IPRPD
International Journal of Business & Management Studies
ISSN 2694-1430 (Print), 2694-1449 (Online)
Volume 05; Issue no 03: March, 2024
DOI: 10.56734/ijbms.v5n3a3

REBALANCE YOUR INVESTMENT PORTFOLIO PERIODICALLY: MANTRA OR MYTH?

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Abstract

The investment mantra goes something like this: "have a well-diversified mix of stocks and bonds and rebalance it to maintain your strategic asset allocation." Recent publications in the financial press have begun to question the value of periodic portfolio rebalancing. This research examines the equity portion of a well-diversified investment portfolio and shows that the "numbers" just don't support the mantra. In fact, this research indicates that traditional rebalancing is the worst strategy, on a risk adjusted basis, for long-term portfolio growth when compared to three other strategies. While the mantra has intuitive appeal, it does not make financial sense.

A very popular portfolio strategy is to execute rebalancing of the equity portfolio periodically, generally every 12 months – for example selling the overperformers. Recent research has noted investors utilizing this strategy may be depriving themselves of the gains that extend beyond one year (Clements 2005 and Constable 2021). Thus, limiting the equity portion of an investment portfolio to passive, low-cost S&P 500 Index fund and avoiding more costly rebalancing strategies in the longer term typically results in both greater reruns for the level of risk and lower fees than the cost of continuous rebalancing.

Keywords

Investment Portfolio, Strategic, Periodical

Introduction

Portfolio rebalancing and momentum strategies have been well documented in the literature. Some of the more notable contributions include Jegadeesh and Titman (1993), Carhart (1997), Gatev (2009) and Davis (2010). Cheng (1971) states that, "… the rebalancing policy can be superior to the buy-and-hold policy, providing certain conditions are met. Superiority of the rebalancing policy can be enhanced by increasing the frequency of rebalancing. Studies show investors holding large funds benefit using rebalancing."

A recent Wall Street Journal article (Hulbert 2023) states that:

> … different studies, covering different time periods and using different stock and bond benchmarks, have sometimes found that annual rebalancing slightly increases portfolio return, the late John Bogle, the legendary founder of Vanguard Group, classified the magnitude of these increases as "noise." Frequent rebalancing "is a personal choice, not a choice that statistics can validate," Mr. Bogle once wrote in his "Ask Jack" blog, "There's certainly nothing the matter with doing it…but also no reason to slavishly worry about it."

A very popular portfolio strategy is to invest 60% in equities (stocks) and 40% in debt instruments (bonds). Depending on the risk tolerance of the investor, the split might be 70%/30%, 80%/20%, 90%/10% or even 100% equity with no allocation to debt. The purpose of this research is to examine the performance of alternate ways to rebalance the equity portion of a portfolio. Our reasoning is, "If the strategy for the equity portion of the portfolio is suboptimal, it would be difficult, if not impossible, to obtain optimal performance of a stock/bond portfolio regardless of the ratio of stocks to bonds."

The traditional rebalancing is executed periodically, generally every 12 months. By rebalancing annually and selling the overperformers, investors may be depriving themselves of the gains that extend beyond one year (Clements 2005 and O'Brien 2017). Sarah O'Brien (2017) states that, "… rebalancing too frequently can mean

missing out on momentum, which is basically when similar investments' values are trending higher in lockstep … I'm eliminating some of those asset classes before their run-up is over."

In our analysis, portfolio performance is measured over a 15-year period by comparing the ending portfolio value along with the corresponding Sharpe Ratio. The Sharpe Ratio helps assess the risk adjusted portfolio returns.

Methodology

Three portfolio strategies are analyzed for this research then compared to a fourth approach. All three portfolios begin with $100,000 equally distributed across the eight ETFs resulting in $12,500 in each ETF. The first of the three approaches is Buy & Hold in which the initial investment is allowed to grow with no movement of money from one asset class to another one. This approach has a slight momentum emphasis.

The second approach is the "traditional" rebalancing strategy which is executed by periodically dividing the total value of the portfolio by the number of asset classes in which the portfolio is invested. Then each asset class is brought back to this "average" value by selling the excess from the overperformers and investing it in the underperformers. This approach is generally considered to be a contrarian approach to portfolio asset allocation (Sharpe 2010).

