

# Custom Equity Indexes



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# Methodology

## Processes



### Filtering Data

- CRSP MSF from Jan 2014 to Dec 2024
- Only U.S. stocks on major exchanges



### Data Cleaning

- Standardized Price and Market Cap
- Removed NAs



### Building Indices

- = Equal-Weighted
- \$ Price-Weighted
- ⚖ Value-Weighted

## Considerations



### Survivorship Bias

- Delisted returns were added to include negative returns



### Avoiding Future Information

- Only information from the previous month was used for reconstitution

# Key Implementation Choices

## Top N Choices

- 100 securities were chosen as this provides enough diversification without including companies that are too small

## Monthly Rebalancing Rules

- Each month, the top 100 stocks with the largest market cap were picked for next months index
- After which, weights are adjusted depending on the index

## Handling Missing Data

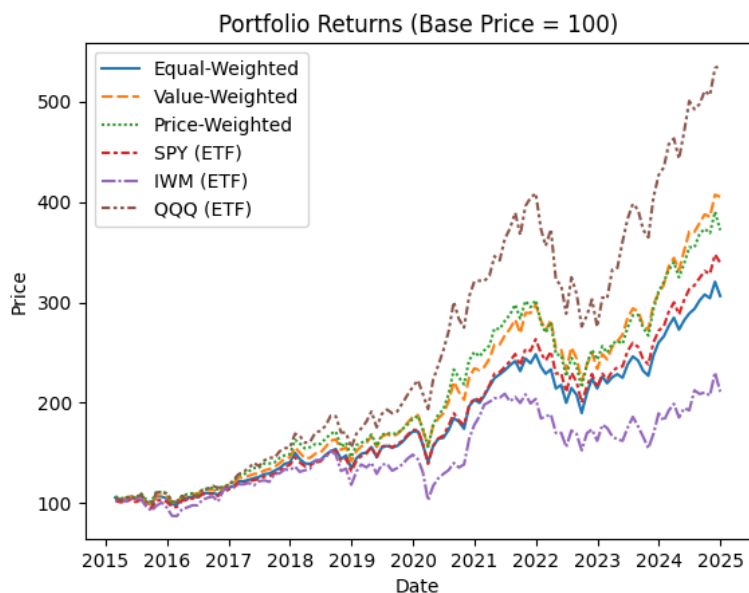
- We carried forward the previous index level when data was missing to keep the indices stable and not introduce fake volatility

## ETF Benchmarking

- We compared our indices to SPY, IWM, and QQQ as they are industry standards ETFs
- Log returns for correlation analysis were used as they are additive

# Results

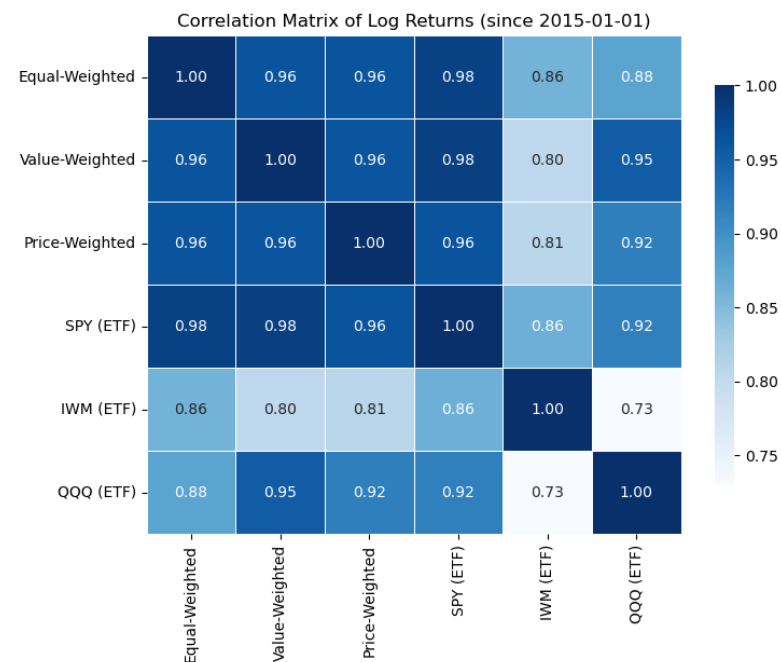
## Portfolio Returns Compared with ETFs



### Key Takeaways

- QQQ maintains the highest portfolio returns, with IWM low being return low variance.
- Equal, value, and price weighted portfolios have similar returns, roughly tracking the S&P 500

