A Quantitative Approach to Tactical Asset Allocation Revisited 10 Years Later

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A Quantitative Approach to Tactical Asset Allocation Revisited 10 Years Later

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In 2006, we wrote a draft white paper titled "A Simple Approach to Market Timing," which introduced a basic market-timing strategy. We circulated it among various friends and professionals but quickly found that no one was particularly interested in reading it. Eventually, we changed the title to "A Quantitative Approach to Asset Allocation" and published it (Faber [2007]), and shortly thereafter, the world was rocked by the global financial crisis. The strategy detailed in our paper performed admirably in the turmoil. Likely because of the performance of this simple system, "A Quantitative Approach to Asset Allocation" would go on to become the most downloaded paper of all time on Social Science Research Network (SSRN), with approximately 200,000 downloads.

Ten years have passed since the article was published, so we thought it would be interesting to examine how well the timing strategy has held up. What lessons have been learned? What might we have done differently with the benefit of hindsight? And what possible extensions and deviations exist for further explorations?

Note that this is not intended to be an expansion of the original article (Faber [2013] published an update to the original article that included substantial new content). Rather, this article should be considered an accompaniment—a reflection on the performance of the timing model using in- and out-of-sample data in the years since publication.

THE ORIGINAL SYSTEM

For those of you who may not have read the original article or would benefit from a refresher, the timing strategy examined was a trend-following strategy. Trend following is one of the oldest market strategies and has been around since at least the time of Charles Dow in the early 20th century.

The most often-cited long-term measure of trend in the technical analysis community is the 200-day simple moving average (SMA). Therefore, we decided to use this as our starting point and make no claims of originality.

We utilized the monthly version of the popular 200-day SMA indicator, the 10-month simple moving average. (This was due mainly to the availability of historical market data at the monthly time frame versus daily.) For illustrative purposes, Exhibit 1 presents a chart of the S&P 500 total return series and the 10-month SMA overlaid on top.

The following criteria are necessary for a trend-following model to be simple enough for investors to follow and mechanical enough to remove emotion and subjective decision making:

1. It must have simple, purely mechanical logic.

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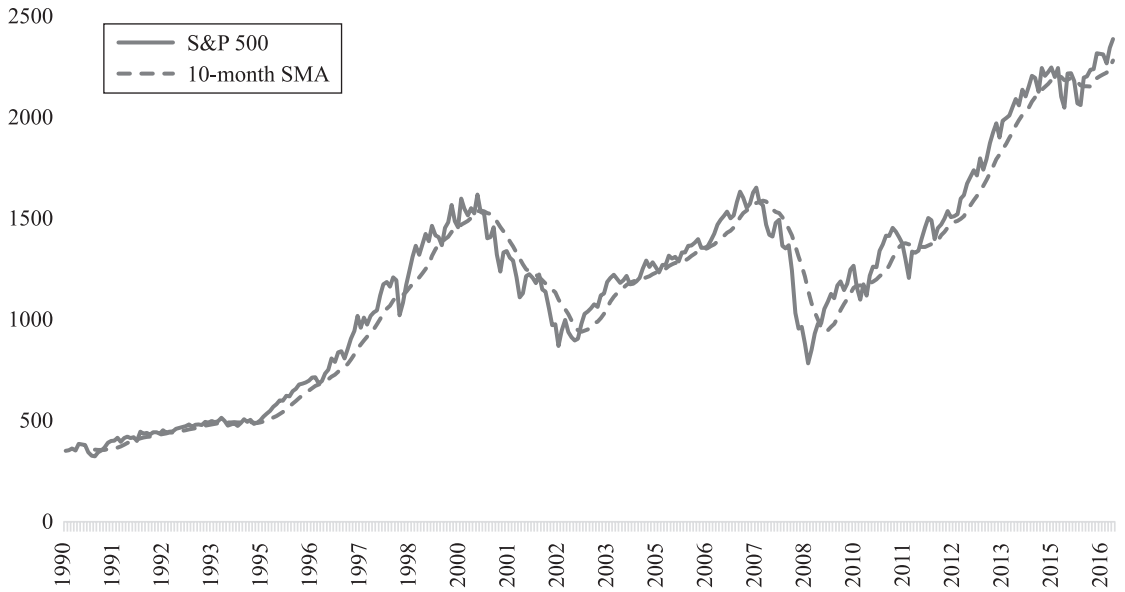
EXHIBIT 1

U.S. Stocks and 10-Month SMA, 1990–2016



2. The same model and parameters must be used for every asset class.
3. It must be a price-based model.

Using this logic, we only had one rule for our timing system: Buy the security when it is in an uptrend, and sell when it is in a downtrend—specifically,

- **Buy Rule**
  - Buy when monthly price > 10-month SMA.
- **Sell Rule**
  - Sell and move to cash when monthly price < 10-month SMA.

That's all there was to the model, but five clarifying bullet points are included below:

1. All entry and exit prices were on the day of the signal at the close. The model was only updated once a month on the last day of the month. Price fluctuations during the rest of the month were ignored.
2. All data series were total return series including dividends, updated monthly.
3. Cash returns were estimated with 90-day Treasury bills.
4. Taxes, commissions, and slippage were excluded (see the Practical Considerations section later in the article).
5. Unless otherwise noted, all data series were total return series including dividends and income and are sourced from Global Financial Data.

