

# Complementing Equity Portfolios with the Nasdaq U.S. Rising Dividend Achievers™ Index (NQDVRIS™): A Brief Empirical Analysis

Rufus Rankin, DBA - Head of Empirical Index Research, Nasdaq Index Research & Development

## Introduction

Investors frequently favor dividend stocks during market drawdowns. Indeed, some research suggests that stocks which pay high dividends outperform during bear markets. The Nasdaq Rising Dividend Achievers™ Index has features which make it an excellent complement to equity portfolios, generally, as well as dividend-focused portfolios. For calendar year 2022, the NQDVRIS™ Index held up much better than the Nasdaq-100® and Nasdaq Composite®, while also outperforming the broader S&P 500. The NQDVRIS Index can complement broad equity portfolios as well as dividend-focused portfolios. In Section I we will review features of the Index in relation to other equity indexes. In Section II we will look at using the exchange traded fund (“ETF”) that tracks NQDVRIS – the First Trust Rising Dividend Achievers ETF (RDVY) – in conjunction with other dividend strategy ETFs. As a ‘bonus’ we will see that RDVY adds material value for more active investors. In summary, passive equity investors, dividend-focused investors and active investors can all benefit from including the NQDVRIS Index in their portfolios or investable universes. These benefits have been stable over the full sample, as well as during the higher volatility regime that began in 2020.

## Index Analysis

On a stand-alone basis, NQDVRIS compares favorably with the Nasdaq-100 and Nasdaq Composite indexes and could be a valuable complement to either index, and passive equity investors could realize material benefits from an allocation to NQDVRIS.

## 2022 Performance

In 2022, NQDVRIS performed better than the other referenced indexes on a cumulative basis, and also outperformed during some of the more challenging days and months throughout the year. April of 2022 was the worst month of the year for both the Nasdaq 100 and the Nasdaq Composite, and September was the worst month of the year for the S&P 500. In both months, NQDVRIS outperformed the other three indexes. This performance may suggest that NQDVRIS can add value to equity portfolios, especially during stressful times.

April 2022 Returns (Total Returns)			
NQDVRIS	S&P 500	Nasdaq-100	Nasdaq Composite
-7.52%	-9.12%	-14.32%	-14.20%

September 2022 Returns (Total Returns)			
NQDVRIS	S&P 500	Nasdaq-100	Nasdaq Composite
-9.40%	-9.66%	-11.15%	-11.03%

Cumulative Return for Calendar Year 2022 (Total Returns)			
NQDVRIS	S&P 500	Nasdaq-100	Nasdaq Composite
-12.92%	-18.11%	-32.38%	-32.54%

