



*Case Study for Coffeehouse Investor  
Part 2*

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In a recent article, I discussed my analysis of a ‘model’ portfolio that a reader had come across and was interested in (<http://www.quantext.com/CoffeehouseInvestor.pdf> or <http://etf.seekingalpha.com/article/11631> ). The reader—I called him John Doe—is trying to figure out a good solid allocation for his retirement assets. The original model portfolio looked like many that you have no doubt encountered: 40% bonds and the remaining 60% allocated across small and large cap stocks and REIT’s, and with 10% invested in a broad international index. So far, so good. John’s main question was what our *Quantext Portfolio Planner* (QPP) would indicate about this portfolio. The results from our first article suggested that John could gain an extra ten years of secure retirement income through a more strategically allocated portfolio (shown below):

Fund Name	Percentage of Funds	Average Annual Return	Portfolio Stats	
			Average Annual Return	Standard Deviation(Annual)
IVV	5.0%	8.35%	10.13%	13.44%
IVE	5.0%	8.69%		
IJR	6.0%	11.97%	<b>Historical Data</b>	
IJS	6.0%	12.11%		
EFA	0.0%	9.04%	Start:	End:
ICF	6.0%	17.06%	6/1/2003	5/31/2006
VBIIX	35.0%	6.46%	Average Annual Return	Standard Deviation (Annual)
IDU	6.0%	10.24%	11.77%	6.43%
IYH	6.0%	5.34%	Historical Beta: <b>64.15%</b>	
ADRU	7.0%	14.97%	Historical Yield: <b>3.41%</b>	
ADRD	8.0%	9.37%		
GNI	4.0%	27.75%		
CEI	6.0%	12.51%		

***Final model portfolio from Part I***

This portfolio, which still has 35% bonds, was designed to generate improved average annual return with the constraint that the historical and projected future volatility in return (as measured by standard deviation in annual return) would be equal to the original portfolio. The average annual return of this portfolio for the three years through May 2006 is 11.77% per year, with a standard deviation in annual return of only 6.43% (see *Historical Data* above). On a *forward-looking* basis, in which I assume an average annual return for the S&P500 of 8.3% per year, this portfolio is projected to return 10.13% per year with a standard deviation of 13.44% per year (see *Portfolio Stats*

above). This portfolio provides higher return, with the same risk as the original portfolio, by exploiting the degree to which we can offset risks across the portfolio components. The risks in this portfolio act as better offsets to one another than in the original portfolio. This is asset allocation in action.

The major caveat that I offered with regard to this portfolio is that even though it generates good returns relative to the total portfolio risk, this does not mean that this is a good portfolio for any given individual—or for John in particular. Each person must determine the right balance of risk and return to accomplish their goals. This is a major issue that many people do not grasp and it is why I have a personal problem with the idea that any generic model portfolio could be held out as being a good idea for any individual. How does one determine the right amount of risk to have in the portfolio? I feel that one of the best metrics to determine whether you are being aggressive enough (or too aggressive, for that matter) in your investing is to use a Monte Carlo simulation to calculate the probability that you will run out of money in retirement. If you are too conservative, you will run out of money early because your average returns will be too low. If you are too aggressive, you will increase your odds of running out of money because of the chance of a major drawdown in portfolio value at a critical withdrawal stage in your life. The right balance of risk is that which maximizes your chances of successfully funding your desired future income stream as long as possible. William Bernstein (author *The Intelligent Asset Allocator*) and Bill Sharpe (Nobel Laureate in Economics) also advocate this as good risk measure, so I am in good company here.

John is 35 years old, has a \$150,000 portfolio, and plans to contribute \$15,000 per year to the portfolio (escalating at 3% per year to keep up with inflation). He wishes to retire at age 65 and we assumed an annual portfolio draw of \$100,000 per year in 2006 dollars. When we used QPP to calculate John's odds of running out of funds in the original portfolio, we found that he still had a 25% chance of running out of funds by age 82. On average, John never runs out of money—but when we include the impact of portfolio volatility, his risk of drawing down his portfolio to nothing is non-trivial. With the final portfolio allocation from the first article—which had no more risk than the original—we

obtained much more attractive results. This portfolio (as shown at the start of this article) had John with a 25% chance of drawing down his portfolio by age 92, an improvement of ten years over the original.

