Using Adaptive Rebalancing to Bridge the Gap between Strategic Asset Allocation and Tactical Asset Allocation

William T. Hepburn
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Summary:

This study introduces a method of periodic adjustments in stock and bond allocations to match current market conditions, the application of which is shown to dramatically lower risk and increase returns compared to buy and hold strategies.

Making adjustments in this manner introduces manager risk that may also create losses. Investors or managers who attempt to tactically adjust stock and bond allocations without robust methodologies often create negative alpha, the exact opposite of what is intended.

Successful active management of investments requires an additional, hard-to-find skill set to deal with this added risk. These skills can be very subjective and are not taught in traditional financial planning curricula.

This obstacle has kept many investors and advisers from changing investments or moving to cash during recent bear markets despite massive losses among users of less active investment methods.

This study creates and measures a system that is easily incorporated into the asset allocation plans of buy and hold oriented investors and their advisers. The system utilizes data from the National Association of Active Investment Managers (NAAIM) weekly *Survey of Manager Sentiment*, and uses it to adjust equity allocations.

This study shows that overall investment risk is dramatically reduced while returns are increased using this simple system.

Hepburn Capital Management, LLC
2069 Willow Creek Road
Prescott, AZ 86301
(928) 778-4000
Will@HepburnCapital.com

Background

Modern Portfolio Theory (MPT) began with Harry Markowitz' 1959 book *Portfolio Selection: Efficient Diversification of Investments*, for which he earned the 1990 Nobel Prize in Economics. Since then, a strategy using the fixed asset allocations advocated by Markowitz has become the de facto standard in financial planning. This is commonly referred to as Strategic Asset Allocation (SAA).

In SAA, an appropriate level of risk is decided upon for an individual investor, and MPT can then be used to identify a combination of investments that historically would have delivered the best investment results within the risk parameters given.

Once set, the allocation among various asset classes does not change in SAA. The allocation does not change because it is based on the investor's attitude regarding risk, rather than market activity. Only when the risk tolerance of the investor changes does the SAA change.

SAA has strong appeal for several reasons.

From an investor standpoint, MPT is both easily understood and easily executed: desirable qualities in a complex field. Investors can determine their appropriate asset allocation, invest, and then not have to attend to their investments except for periodic rebalancing back to the target allocations.

Trading costs and brokerage fees are minimal since there is no trading other than rebalancing, and at many mutual fund companies there is no cost at all to rebalance.

From a professional perspective, a low cost business model can easily be developed around the simplicity and attractiveness of SAA. This may be a part of the reason that SAA has become the standard among independent financial planners.

Changing allocations among investments involves using various tactics to determine the scope, direction and timing of changes. This active form of investment management is referred to as dynamic or Tactical Asset Allocation (TAA).

Barriers to the use of Tactical Asset Allocation

Investors and advisers wishing to actively adjust their various investment allocations face formidable barriers to entry into the realm of active management of investments.

Some of these impediments include:

TAA is difficult to learn, partially due to a lack of educational opportunities. In a 2002 Hepburn Capital Management study, the Certified Financial Planner Board of Standards had 1,802 topics in its approved curriculum, only three of which pertained to active management. Often active tactics are subjective and hard to teach. Many quantitative tactics that are completely objective or mechanical may only work in conjunction with other tactics, which greatly increases the complexity of systems.

Active managers are notoriously protective of proprietary methodologies because investing methods often become less effective as they become more widely used.

Broker/Dealers often have policies restricting investment reps from using active strategies. Some Errors and Omissions policies exclude claims using discretionary trading, which is an important tool for efficient execution of TAA.

TAA is not easy. Tactics that work well in one asset class may not work at all in another. Market conditions can change how well various active tactics will work.

Despite years of data, many tactics lack enough data to develop into robust strategies. Backtesting of tactics may also be fraught with errors due to biases of the backtester.

Even when one is managing a successful strategy, manager error can still creep in due to the need to evaluate and adjust for newly evolving and perhaps never before seen circumstances.

Often individual investors find TAA difficult to understand and this can affect their comfort with TAA.

Advisers wishing to incorporate TAA will find that additional administration, back office support and trading capabilities are required, in addition to good tactics and strategies.

Data to be Studied

Data on what active investment managers do within their portfolios is often a closely guarded secret. Money managers have a fiduciary responsibility to protect their clients interests by keeping outsiders from anticipating their tactics. Mutual funds are only required to report holdings twice a year for this reason.

Surveys have long been conducted on the bullishness or bearishness of individual investors by the American Association of Individual Investors (AAII) and newsletter writers have been polled in the Investors Intelligence survey.

These data sources are generally considered contrary indicators, meaning that these sources are often wrong, especially when the surveys are at extreme readings, and therefore are not useful for the purposes of this study.