Table 1,2 &amp;3: One month and cumulative index returns

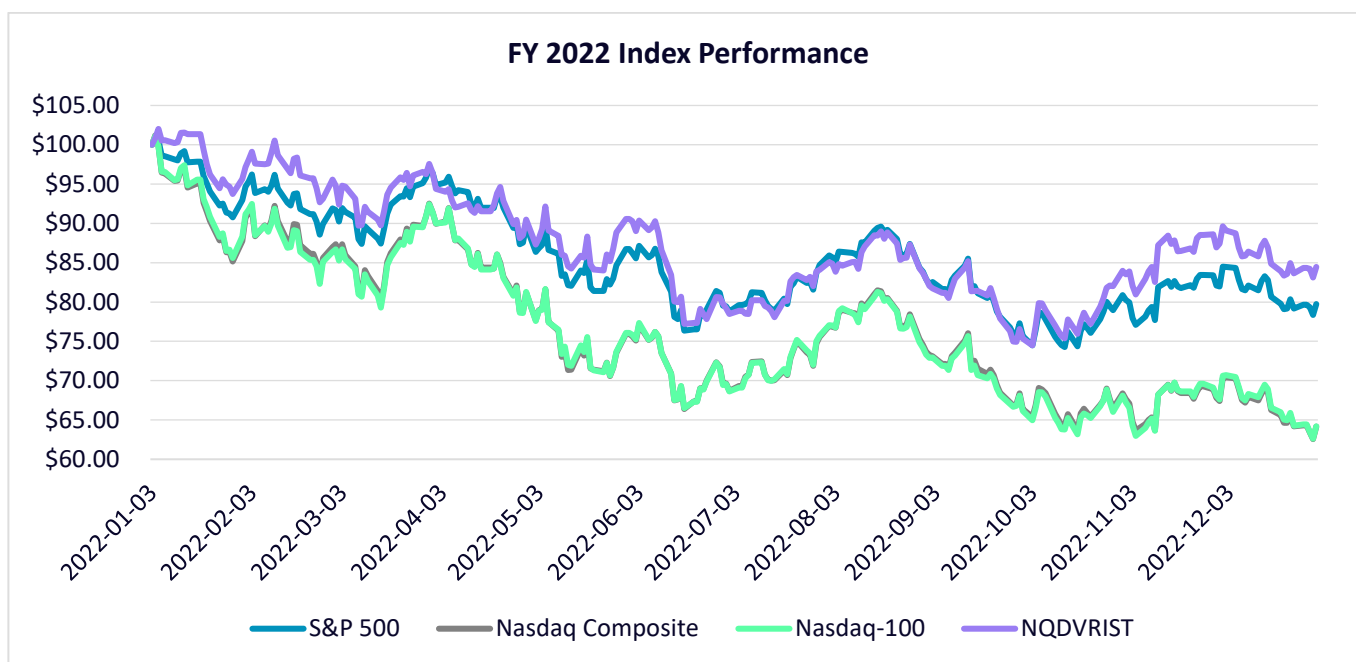


Figure 1: Index Performance FY 2022

## Relative Outperformance

NQDVRIS outperforms either benchmark when they are up less than 50% of the time. On the other hand, NQDVRIS outperforms both benchmarks when they are down about 60% of the time. Monthly figures are shown below, and daily numbers are quite similar. This outperformance is another way to look at the potential risk reduction benefit of including NQDVRIS in an equity portfolio.

	Nasdaq-100	Nasdaq Composite
Up Percent Outperformance	36.75%	38.89%
Down Percent Outperformance	61.25%	61.31%

Table 2: Outperformance of NQDVRIS in up and down periods, daily returns from March 2007 through December 2022.

## Correlation

As expected, NQDVRIS has high correlation with other equity indexes. This does not tell the entire story, however. As we saw above, NQDVRIS often outperforms the Nasdaq-100 and Nasdaq Composite indexes when they are down. This can be seen in the table below, which shows correlation to the S&P 500, Nasdaq-100 and Nasdaq Composite for the full sample of monthly returns, during “stress” periods for each index, and the average correlation of NQDVRIS during the “stress” periods. We define stress periods as months which fall below the 10<sup>th</sup> percentile of monthly returns for each index (which are all losses of approximately 6%). While correlation to the S&P does not materially change, correlation to the Nasdaq Composite decreases substantially, and correlation to the Nasdaq-100 decreases drastically. This is further evidence that NQDVRIS can improve portfolio performance during equity drawdowns, as correlation with comparative indexes ‘decouples’ during stressful periods.

	S&P 500	Nasdaq-100	Nasdaq Composite
Full Sample	0.9494	0.8443	0.8854
SP500 10th %	0.8561	0.3009	0.5661
NComp 10th %	0.9037	0.4033	0.6207
N100 10th %	0.9037	0.4033	0.6207
Stress Avg.	0.8878	0.3692	0.6025

Table 3: Correlations for full sample and stress periods, full months from April 2007 through December 2022

In summary, NQDVRIS has features that make it an attractive investment for passive equity index investors.

## Portfolio Analysis

Investors can access this index via the RDVY ETF which can add value to a concentrated dividend portfolio of dividend index ETFs. Adding RDVY to a concentrated universe of dividend ETFs boosts diversification potential, while enhancing returns. For these illustrations we use the following ETFs, which track the following indexes.

ETF Ticker	ETF Name	Index
RDVY	First Trust Rising Dividend Achievers ETF	Nasdaq U.S. Rising Dividend Achievers Index
DVY	iShares Select Dividend ETF	Dow Jones U.S. Select Dividend Index
HDV	iShares Core High Dividend ETF	Morningstar Dividend Yield Focus Index
SDY	SPDR S&P Dividend ETF	S&P High Yield Dividend Aristocrats Index
NOBL	ProShares S&P 500 Dividend Aristocrats ETF	S&P 500 Dividend Aristocrats

Table 4: Dividend ETFs and their Indexes

## Average Correlation and Dispersion

There are several methods for assessing the internal ‘health’ of a portfolio. Two are average correlation and dispersion. Average correlation is the simple average of the lower triangle of the correlation matrix, sampled on a full or rolling basis. Dispersion can be measured as the single period cross-sectional standard deviation of returns, as suggested by Solnik & Roulet (2000). A lower average correlation and higher dispersion are both indicative of greater diversity within the portfolio. The illustrations below show a material reduction in the rolling average correlation and a material increase in the dispersion for our set of dividend ETFs with and without RDVY included. These results suggest that RDVY can complement an existing Dividend ETF portfolio – as it is bringing something “different” to the table.