Before we examine performance, please note that in the original article, I wrote,

> The attempt is not to build an optimization model (indeed, the chosen parameter is decidedly sub-optimal, as evidenced later in the article), but to build a simple trading model that works in most markets. The results suggest that a market-timing solution is a risk reduction technique rather than a return-enhancing one…The empirical results are equity-like returns with bond-like volatility and drawdown. Faber [2007, p. 1]

It's important to understand that "beating the market" was never the goal of the model. The intent was to identify a trading system that largely approximated market returns, yet did so with significantly less volatility. The reason for this was simple—emotions can wreak havoc on investors' ability to follow their

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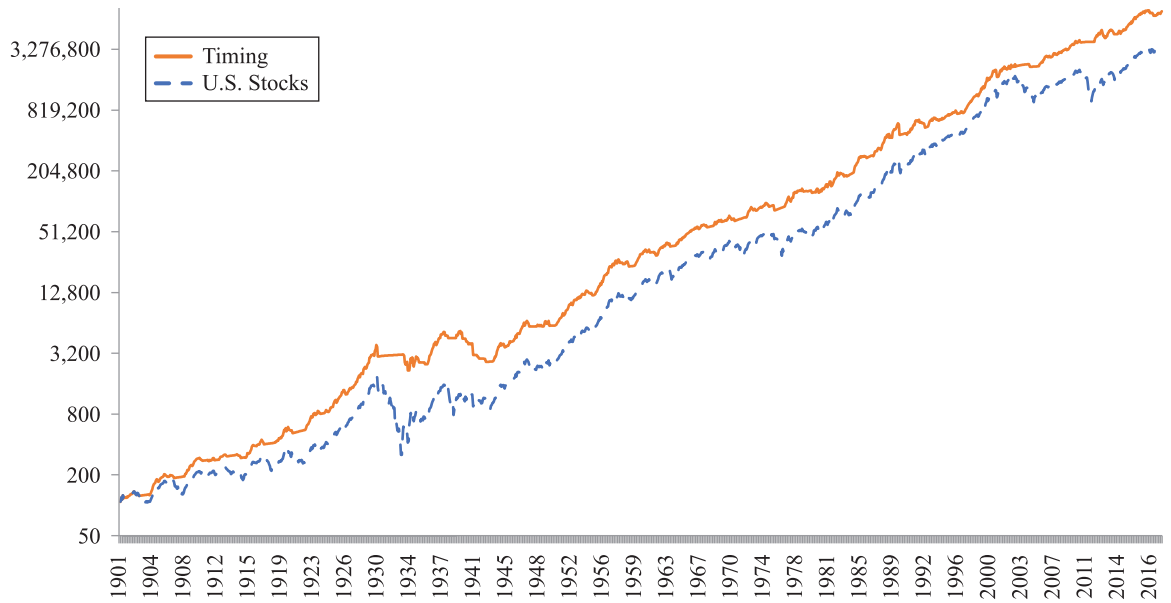
EXHIBIT 2

U.S. Stocks and Timing, 1901–2016



stated investment plan. All too often, we fall victim to fear when markets have turned against us and sell at nearly the worst possible time. Although many market historians enjoy pointing toward the healthy long-term average returns of most equity indexes, what good are those long-term averages if fear caused an investor to sell near a market low?

It was with this question in mind that I sought a model that dramatically reduced volatility and drawdowns. The hope was that by implementing such a model, investors could avoid the exaggerated turbulence that often results in emotion-based, money-losing market decisions.

So, did the system work as intended? The original article was published with data up through 2005. We'll examine the historical in-sample results as well as the out-of-sample returns in the 11 years since. So before delving into the data, what has transpired in the past decade?

In the headlines, we've seen the Boston Marathon bombing; the Russian invasion of Ukraine; the Affordable Care Act; the continued war with Isis, Ebola, and Zika; one of the most partisan periods ever in American politics, culminating in the election of President Trump; and now the increasing threat of war with North Korea. In the investing world, we've seen the global financial crisis and U.S. housing meltdown, followed by the steady march of this historic U.S. bull market, the end of the Fed's Quantitative Easing program, historic lows in bond yields including some negative global sovereign yields, and multidecade highs and lows in oil prices, among other stories.

What has all this meant for our asset allocation strategies and our simple model? Have any of these headlines meant "this time it's different"? Change has always been the constant in markets, and indeed has anything new really been seen in our world of investing? Bubbles, defaults, government interventions, bear markets, and fortunes made and lost—they've all happened before.[1] To answer this question, let's first examine the timing model on U.S. stocks before moving to the perspective of an asset allocation portfolio.

Now, recall all the many caveats to a study such as this. For most of the early part of the 20th century, there was no way to trade an index such as the S&P 500 (because index funds didn't exist in investable form until the 1970s); and even if you could buy a basket of stocks back then, trading them based on a trend system would have been costly because of commissions and frictions such as the bid–ask spread. However, it is still useful to test the algorithm on historical data to help establish a framework for how a modern system may have performed in the past.