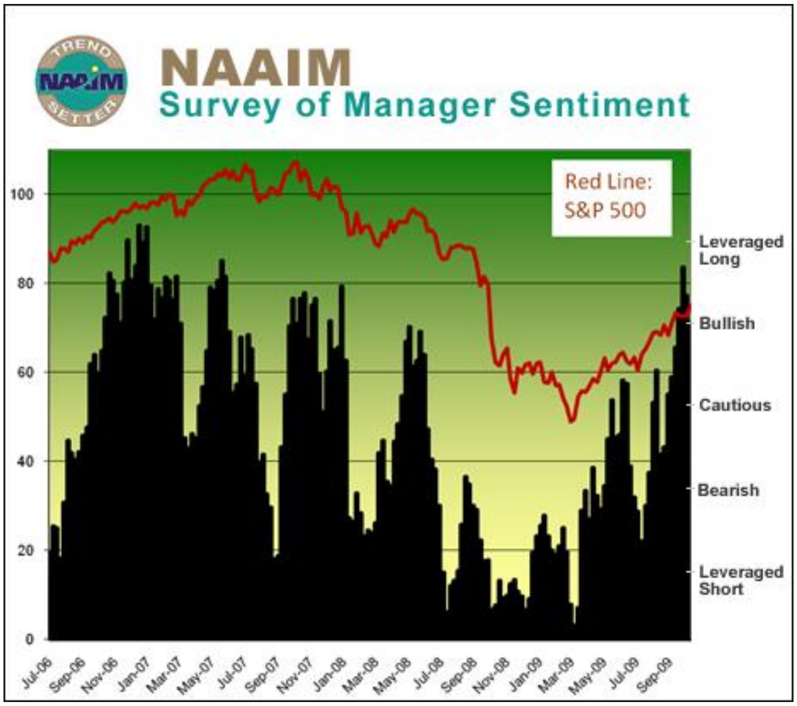
Prior to 2006, there were no surveys of actual money managers.

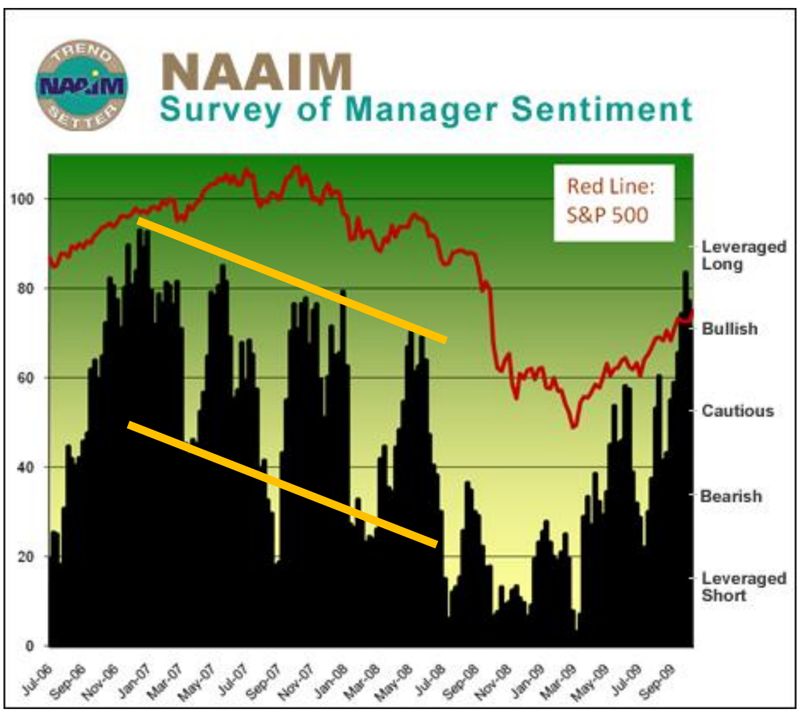
In July of 2006, NAAIM, the National Association of Active Investment Managers (www.naaim.org) began publishing a weekly *Survey of Manager Sentiment* which may be seen at *www.naaim.org/newsroom.php.* NAAIM is a trade group with approximately 180 member firms, most being independent registered investment advisers, who collectively manage $16 billion of client moneys.

Each Wednesday NAAIM member firms are asked to provide a single number that represents their exposure to the equity markets averaged across all of their strategies. Responses can range from 200% long (leveraged) to 200% short. The responses are tallied and averaged, and the weekly average of all NAAIM members' exposure to the stock markets is posted on Thursday of each week.

