# ETF Portfolio: Top Performers

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# What is an Exchange-Traded Fund? (ETF)

- An ETF is a type of security that tracks an index, sector, commodity, or other asset, but which can be purchased or sold on a stock exchange the same way a regular stock can.

- An ETF can be structured to track anything from the price of an individual commodity to a large and diverse collection of securities.

- ETFs can even be structured to track specific investment strategies.

  (source: investopedia.com)

# More ETF Facts

- ETF share prices fluctuate all day as the ETF is bought and sold; this is different from mutual funds that only trade once a day after the market closes.

- ETFs offer low expense ratios and fewer broker commissions than buying the stocks individually does.

## types of ETFs.

**Stock ETFs** track a particular set of related stocks.

**Bond ETFs** are made up of corporate or government bonds.

**Commodity ETFs** invest in commodities like precious metals, agricultural goods, or natural resources.

**Sector or Industry ETFs** track stocks within particular industries.

**Currency ETFs** trade foreign currencies.

**Leveraged ETFs** use leverage to amplify returns.
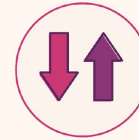
**Inverse ETFs** aim to deliver returns on the decline of the indexes they track.

**Project objective:**
Create our own ETF Portfolio consisting of the top performing stocks found in the set of high ranking ETFs given by the U.S.News & World Report

# Sectors ETFs we looked at:

## Tech

- RYT
  - invesco S&P 500 Eql Wght Technology
- XSW
  - S&P Software & Services
- XLK
  - Technology Select Sector SPDR Fund

## Real Estate

- USRT
  - iShares Core US REIT
- XLRE
  - Real Estate Select Sector SPDR
- RWR
  - SPDR Dow Jones REIT

# U.S.News Objective Ranked ETFs we looked at:

## Growth

- Large: JMOM
  - Jpmorgan US Momentum Factor
- Mid: MDYG
  - SPDR S&P 400 Mid Cap Growth
- Small: SLYG
  - SPDR S&P 600 Small Cap Growth

## Blend (Growth+Value)

- Large: BBUS
  - JPMorgan BetaBuilders US Equity
- Mid: SPMD
  - SPDR Portfolio S&P 400 Mid Cap
- Small: SLYG
  - SPDR S&P 600 Small Cap Growth

# Project Overview

- From our selected ETF's, we pulled the history of each individual stock contained by said ETF's

- After conducting performance and quantitative analysis on the stocks, we ranked and selected some of the most promising stocks over the past year period to include in our ETF

- We then ran simulations to test our ETF future performance

# Setting Benchmarks

For reference, we looked at SPY(S&P 500) and QQQ (Nasdaq100) for rating our ETFs performance

# Getting the market data

Alpaca is a modern platform for algorithmic trading. Alpaca's API is the interface for trading algo to communicate with brokerage services. The API's allows trading to access real time price, fundamentals, place orders and manage your portfolio.

We used Alpaca SDK method to pull 1 year of historical data for the chosen sectors (Real Estate , Technology) ETF's blended with Large,Mid and Small purpose; compared with current stock market data from S&P 500 and Nasdaq 100 exchanges and store into database for easy data analysis. Results were compared showing volatility of each stock from daily , weekly, monthly to yearly performance.

| etf | category | type |
| --- | --- | --- |
| RYT | Sector | Technology |
| XSW | Sector | Technology |
| XLK | Sector | Technology |
| USRT | Sector | Real Estate |
| XLRE | Sector | Real Estate |
| RWR | Sector | Real Estate |
| BBUS | Purpose | Large_blend |
| JMOM | Purpose | Large_growth |
| SPMD | Purpose | Mid_blend |
| MDYG | Purpose | Mid_growth |
| SLY | Purpose | Small_blend |
| SLYG | Purpose | Small_growth |

