

Beating the Market with Mutual Funds?

Part 1. Background

How often have you heard a friend or acquaintance say, "I beat the market last year by 25%"? Or maybe, "I have the BEST mutual fund manager. He/she beat the market last year by 30%"

Do you ever wonder how true these statements are and/or if these statements are applicable over the course of more than a year or two?

MarketWatch put out an article in May 2017 (Ref. 1) indicating that roughly 1 in 20 actively managed mutual funds beat a simple index fund. Their research was conducted over a 15 year period which included the severe market crash of 2008-09 as well as the runup since then. Nonetheless, their conclusion was that a simple index fund beats 95% of actively managed mutual funds.

A separate study (Ref. 2) showed similar results. S&P Global performed their own study and the results were bleak for actively managed funds. Maybe 5-12% of actively managed funds beat a simple index fund (depending upon the capitalization stocks that were involved in the actively managed fund).

Could this be true? Are you better off with continually buying a simple index fund throughout the years?

Part 2. Methodology

I put together a simple Perl-based web scraper to grab the performance of many, many mutual funds over the years. The Perl scraper ran from the 2018 calendar year back to the year 2000.

Some people would argue that going back to the year 2000 was too far since trading technologies, methodologies, and stock/fund selection criteria have changed so much. But I scraped the data for cataloging purposes and subsequently decided how far back to go in this analysis.

I used Perl since I had used this language since the early 2000s when it was the language to use for Web-based backend programming. Perl still has its purpose in life and it was very convenient for this Web scraping task.

Once I had the raw data, I used Python to start performing the real analysis of the data. Working backwards from calendar year 2018 and back, I calculated the average return for each mutual fund as well its standard deviation.

In order to evaluate the benefits/risks of a mutual fund, I compared the average annualized return over a number of years with its standard deviation. This gives the investor an indicator of how much return they can expect on their investment as well as an indicator of the volatility. It is similar if not exactly the same as the modern portfolio theory (MPT of Ref. 3) where the expected returns are maximized for a given level of risk. And then I added in the same average annualized return and standard deviation data from an index fund for comparison sake.

Part 3. Results

Figure 1 shows the average annualized return for many different types of mutual funds against their standard deviations for the years 2018, 2017, and 2016. A total of 21246 mutual funds were evaluated of which 294 funds “performed better” than the Vanguard Index Fund (VFINX) as shown with the blue dot. “Performed better” in this case meant average returns greater than the index fund and a standard deviation less than the index fund (i.e. red data points above and to the left of the index fund blue dot). Or, in other words, returns greater than the index fund with less volatility. Even for as short a period of two years, only 1.4% of all mutual funds performed better than an index fund. Granted many mutual funds provided annualized returns greater than the index fund, but many had significantly greater volatility.

The green dots in the figure show the mutual funds “in the desired range” with either the highest average annualized return over the time period or the lowest standard deviation over the time period.