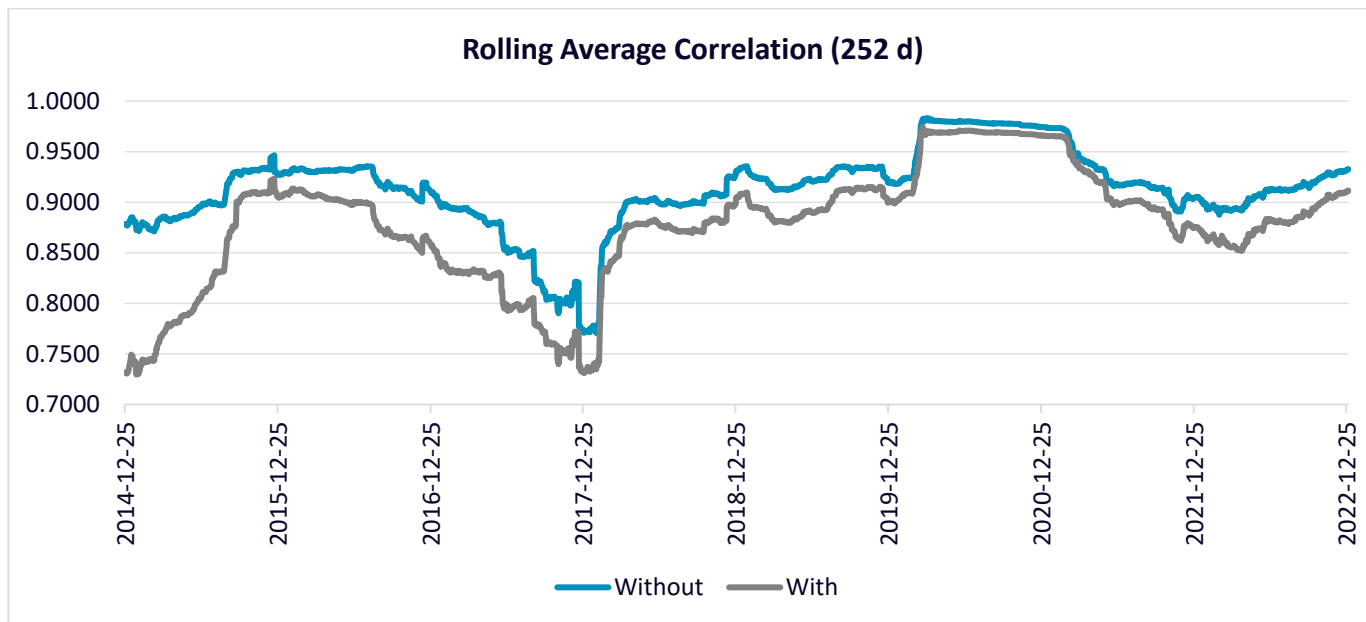


Figure 2: Rolling Average Correlation through December 2022 for Dividend ETF Portfolio Without RDVY vs. With RDVY

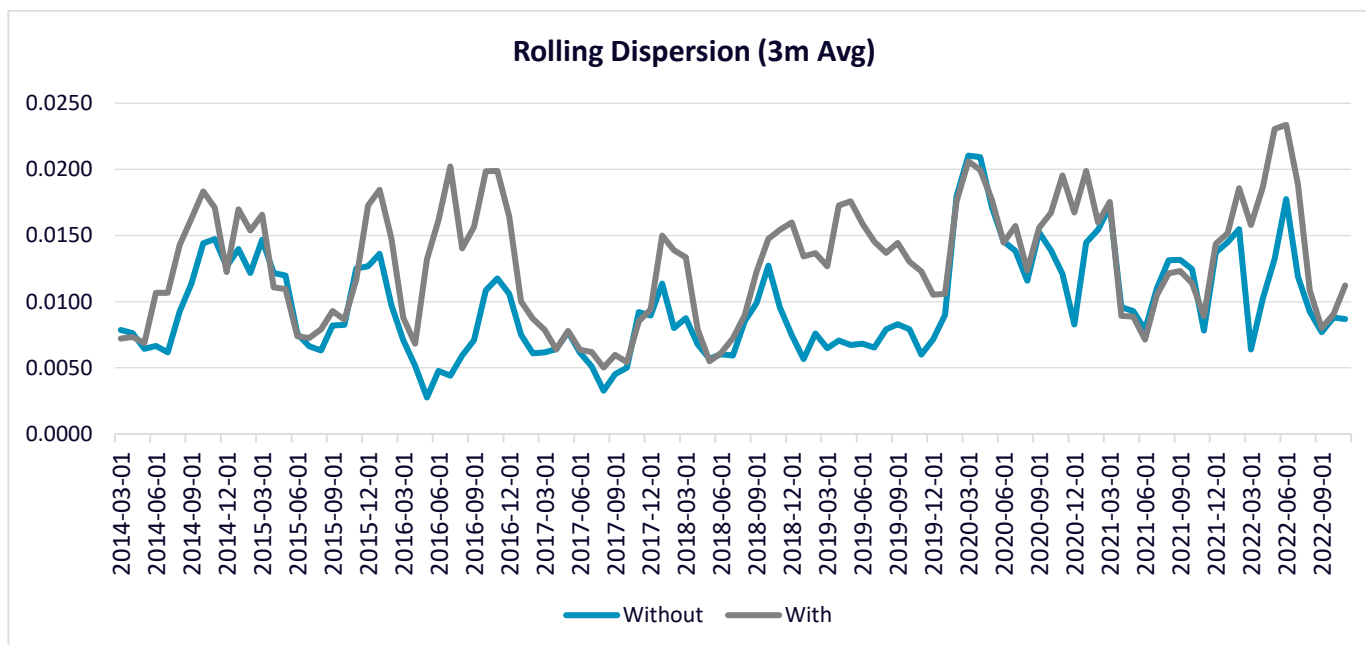


Figure 3: Rolling Dispersion (3-month average) through December 2022 for Dividend ETF Portfolio Without RDVY vs. With RDVY