| | etf | symbol | name | pct_holding |
| --- | --- | --- | --- | --- |
| 0 | RYT | ENPH | Enphase Energy Inc | 0.0192 |
| 1 | RYT | ANET | Arista Networks Inc | 0.0153 |
| 2 | RYT | CRM | Salesforce.com Inc | 0.0153 |
| 3 | RYT | XLNX | Xilinx Inc | 0.0152 |
| 4 | RYT | PAYC | Paycom Software Inc | 0.0151 |
| ... | ... | ... | ... | ... |
| 1073 | XLK | CTXS | Citrix Systems Inc | 0.0011 |
| 1074 | XLK | JNPR | Juniper Networks | 0.0009 |
| 1075 | XLK | DXC | Dxc Technology Company | 0.0007 |
| 1076 | XLK | WU | Western Union Company | 0.0007 |
| 1077 | XLK | IPGP | Ipg Photonics Corp | 0.0005 |

| etf | category | type |
| --- | --- | --- |
| SPY | Benchmark | SP500 |
| QQQ | Benchmark | Nasdaq100 |

| symbol | period D0 | D7_W1 | M1 | M3 | M6 | Y0_YTD | Y1 | Y2 | Y3 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A | 159.81 | 158.18 | 150.01 | 156.52 | 131.88 | 118.66 | 110.2000 | 76.85 | 64.50 |
| AAON | 76.71 | 72.63 | 67.91 | 70.23 | 66.04 | 64.70 | 65.5700 | 50.24 | 42.95 |
| AAPL | 150.83 | 151.49 | 142.80 | 145.61 | 126.86 | 129.41 | 115.9700 | 262.20 | 194.20 |
| AAT | 39.62 | 38.85 | 39.01 | 37.69 | 34.95 | 27.41 | 26.7800 | 46.91 | 39.23 |
| ABBV | 115.60 | 117.57 | 110.34 | 114.81 | 116.19 | 105.41 | 98.8600 | 85.67 | 89.68 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| ZIXI | 8.50 | 8.51 | 7.39 | 7.14 | 6.64 | 8.36 | 6.6700 | 7.11 | 6.62 |
| ZM | 258.40 | 285.58 | 253.86 | 372.36 | 288.49 | 359.78 | 376.2550 | 68.38 | NaN |
| ZS | 352.63 | 327.66 | 267.55 | 240.41 | 165.77 | 196.21 | 127.7862 | 44.03 | 39.34 |
| ZTS | 220.20 | 210.99 | 197.68 | 198.75 | 171.30 | 163.68 | 162.5000 | 117.03 | 94.46 |
| ZUO | 23.05 | 22.06 | 17.11 | 15.74 | 14.84 | 13.55 | 10.0900 | 14.67 | 20.35 |

638 rows × 9 columns

Alpaca ⟶ sqlLite

# Further Quantitative analysis

$$Sharpe\ Ratio = \frac{R_p - R_f}{\sigma_p}$$

$R_p$ = Return of portfolio

$R_f$ = Risk-Free rate

$\sigma_p$ = Standard deviation of portfolio's excess return

For Risk return analysis, In each stock we looked at the following criteria:

- Total return over the period
- Moving average over the period
- Sharpe Ratio
- Covariance to S&P 500
- Average beta over the period

| symbol | Y_Return | XY_Return | Annualized_std_dev | Average_annual_return | Sharpe_ratio | SPY_30d_roll_beta |
|--------|----------|-----------|--------------------|-----------------------|--------------|-------------------|
| MTDR   | 4.346290 | 0.620493  | 0.648978           | 1.946671              | 2.999597     | 1.696524          |
| PDCE   | 2.859788 | 0.430042  | 0.591443           | 1.538393              | 2.601085     | 1.673338          |
| CLF    | 1.725962 | 0.094595  | 0.678703           | 1.236083              | 1.821243     | 1.914329          |
| SBNY   | 2.179636 | 0.278066  | 0.401553           | 1.270229              | 3.163294     | 1.422064          |
| SIG    | 3.017462 | 0.653306  | 0.607639           | 1.613076              | 2.654662     | 1.473068          |