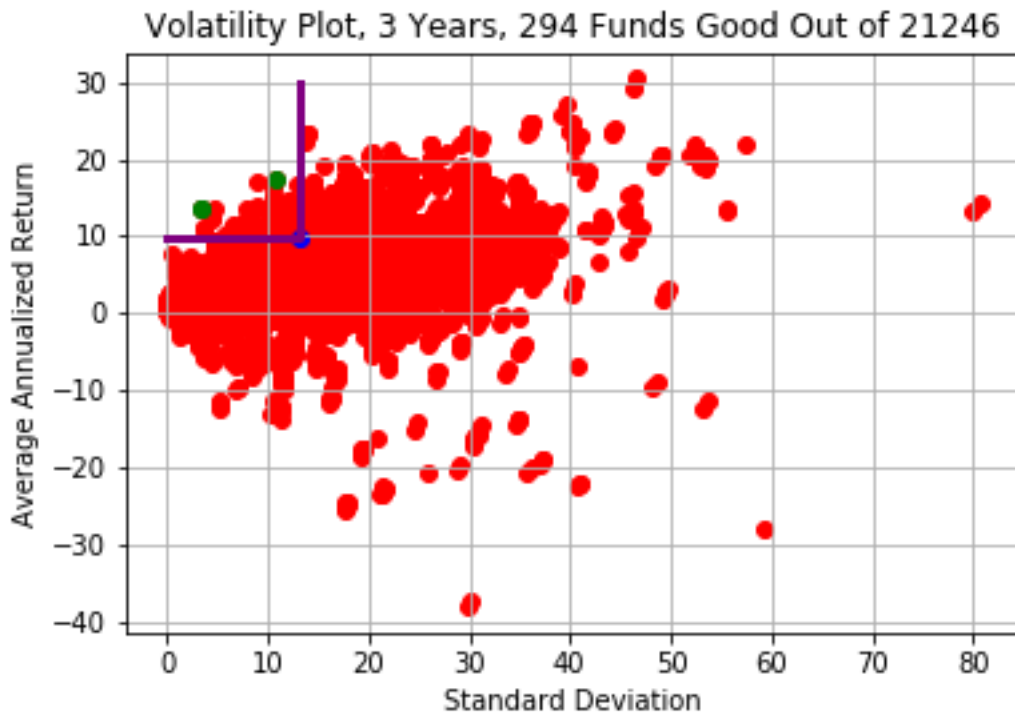


Figure 1. Three Year Annualized Return vs Standard Deviation

This analysis utilized the Vanguard index fund (VFINX) for the blue dot since it had a relatively long history. A comparison with the Fidelity index fund (FXAIX) as shown in Figure 2, for example, shows that both funds are equivalent in terms of returns and standard deviations.

Time Period (Years)	FXAIX Avg Return	FXAIX Std Deviation	VFINX Avg Return	VFINX Std Deviation
3	9.8	13.2	9.7	13.2
4	7.7	11.6	7.6	11.6
5	8.9	10.4	8.7	10.4
6	12.8	13.4	12.7	13.3
7	13.3	12.3	13.1	12.3
8			11.7	12.0
9			12.1	11.3
10			13.5	11.6
11			8.9	18.8

Figure 2. Comparison of Fidelity and Vanguard Index Fund Performances

Advancing to performance for the years 2018 through 2014 yields the five year data shown in Figure 3. Now there are only 112 funds out of 17983 (< 1.0%) of all mutual funds that returned annualized returns greater than an index fund with smaller standard deviations. Note that the total number of mutual funds decreases since funds dissolve or change or disappear from longer time periods.

