



Portfolio Theory Vindicated

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It was more than two years ago that I took a model ETF portfolio developed by David Jackson (founder of Seeking Alpha) and analyzed it using *Quantext Portfolio Planner* (QPP), the portfolio analysis tool that I developed. I ran the initial portfolio of ETF's developed by David through QPP to see if QPP suggested that there were ways to improve the return and lower the risk in this portfolio. My original article is available here:

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

David was kind enough to post a summary of my article to Seeking Alpha at the start of January 2006:

<http://seekingalpha.com/article/5388-an-optimised-portfolio-using-only-etfs-ivv-ijh-iwm-efa-eem-shy-ief-tlt-rwr-idu-ixc-ige>

How did we use portfolio theory to improve the portfolio? The central theme of portfolio theory is that you can get more return with less risk by combining assets in a portfolio that have fairly low correlation to one another. This does not work if you simply use historical data. You need a forward-looking statistical model like *Quantext Portfolio Planner*. Using QPP, I experimented to find a portfolio that was projected to deliver more return without increasing risk by exploiting portfolio effects. My analysis of the original ETF portfolio suggested that this portfolio could be measurably improved by changing the asset allocations around and by adding some substantial concentrations in sector ETF's focused in utilities (IDU), energy (IXC) and natural resources (IGE).

These two articles marked the start of a long-term process of writing articles on testing and benchmarking QPP. When I started writing, there were a lot of indications that individual investors and many advisors had never encountered practical applications of portfolio theory or Monte Carlo simulation. While there are many more people who 'get' the core ideas today, I still find that many people do not grasp the central themes of portfolio analysis from a quantitative perspective. When I wrote my first article, the most basic thing that disturbed many readers was how I could end up with a model portfolio that looked so different from the standard types of asset allocation 'pie charts.' With a bit

more than two years down the road, it is therefore interesting to go back and look at how the first model portfolio published using QPP has fared.

David Jackson's original model portfolio was a perfectly sensible allocation among a series of ETF's:

Name	Ticker	Percentage of Funds
iShares S&P500	IVV	35%
iShares S&P Mid-Cap 400	IJH	10%
iShares Russell 2000	IWM	5%
iShares EAFE Index	EFA	20%
iShares MSCI Emerging Markets	EEM	5%
iShares Short-Term Bond	SHY	10%
iShares Intermediate-Term Bond	IEF	5%
iShares Long-Term Bond	TLT	5%
DJ Wilshire REIT Index	RWR	5%

The Original ETF portfolio

My modified portfolio threw out the allocations to emerging markets (EEM), dropped EAFE from 20% to 10%, and markedly decreased the allocations to the S&P500 index (IVV) from 35% to 5%. I bumped up the weight to the Russell 2000 from 5% to 10%, but dropped the weight to the Mid-Cap index from 10% to 5%. I doubled the REIT allocation from 5% to 10%. The final portfolio that I proposed is shown below:

Name	Fund Name	Percentage of Funds
iShares S&P500	IVV	5%
iShares S&P Mid-Cap 400	IJH	5%
iShares Russell 2000	IWM	10%
iShares EAFE Index	EFA	10%
iShares Intermediate-Term Bond	IEF	15%
iShares Long-Term Bond	TLT	15%
DJ Wilshire REIT Index	RWR	10%
iShares Dow Jones Utility Index	IDU	10%
iShares S&P Global Energy	IXC	10%
iShares GSSI Natural Resources	IGE	10%

Portfolio Modified Using QPP (built in December 2005)

While the original ETF portfolio looks very reasonable—much like many other standard ‘pie chart’ allocations—the portfolio modified using the Monte Carlo portfolio model, QPP, looks a bit odd. Back at the end of 2005, I had used QPP to come up with the following projections for the original ETF portfolio and for the modified portfolio:

Portfolio	QPP Projections from December 2005	
	Average Annual Return	Annualized Standard Deviation in Return
Original ETF Portfolio	9.10%	13.60%
QPP Modified Portfolio	11.04%	11.73%
S&P500 (IVV)	8.30%	15.10%

Projected average return and standard deviation in return

This table (with values taken from the original article) also shows the projected performance for IVV, the S&P500 index ETF. QPP projected that the modified portfolio would outperform the original ETF portfolio and that the modified portfolio would be less risky (i.e. the standard deviation would be lower). QPP also projected that both portfolios would out-perform the S&P500. Another very notable feature of these projected figures is that the projected standard deviations in annual return were all

substantially higher than the volatility in the recent years through 2005—and this can be seen in the original paper.

Now, a bit more than two years later, we can look at how these portfolios have turned out:

	Performance From Jan 2005 Through Jan 2008 (2.1 Years)	
Portfolio	Average Annual Return	Annualized Standard Deviation in Return
Original ETF Portfolio	6.4%	7.8%
QPP Modified Portfolio	7.4%	7.1%
S&P500 (IVV)	5.0%	9.2%

Actual performance over the last 2.1 years

The QPP modified portfolio has outperformed the original ETF portfolio by 1% per year, with less volatility, as projected by QPP. Both portfolios have out-performed the S&P500 index ETF. The annualized volatility for the portfolios has been lower than QPP projected—the big increases in volatility we are seeing in 2008 did not show up until mid-way through 2007.