## Correlation Matrix

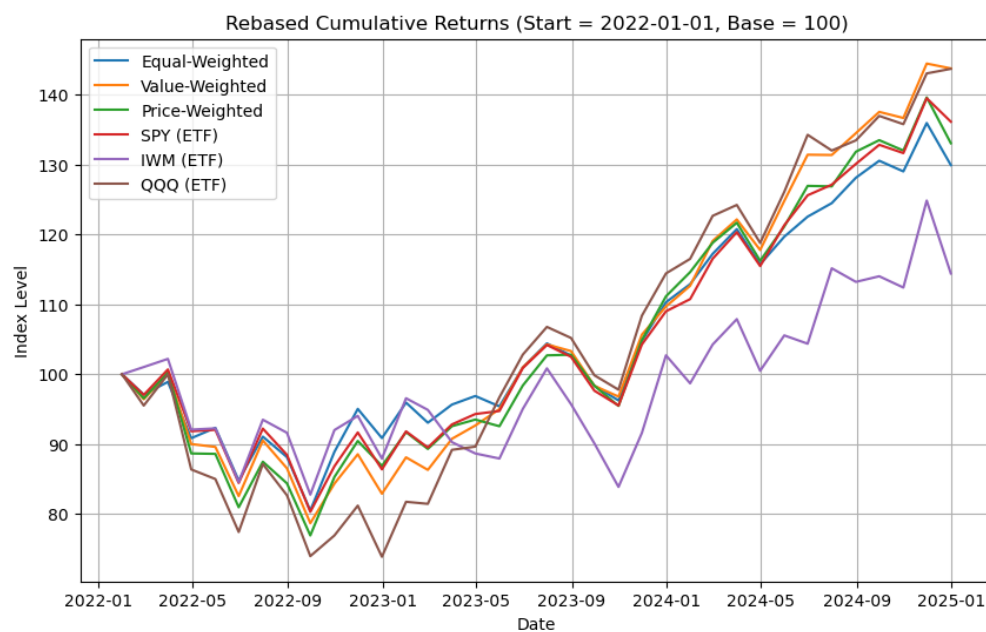


### Key Takeaways

- SPY and QQQ closely correlated with Value-Weighted Index
- Lower correlations with IWM as different basket of stocks

