

The SIMPLE Investment Strategy

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EXECUTIVE SUMMARY

- The SIMPLE investment strategy has provided a higher return, higher risk adjusted return and lower downside risk than conventional investment strategies since 1974.
- The strategy is implemented using low cost exchange traded funds and it has adequate capacity for smaller advisory firms.
- The strategy employs timing algorithms to mitigate downside risk. Market timing has pejorative connotations for some and it is generally not cost-free. However, the mitigation cost of market timing has been less than the cost of mitigation using a static bond allocation.
- The SIMPLE strategy reduces the return risks associated with saving for retirement and with withdrawals during retirement. The potential improvements are so large that planner should consider rethinking guidelines for pre-retirement savings rates and for post-retirement withdrawal rates.
- The strategy should be attractive to risk adverse investors and to advisers who seek to provide improved performance at low incremental cost.
- There are no licensing costs and no third party management fees.
- An extended version with additional detail is available at www.lingane.com/qi.

INTRODUCTION

This article introduces the SIMPLE strategy. The SIMPLE strategy promises a higher return, higher risk adjusted return, less downside risk and a longer lived retirement portfolio as compared to traditional investment strategies.

The SIMPLE strategy ranks three funds: US stocks, foreign stocks and real estate. The strategy allocates to the two funds with the highest momentum.

Momentum refers to stocks which are appreciating in price faster than other stocks. Momentum tends to continue to provide outsized returns for a few weeks or a few months after the measurement date.

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Momentum is one of the investment “factors” which explain market returnsⁱ. Other important factors include size (stocks with smaller capitalizations tend to do better than other stocks), value (stocks with lower book-to-price ratios tend to do better than other stocks), volatility and quality (stocks of profitable companies with persistent earnings and low leverage tend to do better than other stocks.)

Factor and smart beta funds – the names are essentially interchangeable - are the current rage. Half of the exchange traded funds launched in the first half of 2017 were factor fundsⁱⁱ.

The potential incremental returns from factor investing are huge. Figure 1 illustrates that a dollar invested in large cap stocks in December 1927 would have been worth \$3,800 in December 2016 with dividends reinvested, before expenses and taxes. If the same dollar had been invested in small cap stocks with good momentum, the portfolio would have grown to \$1.6 million.

The potential returns of the SIMPLE strategy are less than for factor investing. However, we expect the SIMPLE strategy to outperform factor investing in practice because the SIMPLE strategy is less constrained by cyclicity, capacity and tracking issues.

This article begins with a discussion of the constraints which challenge factor investing. We then address downside risk mitigation and argue that tactical changes to the bond allocation (otherwise known as “market timing”) is cost effective as compared to including a static bond allocation.

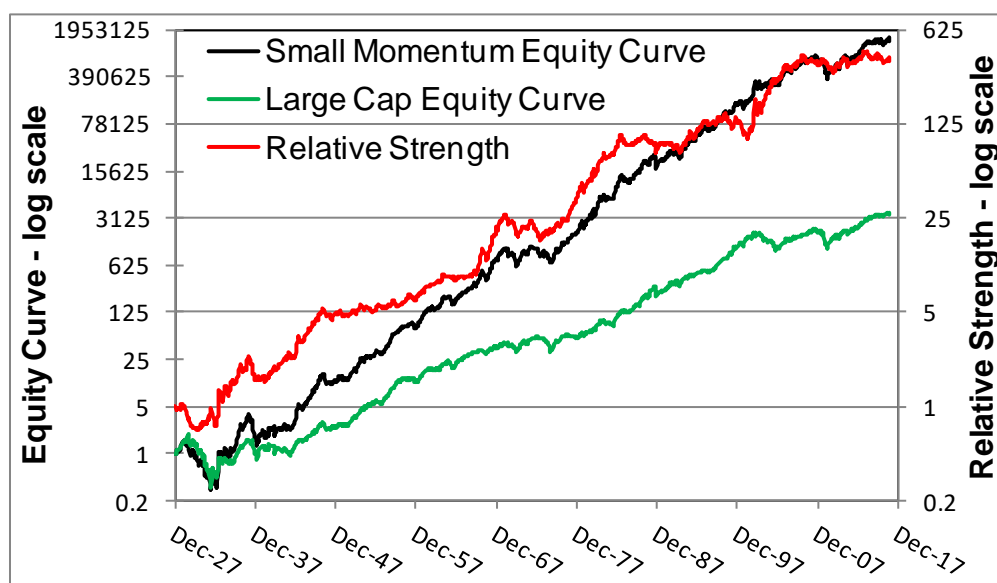
We trace the evolution of the SIMPLE strategy from its origin as Antonacci’s Dual Momentum strategy and describe backtested performance since 1974. We conclude by illustrating the benefits of the SIMPLE strategy for savings accumulation and portfolio longevity.

CONSTRAINTS ON FACTOR INVESTING

Cyclicity

The performance of a factor portfolio tends to vary over time. The industry calls this “cyclicity.” The red curve in Figure 1 demonstrates cyclicity in the performance of a small momentum portfolio versus large cap stocks. The red curve is the ratio of the equity curve of small momentum stocks divided by the equity curve of large cap stocks. Such ratios are called “relative strength.”