# Creating our portfolio

We ranked the individual stocks based on the calculated metrics and selected 122 stocks to include in our ETF portfolio



| | category | type | symbol | grp | D0 | D7_W1 | M1 | M3 | M6 | Y0_YTD | ... | Y2 | Y3 | Start Date | Start Cost | X_End Date | X_End Close | X_Return | Y_End Date | Y_End Close | Y_Return |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Sector | Technology | RYT | TEC | 317.8300 | 311.180 | 288.37 | 298.7300 | 270.32 | 250.34 | ... | 189.07 | 151.228 | 2020-11-10 | 226.61 | 2021-05-10 | 270.32 | 0.192886 | 2021-11-09 | 317.8300 | 0.402542 |
| 1 | Sector | Technology | XSW | TEC | 186.8500 | 182.910 | 171.61 | 172.0100 | 153.47 | 151.01 | ... | 97.35 | 79.120 | 2020-11-10 | 127.36 | 2021-05-10 | 153.47 | 0.205009 | 2021-11-09 | 186.8500 | 0.467101 |
| 2 | Sector | Technology | XLK | TEC | 167.2900 | 163.700 | 151.10 | 153.2500 | 135.52 | 127.90 | ... | 86.17 | 67.410 | 2020-11-10 | 118.46 | 2021-05-10 | 135.52 | 0.144015 | 2021-11-09 | 167.2900 | 0.412207 |
| 3 | Sector | Real Estate | USRT | REA | 64.1900 | 64.470 | 59.64 | 60.3900 | 56.36 | 46.71 | ... | 54.48 | 48.400 | 2020-11-10 | 47.59 | 2021-05-10 | 56.36 | 0.184282 | 2021-11-09 | 64.1900 | 0.348813 |
| 4 | Sector | Real Estate | XLRE | REA | 48.3900 | 48.660 | 44.69 | 46.0300 | 42.53 | 35.38 | ... | 37.85 | 33.385 | 2020-11-10 | 36.78 | 2021-05-10 | 42.53 | 0.156335 | 2021-11-09 | 48.3900 | 0.315661 |
| 5 | Sector | Real Estate | RWR | REA | 116.3100 | 116.450 | 107.74 | 109.1400 | 101.78 | 83.55 | ... | 102.49 | 93.640 | 2020-11-10 | 85.87 | 2021-05-10 | 101.78 | 0.185280 | 2021-11-09 | 116.3100 | 0.354489 |
| 6 | Purpose | Large_blend | BBUS | LAR | 85.6600 | 85.160 | 79.72 | 81.3600 | 76.57 | 67.90 | ... | 55.57 | NaN | 2020-11-10 | 64.56 | 2021-05-10 | 76.57 | 0.186029 | 2021-11-09 | 85.6600 | 0.326828 |
| 7 | Purpose | Large_growth | JMOM | LAR | 48.7900 | 48.530 | 44.18 | 45.2399 | 40.63 | 38.38 | ... | 29.09 | NaN | 2020-11-10 | 35.73 | 2021-05-10 | 40.63 | 0.137140 | 2021-11-09 | 48.7900 | 0.365519 |
| 8 | Purpose | Mid_blend | SPMD | MID | 50.8100 | 50.540 | 46.79 | 47.9900 | 47.99 | 39.77 | ... | 35.07 | 33.020 | 2020-11-10 | 37.02 | 2021-05-10 | 47.99 | 0.296326 | 2021-11-09 | 50.8100 | 0.372501 |
| 9 | Purpose | Mid_growth | MDYG | MID | 83.6695 | 83.350 | 76.02 | 78.1900 | 76.84 | 68.27 | ... | 54.94 | 50.590 | 2020-11-10 | 68.27 | 2021-05-10 | 76.84 | 0.208366 | 2021-11-09 | 83.6695 | 0.315765 |
| 10 | Purpose | Small_blend | SLY | SMA | 104.1400 | 102.300 | 95.99 | 96.5800 | 95.67 | 78.75 | ... | 70.00 | 67.920 | 2020-11-10 | 70.93 | 2021-05-10 | 95.67 | 0.348795 | 2021-11-09 | 104.1400 | 0.468208 |
| 11 | Purpose | Small_growth | SLYG | SMA | 95.9800 | 94.280 | 87.57 | 89.5300 | 85.36 | 75.76 | ... | 61.69 | 60.270 | 2020-11-10 | 67.73 | 2021-05-10 | 85.36 | 0.260298 | 2021-11-09 | 95.9800 | 0.417097 |
| 12 | Benchmark | SP500 | SPY | SP5 | 467.3800 | 464.730 | 434.67 | 442.6600 | 417.98 | 368.85 | ... | 308.39 | 272.490 | 2020-11-10 | 354.07 | 2021-05-10 | 417.98 | 0.180501 | 2021-11-09 | 467.3800 | 0.320021 |
| 13 | Benchmark | Nasdaq100 | QQQ | NAS | 395.2800 | 393.235 | 358.39 | 366.8500 | 325.62 | 309.24 | ... | 200.96 | 166.480 | 2020-11-10 | 283.46 | 2021-05-10 | 325.62 | 0.148734 | 2021-11-09 | 395.2800 | 0.394482 |