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EXHIBIT 3

U.S. Stocks and Timing Equity Curves, 1990–2016

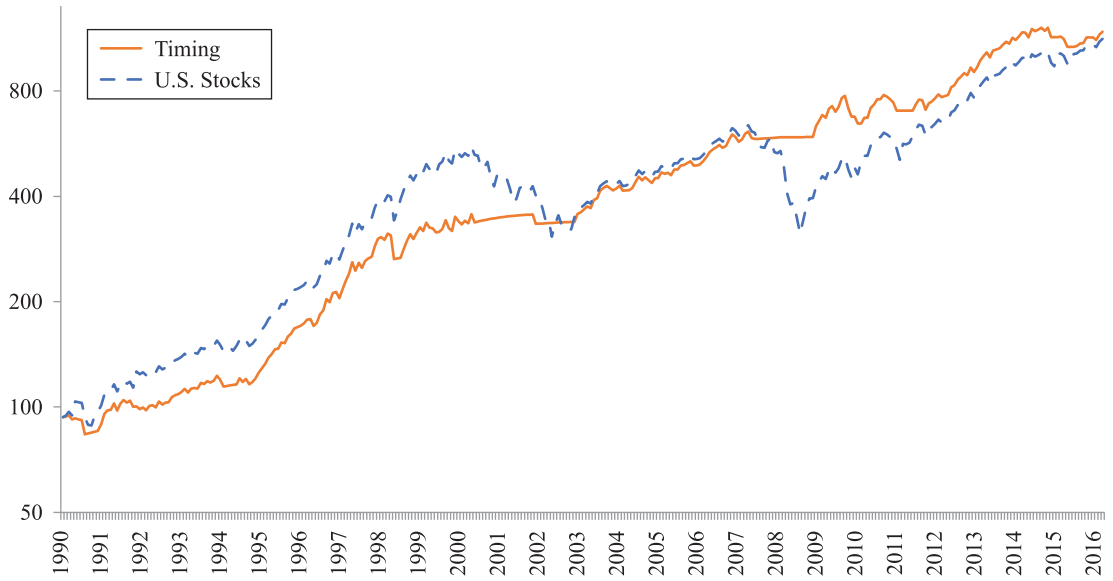

Exhibit 2 shows the performance of the timing model over the past century, largely avoiding the significant bear markets of the 1930s and 2000s. The exhibit also shows that utilizing timing would not have left the investor completely unscathed from the late 1920s to early 1930s bear market, nor would it have saved the investor from the sharp drop in 1987.

Exhibit 3 zooms into the more recent 1990–2016 period and is charted on a non-log scale to detail the differences between the two equity curves. A few features of the timing model stand out. First, a trend-following model can underperform buy and hold during a roaring bull market such as the U.S. equity market in the 1990s. On the flip side, the timing model can avoid lengthy and protracted bear markets. Consequently, the value added by timing is evident only over the course of the entire business and market cycles.

Many investors will look at Exhibits 2 and 3 and think, "They both basically end up in the same place. Is it even worth it?" That is a valid question, and if buy-and-hold investors can live through bear markets down 40%, 60%, or even 80% and stay the course, then they may not need a trend-following system. However, as earlier noted, many investors cannot handle the drawdowns, and as many advisors can attest, investors of all types are tempted to capitulate and sell in bear markets. On the flip side, market timing provides its own set of challenges—namely, whipsaws with the false signals often found in choppy markets; and one of the hardest emotional challenges of investing is looking different than your peers when they are performing well.

With this historical perspective in mind, let's now turn to the results of our model since the original publication date. Exhibit 4 details the in-sample and out-of-sample results for the simple timing model.

A cursory review reveals that the timing solution improved compounded returns while reducing risk and drawdowns in both periods. Volatility is measured as the annualized standard deviation of monthly returns. Drawdown is the peak-to-trough decline an investor would experience in an investment, and we calculate it here monthly.

After publication of our article, U.S. stocks were pummeled in the global financial crisis, then continued their upward trajectory. Exhibit 5 shows the yearly returns for U.S. stocks and the timing system, detailing the out-of-sample performance. Though the timing system outperformed by a significant amount during the 2008–2009 bear market, it went on to underperform stocks six of the next eight years. Many investors who had implemented the timing model after the crash likely struggled with staying the course with a tactical approach.

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EXHIBIT 4

U.S. Stocks and Timing Model, 1901–2005 and 2006–2016

	1901–2005		2006–2016	
	U.S. Stocks	Timing	U.S. Stocks	Timing
Return	9.65%	10.36%	7.66%	8.53%
Volatility	17.97%	12.14%	14.67%	9.38%
Sharpe Ratio	0.33	0.55	0.45	0.80
MaxDD	–83.66%	–50.29%	–50.95%	–16.73%
Inflation	3.16%	3.16%	1.86%	1.86%

Most investors don't own only U.S. stocks but instead allocate to a broad spectrum of assets, including bonds, foreign assets, and real assets. Given this, let's now turn our attention to the performance of the timing system as applied to a diversified global portfolio.

PORTFOLIO VIEW

Dimson, Marsh, and Staunton's [2002] book *Triumph of the Optimists: 101 Years of Global Investment Returns* illustrates that many global asset classes in the twentieth century produced spectacular gains in wealth for individuals who bought and held those assets for generation-long holding periods. Of course, the assets also went through regular and painful drawdowns, such as in 2008. All the G-7 countries have experienced at least one period in which stocks lost 75% of their value. The unfortunate arithmetic of a 75% decline requires an investor to realize a 300% gain just to get back to even—the equivalent of compounding at 10% for 15 years!

