



*The Humble Arithmetic of
Portfolio Management*

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I am often in the situation that people want to tell me about their unpleasant experiences with financial advisors. The basic story is remarkably consistent. The person has spent time with an ‘advisor’ or ‘planner’ at a brokerage firm or fund family or local bank and has come away feeling that all the advisor really wants to do is to steer clients into high-fee investments or other strategies that will benefit the advisor and his/her firm. On top of this, many investors are familiar with studies that show that passive investment strategies tend to dominate active strategies over time. Through the combination of direct experience and such studies, many people give up on financial advisors altogether. I think that this is often a big mistake, and I developed a simple ‘equation’ to map the costs and gains for individual investors that can be jotted on the back of a napkin. After going through this same process a number of times, I decided that this was worth writing down and explaining in detail. This article is the result.

A good advisor can provide substantial value to individual investors, but this does not mean that an individual investor can’t do just as good a job themselves. I believe they can. That said, the question that individual investors need to ask themselves is whether they are willing to take the time to learn what they need to learn to do this right. Following the simple steps in this article, the average retail investor can vastly improve his or her performance—but the question is whether you *will* do these things consistently and well. A good advisor can help, and add value far beyond his/her fees.

Step 1: Humble Arithmetic

One of my favorite essays in the world of retail investing is John Bogle’s *The Relentless Rules of Humble Arithmetic*:

http://www.vanguard.com/bogle_site/sp20050210.htm

This does not mean that I agree with everything Mr. Bogle says (there is even a lot that does not agree with Mr. Bogle later in this article), but the essay explains the motivation behind the idea that the majority of investors would be better off if they followed a simple disciplined investment strategy into index funds. Mr. Bogle’s case is built on laying out an equation for the sources of return and the sources of loss that investors face. His key point is laid out in the following form for the historical period from 1983 through 2003:

	Return / Loss
S&P500 Market Return	13%
Average Fund Lag (expenses included)	-3%
Bad Timing by Investors	-3.7%
Inflation	-3%
Real Return	<hr/> 3.3%

The S&P500 returned an average of 13% over this period, but the average retail investor generated a real return (after inflation) of only 3.3% a year. Mr. Bogle’s point is that the fees and average performance lags of mutual funds, combined with investor’s bad timing

choices (from chasing performance) have the combined effect of consuming about two thirds of the total returns from the market index. Mr. Bogle suggests that investing in an S&P500 index fund without trying to time the market will result in an equation like this:

	Return / Loss
S&P500 Market Return	13%
Index Fund Lag	-0.2%
Bad Timing by Investors	0.0%
Inflation	-3%
Real Return	9.8%

The investor who invests in a disciplined manner in the S&P500 index fund would have achieved almost three times the real return of the average mutual fund investor. Clearly, if the process of investing for retail investors consumes two thirds of the available return, we have a major problem for investors and for the broader society when these investors do not generate sufficient returns to fund their retirements. This ‘humble arithmetic’ puts all the articles and books on picking stocks and beating the market into perspective. The scale of the ‘losses’ in Mr. Bogle’s arithmetic are also regularly documented by DALBAR, in their annual Quantitative Analysis of Investor Behavior (QAIB).

Let’s delve a little deeper into the two main sources of loss for investors and the implications of these for portfolio planning. Very few actively managed funds outperform their benchmarks over long periods of time, and net of fees. This is a sad reality of the investing world that has been documented time and time again. Some do, but it is hard to identify these funds ahead of time. Second, investors are truly their own worst enemies, buying into asset classes after they have experienced outsized gains, and thereby reaping (on average) sub-par returns. Mr. Bogle discusses this effect by looking at time-weighted returns of a fund vs. dollar-weighted returns. There is clear evidence that investors tend to buy in too late in bull markets and bail out in down markets before the recovery:

http://www.usc.edu/schools/business/FBE/FEA2004/FEApapers/J-SA_IDICHEV.pdf

Bad timing by investors is very costly.

