



*Analysis of Sample ETF Portfolios from  
Agile Investing*

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## *Executive Summary*

We have analyzed three model portfolios proposed by Agile Investing. These portfolios are designed for conservative growth, moderate growth, and aggressive growth allocations. When I ran these portfolios through Quantext's Monte Carlo portfolio simulation, the three portfolios yielded the following projected future results (with the S&P500 provided for reference):

|                     | Projected Annual Return | Projected Annual Standard Deviation in Return |
|---------------------|-------------------------|---|
| Conservative Growth | 7.24%                   | 8.26%   |
| Moderate Growth     | 8.39%                   | 10.34%  |
| Aggressive Growth   | 9.45%                   | 12.71%  |
| S&P500              | 8.30%                   | 15.07%  |

These three portfolios are good examples of the effective application of strategic asset allocation. The projected average annual returns on these portfolios are substantially higher relative to the projected standard deviation (the risk) than the results for the S&P500. This is easily seen for the Moderate and Aggressive portfolios, in which the projected average returns are higher than the market as a whole, but the projected standard deviation in return is lower than for the market as a whole.

Beta is markedly less than 100% for all three of these portfolios. Low Beta is not necessarily a goal unto itself, but if you are feeling fairly conservative about the future--- as is the premise for these portfolios (they call the outlook 'cautiously optimistic'), keeping Beta under control is a good way to manage exposure to the total market.

It is notable that the projected future returns generated by the Monte Carlo model are substantially lower than the returns over the previous three years and the projected future portfolio risk is higher. The recent years have been very good for several of the portfolio components, but it would be a bad idea to simply extrapolate this performance forward.

The complete paper that details this analysis is available at:

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



## ***Introduction***

One of the largest sources of value from portfolio Monte Carlo tools is the ability to analyze portfolios, project risk and return, and look critically at the likely future performance. One of the ways that we test Quantext's portfolio management tools is by looking at a range of model portfolios that have been published and running them through the Quantext Monte Carlo portfolio management software. For this study, we have analyzed three portfolios proposed by Agile Investing, and ETF advisor and investment manager:

<http://etfinvestor.com/article/5981>

This article proposed allocations for conservative growth, moderate growth, and aggressive growth. While these specifications are qualitative, the Monte Carlo analysis allows us to determine exactly what this implies. The components of this portfolio include the usual common elements, such as large cap, mid cap, international funds, and bonds. The portfolio also includes some focused funds. Focused funds include U.S. healthcare, commodities, precious metals, and energy.

We had to change the portfolio components somewhat, as shown below, due to short data records for a number of these ETF's.

| <b>Original Ticker</b> | <b>Ticker Used</b> | <b>Style</b>            |
|------------------------|--------------------|-------------------------|
| IVV                    | IVV                | S&P500                  |
| IVW                    | IVW                | S&P500 Growth           |
| IJH                    | IJH                | S&P MidCap 400          |
| IYH                    | IYH                | U.S. Healthcare         |
| EFA                    | EFA                | International/Developed |
| EEM                    | ADRE               | International/Emerging  |
| VPL                    | ADRA               | Pacific                 |
| MONEY MARKET           | DVMKX              | Money Market            |
| SHY                    | SHY                | Short-Term Bond         |
| AGG                    | FRTRX              | Mid-Term Bond           |
| PCRDx                  | IYM                | Commodity               |
| GLD                    | VGPMX              | Gold                    |
| KYN                    | APL                | Energy MLP              |

**Original portfolio components and those used for analysis**

When we first put all of these tickers into Quantext Portfolio Planner and retrieved historical data for the past three years, it was immediately evident that many of these ETF's have been around for a short period of time—some less than two years and six of them less than three years. We found close substitutes for the short-lived components (shown above). We replaced GLD with VGPMX, Vanguard's Precious Metals and Mining fund. GLD has only been trading since November 2004 which provides scant data for a risk analysis. We have also replaced PCRDX, a commodities fund with a short history, with iShares materials ETF, IYM. While PCRDX is designed to follow a more sophisticated strategy with respect to commodities, it has tracked fairly closely to IYM over the past two years. That said, the results started to diverge in mid and late 2005.

The Quantext Portfolio Planner (and Retirement Planner) takes the input portfolios, retrieves total return data for a specified history, calculates statistical parameters for each position, and then simulates the entire portfolio for years into the future. The simulation is a Monte Carlo process, which means that the software generates hundreds of possible future outcomes and then analyzes across the possible outcomes. A key feature of Monte Carlo models is how they generate the all-important assumptions about future uncertainty in returns. We use a process called risk-return balancing (described in a number of papers on our site) to estimate future returns and risk such that the projected future is not simply a rehashing of recent history. The analysis accounts for fees (except for loads) and assumes reinvestment of dividends.