The solution for most investors is to diversify across uncorrelated asset classes and return streams. Every bear market has a different personality, of course. The 2000–2003 bear was largely confined to the high-flying technology stocks, and many asset classes and securities came nowhere close to experiencing the major losses suffered by market-capitalization-weighted U.S. stock indexes.

Exhibit 6 details the returns of five major asset classes from 1972 to 2005. Although the indexes traveled different routes from start to finish, most finished with similar returns over time. The exception was bonds, which trailed the other asset classes—an expected outcome because of their lower volatility and risk. The fact

EXHIBIT 5

U.S. Stocks and Timing Annual Returns, 2006–2016

Year	U.S. Stocks	Timing
2006	15.80%	15.80%
2007	5.49%	5.49%
2008	–37.00%	1.24%
2009	26.46%	22.71%
2010	15.06%	–1.25%
2011	2.11%	–1.77%
2012	16.00%	11.03%
2013	32.39%	32.39%
2014	13.69%	13.69%
2015	1.38%	–4.12%
2016	11.96%	5.04%

that bonds were even close to the other equity-like asset classes in absolute performance reflects the greater-than-twenty-year bull market that took yields from double-digit levels to near 2% today. The returns for a buy-and-hold allocation are referenced as "Global Asset Allocation" or "GAA" and are equally weighted across the five asset classes.

Higher resolution daily data and longer look-back periods can only increase the drawdown amount. A good rule of thumb is that risky asset classes have Sharpe ratios that cluster around 0.2 to 0.3, while a diversified portfolio is around 0.4 to 0.6. Exhibit 6 shows that while the various asset classes posted healthy returns, they are coupled with some substantial drawdowns. Except for U.S. government bonds, which declined less than 20%, the other four asset classes suffered drawdowns of around 40% to 60%. If an investor was to include inflation or take the data back further, those drawdowns only increase.

So how did these asset classes perform in the out-of-sample period since 2005? Exhibit 7 shows the results. The normal benefits of diversification disappeared in 2008, as many noncorrelated asset classes experienced large declines simultaneously. As written above, every bear market has its own personality—and whereas the 2000–2003 bear market was largely confined to technology stocks, the 2008–2009 bear market was felt on a far broader basis. The GAA asset allocation portfolio would have seen a drawdown of twice what it experienced in the in-sample period—a good reminder that the largest drawdown is always in your future.

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EXHIBIT 6
Asset Class Returns, 1972–2005

1972–2005	U.S. Stocks	Foreign Stocks	U.S. Bonds	REITs	Commodities	GAA
Return	11.15%	11.31%	8.24%	10.57%	12.00%	11.51%
Volatility	15.32%	16.81%	8.42%	15.35%	19.14%	8.88%
Sharpe Ratio	0.32	0.31	0.24	0.29	0.30	0.60
MaxDD	–44.73%	–47.47%	–15.79%	–58.10%	–48.25%	–19.62%
Inflation	4.70%	4.70%	4.70%	4.70%	4.70%	4.70%

EXHIBIT 7
Asset Class Returns, 2006–2016

2006–2016	U.S. Stocks	Foreign Stocks	U.S. Bonds	REITs	Commodities	GAA
Return	7.66%	3.29%	4.48%	7.05%	–8.70%	3.51%
Volatility	14.67%	18.33%	7.67%	23.28%	23.40%	12.81%
Sharpe Ratio	0.45	0.12	0.45	0.26	–0.42	0.19
MaxDD	–50.95%	–56.40%	–10.14%	–67.88%	–80.90%	–46.00%
Inflation	1.86%	1.86%	1.86%	1.86%	1.86%	1.86%

EXHIBIT 8
GAA and QTAA Equity Curves, 1972–2005 and 2006–2016

	1972–2005		2006–2016	
	GAA	QTAA	GAA	QTAA
Return	11.51%	11.73%	3.51%	4.88%
Volatility	8.88%	6.84%	12.81%	6.55%
Sharpe Ratio	0.60	0.81	0.19	0.59
MaxDD	–19.62%	–9.54%	–46.00%	–9.45%
Inflation	4.70%	4.70%	1.86%	1.86%

Having documented the individual returns of these various asset classes, let's now evaluate the timing model on an aggregated portfolio level. How might the simplistic market-timing rule work across these various asset classes, as well as in the context of an investor's portfolio?

The allocation we'll evaluate consists of the five global asset classes mentioned above: U.S. stocks, foreign stocks, bonds, real estate, and commodities. The timing model uses equal weightings and treats each asset class independently; it is either long the asset class or its 20% allocation sits in cash. Here we refer to the timing model as *Quantitative Tactical Asset Allocation* or *QTAA*.

Exhibit 8 details the in-sample and out-of-sample equity returns.

The additional advantages conferred by timing are striking. Timing results in a reduction of volatility to single-digit levels, as well as a single-digit maximum drawdown in both periods. Although returns have been far lower for all assets in the out-of-sample period, timing added value.

Exhibits 9 and 10 detail the in- and out-of-sample equity curves as well.