# Results – Stock Crash Start

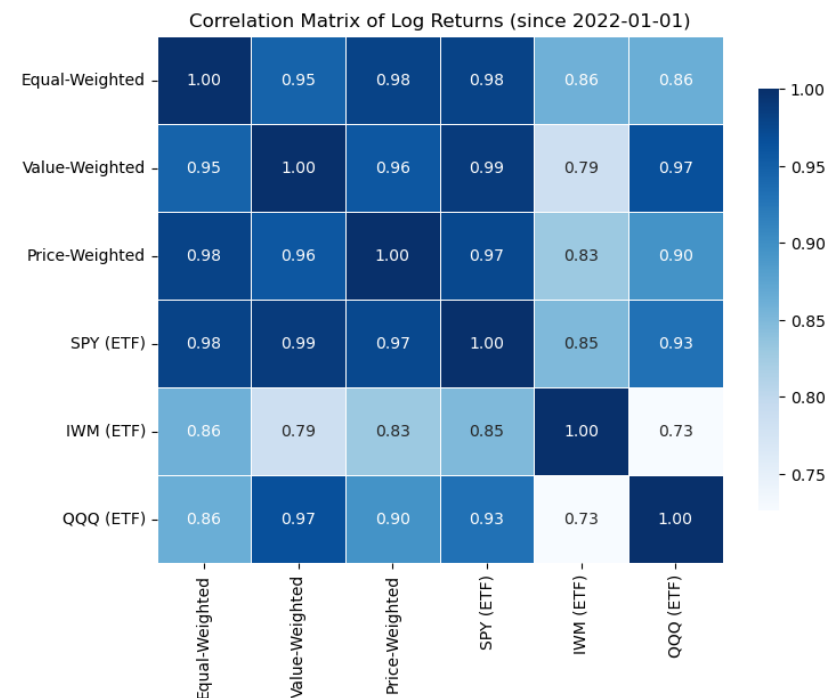
## Portfolio Returns Compared with ETFs



### Key Takeaways

- Higher variance portfolios will see lower returns following stock crashes

## Correlation Matrix

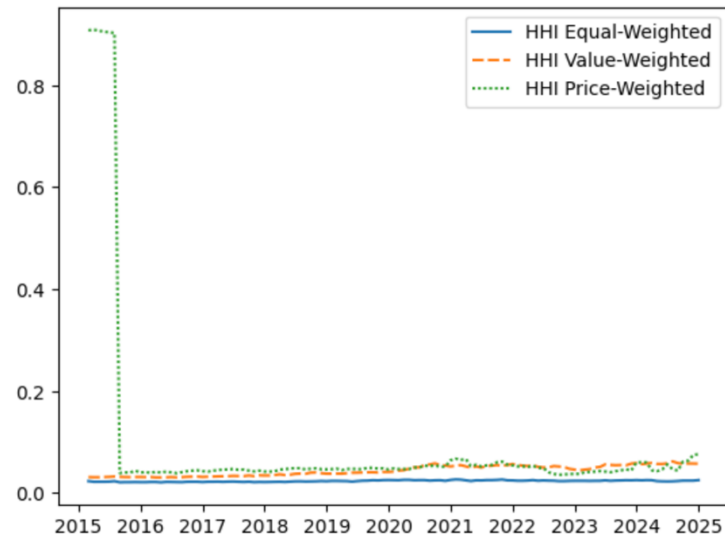


### Key Takeaways

- Correlations between stocks stay constant despite differing timelines

# Results – HHI

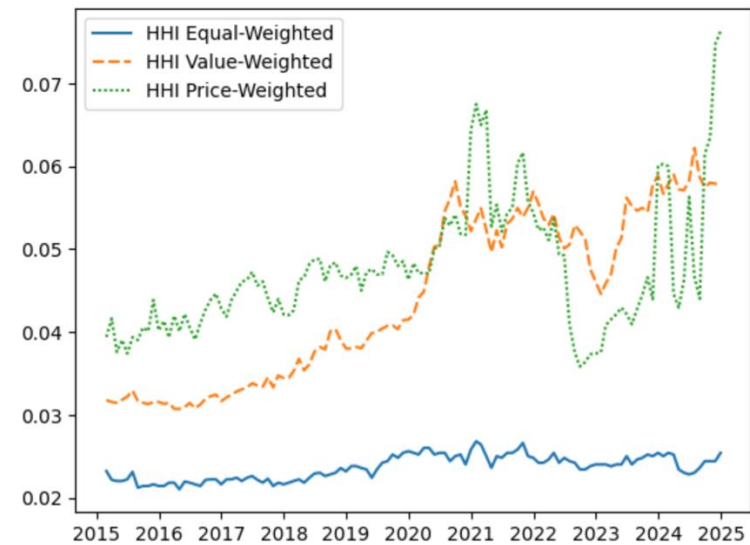
## HHI with Berkshire Hathaway



### Key Takeaways

- Equal and Value Weighted Indexes diversified across all months
- Price Weighted dominated by BRK.A in first 7 months of data

## HHI without Berkshire Hathaway



### Key Takeaways

- The equal weighted portfolio yields the highest diversification
- Spike in portfolio concentration in 2021 and 2024