### Case 1: Conservative Growth Portfolio

|                                    |                     |                       | Portfolio Stats                              |                             |
|------------------------------------|---------------------|-----------------------|--|-----------------------------|
| Fund Name                          | Percentage of Funds | Average Annual Return | Average Annual Return                        | Standard Deviation (Annual) |
| IVV                                | 15.0%               | 8.46%                 | 7.24%  | 8.26%                       |
| IVW                                | 5.0%                | 7.88%                 |  |                             |
| IJH                                | 0.0%                | 10.51%                |  |                             |
| IYH                                | 5.0%                | 8.72%                 | <b>Historical Data</b>                       |                             |
| EFA                                | 10.0%               | 10.72%                | Start:                                       | End:                        |
| ADRE                               | 0.0%                | 16.77%                | 1/1/2003                                     | 12/31/2005                  |
| ADRA                               | 5.0%                | 13.40%                | Average Annual Return                        | Standard Deviation (Annual) |
| DVMKX                              | 12.0%               | 1.11%                 | 11.30%                                       | 5.34%                       |
| SHY                                | 25.0%               | 2.15%                 | Historical Beta: <b>50.67%</b>               |                             |
| FRTRX                              | 10.0%               | 4.19%                 | Performance of S&P500 over historical period |                             |
| IYM                                | 5.0%                | 14.47%                | Average Annual Return on S&P500              |                             |
| VGPMX                              | 5.0%                | 20.36%                | 13.40%                                       |                             |
| APL                                | 3.0%                | 19.75%                | Annual Standard Deviation on S&P500          |                             |
| -                                  | 0.0%                | 8.30%                 | 8.97%  |                             |
| -                                  | 0.0%                | 8.30%                 |  |                             |
| -                                  | 0.0%                | 8.30%                 |  |                             |
| -                                  | 0.0%                | 8.30%                 |  |                             |
| -                                  | 0.0%                | 8.30%                 |  |                             |
| -                                  | 0.0%                | 8.30%                 |  |                             |
| Sums to                            | 100.0%              |                       |  |                             |
| Simulated Portfolio Beta<br>50.67% |                     |                       | Market Index (S&P500)                        |                             |
|                                    |                     |                       | Average Annual Return                        | Standard Deviation (Annual) |
|                                    |                     |                       | 8.30%  | 15.07%                      |

### Monte Carlo Analysis of Conservative Growth Portfolio

The conservative growth portfolio (above) has generated an average annual return of 11.3% per year over the past three years with a standard deviation in annual return of 5.34% (see **Historical Data** above). This is impressive, but must also be considered in light of the fact that the S&P500 has returned 13.4% per year, with standard deviation in annual return of 8.97% (also shown above). The Beta for the total portfolio is 50.7%, so this portfolio tends to be quite insensitive to the S&P500. When we look at the Monte Carlo projection into the future, we see (under **Portfolio Stats** above) that this portfolio is predicted to generate an average annual return of 7.24% with a standard deviation of

8.26%. For these results, we have assumed that the S&P500 will return an average of 8.3% per year, with a standard deviation of 15% (see **Market Index** above). This portfolio is projected to generate average return that is 1% per year less than the S&P500 but with slightly more than half the risk (as measured by standard deviation). This portfolio shows a good application of strategic asset allocation—the use of offsetting risks between positions to manage risk while maintaining return.

**Case 2: Moderate Growth Portfolio**

|                                    |                     |                       | Portfolio Stats                              |                             |
|------------------------------------|---------------------|-----------------------|--|-----------------------------|
| Fund Name                          | Percentage of Funds | Average Annual Return | Average Annual Return                        | Standard Deviation (Annual) |
| IVV                                | 20.0%               | 8.46%                 | 8.39%  | 10.34%                      |
| IVW                                | 10.0%               | 7.88%                 |  |                             |
| IJH                                | 0.0%                | 10.51%                |  |                             |
| IYH                                | 5.0%                | 8.72%                 | <b>Historical Data</b>                       |                             |
| EFA                                | 7.0%                | 10.72%                | Start: 1/1/2003                              | End: 12/31/2005             |
| ADRE                               | 5.0%                | 16.77%                | Average Annual Return                        | Standard Deviation (Annual) |
| ADRA                               | 5.0%                | 13.40%                | 13.54%                                       | 6.56%                       |
| DVMKX                              | 5.0%                | 1.11%                 | Historical Beta: <b>65.04%</b>               |                             |
| SHY                                | 20.0%               | 2.15%                 | Performance of S&P500 over historical period |                             |
| FRTRX                              | 10.0%               | 4.19%                 | Average Annual Return on S&P500              |                             |
| IYM                                | 5.0%                | 14.47%                | 13.40%                                       |                             |
| VGPMX                              | 5.0%                | 20.36%                | Annual Standard Deviation on S&P500          |                             |
| APL                                | 3.0%                | 19.75%                | 8.97%  |                             |
| -                                  | 0.0%                | 8.30%                 |  |                             |
| -                                  | 0.0%                | 8.30%                 |  |                             |
| -                                  | 0.0%                | 8.30%                 |  |                             |
| -                                  | 0.0%                | 8.30%                 |  |                             |
| -                                  | 0.0%                | 8.30%                 |  |                             |
| -                                  | 0.0%                | 8.30%                 |  |                             |
| -                                  | 0.0%                | 8.30%                 |  |                             |
| Sums to                            | 100.0%              |                       |  |                             |
| Simulated Portfolio Beta<br>65.04% |                     |                       | Market Index (S&P500)                        |                             |
|                                    |                     |                       | Average Annual Return                        | Standard Deviation (Annual) |
|                                    |                     |                       | 8.30%  | 15.07%                      |