For perspective, Exhibit 11 presents a chart that demonstrates the full period returns.

It is good to see the simple system work out of sample. But one might wonder, "Are these results in some way skewed or influenced by the specific moving average parameters of our model?"

Exhibit 12 demonstrates that the choice of the moving average doesn't really matter all that much, and any of the moving average lengths would have outperformed a buy-and-hold allocation.

In summation, we found the model performed as expected despite geopolitical conflict, terrorism, global health scares, and other such headline-making news.

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EXHIBIT 9
GAA and QTAA Equity Curves, 1972–2005

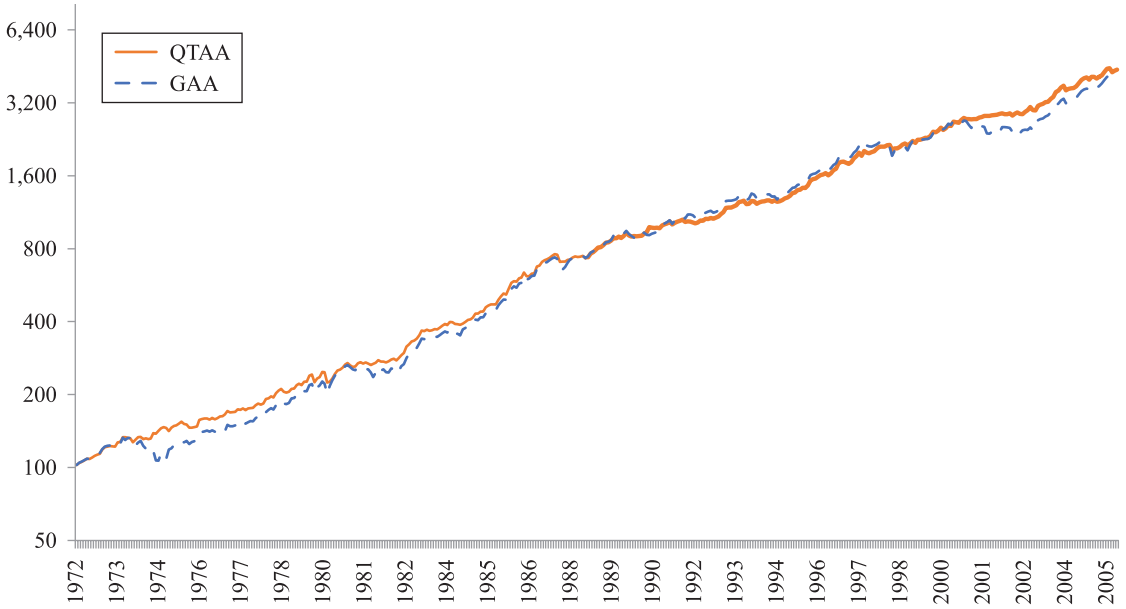
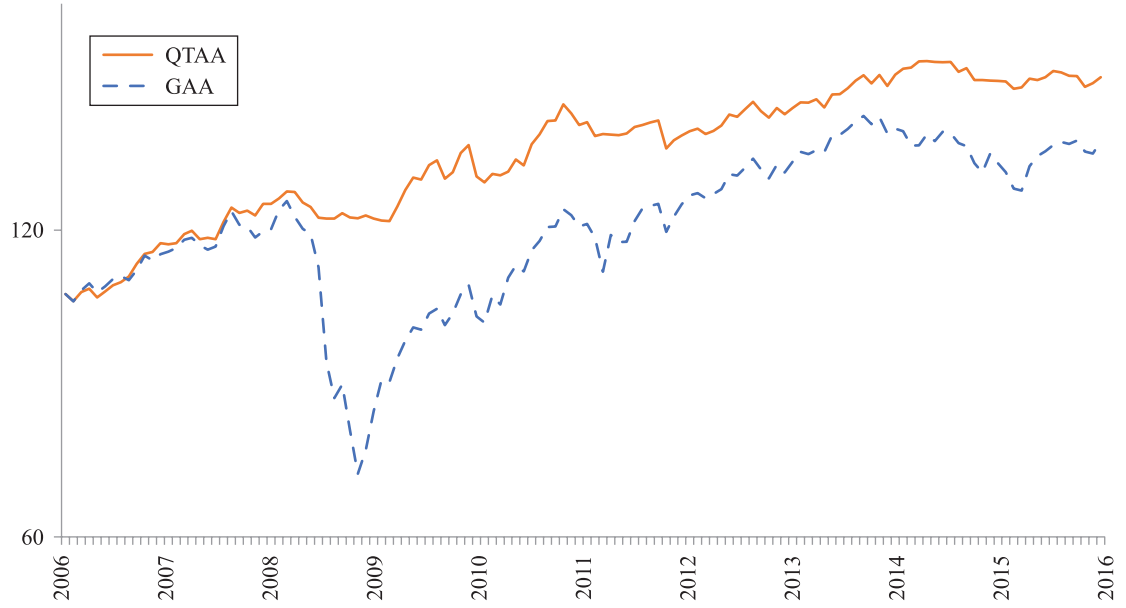


EXHIBIT 10
GAA and QTAA Equity Curves, 2006–2016



EXTENSIONS

Since the publication of the original white paper, we have written six books, ten white papers, over two thousand blog articles, and produced nearly 100 podcast episodes. Some of this content addressed, in varying degrees, how an investor might improve upon or alter this basic system. Although the intent of the original