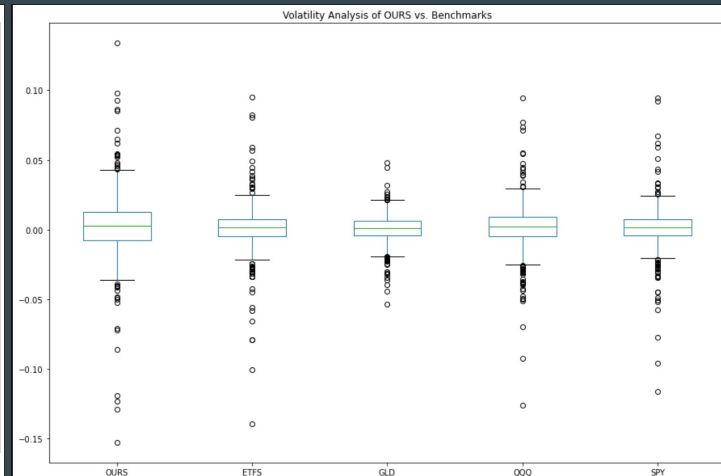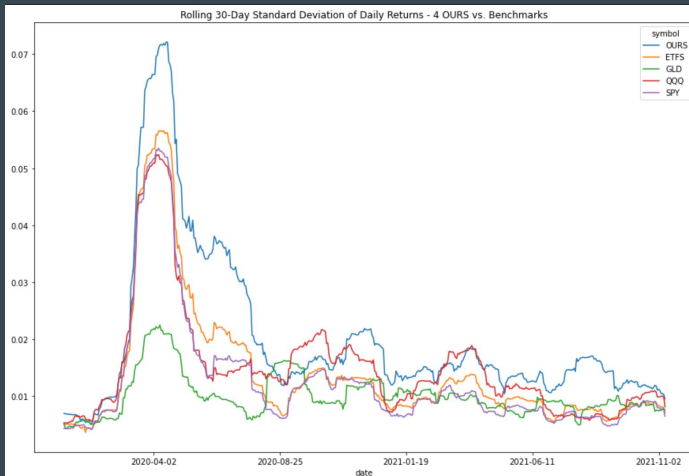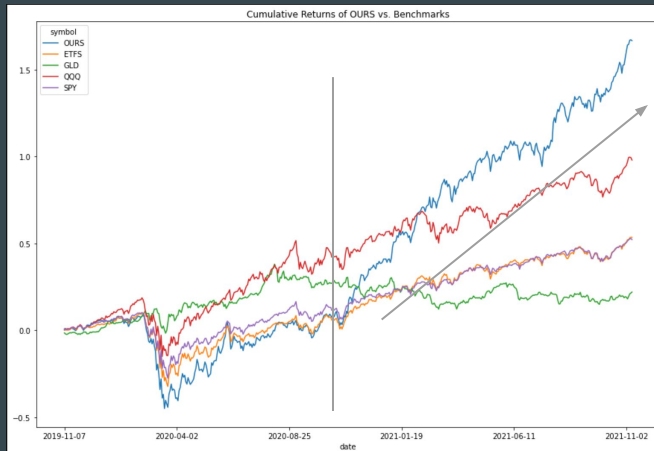| symbol | LAR | MID | REA | SMA | TEC | D0 | D7_W1 | M1 | M3 | M6 | ... | X_End Close | X_Return | Y_End Date | Y_End Close | Y_Return | XY_Return | Annualized_std_dev | Average_annual_return | Sharpe_ratio | SPY_30d_roll_beta |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTDR | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 45.39 | 41.94 | 42.750 | 29.35 | 28.01 | ... | 28.01 | 2.299176 | 2021-11-09 | 45.39 | 4.346290 | 0.620493 | 0.648978 | 1.946671 | 2.999597 | 1.696524 |
| PDCE | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 58.36 | 52.99 | 49.640 | 39.99 | 40.81 | ... | 40.81 | 1.699074 | 2021-11-09 | 58.36 | 2.859788 | 0.430042 | 0.591443 | 1.538393 | 2.601085 | 1.673338 |
| CLF | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 22.68 | 22.65 | 21.475 | 26.02 | 20.72 | ... | 20.72 | 1.490385 | 2021-11-09 | 22.68 | 1.725962 | 0.094595 | 0.678703 | 1.236083 | 1.821243 | 1.914392 |
| SBNY | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 323.21 | 325.31 | 295.125 | 254.50 | 252.89 | ... | 252.89 | 1.487850 | 2021-11-09 | 323.21 | 2.179636 | 0.278066 | 0.401553 | 1.270229 | 3.163294 | 1.422064 |
| SIG | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 103.53 | 103.19 | 82.040 | 67.94 | 62.62 | ... | 62.62 | 1.429957 | 2021-11-09 | 103.53 | 3.017462 | 0.653306 | 0.607639 | 1.613076 | 2.654662 | 1.473068 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| GPI | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 202.50 | 198.51 | 186.890 | 171.77 | 166.75 | ... | 166.75 | 0.356022 | 2021-11-09 | 202.50 | 0.646743 | 0.214393 | 0.458230 | 0.638720 | 1.393887 | 1.597500 |
| TGT | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 255.17 | 260.47 | 228.720 | 264.01 | 213.93 | ... | 213.93 | 0.353902 | 2021-11-09 | 255.17 | 0.614898 | 0.192773 | 0.222984 | 0.497637 | 2.231720 | 0.869308 |
| FLOW | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 79.50 | 77.44 | 71.970 | 79.80 | 70.59 | ... | 70.59 | 0.353855 | 2021-11-09 | 79.50 | 0.524741 | 0.126222 | 0.370134 | 0.518036 | 1.399590 | 0.701804 |
| LTHM | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 31.44 | 30.22 | 24.030 | 25.23 | 17.66 | ... | 17.66 | 0.353775 | 2021-11-09 | 31.44 | 1.410119 | 0.780294 | 0.646595 | 1.091797 | 1.688534 | 1.961681 |
| LAMR | 0.0 | 2.0 | 1.0 | 0.0 | 0.0 | 121.82 | 121.62 | 117.410 | 107.87 | 103.85 | ... | 103.85 | 0.352214 | 2021-11-09 | 121.82 | 0.586198 | 0.173038 | 0.256489 | 0.533123 | 2.078542 | 1.090058 |