It is in these two areas that advisors can generate substantially better returns for their clients. If advisors play the role of ‘financial coaches’ and train their clients not to chase performance, they can return most of the losses due to bad timing. Further, if advisors can either convince their clients to (a) invest in ETF’s or index funds, or (b) provide meaningful analysis of the skill of fund managers, they can return much of the average drag of actively managed mutual funds. Conservatively, then, a good advisor could potentially have helped an investor to keep much of the 6% or so lost to bad timing and expensive funds. If the advisor charges on the order of 1% a year, this would be a bargain. If investors are disciplined and knowledgeable enough to do this form

themselves, they can also save the 1% in fees to the advisor, but the average investor would clearly be better off with a good advisor who provides these services.

It may not be easy for financial advisors to coach their clients to effectively tune out the noise of the financial media and focus on what are known to be the best standard practices—and this is precisely why the good advisors are well worth their fees.

Step 2: Looking Forward

Before continuing, let's take a step back and acknowledge that the current thinking is that the S&P500 will deliver far less in the future than it has in recent decades. This has important implications for Mr. Bogle's arithmetic. Further, I don't believe that the S&P500 is the most relevant benchmark. Most investors want less risk than this index. Going forward, I think a more realistic version of the equation is the following:

	Return
60/40 Portfolio Return	7.8%
Fund Lag	-1.5%
Bad Timing by Investors	-3.0%
Inflation	-3.0%
	<hr/>
	0.3%

My benchmark is a portfolio split into 60% S&P500 and 40% bonds. I am giving actively managed mutual funds a break on their lag, and I am tempering the costs of bad timing a bit. Even so, we end up with a real return of close to zero percent. If the total fund lag is closer to historical, or investors don't improve their behavior at all, the average real return will be negative. Similarly, if inflation goes up, we can easily see a negative real return. The -1.5% per year for Fund Lag simply reflects the average expense ratio of equity funds—I am trying to be really fair to the mutual funds. This equation, in which I have tempered the sources of loss, still suggests that the average investor may end up better off investing 100% in TIPS. I have heard this argument made.

Let's imagine that a good advisor coaches his client to invest in ETF's and follow a strict disciplined strategy. The equation now looks like this:

	Return
60/40 Portfolio Return	7.8%
Index Fund Lag	-0.3%
Bad Timing by Investors	0.0%
Inflation	-3.0%
Advisor's Fee	-1.0%
	<hr/>
	3.50%

The advisor will have enabled his client to achieve 6.5% in return (3.5% in real return), vs. 3.3% in return for the average investor. This difference in return is enormous and will

make the difference between successfully funding retirement and not. As a rule of thumb, 1% a year equates to ten years of retirement income.

From this perspective, the advisor has more than justified his fees. If the individual investor did this, he/she could add another 1% a year. The problem is that most retail investors don't do this, as evidenced by their very poor performance.

Step 3: Effective Diversification

What we have not yet discussed is what I call the ***Diversification Premium***, which is the increase in return that can be achieved by diversifying effectively. I discussed the diversification premium, and different estimates of its value in a recent article:

<http://seekingalpha.com/article/71946-what-is-diversification-worth>

Estimates from a range of sources suggest that the diversification premium (at the same risk level as the 60/40 portfolio) is between 2% and 2.5% per year. Analysis using our portfolio planning tool, Quantext Portfolio Planner, suggests that this can be achieved by investing in sector ETF's, and without ever investing in individual stocks. If an advisor can help his client to reap the diversification premium via low-cost ETF's as well as training his client out of chasing performance, the equation is now:

	Return
60/40 Portfolio Return	7.8%
Index Fund Lag	-0.3%
Bad Timing by Investors	0.0%
Inflation	-3.0%
Diversification Premium	2.0%
Advisor's Fee	-1.0%
	<hr/>
	5.5%

This shift in performance is huge. Despite his or her fees, the average return that the investor can expect now exceeds the post-fee return of the basic 60/40 portfolio by 1% per year.

We expect that the average investor will generate a real return of only 0.3% per year but that a good advisor can assist the average investor to generate an average real return of 5.5% per year. The 5% premium (net of fees) is, obviously, somewhat optimistic but is attainable. The investor in this situation will have a portfolio made up entirely of ETF's and the advisors role is largely to review the risk-return balance of the portfolio and to help the investor to avoid detrimental activity.