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EXHIBIT 11
GAA and QTAA Equity Curves, 1972–2016

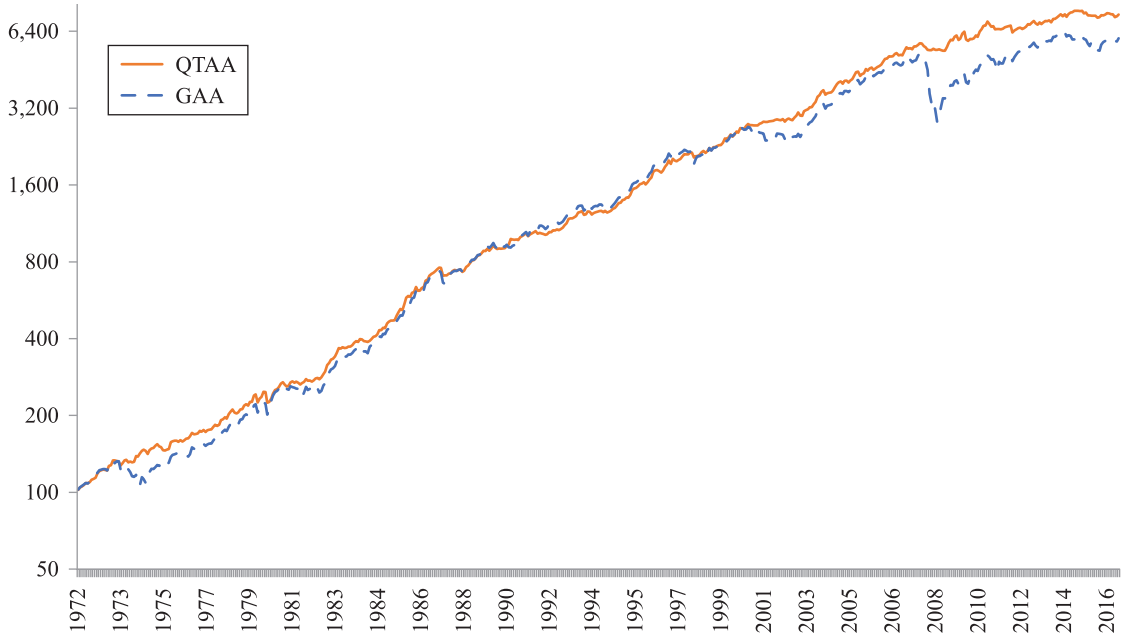

EXHIBIT 12
Parameter Stability of Various Moving Average Lengths, GAA and QTAA, 2006–2016

2006–2016	GAA	QTAA	6-Month SMA	8-Month SMA	12-Month SMA
Return	3.51%	4.88%	5.46%	5.73%	3.62%
Volatility	12.81%	6.55%	6.62%	6.43%	6.75%
Sharpe Ratio	0.19	0.59	0.67	0.73	0.38
MaxDD	–46.00%	–9.45%	–10.30%	–7.09%	–14.76%
Inflation	1.86%	1.86%	1.86%	1.86%	1.86%

paper was to demonstrate a simple tactical system, an investor can take significant departures to tailor the portfolio to his or her own investing temperament. A few deviations were mentioned in a prior paper update, and we will reexamine a few below. Because these were published in the period after the original white paper, we present the full sample dates (beginning in 1972) so as not to imply they are truly out of sample.

1. Alternative cash management strategies
2. Alternate weighting strategies
3. Adding more asset classes and tilts

EXHIBIT 13
Asset Allocation and QTAA Portfolios, 1972–2016

1972–2016	GAA	QTAA Bills	QTAA Bonds
Return	9.24%	9.79%	11.77%
Volatility	10.10%	6.85%	8.23%
Sharpe Ratio	0.43	0.71	0.83
MaxDD	–46.00%	–9.54%	–11.12%
Inflation	4.02%	4.02%	4.02%

Extension 1—Alternative Cash Management Strategies

On average, the QTAA portfolio is invested in approximately 30% cash because at any time, one or more asset classes may not be invested because of our trading rules. This is a drag on the portfolio, and many investors employ other means to increase the yield on the cash portion of the portfolio using any number of funds or concepts. Exhibit 13 looks at a simple method of taking on more duration risk by investing the cash portion of the portfolio in 10-year government bonds instead of Treasury bills.

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EXHIBIT 14
Asset Allocation and QTAA Portfolios, 1972–1981

1972–1981	GAA	QTAA Bills	QTAA Bonds
Return	8.30%	9.38%	11.47%
Volatility	10.83%	8.13%	10.17%
Sharpe Ratio	–0.01	0.12	0.30
MaxDD	–19.62%	–9.54%	–11.12%
Inflation	9.13%	9.13%	9.13%

EXHIBIT 15
Asset Allocation and QTAA Portfolios, 1972–2016

1972–2016	GAA	QTAA Conservative	QTAA Moderate	QTAA Aggressive
Return	9.24%	9.11%	9.79%	13.40%
Volatility	10.10%	5.85%	6.85%	9.52%
Sharpe Ratio	0.43	0.72	0.71	0.89
MaxDD	–46.00%	–7.14%	–9.54%	–12.96%
Inflation	4.02%	4.02%	4.02%	4.02%

An investor would have realized nearly an additional 2% per annum in returns for marginally more volatility and drawdown—but how much of this is attributable to the major bull market in bonds?