Figure 1. Equity Curves (left axis) of Small Momentum and Large Cap Stock Portfolios and the Relative Strength (right axis) of Small Momentum Stocks versus Large Cap Stocks.



A rising relative strength identifies the years when small momentum stocks outperformed large cap stocks. A flat relative strength, after 2005 for example, identifies an interval when small momentum stocks provided about the same return as large cap stocks. Declines in relative strength in 1937-38 and 1969-73 identify intervals when the value of the small momentum portfolio lost 35% of its value relative to the large cap portfolio.

Individual factors tend to be hot at different times and the performance of one factor tends to show low correlations to the performance of other factors. Index providers argue that diversifying across several factors provides a more reliable performance and a partial solution to the cyclical constraint.

Index providers design multi-factor indices by ranking each stock in terms of a particular factor and combining the ranks in some manner. The final index is composed of stocks with exposure to several factorsⁱⁱⁱ. The return of multi-factor indices is generally less than the potential return of the highest performing factor.

We will show that the SIMPLE strategy exhibits low cyclical and high returns.

Underperformance Percentage (UPP)

Our goal is an investment strategy which consistently provides more return and less risk than conventional benchmarks. We measure the consistency of a strategy as the percentage of time that the return is less than the return of the benchmark over rolling 36-month intervals.

The small momentum portfolio provided less return than the large cap benchmark in 232 of the 1,033 rolling 36-month intervals between December

1927 and December 2016. The underperformance percentage (UPP) of the small momentum portfolio is 22%, 232 intervals in which the small momentum portfolio provide less return than the large cap benchmark divided by 1033 total intervals.

Gray and Vogel argue that investment managers risk their careers when they adopt strategies which could underperform over an extended period^{iv}.

Index providers minimize underperformance by avoiding concentrated portfolios and sector bets. Factor indices therefore tend to resemble cap weighted funds with small tilts to a factor or factors.

Backtesting shows that the SIMPLE strategy provides a low underperformance percentage. Career risk is low for the adviser who adopts the SIMPLE strategy.

Capacity, Trading Costs and Rebalancing

The third constraint on factor investing is capacity. Large trades move prices and price distortion decreases profitability. Capacity becomes more of a constraint as portfolios become more concentrated, as market capitalizations and trading volumes decrease and as the rebalancing frequency increases. It is no surprise therefore that factor indices tend to avoid stock with low capacity (that is, smaller stocks generally) and to trade quarterly or less frequently.

The SIMPLE strategy is a fund of funds which trades monthly based on the relative momentum of the candidate funds. Although candidate funds have hundreds of millions of dollars of daily volume, capacity won't be adequate if many advisors adopt the SIMPLE strategy and rebalance on the last day of the month. Market arbitrageurs would notice as well. For these reasons, consider rebalancing one fourth of the portfolio at weekly intervals.

The SIMPLE strategy owns at most two funds but it is not a concentrated strategy because the funds are broadly diversified. The return is not as high as with concentrated momentum strategies but the return is significantly more than the returns of conventional benchmarks.

DATA SOURCES

The small momentum portfolio is represented by dividend adjusted total return data from the French data library at the Tuck School of Business. The French small momentum portfolio is a capitalization weighted portfolio containing stocks with momentum in the top 30% and capitalizations in the smaller half. Momentum is measured as the total return over eleven months, the past year omitting the most recent month.

Funds have an advantage over indices in that they reflect performance net of fees. Unfortunately, funds have only about thirty years of history and it is therefore necessary to use spliced data sets to cover the past eighty-nine years.

A spliced dataset uses an index prior to the availability of fund data and fund data thereafter. Details can be found in the extended version of this article.

The strategy would be implemented using ETFs.

MITIGATING DOWNSIDE RISK

Drawdown is defined as the current value of a portfolio divided by the highest prior value of the portfolio minus one. It is probably impossible to eliminate drawdowns entirely but it is possible to mitigate downside risk. For example, one could

- Include a permanent allocation to defensive securities. The traditional 60:40 portfolio is an example of this approach.
- Hedge the portfolio^v.
- Tactically vary the allocation to defensive securities in response to market conditions in a rules based manner. This is “market timing.”

The challenge is not in mitigating downside risk. The challenge is to mitigate risk *cost effectively*.

The standard by which a risk mitigation strategy should be evaluated is whether it preserves more of the return than other mitigation strategies.

We have tested many risk mitigation timing algorithms. Two of our favorites are Antonacci’s Absolute Momentum^{vi} and the Nicholas timer^{vii}. Absolute Momentum invests in stocks when the return of US large cap stocks, including dividends, exceeds the total return of T-bills, both returns being measured over the trailing twelve months. When T-bills have the higher return, the portfolio is invested in intermediate term bonds.

