Do cryptocurrencies extend the mean-variance frontier of an equity investor?

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2023

The Project

In this project we will investigate if cryptocurrencies extend the mean-variance frontier of an equity investor. By using an industry portfolio data set consisting of 12 different industries collected from Kenneth French data library combined with the 3 largest cryptocurrencies based on market capitalization, we extract the mean-variance frontier. We show that adding cryptocurrencies to the mean-variance frontier has a significant impact.

Data

Equity data: Kenneth French website, 12 industry portfolios. The assets within the industry portfolios are equally weighted and the data downloaded has daily frequency.

Crypto's: Imported the 3 largest crypto currencies based on market cap, source: Yahoo Finance. Can also be extended in the data grabbing. Crypto data is downloaded with daily frequency.

Caveat: We only have data from 2017-2023 on the cryptocurrencies. Ideally, to conclude that cryptocurrencies actually extends the mean-variance frontier of an equity investor, we would want data on a longer time frame.
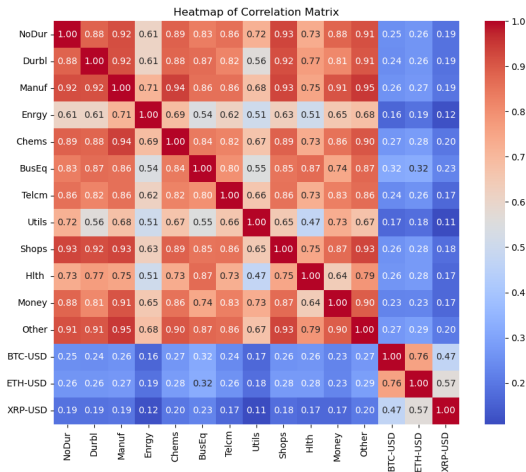
Analysis

Heatmap of Correlation Matrix

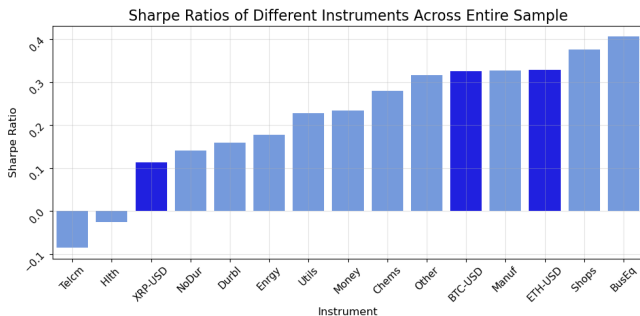Figure: Full sample correlations

Analysis

Figure: Full sample Sharpe's

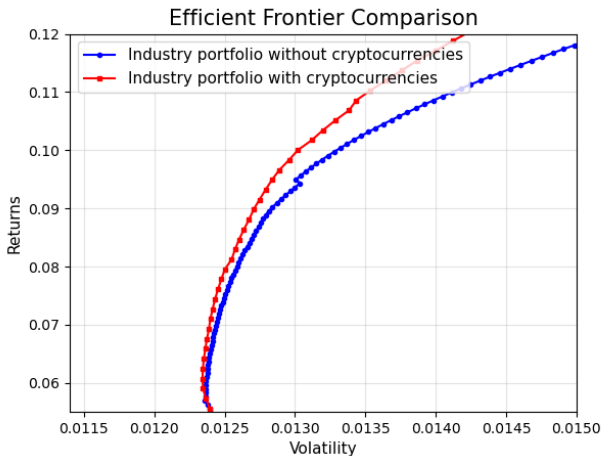# Full sample, from 2017-10-31 to 2023-10-31

Figure: Comparing the two mean-variance frontiers for the full sample
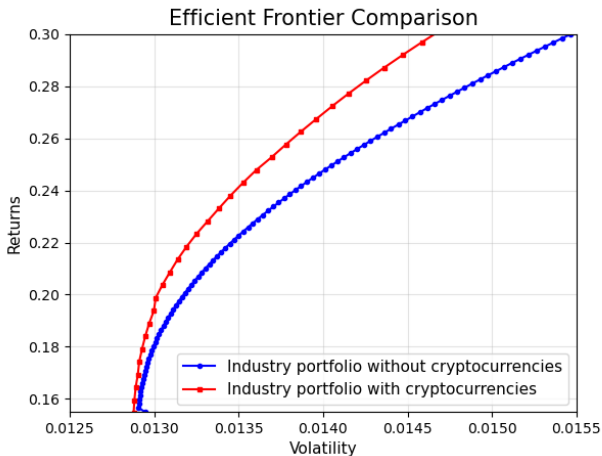
Bull market, from 2017-10-31 to 2021-12-1

Figure: Comparing the two mean-variance frontiers for the bull market time frame

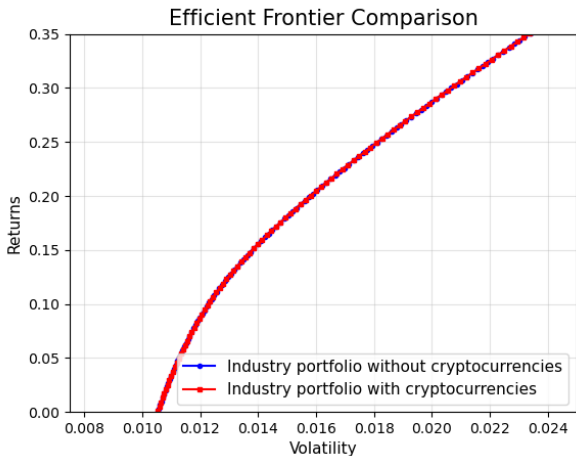# Drawdown market, from 2021-12-1 to 2023-10-31

Figure: Comparing the two mean-variance frontiers for the drawdown market

Conclusion

The inclusion of cryptocurrencies in an investment portfolio
extends the mean-variance frontier for an equity investor,
introducing a new dimension to diversification strategies and
expanding the spectrum of risk and return possibilities.

Bibliography

📄 Wikipedia (2023).
Modern portfolio theory.
https:
//en.wikipedia.org/wiki/Modern_portfolio_theory.
Accessed: December 6, 2023.