Exhibit 14 demonstrates that taking on additional duration risk still helped during the period of sharply rising interest rates from 1972 to 1981.

Extension 2—Weighting Strategies

No two investors are alike. Some investors value wealth preservation with low volatility above all else; others can handle a 50% loss to generate higher gains.

Next, we look at three different allocations that we will call 1) QTAA Conservative, 2) QTAA Moderate, and 3) QTAA Aggressive. We will name the base case model we have already examined QTAA Moderate.

QTAA Conservative is an allocation that broadly follows QTAA Moderate but puts a higher weighting on bonds (40% versus 20%). Cash is invested in T-bills.

The QTAA Aggressive portfolio begins with the asset classes listed in the QTAA Moderate allocation. It then selects the top three out of the five assets as ranked by an average of 1-, 3-, 6-, and 12-month total returns (momentum). This method was detailed in our white paper, "Relative Strength Strategies for Investing" (Faber [2010]). The assets are only included if they are above their long-term moving average, otherwise that portion of the portfolio is moved to cash using T-bills. Exhibit 15 examines the results, and as one might expect, QTAA Aggressive posts the highest returns, albeit with increased volatility and drawdowns numbers.

Extension 3–More Assets and Tilts

Other than simplicity, there is no reason to focus only on five asset classes. Technically, we believe there are only four main asset classes: stocks, bonds, commodities, and currencies. Everything else (such as REITs) is a combination of the prior four.

At the same time, expanding a portfolio to include allocations with sizes that are less than 5% would have a marginal impact on the entire portfolio's risk and reward characteristics. (This ignores derivatives and holdings with highly asymmetric payoffs.)

We also face the challenge that many asset classes and indexes simply have not existed for a very long time. For example, we do not include TIPs, junk, or high-yield bonds, emerging bonds, foreign REITs, fundamental indexes, managed futures, currencies, or other asset classes and strategies we might otherwise consider. We found that 13 asset class subgroups will likely cover most of the global market portfolio that we would like to allocate to, while maintaining a large-enough allocation size to affect the overall portfolio's performance.

Exhibit 16 expands the original portfolio from the original five assets to include these additional assets. We also decided to use tilts that have historically been shown to improve upon market-capitalization weightings. Note that we are including these tilts and adjustments with the full benefit of hindsight; regardless, we believe they are still reasonable modifications to make if implemented in a thoughtful and cost-effective manner. Investors need to be mindful of the fees they pay to express these asset class tilts in their portfolio. Many funds are sold on Wall Street with 1%+ expense ratios, likely destroying all the potential alpha these funds may generate.

We then look at the historical returns compared to the simple strategy of five asset classes. As we see in Exhibit 17, including more asset classes (identified by the "+" symbol in the column heading) improves returns by about 150 basis points, largely because of the tilts. We believe this is enough to warrant increasing the assets in the portfolio.

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EXHIBIT 16
Additional Asset Classes

Allocation	Asset Class or Subgroup
5%	U.S. Large-Cap Value
5%	U.S. Large-Cap Momentum
5%	U.S. Small-Cap Value
5%	U.S. Small-Cap Momentum
10%	Foreign Developed
10%	Foreign Emerging
5%	U.S. 10-Year Government Bonds
5%	Foreign 10-Year Government Bonds
5%	U.S. Corporate Bonds
5%	U.S. 30-Year Government Bonds
10%	Commodities
10%	Gold
20%	Real Estate Investment Trusts

EXHIBIT 17
Asset Allocation and Timing Returns, 1972–2016

1972–2016	GAA	GAA+	QTAA	QTAA+
Return	9.24%	10.82%	9.79%	11.29%
Volatility	10.10%	10.43%	6.85%	7.03%
Sharpe Ratio	0.43	0.57	0.71	0.91
MaxDD	–46.00%	–41.93%	–9.54%	–10.75%
Inflation	4.02%	4.02%	4.02%	4.02%

EXHIBIT 18
Asset Allocation and Timing Returns, 1972–2016

1972–2016	GAA	GAA+	QTAA	QTAA+	QTAA+ Agg with Bonds
Return	9.24%	10.82%	9.79%	11.29%	17.20%
Volatility	10.10%	10.43%	6.85%	7.03%	11.58%
Sharpe Ratio	0.43	0.57	0.71	0.91	1.06
MaxDD	–46.00%	–41.93%	–9.54%	–10.75%	–23.48%
Inflation	4.02%	4.02%	4.02%	4.02%	4.02%

There are limitless extensions to these studies; for example, an investor could incorporate both the tilts and asset class granularity with the aggressive approach and cash management strategies of the prior two extensions. This exercise is potentially venturing into some data mining, but all three of the deviations are reasonable and pass the common sense test. Exhibit 18 examines some of the combined strategies.

Will those deviations add value in the future; ask us again in 10 years!

PRACTICAL CONSIDERATIONS

There are a few practical considerations an investor must analyze before implementing these models for real-world applicability—namely, management fees, taxes, commissions, and slippage.