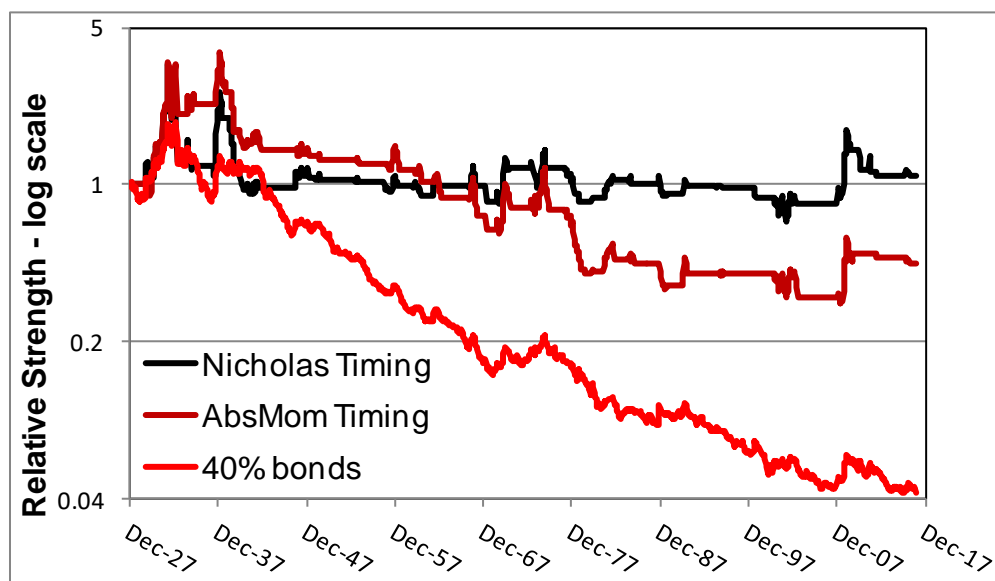
The Nicholas timer recommends stocks when the total return of US large cap stocks, averaged over the prior 1-, 3-, 6- and 12-months is positive. The Nicholas timer recommends intermediate term bonds when the average total return of large cap stocks is negative.

These algorithms trade infrequently. The Absolute Momentum timer adjusted the bond allocation about every 13 months over the past eighty-nine years. The Nicholas timer adjusted the bond allocation about every eight months.

The long term performance of these algorithms is shown in Figure 2 relative to the performance of the unmanaged small momentum portfolio. The relative strengths of the Absolute Momentum and Nicholas timers rise sharply at times, indicating protection in a falling market, and fall equally sharply at other times, indicating that the timer has been fooled by a moderate market decline or has stayed too long in bonds as the market recovered.

The relative strength of the Absolute Momentum timer shows a pronounced downward trend, meaning that Absolute Momentum timing has a tendency to destroy value relative to the untimed portfolio. The annualized decline rate is about 1%. The decline rate should be thought of as the cost of insuring against severe drawdowns.

Figure 2. Relative Strengths of Timed Small Momentum Portfolios and of the French Small Momentum Portfolio plus 40% Bonds. Relative strengths are being compared to the value of the unmanaged small momentum portfolio.



Nicholas timing also exhibits a decline in some intervals. Because the relative strength is variable, the cost of Nicholas timing depends on the interval being tested. From 1977 through 2007, the annualized decline rate was 1.2% per year. For the entire interval, the relative strength increased slightly and the cost was zero.

We have yet to find a timing strategy which does not incur some cost with some portfolios under some market conditions.

A common mitigation strategy is a static bond allocation. As shown in Figure 2, adding 40% bonds to the small momentum portfolio would have destroyed 96% of the value since 1927 relative to the value of the portfolio without bonds. This is a 4% annualized decline rate. The insurance cost of adding a static 40% bond allocation to the small momentum portfolio is 4% a year.

Absolute Momentum and Nicholas timing mitigate severe drawdowns at a lower cost than a static bond allocation. Market timing is imperfect but it is a better mitigation strategy than a static allocation to bonds.

Optional Sidebar

"CAGR" is the compounded annual growth rate or annualized return. It is computed as the n th root of the ratio of the current value to the value n years ago, minus 1.

"Sharpe ratio" measures the annualized return per unit of return variation. It is computed as the square root of 12 times the average Adjusted Monthly Return divided by the standard deviation of the Adjusted Monthly Returns. Adjusted Monthly Return is the portfolio return less the return of Treasury Bills.

"Drawdown" is the decline in portfolio value from the previous high (measured at month's end) to the current value of the portfolio (again measured at month's end.) minus one. "Maximum drawdown" is the largest drawdown over an interval. "Drawdown date" is the month-end at which the maximum drawdown is observed.

EVOLUTION OF THE SIMPLE STRATEGY

Strategy goals were

- Easy to implement without extensive computations;
- Higher returns and lower drawdowns than traditional benchmarks;
- Infrequent underperformance against conventional benchmarks;
- Adequate capacity for implementation by individual investors and smaller RIAs; and
- No market timing.

This section describes the degree to which the SIMPLE strategy met these goals.

Dual Momentum

The simplicity and effectiveness of Dual Momentum is attractive. Antonacci's strategy employs three assets and two algorithms. The portfolio is invested in an intermediate-term bond fund when the total return of T-bills over the trailing twelve months exceeds the total return of US large cap stocks. This is the Absolute Momentum timing algorithm that we discussed previously.