The third approach analyzed is a "Top Half" momentum strategy where the total assets in the portfolio are reallocated to the best performing half of the asset classes based on the prior month returns. For this research the total assets in the portfolio at the end of the prior period are divided into four equal amounts and invested in the four best performing asset classes from the prior period. Mattei and Mattei (2016) analyzed this approach and found it to result in a higher risk adjust higher return. Their research, however, used annual sector index data and not monthly exchange traded equity data as in this research.

The monthly returns for 8 Vanguard ETFs (Table 1) were downloaded from the CRSP database for every month from 9/30/2007 to 9/30/2022. In addition, the data for the SPDR Bloomberg 1-3 Month T-Bill ETF was downloaded to compute the Sharpe Ratios. This is the longest period for which ETF data is available for all 9 asset classes-

For the Buy & Hold portfolio, the 12-month returns were calculated for each year beginning with the year ending 9/2008. For the Traditional and Top Half portfolios, the 12-month returns were computed for rebalancing periods of 1 month, 2 months, up to every 12 months. Buy & Hold maintains the initial assets allocations and allowed to grow "organically" for the entire 15-year period with no rebalancing.

EFT Name	Ticker Symbol
Large Cap Growth	VWO
Large Cap Value	VUG
Mid-cap Growth	VTV
Mid-cap Value	VOT
Small-cap Growth	VOE
Small-cap Value	VEA
FTSE Developed	VBR
FTSE Emerging	VBK
SPDR 1-3 Mo T-Bill ETF	BIL

Table 1. Vanguard and T-Bill ETF Names and Symbols

Results

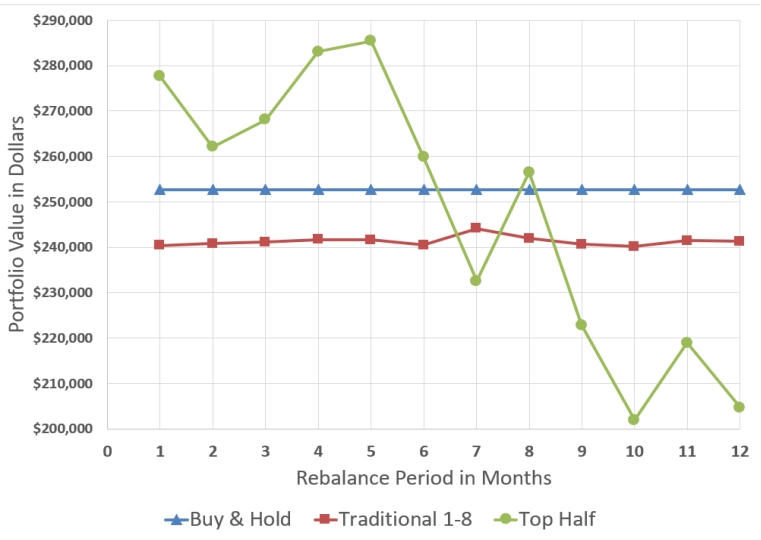

Figure 1. Portfolio 15-Year Ending Value under Various Rebalancing Periods

The graph (Figure 1) shows the total value of the portfolio after 15 years for each rebalancing period from 1 to 12. For instance, if the portfolio is rebalanced quarterly, 3 months on the x-axis, the Traditional Rebalancing approach has an ending value of approximately $241,000, the Buy & Hold approach has an ending value of approximately $252,000 and the Top Half approach has an ending value of approximately $268,000.

If the portfolio is rebalanced annually, 12 months on the x-axis, the Traditional Rebalancing approach has an ending value of approximately $241,000, the Buy & Hold approach has an ending value of approximately $252,000 and the Top Half approach has an ending value of approximately $202,000.

From this graph it is apparent that Buy& Hold always outperforms the Traditional approach while the Top Half approach outperforms both with rebalancing every 1 through 6 months, but generally underperforms both other approaches if rebalancing is done every 7 through 12 months. A closer examination of the 5-year results helps to identify which approach provides the best overall performance.

Table 2 below shows the dollar return for each portfolio for each 5-year ending period, specifically 9/2007 to 9/2012, 9/2012 to 9/2017 and 9/2017 to 9/2022, with rebalancing the Traditional and Top Half approaches every 3, 6 and 12 months. For example, the Buy & Hold approach increased in value by $4,464, for the year ending 2012, regardless of rebalancing period since no rebalancing is performed. For the 5-year period ending 2017, the value of the Traditional portfolio increased by $82,173 when the portfolio was rebalanced every 3-months. As the matrix indicates, the Traditional approach never exceeds at least one of the other two strategies.