Management fees should be identical for both the buy-and-hold and timing models and will vary depending on the instrument used for investing. A fair estimate for these fees using ETFs and no-load mutual funds (obviously the lower the better) would be in the range of 0.03% to 0.70%. Many all-ETF portfolios can be formed for approximately 0.05% to 0.50%.

Commissions should be a minimal factor because of the low turnover of the models. On average, the investor would be making three to four round-trip trades per year for the portfolio and less than one round-trip trade per asset class per year. Likewise, slippage should be nearly negligible, because an investor can choose from numerous mutual funds (end-of-day pricing means zero slippage) as well as liquid ETFs. And many brokerages offer commission-free trading for some or all the funds on their platform.

Taxes, on the other hand, are a very real consideration. Many institutional investors, such as endowments and pension funds, enjoy tax-exempt status. The obvious solution for individuals is to trade the system in a tax-deferred account such as an IRA or 401(k). Because of the various capital gains rates for different investors (as well as varying tax rates across time and the impact of dividends), it is difficult to estimate the hit an investor would suffer from trading this system in a taxable account. Most investors rebalance their holdings periodically and introduce some turnover into the portfolio even if they apply a strategic buy-and-hold methodology.

The system results in a high number of short-term capital losses and a large percentage of long-term capital gains.

CONCLUSION

The purpose of the original article was to evaluate a simple-to-follow method for managing risk in a single asset class and, by extension, a portfolio of assets. Utilizing a monthly system since 1972, an

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investor would have been able to increase risk-adjusted returns by diversifying portfolio assets and employing a market-timing solution. In addition, the investor would have been able to sidestep many of the protracted bear markets in various asset classes. Avoiding these massive losses would have resulted in equity-like returns with bond-like volatility and drawdowns. Investors looking to tailor their portfolios may consider using alternate cash strategies, more assets in the portfolio, and alternative weighting schemes to find a portfolio that is right for them.

As we look back and reflect, we find that QTAA has performed as expected out of sample, which is to say it performed well. Given this, it's tempting to give ourselves a pat on the back. However, what if QTAA had performed poorly? Then likely no one would be reading this article, because it would never have become popular in the first place. So despite the great out-of-sample performance, is it fair to judge our timing strategy in such short a time? Probably not. The value of such a model is better evaluated over the course of multiple decades rather than years (and certainly not quarters). And this might be especially important given where we stand today, looking forward to what could be in store for the markets over the next decade.

Although investors have benefitted from strong equity markets since the global financial crisis, the opportunity set for domestic investments is quite poor. Valuations for U.S. stocks using the 10-year Shiller cyclically adjusted price/earnings (CAPE) have risen above a value of 30, which puts them well above the long-term average of around 17. Such a reading suggests that future returns could underperform historical long-term averages. Even the father of indexing, John Bogle, recently suggested that U.S. stocks may return about 4% in the coming decade. Are we to expect any help from bonds? Perhaps the opposite is what we should expect: U.S. government bond yields have declined to all-time low levels of around 2.3%. Looking forward, we expect future total bond returns to approximate their starting yield. Given this, investors are presented with the following opportunity set (assuming 2% inflation going forward and rounding to make it simple): U.S. stocks, 4% nominal, 2% real; U.S. Bonds, 2% nominal, 0% real.

Will U.S. equities significantly underperform their long-term averages? What direction will U.S. bond yields go? Will alternate global asset classes prove to be better places for your investment capital? No one can answer these questions with complete accuracy. Given that, it's crucial to invest thoughtfully and deliberately.

Most importantly, every investor should have a plan and process for investing in any environment, regardless of how improbable or unfathomable that may be. Are you prepared for all the possible outcomes, such as declines of 50% in an asset class or portfolio? Are you prepared not only for currency devaluations but also for massive rallies in stocks or bonds? Can you fathom a world with interest rates at 0% as well as at 10%?

The beauty of the simplistic timing model documented in this article is that it's dynamic, therein enabling us to answer "yes" to the questions above. Whether you deem it appropriate or not for your own investing style, the broader point remains: Do you have a plan or process that has prepared you for tomorrow's market, in whatever condition you may find it?

APPENDIX

DATA SOURCES

We used Global Financial Data for the data in this article. However, there are many free sources of data available online for the asset classes included in this article.

- **S&P 500 Index**—a capitalization-weighted index of 500 stocks that is designed to mirror the performance of the U.S. economy. Global Financial Data provided the total return series and constructed the results pre-1971. Data from 1900 to 1971 use the S&P Composite Price Index and dividend yields supplied by the Cowles Commission and from S&P itself.
- **MSCI EAFE Index** (Europe, Australasia, Far East)—a free float–adjusted market capitalization index that is designed to measure the equity market performance of developed markets, excluding the United States and Canada.
- **U.S. Government 10-Year Bonds—**a total return series.
- **Goldman Sachs Commodity Index** (GSCI)—a diversified basket of commodity futures that is unlevered and long only. This total return series is provided by Goldman Sachs.
- **National Association of Real Estate Investment Trusts** (NAREIT)—a total return index that reflects the performance of publicly traded REITs.

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ENDNOTE

[1]For a lengthy examination of bubbles, see Faber [2011].

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