### Optimization

Many investors and advisors will use optimization as a part of their portfolio construction process. As optimization outputs come with errors, it is often a good idea to average the outputs of multiple optimizers with similar objectives, with the hope that the ‘signal’ will remain while errors cancel each other out. A simple average of four risk-based optimizers (minimum variance, equal risk contribution, maximum diversification, and minimum tail dependence) is used for the following illustration. We look at the full-sample optimization as well as a rolling one-year optimization with monthly rebalancing. We can see that RDVY, which tracks the NQDVRIS Index, has a higher than 1/n allocation for the full sample and on average over the rolling optimizations. Other than HDV, RDVY has the highest full-sample and average rolling allocation and has the lowest volatility of rolling allocation (as measured by standard deviation of the allocation weights). The rolling weight of RDVY is remarkably stable, relative to the other ETFs. This suggests that RDVY can complement a portfolio of Dividend ETFs with a high degree of confidence and can even serve as a core holding.

	RDVY	DVY	HDV	SDY	NOBL
Full Sample Wgt	21.75%	14.29%	38.80%	15.14%	10.01%
Mean Roll Wgt	21.22%	17.97%	32.48%	15.44%	12.89%
SD Roll Wgt	2.62%	9.21%	10.21%	4.91%	5.18%

Table 5: Optimization Weights for full sample date range from January 2014 – December 2022.

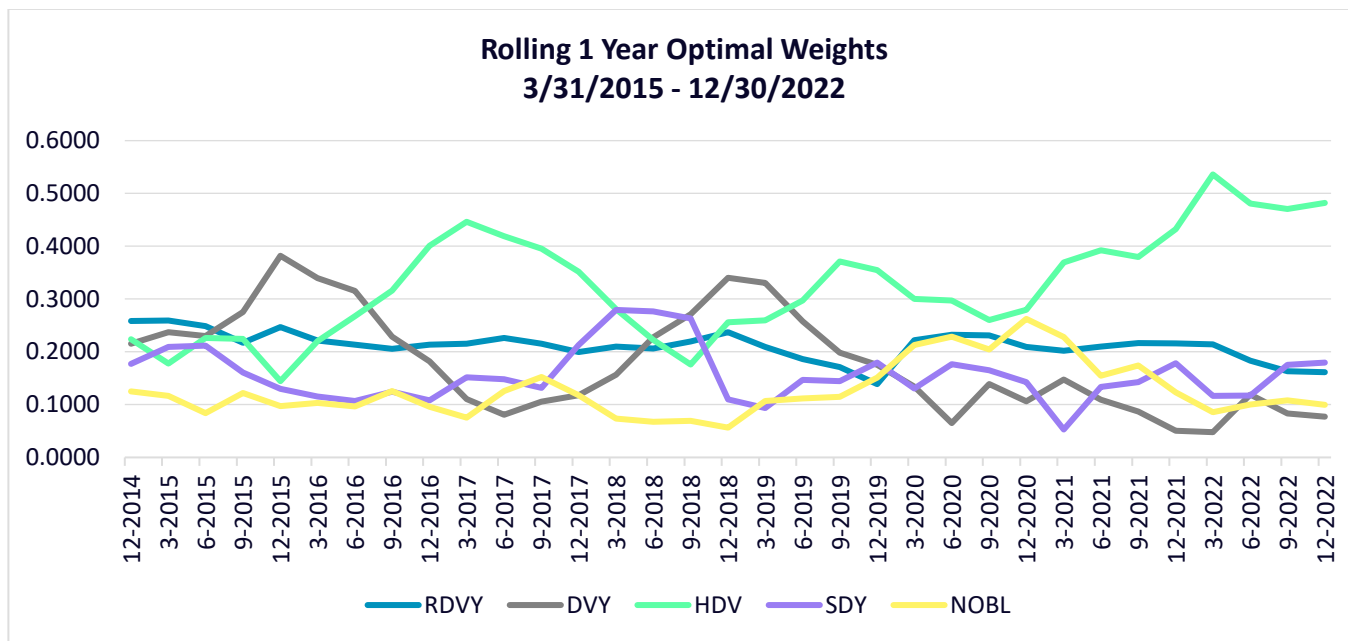


Figure 4: Rolling 1 Year Optimization Weights, quarter-end observations.