Step 4: Going Beyond Index Funds

I am now going to delve into a somewhat more controversial topic. If you don't agree with my argument, you can skip this section altogether. My research, combined with

work from a number of sources, suggests that investing in index funds is not optimal. To further improve the portfolio, we will need to add individual stocks. I do not advocate this for any investors other than those who are quite sophisticated and who have a well-designed strategy.

There is no essential reason to believe that the way that the indexes are weighted is the best approach. The vast majority of market indices are market-capitalization weighted. This means that more weight in the index is given to the larger companies and vice versa. There are several arguments against the idea that these allocations are the best that you can do.

First, there is a body of work that suggests that market cap indexing is inherently inefficient because companies with low prices (relative to their value) will tend to be weighted less than companies with high prices (relative to their value). For a discussion of this topic, I like Rob Arnott:

<http://www.researchaffiliates.com/rafi/methodology.htm>

His research suggests that using fundamental measures of value to construct a broad index fund would have provided an extra 2% per year over the last forty years, as compared to the S&P500. Granted, these are historically-derived statistics, so we would not want to count on this level of improvement going forward.

Second, a 2006 study by two Yale professors showed that the more the allocations to specific holdings in a mutual fund differed from any standard index, the better the performance (on average):

<http://www.som.yale.edu/Faculty/petajisto/active50.pdf>

This study defines the difference between weights by a statistic called Active Share. In calculating Active Share, you compare weights in an index to weights in the fund for every single holding that is either in the index or the fund. The authors found that funds with weights to specific holdings that were most similar to an index tended to underperform their benchmarks and that those with weights most different from the index tended to beat their index. See Section 5 of this article for the punch line: having asset weights that are substantially different from the index allows funds to generate higher returns. The funds with the highest 20% of Active Share beat their benchmarks by about 1.4% per year. Again, this is a purely backward-looking study, so it would be unwise to simply extrapolate these results into the future.

Both the work on fundamental indices and the Active Share research suggest that the weights given to members of a market cap-weighted stock index are not optimal. A caveat must be applied here. Part of the benefit conferred by these two approaches is, in fact, probably part of the diversification premium. I have found, for example, that increasing the weight in utilities relative to the S&P500 often provides increases in performance. Simply increasing the weights to utility stocks that are already in the

S&P500 improves the risk-adjusted performance of the S&P500 on an historical basis and in Monte Carlo simulations. Increasing these weights increases the Active Share and also tends to be favored by fundamental measures (because utilities tend to be value-oriented stocks).

You may depart from a portfolio of market cap weighted index funds by adding allocations to individual stocks or by buying funds with high Active Share. Let us estimate the benefits of adding individual stocks to a well-diversified portfolio of ETF's at around 1% per year (considerably lower than the estimates from Arnott or from the Active Share research).

Individual stocks have some additional advantages if chosen in a disciplined manner. There are tax advantages to owning individual stocks (you can control tax impacts very tightly). Further, owning a portfolio of individual stocks for the long haul incurs zero annual expense.

The new version of the equation is shown below:

	Return
60/40 Portfolio Return	7.8%
Index Fund Lag	-0.3%
Bad Timing by Investors	0.0%
Inflation	-3.0%
Diversification Premium	2.0%
Individual Stocks Added	1.0%
Advisor's Fee	-1.0%
	<hr/>
	6.50%

The simple mix of stocks and bonds in index funds or ETF's is projected to generate a real return of 4.5% per year (7.8%-0.3%-3%), and I believe that a well-managed portfolio can get up to 6.5% per year, even after paying an advisor 1% per year.