# Comparing our Performance
# with benchmarks based on history

Here we looked at how our ETF portfolio fared
against benchmarks (ETFs, SPY, QQQ and GLD)



Cumulative Returns of OURS vs. Benchmarks

| symbol | OURS | ETFS | GLD | QQQ | SPY |
|--------|------|------|-----|-----|-----|
| **date** | | | | | |
| **2019-11-07** | 0.007890 | -0.000113 | -0.015591 | 0.003404 | 0.003516 |
| **2019-11-08** | 0.008927 | 0.001052 | -0.021926 | 0.007509 | 0.005958 |
| **2019-11-11** | 0.005893 | 0.001082 | -0.024418 | 0.006058 | 0.004070 |
| **2019-11-12** | 0.007578 | 0.000506 | -0.021570 | 0.008811 | 0.005861 |
| **2019-11-13** | 0.002342 | 0.002180 | -0.017726 | 0.008110 | 0.006284 |
| **...** | ... | ... | ... | ... | ... |
| **2021-11-03** | 1.640005 | 0.520282 | 0.180181 | 0.968636 | 0.513088 |
| **2021-11-04** | 1.644259 | 0.520602 | 0.193564 | 0.993692 | 0.520023 |
| **2021-11-05** | 1.668161 | 0.530816 | 0.208941 | 0.995344 | 0.525330 |
| **2021-11-08** | 1.670273 | 0.534805 | 0.213426 | 0.992791 | 0.526893 |
| **2021-11-09** | 1.665599 | 0.534265 | 0.219335 | 0.978874 | 0.521716 |