Antonacci uses the Relative Momentum algorithm to choose between US and foreign stocks. The algorithm compares the total return of US stocks over the trailing twelve months to the total return of foreign stocks and invests in a US stock fund when US stocks have the higher return or in a foreign stock fund when foreign stocks have the higher return.

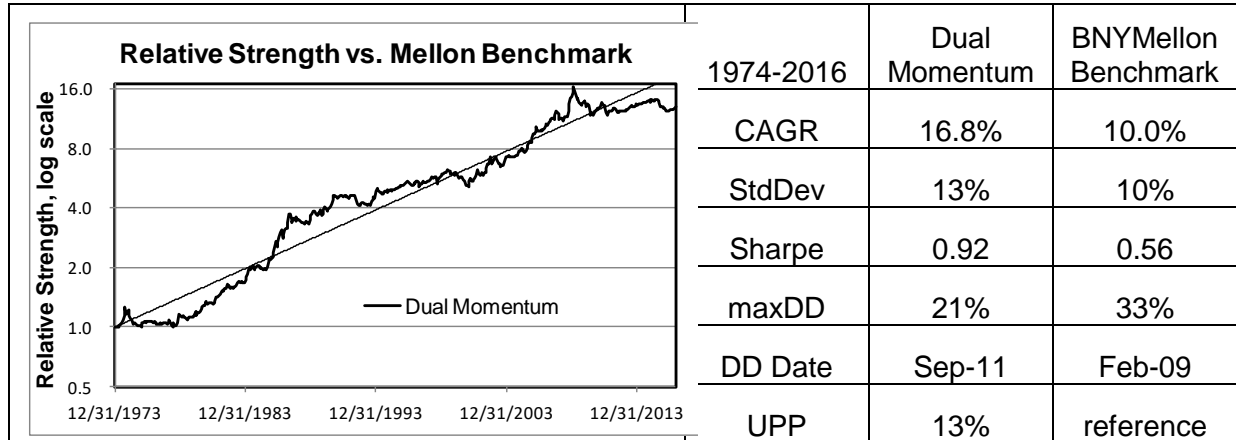
At any given time, the Dual Momentum strategy is exclusively invested in a large cap US stock fund, in a foreign stock fund or in an intermediate bond fund.

Figure 3 shows the relative strength of the Dual Momentum strategy over time. We are plotting the value of the portfolio managed by the Dual Momentum algorithms divided by the value of the BNY Mellon benchmark^{viii}. We choose the BNY Mellon benchmark because it is more globally diversified than the usual benchmark of 40% US bonds and 60% US stocks.

Dual Momentum is outperforming when the relative strength is rising.

The time interval is limited by the availability of foreign stock data.

Figure 3. Relative Strength of Dual Momentum versus the BNY Mellon Benchmark, 1974 – 2016. The straight line is the least squares fit to the relative strength. Dual Momentum uses the Relative Momentum ranking algorithm and the Absolute Momentum timing algorithm to choose among US stocks, foreign stocks and bonds.



Performance statistics for the Dual Momentum strategy and for the BNY Mellon benchmark are shown to the right of the chart and defined in the sidebar. The Dual Momentum strategy would have provided more return than the benchmark, the maximum drawdown would have been less than the benchmark drawdown and the Sharpe ratio would have been higher.

The underperformance percentage is 13%. That is, the return of the Dual Momentum strategy underperformed the BNY Mellon benchmark in 13% of the rolling 36-month intervals. We will show that the SIMPLE strategy reduces the underperformance percentage.

Relative strength has been declining since March 2009. While the benchmark has appreciated 10.9% annually since then, Dual Momentum has appreciated only 8.3%. The 10.6% appreciation rate of the SIMPLE strategy nearly matches that of the benchmark.

The SIMPLE Strategy Defined

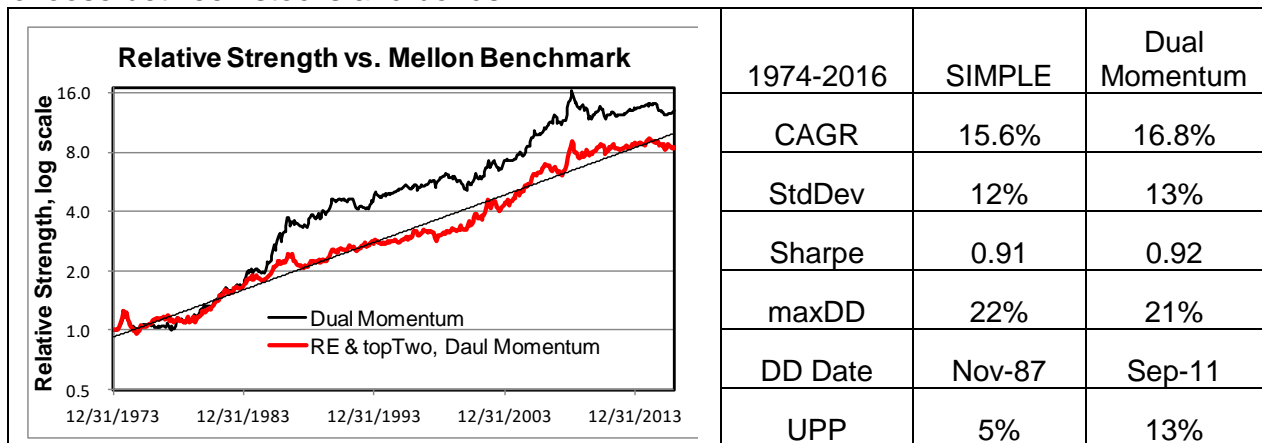
The SIMPLE strategy adds a third equity component, real estate, to the Dual Momentum strategy and invests in the two funds with the highest momentum. The investment options are generally large cap US stocks and foreign stocks, large cap US stocks and real estate or foreign stocks and real estate. The portfolio is invested in intermediate term bonds in times of market stress.