### Performance

Adding RDVY to a portfolio of dividend strategy ETFs, even with a simple equal weight approach that rebalances on a quarterly basis, has a beneficial impact. We can see that for the full available sample and for the period starting in January of 2020, the equal weight portfolio that includes RDVY has a higher return without taking on meaningful additional risk. While volatility is slightly higher, “penalized risk” and conditional drawdown at risk are slightly lower for the full sample, and much lower since January 2020, suggesting a more stable risk profile for the portfolios that include RDVY. January 2020 is used as a starting point for a potentially new, higher risk regime in equity markets.

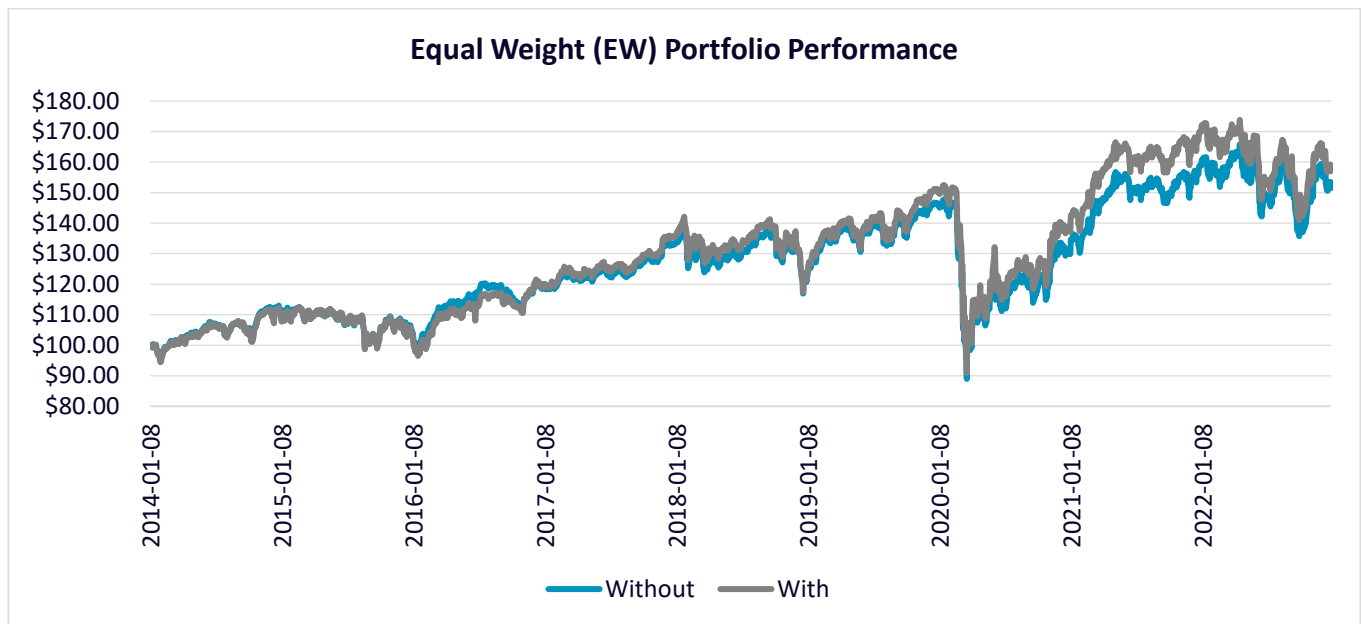


Figure 5: Equal Weight Portfolio Performance for Dividend ETF Portfolio Without RDVY vs. With RDVY

EW Portfolio Performance Full Sample			EW Portfolio Performance Since 2020		
	EWwo	EWwith		EWwo	EWwith
AROR	0.0463	0.0505	AROR	0.0125	0.0152
SD	0.1668	0.1719	SD	0.2419	0.2491
SR	0.2773	0.2938	SR	0.0517	0.0609
PenRisk	0.0245	0.0237	PenRisk	0.0481	0.0313
MaxDD	0.3977	0.4044	MaxDD	0.3977	0.4044
CDar	0.0575	0.0565	CDar	0.1065	0.0706
MDD/SD	2.3841	2.3522	MDD/SD	1.6443	1.6233
END\$	1.5227	1.5812	END\$	1.0394	1.0479
RSQ	0.7539	0.7872	RSQ	0.5353	0.5084
SKEW	-0.7285	-0.7614	SKEW	-0.5887	-0.6236
MDD/AR	8.5900	8.0078	MDD/AR	31.8172	26.6050

Table 6: Equal Weight Portfolio Statistics, full sample and since Jan 2020

### A More Active Approach Using Mean-Variance Optimization (“MVO”)

We have seen that the NQDVRIS Index is complementary to broad equity allocations, as well as a focused portfolio of dividend ETFs. Active investors would also benefit from including the NQDVRIS Index in their universe. In this exercise, we will apply a simple version of Mean-Variance optimization to see how RDVY might complement a slightly more return-focused approach to managing a portfolio of dividend strategy ETFs.