The baseline 60/40 portfolio of 60% domestic stocks and 40% bonds is projected to have a forward-going standard deviation (i.e. risk) of about 11% per year (vs. 15% for the S&P500). The improved process is projected to generate a non-inflation-adjusted return of 9.5% per year, with a standard deviation in return of 11% per year. Without the advisor's 1% fee, this portfolio would very close to a 1-to-1 ratio between average annual return and standard deviation in annual return—something a range of research has suggested is optimal on a forward-going basis:

<http://www.quantext.com/RiskReturn2.pdf>

Step 5: Minimizing Intermediation

We will now revisit John Bogle, who got us started down this road. In the essay linked at the start of this article, Mr. Bogle describes the enormous costs of ‘financial intermediation,’ which includes fund fees, brokerage fees, advisory fees, etc. He posits that the role and costs of intermediation are so high that we are not, in fact, an ‘ownership society,’ but that we have evolved into an ‘intermediation society.’ The costs of intermediation are enormous and, Mr. Bogle argues, need to be trimmed back dramatically so that the investor reaps the lion’s share of the wealth in the stock market. Mr. Bogle and Vanguard provided investors with a way to reduce intermediation costs via index funds and by educating the public on the costs of intermediation. But we can go further still.

Why should investors buy funds at all? In the past, it was simply impractical and too expensive for investors to own and manage a portfolio of individual stocks. With the advent of low-cost brokerage, these costs dropped substantially. Building and managing diversified portfolios out of individual stocks used to be prohibitively expensive due to brokerage fees, but firms like FOLIO*fn* have made this approach viable (Disclosure: Quantext is a strategic advisor to FOLIO*fn*). This solution means that investors might simply own hundreds of individual stocks in a ‘group’ that tracks the S&P500 or a ‘group’ that tracks the Dow Jones Utilities Index, etc. This is the next stage in minimizing intermediation costs.

Bringing the Parts Together

Now, let’s take a step back and see where this leaves us. I summarize the key points below:

1. The average retail investor is earnings only a fraction of the returns generated by the broad market indices
2. A simple 60/40 ETF portfolio with no market timing would add 3% per year for the average investor
3. A well-diversified portfolio would add 2% per year for the average investor
4. Reasonable allocation to individual stocks would add 1% per year for the average investor
5. A highly diversified portfolio of individual stocks could add another 0.3% a year in saved fees
6. Holding individual stocks can confer additional advantages via tax efficiency

The process that would be taken to reap the gains of better portfolio planning should proceed from #2 through #4, in that order. Adding individual stocks is the last thing an investor should consider—and many investors may happily opt to skip this step altogether. Reclaim the first 5% (in #2 and #3).

The statistics (from DALBAR and Bogle, among others) show that investor behavior is the first place to start in improving portfolio performance. The true impact of poor

investor choices with regard to market timing are not even fully reflected in the DALBAR statistics because these only look at asset in equity funds, and cannot capture the substantial losses to real purchasing power of assets in cash or cash equivalents. Altering investor behavior is not an easy process. In much the same way that people have a hard time sticking to an exercise regimen, many investors have a very hard time not letting their emotions get the best of them in their investing. A good advisor plays the role of a coach, in this regard.

After modifying bad timing behaviors, the next step is to diversify effectively into low-cost index trackers. This task is made harder by the large number of funds that claim to add value but are, in fact, simply 'closet index funds.'

The move into individual stocks or into well-vetted actively managed funds should only be considered after all other steps have been taken. The research supports the potential value of high Active Share funds and well-chosen individual stocks, but there are ample evidence that the average investor loses money in these pursuits.

Conclusions

In this article, I have laid out my view of the best standard for portfolio management. There is no question that the average retail investor can do far better by following a few simple steps. Successfully navigating these steps requires some core knowledge and discipline. I believe that an individual investor, who learns the requisite skills and is willing to be disciplined and spend the necessary time, can apply all of the steps outlined in this article. The question that individual investors must ask themselves is whether they will perform these crucial tasks. It is one thing to know what to do, and quite another to execute successfully. A good advisor can provide these services, and will be well worth his or her fees for many investors.

This is not the entire story of what needs to be done to build a solid portfolio management plan, of course, but it's a start. Future articles will discuss other key themes.

Quantext Portfolio Planner is a portfolio management tool. Extensive case studies, as well as access to a free extended trial, are available at <http://www.quantext.com>

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