Adding real estate makes strategic sense since the value of investable real estate is comparable to the values of the US and foreign stock markets.

Adding a third equity fund allows simultaneous investment in two equity funds. Allocating to more than one fund generally means less abrupt portfolio changes when rebalancing.

Investing in more than one equity fund tends to decrease returns. The 15.6% return of the SIMPLE strategy is less than the 16.8% return of Dual Momentum.

Figure 4. Relative Strength of Dual Momentum and of the SIMPLE Strategy versus the BNY Mellon Benchmark, 1974 – 2016. The SIMPLE strategy uses Relative Momentum ranking to choose the best two from among US stocks, foreign stocks and real estate. The SIMPLE strategy uses Absolute Momentum timing to choose between stocks and bonds.



On the other hand, investing in more than one equity fund reduces the risk of have the entire portfolio in the wrong fund and should increase Sharpe ratios and reduce drawdowns. The standard deviation is less with the SIMPLE strategy but there is no difference between the Sharpe ratios and drawdowns of the SIMPLE and Dual Momentum strategies.

The primary advantages of the SIMPLE strategy are that the relative strength of the SIMPLE strategy is more consistent over time and that the underperformance percentage is reduced to 5%. This means fewer calls from anxious customers and less career risk for the adviser.

The greater consistency is evidenced qualitatively in Figure 4 by the better alignment between the red curve and its least squares line and by the flat relative strength post 2009.

A Variation of the SIMPLE Strategy

A concern with backtesting is that the results may be sensitive to the specific algorithms employed.

A concern with using a single ranking and a single timing algorithm is that the recommendations may prove to be unreliable in certain markets since the predictive strengths of almost any algorithm varies with market conditions.

Figure 5 shows the performance with a second set of algorithms. Since the long term statistics are essentially the same as for the SIMPLE strategy, performance is not sensitive to the specific algorithms. The extended version of this article shows that a variety of algorithms provide more return, better

Sharpe ratios and lower drawdowns than the benchmark. Figures 4 and 5 are simply two of the better choices.

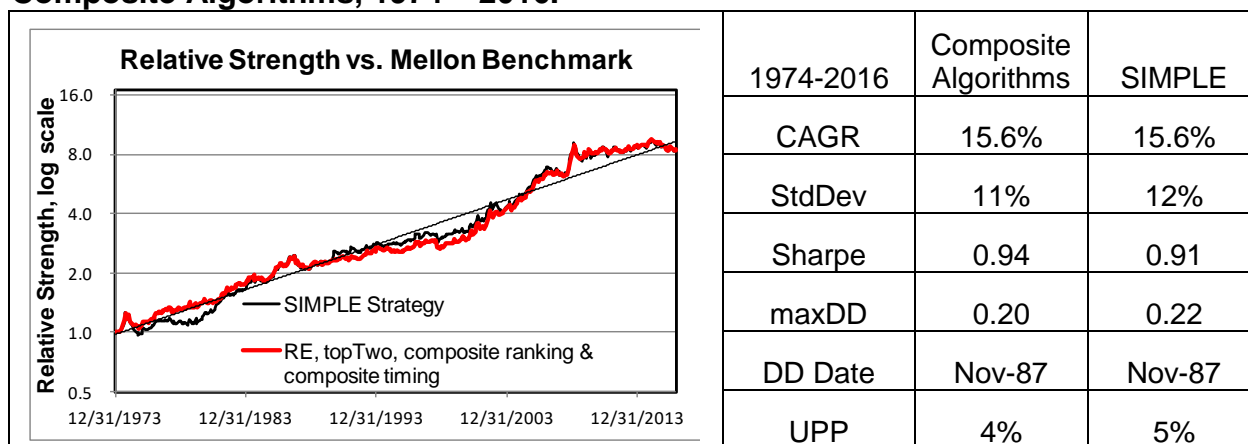
The algorithms used in Figure 5 are combinations of algorithms and might be expected to provide more reliable performance. The bond allocation is the equally weighted recommendations of the Absolute Momentum, Nicholas and StormGuard® standard^{ix} timing algorithms. If two of the algorithms recommend stocks and the third recommends bonds, two thirds of the portfolio is invested in stocks and one third in bonds.

*The StormGuard® standard timing algorithm is bullish when $22 * DEMA50 + 0.006$ is greater than zero. DEMA50 is the double exponential moving average of the daily returns of the S&P Composite without dividends. The factor used in the DEMA calculations is the reciprocal of fifty days.*

Funds are ranked by two algorithms, Relative Momentum and annualized FundX^x. If one algorithm recommends US stocks and foreign stocks at the end of a month while the other recommends US stocks and real estate, the equity portion of the portfolio during the following month would be 50% US stocks, 25% foreign stocks and 25% real estate.