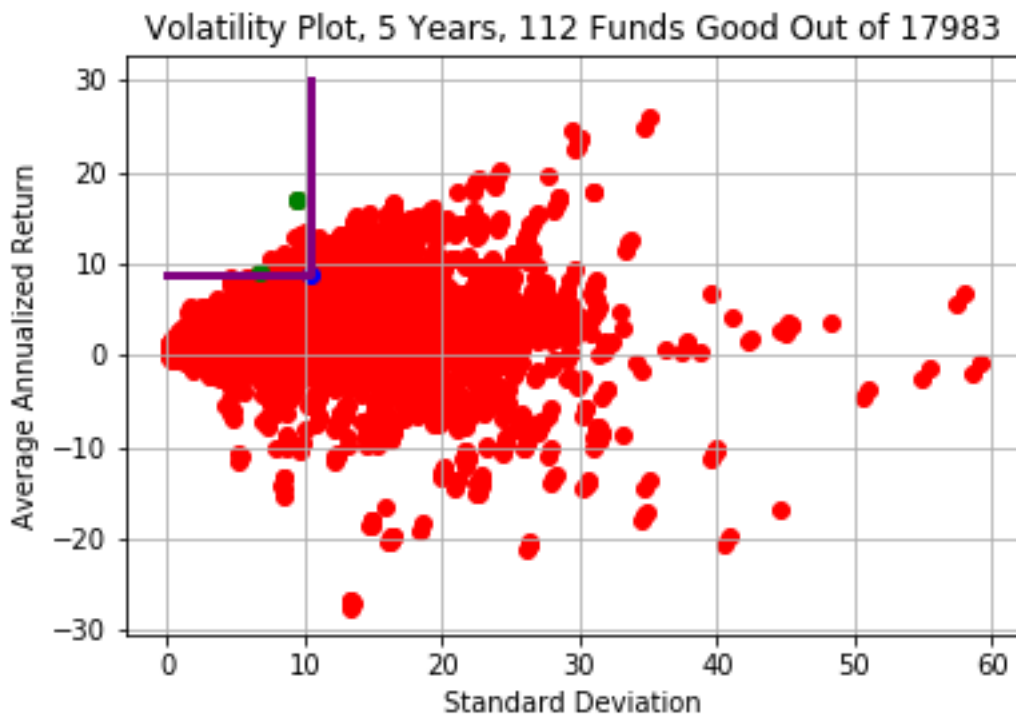


Figure 3. Five Year Annualized Return vs Standard Deviation

Finally ten year data for 2018 through 2009 is shown in Figure 4. A paltry 19 mutual funds do better than the Vanguard index fund for this period of time. Certainly other funds could yield greater returns if one wanted to accept higher standard deviations (i.e., volatility from year to year).

Each of these sets of data, as well as data not shown for other time periods, was plotted for the given time period only. There was no attempt yet to track which funds stayed “in the desired range” over differing time periods.

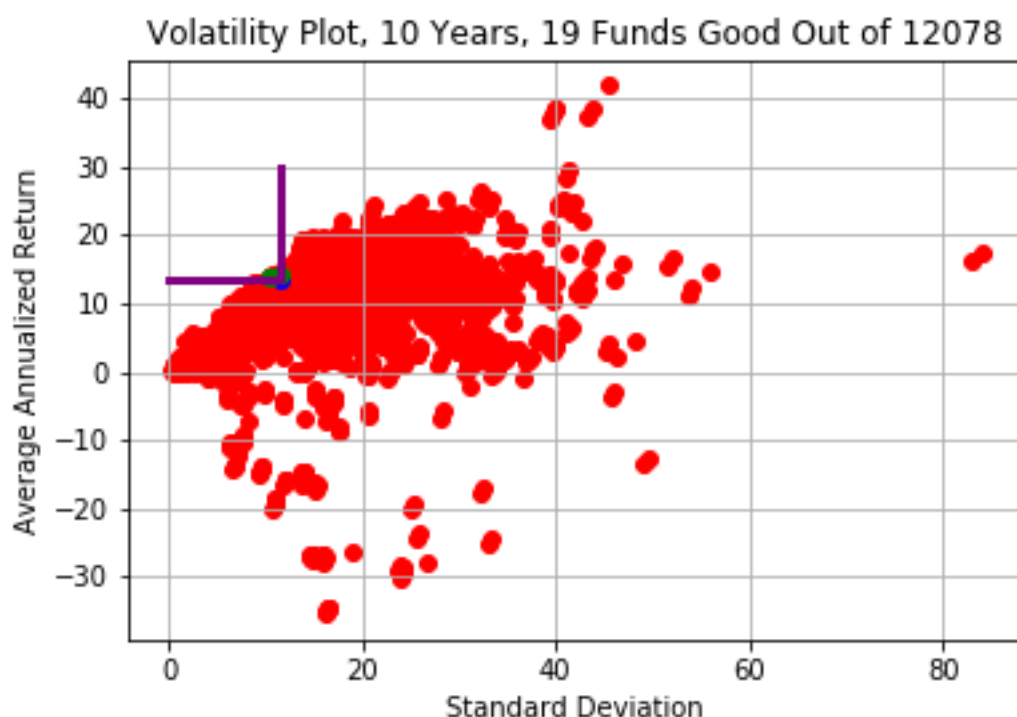


Figure 4. Ten Year Annualized Return vs Standard Deviation

Part 4. Commentary

The data shows, as has been noted in other references, that it is very difficult to beat a simple index fund. And considering that some managed funds charge higher fees makes the case better for choosing a low cost index fund. You may not get the absolute highest return over a specific time period, but you’ll beat a vast majority of other mutual funds on offer.

The next step in this analysis is to track which, if any, mutual funds stayed “in the desired range” over various time periods.

References

1. “This is how many fund managers actually beat index funds”, MarketWatch, 13 May 2017, <https://www.marketwatch.com/story/why-way-fewer-actively-managed-funds-beat-the-sp-than-we-thought-2017-04-24>.

2. Soe, A. M. and Poirier, R., "SPIVA U.S. Scorecard", Year-End 2016, <https://us.spindices.com/documents/spiva/spiva-us-year-end-2016.pdf>.
3. Markowitz, H.M. "Portfolio Selection", Journal of Finance, 7 (1): 77-91, March 1952.