Using a rolling window of 252 days and rebalancing monthly, an MVO approach that includes RDVY in the universe along with the other four dividend ETFs has materially better performance than using the four dividend ETFs without RDVY in many periods. The MVO portfolio that includes RDVY also outperforms the simpler equal-weight portfolios examined above.

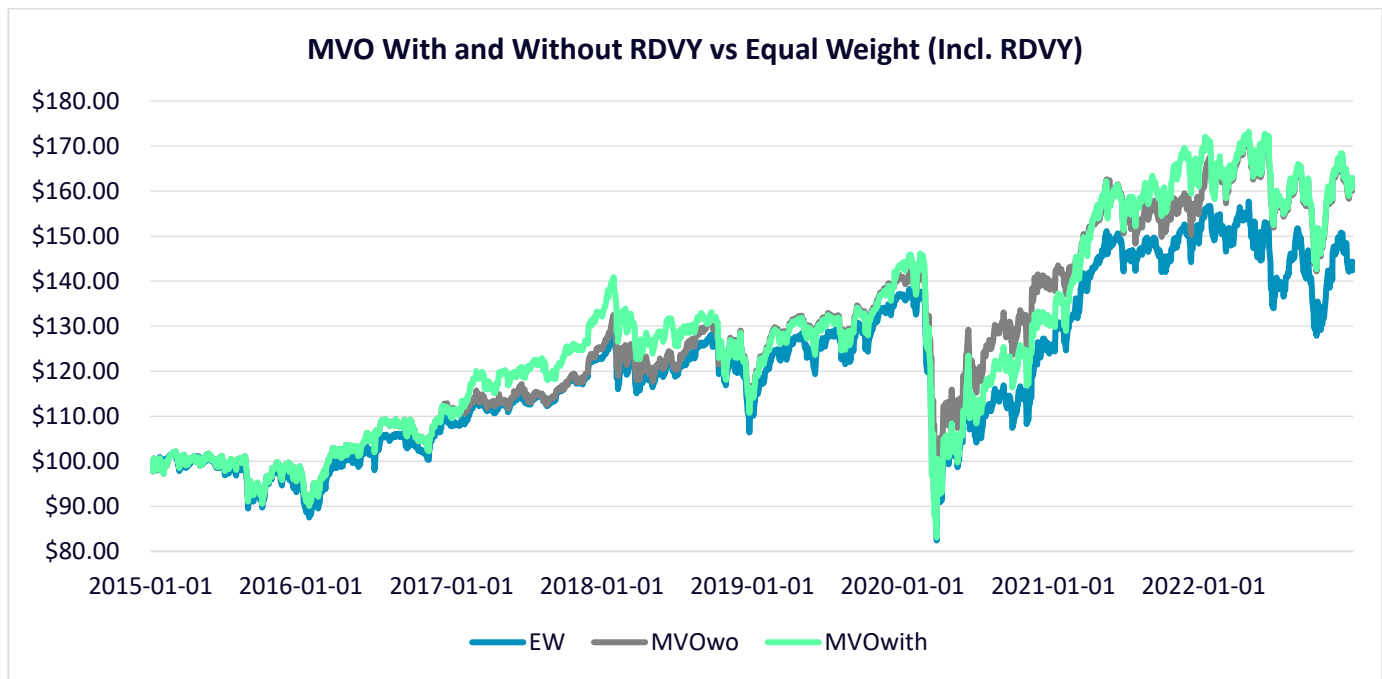


Figure 6: MVO Portfolio Performance for Dividend ETF Portfolio Without RDVY vs. With RDVY, vs. Equal Weight With RDVY.

MVO - With & Without RDVY			
	EW	MVOwo	MVOwith
AROR	0.0445	0.0596	0.0601
SD	0.1792	0.1722	0.1909
SR	0.2484	0.3462	0.3148
PenRisk	0.0244	0.0216	0.0269
MaxDD	0.4044	0.3735	0.4315
CDar	0.0575	0.0603	0.0614
MDD/SD	2.2562	2.1689	2.2603
END\$	1.4343	1.6153	1.6213
RSQ	0.7413	0.8626	0.7603
SKEW	-0.7416	-0.6471	-1.1537
MDD/AR	9.0875	6.2662	7.1793

Table 7: MVO portfolio statistics - with and without RDVY - 2/2/2015:12/30/2022

## Conclusion

The Nasdaq U.S. Rising Dividend Achievers Index can complement a broad equity index portfolio as well as a dividend-focused portfolio. Furthermore, it is an excellent complement to a concentrated universe for more active investors. In summary, passive equity investors, dividend-focused investors and active investors may all benefit from including the NQDVRIS Index in their portfolios or investable universes, as NQDVRIS has historically shown the potential to boost returns and reduce risk, especially during periods of equity market stress.