Strategy	Rebalancing Every →	3 months	6 months	12 months
Buy & Hold	2012 Year End Total	$4,464	$4,464	$4,464
Traditional Rebalancing	2012 Year End Total	$5,023	$4,704	$4,452
Top Half Rebalancing	2012 Year End Total	$10,532	$12,736	-$515
Buy & Hold	2017 Year End Total	$85,150	$85,150	$85,150
Traditional Rebalancing	2017 Year End Total	$82,173	$81,582	$81,654
Top Half Rebalancing	2017 Year End Total	$84,003	$96,257	$74,372
Buy & Hold	2022 Year End Total	$63,076	$63,076	$63,076
Traditional Rebalancing	2022 Year End Total	$53,929	$54,203	$55,173
Top Half Rebalancing	2022 Year End Total	$73,547	$50,862	$30,851

Table 2. 5-Year Performance for Each Portfolio with Three Rebalancing Periods

To assess the risk adjusted performance of the three strategies, Table 3 shown below, presents the 15-year ending portfolio value along with the annualized Sharpe Ratio. The Top Half strategy, rebalancing every 3 and 6 months, has a Sharpe Ratio of .430 and .416 respectively. By comparison, the Buy and Hold strategy has a Sharpe Ratio of .405. The Traditional approach, which the mantra leads one to believe would have the best Sharpe Ratio, actually has the worst Sharpe Ratio of the three analyzed. Investors are better off on a risk adjusted basis to utilize either a Buy and Hold strategy or Top Half strategy (assuming rebalancing every 3 or 6 months).

Strategy	Rebalancing Every →	3 months	6 months	12 months
Buy & Hold	Portfolio Value after 15 Years	$252,690	$252,690	$252,690
Traditional Rebalancing	Portfolio Value after 15 Years	$241,125	$240,488	$241,279
Top Half Rebalancing	Portfolio Value after 15 Years	$268,082	$259,855	$204,708
Buy & Hold	Sharpe Ratio for 15 Year Period	0.405	0.405	0.405
Traditional Rebalancing	Sharpe Ratio for 15 Year Period	0.391	0.390	0.391
Top Half Rebalancing	Sharpe Ratio for 15 Year Period	0.430	0.416	0.331

Table 3. 15-Year Ending Values for Each Portfolio with Corresponding Annualized Sharpe Ratios

While Traditional Rebalancing did not perform well as compared to Buy & Hold or Top Half, the question then becomes, how does it compare to the simple strategy of holding only the S&P 500. Intuitively, this sounds like a much riskier approach, but the data indicates the exact opposite. Data for two very popular S&P 500 ETFs was downloaded from the CRSP database. Specifically, the SPDR S&P 500 ETF (SPY) and the iShares Core S&P 500 (IVV).

Once again, the Traditional Rebalancing strategy did not perform well when compared to the S&P 500. In fact, neither did the other two strategies, Buy & Hold or Top Half, outperform the S&P 500. For SPY, the 15-year return was $313,583 with an annual Sharpe Ratio of .525, considerably above the Sharpe Ratio for the three strategies listed above. The IVV 15-year return was $316,763 with an annual Sharpe Ratio of .529. SPY has an expense ratio of .09% and IVV has an expense ratio of .03%, anecdotally confirming the advantage of a lower expense ratio ETF.

Conclusions

The purpose of this study is to expand on previous research on the potential superiority of rebalancing investment portfolios by examining the performance of alternate ways to rebalance the equity portion of a portfolio. In examining the performance of the three original approaches over the 2007-2022 (15-year) period, the Top Half Rebalancing strategy produces excess returns on a Sharpe risk adjusted basis over both Traditional Rebalancing and a typical Buy and Hold strategy. However, buying and holding just the S&P 500 outperformed the initial three researched on a risk adjusted basis.

Thus, accounting for risk, the Top Half approach, rebalancing every three or six months, provides superior portfolio performance over and above what could have been earned by either the Buy and Hold or Traditional Rebalancing Strategies. Future research will apply the methodologies of this research effort using the four strategies (including buy and hold the S&P 500) to stock/bond portfolios with allocations of 60%/40%, 70%/30% and 80%/20%.

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