When David Jackson first published his article on my modified portfolio, it evoked a reaction from another Seeking Alpha contributor, Roger Nusbaum. Roger’s reaction was generally representative of conventional wisdom in asset allocation:

<http://seekingalpha.com/article/5411-thoughts-on-geoff-considine-s-model-etf-portfolio>

In a nutshell, Roger objected to the fact that energy and utilities had a far higher weight in the portfolio than the allocation to energy in the S&P500 index and that Tech was very lightly represented:

The energy weight is colossal at 26.96% (all of these numbers are from Morningstar) compared to 10.29% in the S&P 500, utilities have a 13.76% weight compared to 3.6% in the S&P 500. Tech is very underweight vs. the market.

The essence of Roger’s critique is that all allocations to specific sectors were to be judged relative to the S&P500. My modified portfolio has a lot more utilities and energy than the S&P500, so the portfolio was massively “overweight” in these sectors. Similarly, my portfolio had a very small allocation to technology relative to the S&P500, so I was “underweight” in these sectors. This line of reasoning is fairly standard.

From my perspective, using portfolio theory, I was not at all concerned with whether the portfolio had more or less than the S&P500 of any given sector. I am not a closet indexer. From the standpoint of portfolio theory, you take forward-looking estimates of risk, return, and the correlations between asset classes and you find the portfolio that gives you the most return for a given risk level. *From the perspective of portfolio theory, there is no reason that the market-capitalization weights in the S&P500 should be optimal, so why use them as a benchmark?*

Another of the core lines of argument against my modified portfolio was that it did not include any emerging markets exposure. As I pointed out in my response to Roger’s comments:

The upshot is that while people have this idea that foreign stocks will provide ‘diversification,’ many foreign funds will actually make your portfolio more sensitive to the moves in the U.S. market via high Beta and these funds can also add a lot of volatility to your portfolio—such as those above. Does it make sense to have foreign stock just to have it, even if it actually makes your portfolio riskier and more sensitive to the S&P500?

<http://seekingalpha.com/article/5437-the-case-for-an-all-etf-portfolio-with-no-tech-or-emerging-market-stocks>

I was not saying that emerging markets were not potentially attractive, but rather that it did not make sense to add emerging markets simply because they were a **different** asset class. Many investors and advisors bought into the idea that investing internationally

provided powerful diversification effects. As I pointed out at the start of 2006 (in the article linked above) many international indexes exhibited high Betas and high volatilities, suggesting that their diversification benefits were not nearly as good as people believed. The realization that “decoupling” of global markets was a mirage has been widely recognized in the wake of the major declines in late 2007 and early 2008, but the statistical evidence was there way back in 2005. For the three years through 2005, the correlations between VEIEX, the Vanguard emerging market fund, and IVV was 76% (we couldn’t use EEM because it did not have three years of data at that time). The correlation between IVV and EFA was 83%. By contrast, the correlation between IVV and IDU, IXC, and IGE ranged from 46% (for IDU) to 60% (for IGE). These correlations showed that energy and utilities provided far better diversification benefits than international stocks at the target risk level of this portfolio. QPP picked up on this statistical evidence and used it in the forward-looking estimates that it generated.

Roughly a year and half after I first published this portfolio, someone posted a comment to Roger’s article about my portfolio on Seeking Alpha. The gist of the comment was that my model portfolio had held up pretty well. Roger’s response bears a note:

SA Reader: Roger, You now have the benefit of hindsight, both energy and utilities outperformed in 2006. Your concerns were unfounded and you should recognize how this portfolio actually performed vs. the one you recommended in a future article. Give credit where credit is due.

Roger Nusbaum: I don't know how this portfolio did...but the focus of this post was the risk taken to get the return. 100% in Garmin would have been even better.

<http://seekingalpha.com/article/5411-thoughts-on-geoff-considine-s-model-etf-portfolio>

Roger was implying that my portfolio was some sort of naked speculative bet—like a big bet on Garmin—but this totally missed the point. I went back and analyzed Garmin using data through the end of 2005 and QPP found that the trailing volatility (annualized standard deviation in return) was 43% with a Beta of 226%. QPP predicted that the modeled portfolio would outperform with at risk levels on the order of the S&P500---and this is what has occurred. Roger compared this to a simple bet on a massively risky

issue. The difference here is the difference between portfolio management and speculation. I bring this up because I feel that many people simply don't get the difference between speculation and portfolio management. Getting high returns by betting on one or more very high risk stocks is speculation. Getting superior returns with less risk is portfolio management.

Now, this discussion started a long time ago but I feel that it is fundamentally useful to go back and look at how a forward-looking analysis actually performs in the future. If we don't go back and look at how our analysis actually performed in the real world, what's the point of analysis?

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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