Appendix

Additional Illustrations and Information

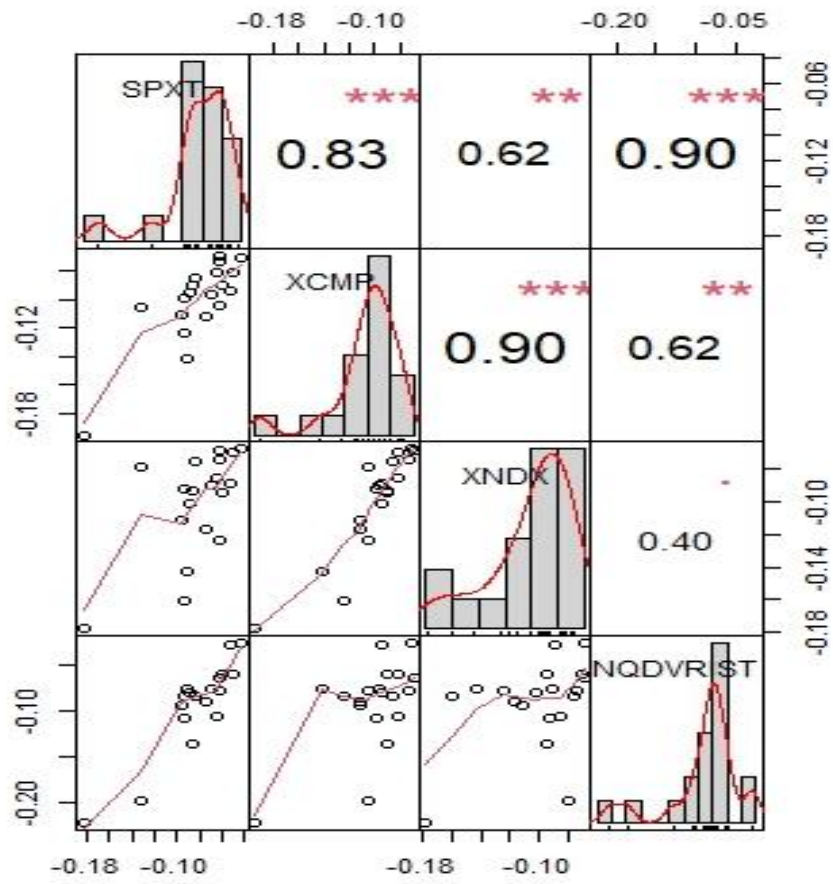


Figure 7: Correlation during "Stress" months for Nasdaq-100



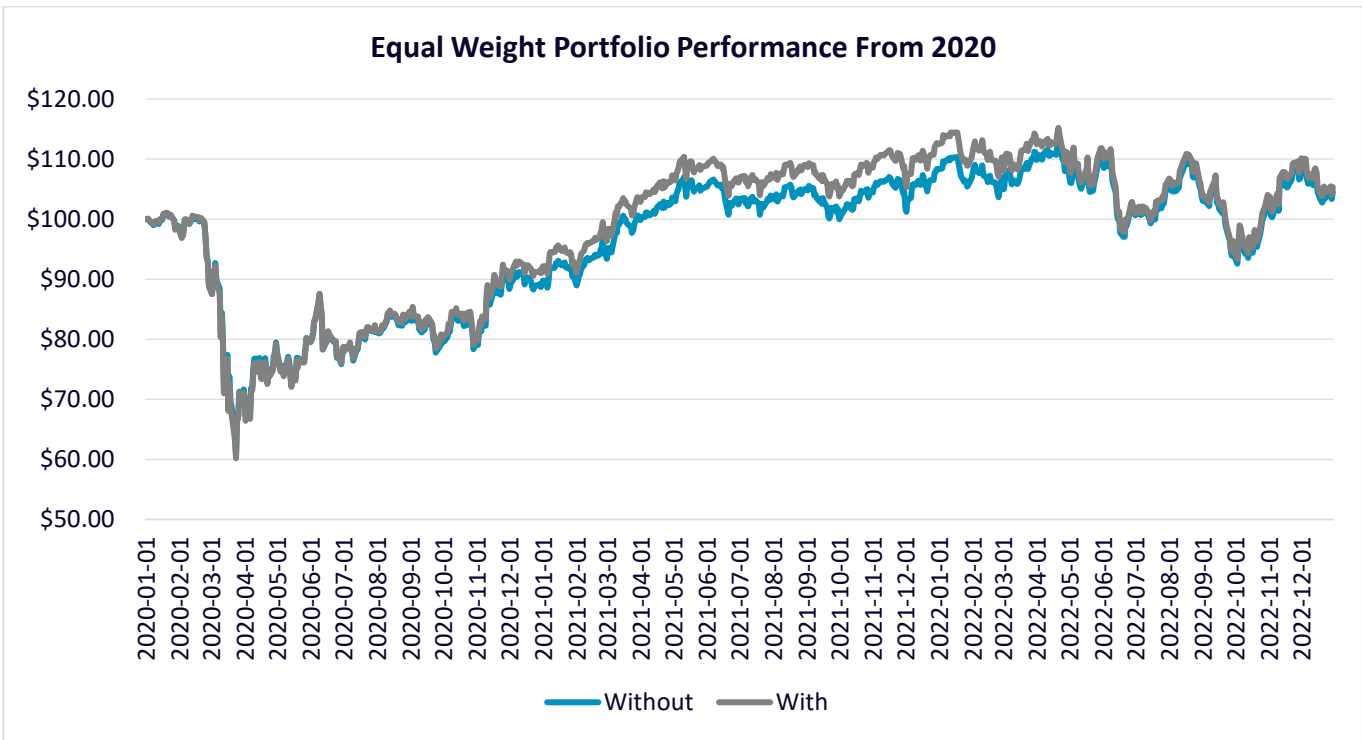


Figure 8: Equal Weight Portfolio Performance from January 2020

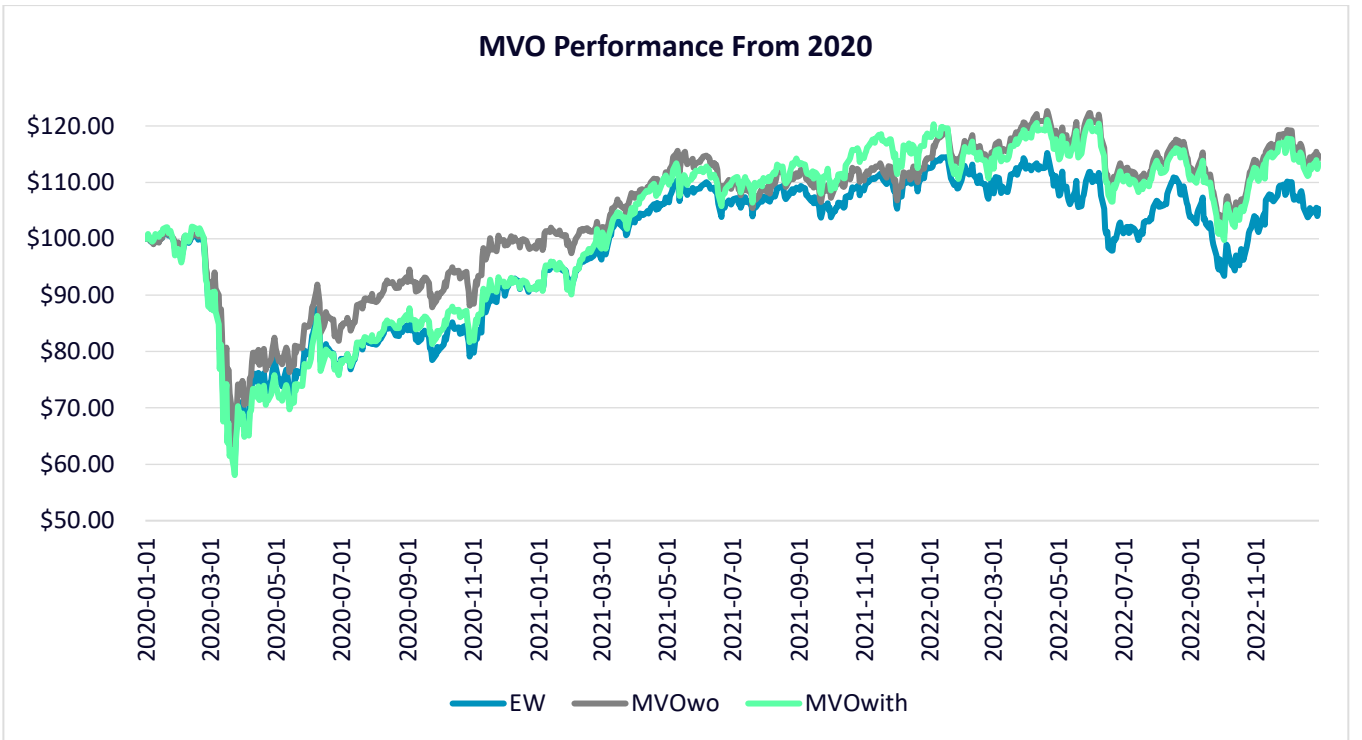


Figure 9: EPO Portfolio Performance from January 2020

Return and Risk Measures	
Abbreviation	Description
AROR	Annualized Rate of Return
SD	Annualized Standard Deviation of Returns
SR	Sharpe Ratio
PenRisk	Penalized Risk ( <i>please see KeyQuant 2018</i> )
MaxDD	Maximum Drawdown
CDar	Conditional Drawdown at Risk
MDD/SD	Max Drawdown/Annualized Standard Deviation
END\$	Ending value of \$1
RSQ	R-squared, a measure of 'smoothness' of the portfolio value
SKEW	Skewness
MDD/AR	Max Drawdown/Annualized Rate of Return

Table 8: Definition of Return and Risk Measures

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## Data Sources

- Index & ETF data from Bloomberg

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