506 rows × 5 columns

| symbol | Annualized_std_dev | Annualized_return | Sharpe_ratios | Beta to SP500 |
|--------|-------------------|-------------------|---------------|---------------|
| **OURS** | 0.387413 | 0.564650 | 1.457489 | 1.275100 |
| **ETFS** | 0.280843 | 0.253239 | 0.901711 | 1.031540 |
| **GLD** | 0.167031 | 0.112754 | 0.675050 | 0.140768 |
| **QQQ** | 0.280404 | 0.379715 | 1.354171 | 1.128833 |
| **SPY** | 0.255632 | 0.242071 | 0.946948 | 1.000000 |



Rolling 30-Day Standard Deviation of Daily Returns - 4 OURS vs. Benchmarks



Volatility Analysis of OURS vs. Benchmarks
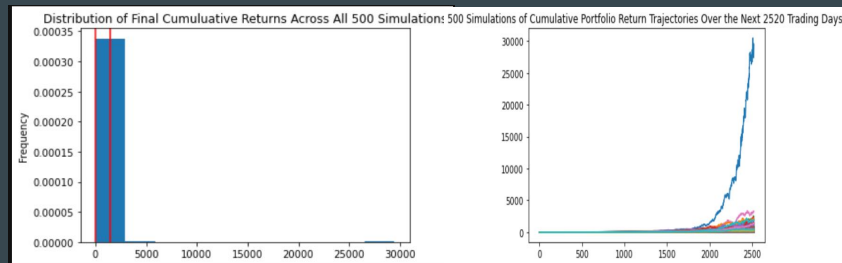
# Our Portfolio Performance Forecast

Performance in 10 years:
Our Portfolio is expected perform best among 5 comparisons based on MC simulation result:
There is a 95% chance that our portfolio over the 10 years will end within in the price upside potential range of 13.8% and 1420.21%
while 2nd best (QQQ) has 4.95% and 170.42%

| | OURS | ETFS | SPY | QQQ | GLD |
|---|---|---|---|---|---|
| count | 500.000000 | 500.000000 | 500.000000 | 500.000000 | 500.000000 |
| mean | 315.347920 | 13.877895 | 11.721062 | 45.761956 | 3.229222 |
| std | 1356.086171 | 18.510605 | 16.870006 | 47.930563 | 1.841952 |
| min | 6.595019 | 0.308895 | 0.438375 | 1.860615 | 0.364852 |
| 25% | 63.512742 | 5.267784 | 4.472366 | 16.853377 | 2.014422 |
| 50% | 137.748396 | 9.245263 | 8.073615 | 30.659559 | 2.780318 |
| 75% | 293.263871 | 16.226919 | 14.467639 | 55.124420 | 3.913972 |
| max | 29462.875530 | 297.671695 | 317.733387 | 506.160312 | 13.957448 |
| 95% CI Lower | 13.817310 | 1.296673 | 1.612989 | 4.950681 | 1.021603 |
| 95% CI Upper | 1420.212359 | 48.344110 | 39.240372 | 170.424122 | 8.282655 |



Distribution of Final Cumulative Returns Across All 500 Simulations: 500 Simulations of Cumulative Portfolio Return Trajectories Over the Next 2520 Trading Days.