Let's now revisit John's situation and start from the idea that *we want to increase John's prospects for a successful retirement by maximizing the age at which he reaches a 25% chance of running out of funds*. After some experimentation, I came up with the following portfolio:

			Portfolio Stats	
Fund Name	Percentage of Funds	Average Annual Return	Average Annual Return	Standard Deviation(Annual)
IVV	4.0%	8.35%	11.30%	17.08%
IVE	9.0%	8.69%		
IJR	9.0%	11.97%		
IJS	12.0%	12.11%	<b>Historical Data</b>	
EFA	6.0%	9.04%	Start:	End:
ICF	10.0%	17.06%	6/1/2003	5/31/2006
VBIIX	12.0%	6.46%	Average Annual Return	Standard Deviation (Annual)
IDU	10.0%	10.24%	16.03%	8.15%
IYH	8.0%	5.34%	Historical Beta: <b>91.22%</b>	
ADRU	5.0%	14.97%	Historical Yield: <b>2.60%</b>	
ADRD	5.0%	9.37%		
GNI	5.0%	27.75%		
CEI	5.0%	12.51%		

***New portfolio for John Doe without the risk constraint***

This is a much more aggressive portfolio than we designed in Part I because we are now using our goal of increasing John's realistic retirement horizon to determine how aggressive we should be. This portfolio has only 12% in bonds. The portfolio has a bias towards value and also towards the smaller end of the market cap scale. Over the past three years, this portfolio has delivered an average of 16.03% per year (see **Historical Data** above). The projected future performance of this portfolio is much more conservative, with QPP estimating much more modest future returns for real estate and foreign markets than we have seen in the recent three years. One of the key features of a good portfolio planning tool is the ability to realistically discount recent out-performance

in a sector. The projected future portfolio performance (*Portfolio Stats*) is for an average annual return of 11.3% per year with a standard deviation of 17.08% per year. This looks pretty tame compared to the 16% per year that this portfolio has been generating recently, but our extensive benchmarking and testing of QPP leads me to believe that this is a fair, if slightly conservative, projection. There are so many uncertainties in modeling a portfolio and projecting its future performance, it is better to plan conservatively. If the S&P500 does, indeed, return an average of only 8.3% per year (consistent with the estimates of many experts), most people would be very happy with the 11.3% per year that is projected for this portfolio. Note that QPP accounts for all fund fees and excludes only your transaction costs. The exclusions are minimal given that we assume that the portfolio has new funds added and is re-balanced only once per year.

When we examine the probabilities of John now running down his new portfolio in retirement, things are improved yet again:

Probability of Running Out of Money	Age
10%	80
15%	85
20%	91
25%	98
30%	100

***John's Probabilities for New Portfolio***

QPP now estimates that John has a 25% chance of running down his portfolio by age 98. While everyone has different risk tolerances, I think that this looks like a pretty good bet.

***Note that John has lowered his risk of running out of money in retirement by increasing the risk in his portfolio.*** He is estimated to have added six years to his potential retirement horizon (increasing the 25% probability level from age 92 to age 98) by increasing portfolio risk by about 27%.

There are several caveats that I must add here. First, I did not use an ‘optimizer’ to find the best possible portfolio to maximize John’s 25<sup>th</sup> percentile age of running out of funds. I adjusted this portfolio by hand—which is how QPP’s users do it. Optimizers tend to ‘over fit’ the data and hindsight is, of course, 20/20. Even working by hand, it is always possible to ‘tune’ a portfolio so much that it ends up being unrealistic. While I found some even more aggressive portfolios that increased John’s odds even further, I felt that this portfolio represented a sweet spot in terms of the risk and return balance. QPP also estimates future probabilities of gain or loss for users in a given time horizon. With the portfolio shown above, QPP estimates that John has a 5% chance of losing 17% in a one year time horizon and that this portfolio will generate positive returns in three out of four years. Each investor will have different tolerances for this short-term risk. Perhaps this is too much for John—only he can make this type of determination.

Portfolio design and asset allocation are very personal undertakings. You ultimately combine the quantitative results with your own judgment about the reasonableness of a plan and how comfortable you are with near-term risk. *Quantext Portfolio Planner* generates forward-looking projections for portfolio risk and return, accounting for the effects of correlations between assets and asset classes. The goal in portfolio planning is to find the best risk-return balance to meet your needs. To generate a reasonable plan and outlook, you do not need to be an equity analyst—and abundant evidence suggests that most investors will be better off with a periodic investment and re-balancing across the major asset classes. QPP helps investors and their advisors find an asset allocation with solid returns relative to risk and then to identify the right total risk-return level to meet their goals. In John’s case, QPP suggests that he will benefit from a fairly aggressive portfolio of ETF’s combined with some high-yield individual stocks. There are undoubtedly many other portfolios that will achieve this same level of risk and return—this case study presents just one.

More information on *Quantext Portfolio Planner* and a free trial are available at <http://www.quantext.com/gpage3.html>