Annualized FundX measures momentum as twelve times the 1-month total return for the fund plus four times the 3-month total return plus two times the 6-month total return plus the 12-month total return.

Figure 5. Relative Strength and Statistics for the SIMPLE Strategy with Composite Algorithms, 1974 – 2016.



The chart illustrates that the variation outperforms the SIMPLE strategy in the first part of this interval and underperforms in the middle of the interval. The long term statistics are similar for the SIMPLE strategy and the variation.

Some advisers may prefer the SIMPLE strategy with its single ranking and timing algorithms because it is the easier to explain to customers. Other advisers may prefer the variation which uses composite ranking and timing algorithms because composite algorithms might be more reliable going forward.

An Alternative to Market Timing

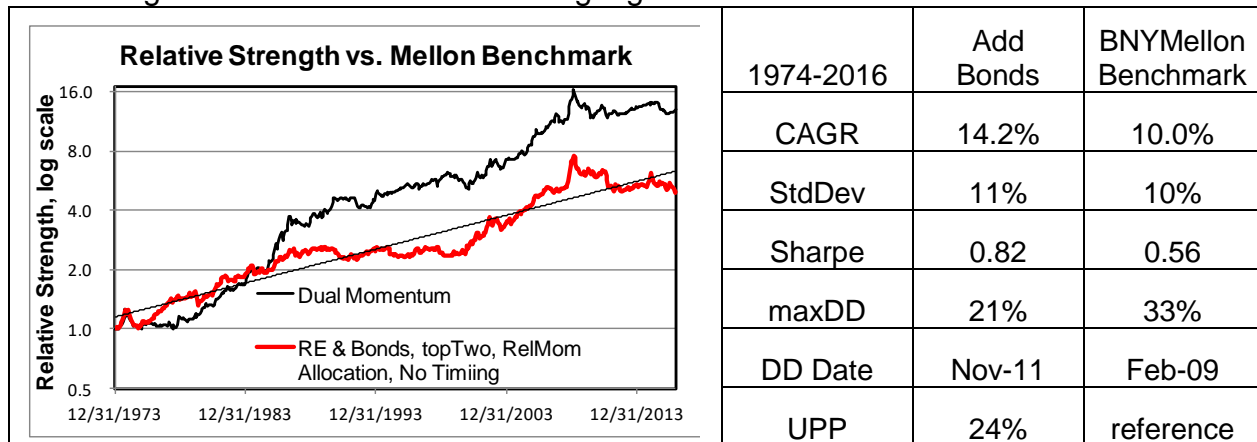
A goal was to eliminate market timing both because of its pejorative connotation and because timers sometimes take the portfolio to bonds even though one of the equity components is appreciating more rapidly than bonds.

It is possible to mitigate drawdowns without market timing by asking the ranking algorithms to choose among US and foreign stocks, real estate and bonds. The ranking algorithms will choose the funds with the highest momentum or the least negative momentum. In times of market stress, the ranking algorithms will generally choose bonds.

Since we are using top2 allocation, two bond funds are needed so that the portfolio can fully transition to bonds.

An advantage of this approach is that the portfolio transitions more gradually into and out of bonds as compared to explicit timing.

Figure 6. Relative Strength and Statistics for the SIMPLE Strategy plus Bonds, 1974 – 2016. The SIMPLE strategy plus bonds uses Relative Momentum to choose the best two from among US stocks, foreign stocks, real estate, an intermediate bond fund and a long bond fund. There is no timing algorithm.



The bond approach significantly increases the return and improves the Sharpe ratio and drawdown as compared to the BNY Mellon benchmark but the improvements are less than achieved with the SIMPLE strategy. This approach might nonetheless be attractive to a customer who is convinced that “market timing does not work.”

The bond approach involves career risk since the 36-month returns are less than the returns of the BNY Mellon benchmark nearly a quarter of the time. UPP is 24%.

Including bonds in the ranking decision is a form of downside risk mitigation. The mitigation cost is about 2% a year more than the cost of market timing. This estimate was derived from the slope of the relative strength of the strategy including bonds versus the SIMPLE strategy.

RISK ADVERSE INVESTORS

The SIMPLE strategy is attractive for risk adverse investors because the downside risk is less than with traditional benchmarks and because retirement portfolios last longer. This section illustrates these benefits.

Downside Risk

Four benchmarks are shown in Table 1. Performance statistics are shown for the most recent twenty-three years because benchmark performance can generally be evaluated using real funds over this interval. The return of the SIMPLE strategy over this shortened interval is lower than for the longer interval discussed previously.

Benchmarks are shown with static bond allocations because risk adverse investors probably would not identify with these benchmarks if the drawdowns were not mitigated by bonds.

Table 1. Comparison of the SIMPLE Strategy to Benchmarks, 1994-2016.