**Monte Carlo Analysis of Moderate Growth Portfolio**

The moderate growth portfolio (above) has generated average returns over the past three years that are very close to the S&P500 (13.54% vs. 13.4%, above), but with less risk (volatility) than then S&P500. The portfolio Beta is 65%, still quite low. This portfolio is projected to generate 8.39% per year with a standard deviation of 10.34%, as compared to the assumed conditions for the S&P500 with an average annual return of 8.3% per year and a standard deviation of 15.07%. In other words, the moderate growth portfolio is projected to generate returns equal to or slightly higher than the S&P500, but with only 2/3 of the portfolio volatility (10.3% vs. 15.07%, as above).

### Case 3: Aggressive Growth Portfolio

|  |                     |                       | Portfolio Stats                              |                             |
|--|---------------------|-----------------------|--|-----------------------------|
| Fund Name  | Percentage of Funds | Average Annual Return | Average Annual Return                        | Standard Deviation (Annual) |
| IVV  | 25.0%               | 8.46%                 | 9.45%  | 12.71%                      |
| IVW  | 10.0%               | 7.88%                 |  |                             |
| IJH  | 5.0%                | 10.51%                |  |                             |
| IYH  | 5.0%                | 8.72%                 | <b>Historical Data</b>                       |                             |
| EFA  | 12.0%               | 10.72%                | Start:                                       | End:                        |
| ADRE   | 5.0%                | 16.77%                | 1/1/2003                                     | 12/31/2005                  |
| ADRA   | 5.0%                | 13.40%                | Average Annual Return                        | Standard Deviation (Annual) |
| DVMKX  | 5.0%                | 1.11%                 | 16.17%                                       | 7.97%                       |
| SHY  | 10.0%               | 2.15%                 | Historical Beta: <b>81.11%</b>               |                             |
| FRTRX  | 5.0%                | 4.19%                 | Performance of S&P500 over historical period |                             |
| IYM  | 5.0%                | 14.47%                | Average Annual Return on S&P500              |                             |
| VGPMX  | 5.0%                | 20.36%                | 13.40%                                       |                             |
| APL  | 3.0%                | 19.75%                | Annual Standard Deviation on S&P500          |                             |
| -  | 0.0%                | 8.30%                 | 8.97%  |                             |
| -  | 0.0%                | 8.30%                 |  |                             |
| -  | 0.0%                | 8.30%                 |  |                             |
| -  | 0.0%                | 8.30%                 |  |                             |
| -  | 0.0%                | 8.30%                 |  |                             |
| -  | 0.0%                | 8.30%                 |  |                             |
| -  | 0.0%                | 8.30%                 |  |                             |
| Sums to  | 100.0%              |                       |  |                             |
| <div style="border: 1px solid black; padding: 10px; text-align: center;"> <b>Simulated Portfolio Beta</b><br/>           81.11%         </div> |                     |                       | <b>Market Index (S&amp;P500)</b>             |                             |
|  |                     |                       | Average Annual Return                        | Standard Deviation (Annual) |
|  |                     |                       | 8.30%  | 15.07%                      |

### Aggressive Growth Agile Portfolio

The aggressive growth portfolio (above) follows the other two portfolios, making good use of strategic diversification. The projected average annual return is 9.45% per year, with a standard deviation of 12.7% per year. This performance beats the projected returns on the S&P500 by 1.15% (9.45% vs. 8.3%), but with less risk than the S&P500. The standard deviation in return on this portfolio is 12.7% per year, about 4/5 of the projected standard deviation on the market as a whole.

### ***Summary***

These portfolios are good examples of effective use of strategic asset allocation to preserve returns while managing risk. One of the most notable features that a potential investor should consider is that the projected future returns on all three of these portfolios are markedly less than the returns over the past three years. The Monte Carlo analysis suggests that these are all good portfolios, but the last three years have been particularly high gainers and it would be a bad idea to assume that such high returns (and such low volatility) will continue into the future.

This analysis has assumed that the future average annual return on the S&P500 will be 8.3% per year, with a standard deviation of 15% per year. These are consistent with a range of expert estimates, but the projected future returns are (I hope) a bit conservative. The projected performance of these portfolios are dependent on these assumptions via correlations between these assets and the broader market.

You can learn more about Quantext's Monte Carlo portfolio management tools at:

<http://www.quantext.com/gpage3.html>