing positive correlation of 0.39 with NASDAQ.

With two months rolling mean correlation, both BTC, and ETH are showing positive correlation with NASDAQ, which is around 0.43.

With six months rolling mean correlation, both BTC, and ETH are showing positive correlation with SPY, which is around 0.33. LUNA and NASDAQ are negatively correlated.

With one year rolling mean correlation, BTC and SPY are most correlated with about 0.24 positive correlation between them. LUNA and NASDAQ are negatively correlated.

Conclusions For Correlations with USD/EUR

With one month rolling mean correlation, LUNA, and USD/EUR are showing positive correlation, which is around 0.18.

With two months rolling mean correlation, LUNA, and USD/EUR are showing positive correlation, which is around 0.12.

With two months rolling mean correlation, BNB, and USD/EUR are showing positive correlation, which is around 0.12.

With one year rolling mean correlation, no asset is showing decent positive correlation with USD/EUR because the value is very close to 0. XRP is showing negative correlation with USD/EUR.