	CAGR, %	Sharpe	maxDD, %	UPP, %
S&P 500 [®] Composite (VFINX) plus 40% bonds	7.8	0.61	33	49
S&P 500 [®] Dividend Aristocrats [®] plus 40% bonds ^{xi}	8.5	0.80	26	34
BNY Mellon benchmark (40% bonds)	7.8	0.61	33	Ref.
Wellesley Income (VWINX, 65% bonds)	8.0	0.88	19	53
SIMPLE strategy	13.0	0.91	19	4

The annualized returns for the benchmarks are all about 8% over this interval. The backtested return of the SIMPLE strategy is 13%, a full five percentage point improvement over the returns of the benchmarks.

The Wellesley Income fund exhibits the largest Sharpe ratio and lowest drawdown of these benchmarks. The SIMPLE strategy matches the Sharpe ratio and drawdown of the Wellesley Income fund and provides a higher return.

The SIMPLE strategy underperforms the BNY Mellon benchmark over rolling 36-month intervals only 4% of the time, which is less frequent than the underperformance of the other benchmarks.

The SIMPLE strategy should be attractive to the risk adverse investor because it is less volatile per unit of return, because it presents less downside risk than conventional benchmarks and because it underperforms less frequently.

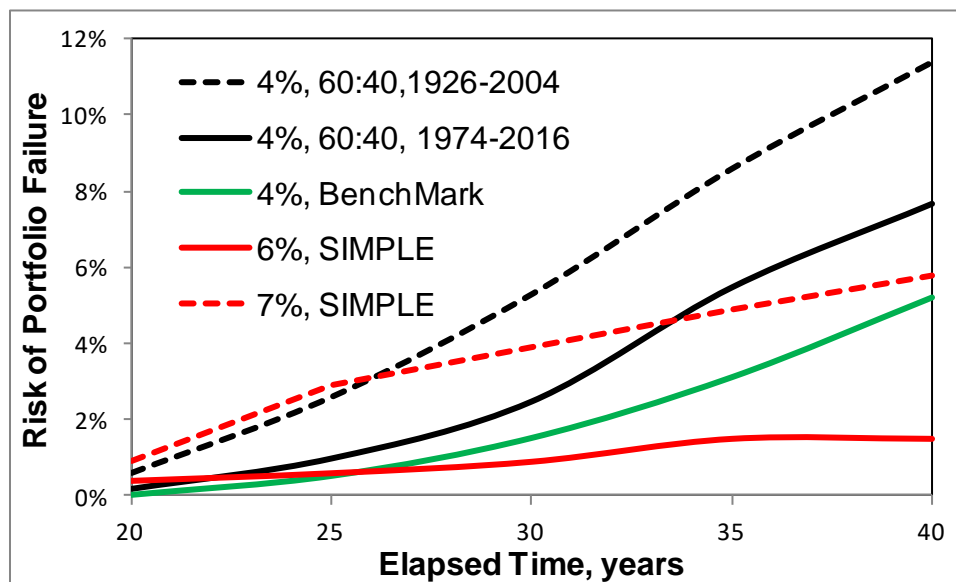
Longevity Risk

Cloonan has written a book^{xii} dedicated to the thesis that advisers put too much emphasis on volatility and other measures of downside risk and not

enough emphasis on return risk. Return risk evidences itself as having inadequate savings at retirement and inadequate longevity of the retirement portfolio. The higher return and Sharpe ratio which are characteristic of the SIMPLE strategy reduce these risks.

Determining an appropriate withdrawal rate during retirement involves many considerations as is evidenced by the numerous articles published in this *Journal* over the past twenty years^{xiii}. A constant withdrawal amount was assumed, adjusted annually for inflation. Optimization strategies were not employed.

Figure 7. Risk of Portfolio Failure as a Function of Time for Alternate Investment Strategies. The simulations of the BNY Mellon benchmark and of the SIMPLE strategy use randomized returns from the 1974-2016 interval.



Portfolio longevity of a strategy was forecast by drawing randomly with replacement from the historical inflation-adjusted returns of that strategy. This process was repeated five thousand times and the number of failures was counted before the end of the elapsed time interval. Results are presented in Figure 7 with details in the extended version of this article.

The solid black curve lies below the dashed black curve, which suggests that performance during 1974-2016 was slightly “safer” than over the longer interval tested by Bengen, *op. cit.* The curve based on the BNY Mellon benchmark lies lower still indicating that the returns of this benchmark are slightly “safer” than the returns of the 60:40 portfolio.

The differences among the five simulations are small, however. The risks of running out of money within thirty years range from 1 to 5%.

What is not small is the fact that the 60:40 and benchmark simulations assume an initial withdrawal rate of 4% while the SIMPLE simulations assume initial withdrawal rates of 6 and 7%.

The conventional wisdom has been that the “safe” withdrawal rate is about 4% of the initial portfolio value, with subsequent withdrawal amounts adjusted for inflation. The backtested performance of the SIMPLE strategy suggests that the initial withdrawal rate could be increased to 6% without increasing the risk of running out of money.

Increasing the initial withdrawal rate from 4 to 6% has, obviously, a large and beneficial impact on the amount that must be saved prior to retirement. If someone needs \$70,000 annually from a retirement portfolio to supplement Social Security benefits and other income, he or she will need to have saved \$1.8 million at retirement if the safe withdrawal rate is 4% but only about \$1.2 million if the safe withdrawal rate is 6%.