Monte Carlo simulation for ours vs. index-based and benchmark ETFs:

- S&P 500:(SPY)
- Nasdaq 100 (QQQ)
- 12 benchmark ETF- Parents ( RYT, XSW , XLK , USRT, XLRE, RWR, BBUS, JMOM, SPMD, MDYG, SLY, SLYG)

# Benchmark ETFs Performance Forecast

• Then let's check out the performance in 20 years

| | ETF | ci_lower_20yrs | ci_upper_20yrs | mean_20yrs | std_20yrs | median_20yrs |
|---|---|---|---|---|---|---|
| 0 | RYT | 10.094816 | 1672.709842 | 353.227271 | 561.779986 | 164.361002 |
| 1 | XSW | 52.909431 | 5981.174683 | 1153.669340 | 1746.000844 | 570.348660 |
| 2 | XLK | 43.010426 | 11073.609877 | 1679.775439 | 3457.237748 | 639.654363 |
| 3 | USRT | 0.118266 | 39.743224 | 6.070057 | 12.372842 | 2.346964 |
| 4 | XLRE | 0.334226 | 56.096938 | 10.633570 | 24.935080 | 4.206110 |
| 5 | RWR | 0.077231 | 32.961900 | 4.321838 | 9.237027 | 1.270136 |
| 6 | BBUS | 6.699238 | 510.618302 | 114.701697 | 183.941431 | 62.614185 |
| 7 | JMOM | 9.703486 | 676.558443 | 147.131067 | 261.156907 | 70.818653 |
| 8 | SPMD | 2.257828 | 389.996786 | 75.861232 | 144.509633 | 33.969756 |
| 9 | MDYG | 2.573720 | 689.282061 | 119.760130 | 292.913793 | 42.546139 |
| 10 | SLY | 2.759415 | 786.501781 | 147.097616 | 446.538559 | 48.515820 |
| 11 | SLYG | 4.245367 | 965.018210 | 211.759406 | 706.502279 | 65.186620 |
| 12 | SPY | 5.489789 | 563.697911 | 101.570193 | 189.103687 | 46.502370 |
| 13 | QQQ | 64.502315 | 7741.425664 | 1494.960519 | 3155.356702 | 628.770891 |
| 14 | GLD | 1.096076 | 19.425952 | 6.548121 | 5.042002 | 4.917592 |

# Benchmark ETFs Performance Forecast

- How about performance in 30 years?

| | ETF | ci_lower_30yrs | ci_upper_30yrs | mean_30yrs | std_30yrs | median_30yrs |
|---|---|---|---|---|---|---|
| 0 | RYT | 77.016361 | 63185.811822 | 7528.326817 | 20277.055978 | 1984.035631 |
| 1 | XSW | 614.744852 | 294768.381613 | 50717.774685 | 132560.779110 | 15629.741824 |
| 2 | XLK | 591.284742 | 354005.715120 | 54952.846305 | 169286.504046 | 12667.068599 |
| 3 | USRT | 0.087632 | 144.514060 | 17.512698 | 54.859574 | 3.187231 |
| 4 | XLRE | 0.341095 | 255.765444 | 33.642431 | 83.706145 | 7.554871 |
| 5 | RWR | 0.032389 | 47.818560 | 9.398889 | 43.904291 | 1.641182 |
| 6 | BBUS | 36.753749 | 5683.028907 | 1004.291196 | 2054.589755 | 403.505545 |
| 7 | JMOM | 35.547095 | 15727.129010 | 2120.977277 | 5107.007195 | 698.410033 |
| 8 | SPMD | 5.900234 | 3981.551403 | 665.698912 | 1898.176049 | 170.141593 |
| 9 | MDYG | 15.977656 | 5028.571315 | 901.285708 | 2787.539174 | 236.719938 |
| 10 | SLY | 11.828608 | 11128.655163 | 1625.689617 | 6176.320977 | 311.882639 |
| 11 | SLYG | 17.014560 | 14096.586949 | 2148.132547 | 8543.714766 | 495.880705 |
| 12 | SPY | 29.457200 | 6594.738482 | 1085.999268 | 2323.986073 | 396.146854 |
| 13 | QQQ | 653.659908 | 381900.402164 | 65212.609676 | 260012.345034 | 19262.933355 |
| 14 | GLD | 2.292456 | 61.844224 | 17.197233 | 19.035393 | 11.526843 |

# Limitations

- Need to conduct More Financial and Fundamental Analytics (such as PER, Revenue, Dividend) to pick better quality names for long-term investment  in addition to historical price return analytics

- Consider rebalancing and replacing names periodically to lower risk and maximize the return (also consider to do outside of short term tax investment period)

- Increase historical data range (currently, only limited to 2 years) and add more research data to conduct more in-depth analysis

# Thank you!