The investment strategy also affects the rate of savings growth before retirement. If someone has \$100,000 saved, the retirement portfolio would be worth about \$1.6 million in real dollars thirty years hence assuming the returns of the SIMPLE strategy and no taxes or fees. A \$1.6 million portfolio is well in excess of the \$1.2 million needed.

The forecast of the future portfolio value is not a single value but a range of values. The estimates quoted are the lowest twenty-fifth percentile of the empirical distribution of five thousand future values.

Using a conventional investment strategy, this same individual would need to save about \$25,000 each year, adjusted for inflation, to accumulate the \$1.8 million portfolio corresponding to 4% withdrawals in retirement.

It has been remarked that forecasting is difficult, especially when it concerns the future, and we do not want to overemphasize the quantitative benefits of the SIMPLE strategy. Suffice it to say that the SIMPLE investment strategy could allow for earlier retirement and more protection against Social Security and market shocks and/or lower pro-retirement savings rates. Lower savings rates could translate into life style options, more protection against pre-retirement disability and/or increased contributions to children and charity.

The SIMPLE strategy should also improve performance with optimized withdrawal strategies.

The SIMPLE strategy is safer for the risk adverse investor than traditional investment strategies in the conventional sense of providing larger risk adjusted returns and smaller drawdowns. The SIMPLE strategy is also safer in Cloonan’s sense of a reduced risk when saving for retirement and when taking withdrawals during retirement.

The potential benefits of the SIMPLE strategy are so many and so large as to suggest that planners need to rethink the conventional advice about savings and withdrawal rates.

SUMMARY AND CONCLUSIONS

Factor investing offers the possibility of considerably higher returns than traditional benchmarks but practical issues limit the return potential of factor-based funds and large portfolios.

Downside risk mitigation by market timing is generally not cost-free but the cost is less than mitigation using a static bond allocation.

The SIMPLE strategy has, based on backtesting, provided higher returns, higher risk adjusted returns, smaller drawdowns and a lower underperformance percentage than traditional benchmarks.

The SIMPLE strategy has adequate capacity for most individual portfolios and for smaller advisory firms.

The SIMPLE strategy reduces the return risks associated with saving for retirement and with withdrawals during retirement.

The potential improvements with the SIMPLE strategy are so large that planners should consider rethinking the guidelines for pre-retirement savings rates and for post-retirement withdrawal rates.

DISCLAIMER

Past performance is not necessarily indicative of future results and the SIMPLE strategy may not outperform in the future.

This article may contain errors. It would be foolhardy to recommend the SIMPLE strategy to a customer without you, the adviser, conducting appropriate due diligence.

ⁱ Fama, Eugene F. and French, Kenneth R. 1993. "Common Risk Factors on the Returns of Stocks and Bonds." *Journal of Financial Economics*. **33**: 3–56; Mark M. Carhart. 1997. "On Persistence in Mutual Fund Performance." *Journal of Finance*. **52**: 57-82.

ⁱⁱ *ETF Report*, August 2017, p. 21.

ⁱⁱⁱ FTSE Russell. 2015. "Factor Exposures of Smart Beta Indexes" and FTSE Russell. 2017. "Focused Factor Indices Methodology Overview."

Andrew Innes, S&P Dow Jones Indices. 2017. "The Merits and Methods of Multi-Factor Investing,"

^{iv} Gray, Wesley R. and Jack R. Vogel. 2016. *Quantitative Momentum*. Hoboken: John Wiley & Sons, Inc. Chapters 2 and 8.

^v Hedging using protective puts is described in the Swan blog at swanglobalinvestments.com. Over the past twenty years, the Swan Defined Risk Strategy has slightly exceeded the total return of US stocks net of fees with half of the volatility. The largest annual losses were 5% (in 2008 and 2011).

^{vi} Antonacci, Gary. 2015. *Dual Momentum Investing*. City: McGraw Hill., p. 98. Antonacci does not use the method described in his Figure 8-4 and in his section "How to Use It."

^{vii} Nicholas, John B. 2015. "Market Timers Yet Again." AAll Silicon Valley CIMI Group.

^{viii} BNY Mellon compares hundreds of corporate and public pension, foundation, endowment, Taft-Hartley and health care plans to a portfolio of 50% Russell 3000, 10% MSCI ex-US and 40% Lehman Aggregate

Bond Index. As implemented here, the benchmark is 50% spliced VFINX, 10% spliced HAINX and 40% spliced VBMFX rebalanced monthly.

^{ix} www.sumgrowth.com.

^x This ranking algorithm is described at www.seekingalpha.com as “vigilant asset allocation.”

^{xi} ProShares S&P 500 Dividend Aristocrats ETF (ticker: NOBL) has tracked this index since October 2013. The expense ratio is 0.35%. Index returns shown have been reduced by 0.4%.

^{xii} Cloonan, James B. 2016. Investing at Level3. Chicago: American Association of Individual Investors.

^{xiii} Bengen, William P. 2006. Conserving Client Portfolios During Retirement, Denver: FPA Press. The appendix includes an extensive pre-2006 bibliography.