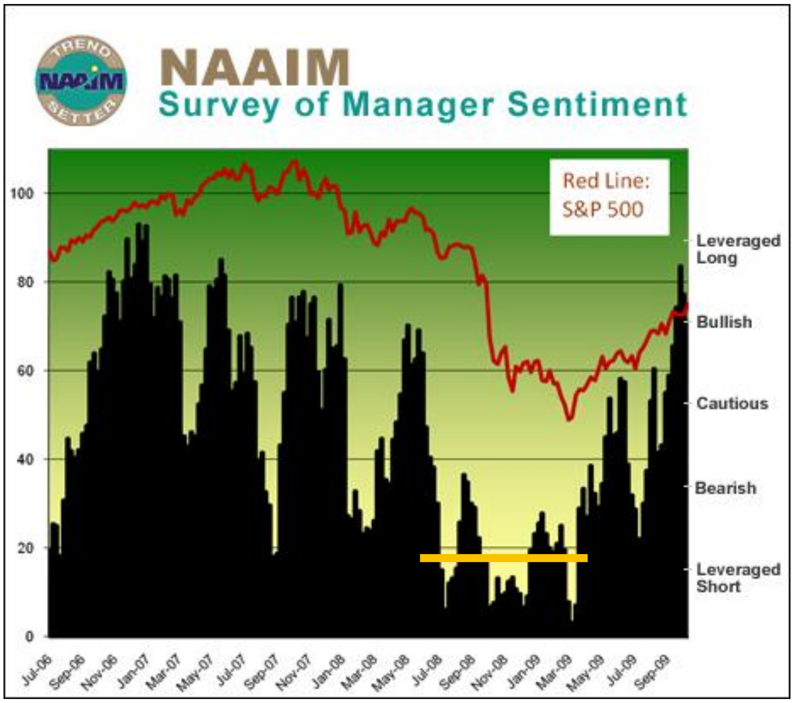
The NAAIM *Survey of Manager Sentiment* began on July 5, 2006, and data through September 30, 2009 gives us more than three full years of data to use. The study period uses stock market returns from 9/30/2006 to 9/30/2009 during which the S&P 500 stock index produced six positive quarters and six negative quarters – essentially a full market cycle.

The graph below shows the NAAIM data from inception on July 5, 2006 through October 15, 2009 plotted along with the S&P 500 Index.

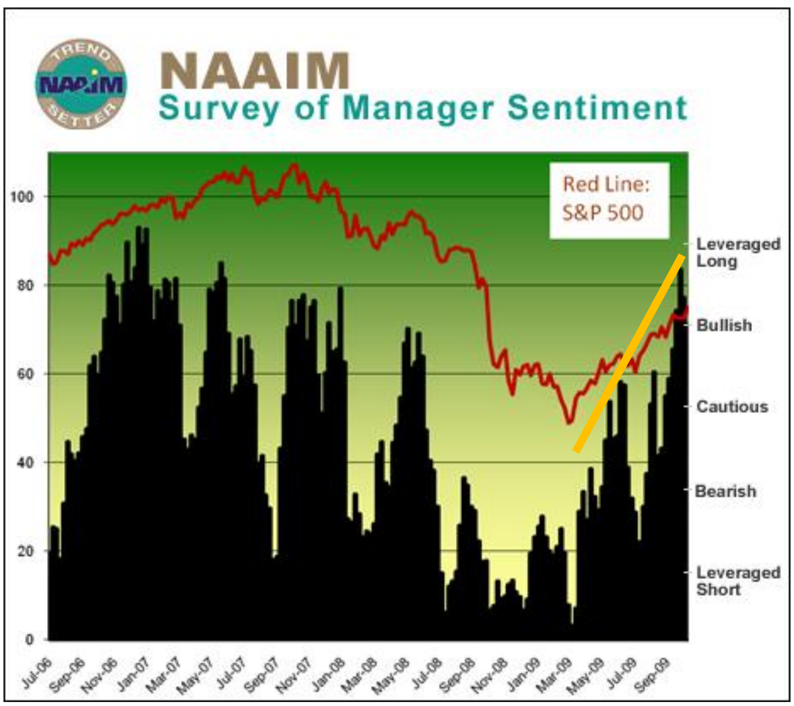




NAAIM members clearly proved their skill by having been progressively more conservative beginning in early 2007, months before the market top of October 9, 2007 became evident to most investors. This can be seen in the steady decline of their stock market exposure during 2007 and 2008 as shown in the declining tops and declining bottoms in the peaks and valleys of the graph, left.



Significant to investors who seek to avoid devastating bear market losses, NAAIM members averaged only 18.46% exposure to the stock market between June 11, 2008 and March 11, 2009. This was a pretty good time to be under-allocated to the stock market considering that the S&P 500 lost 44.88% of its value during that same period. (data from FastTrack, dividends reinvested)



NAAIM members further proved they are worth studying when, soon after the market bottomed on March 9, 2009, they increased market exposure from 9.97% on March 18, 2009 to an average of 47.75% on March 25, 2009. As shown here, stock market exposure among NAAIM members has expanded during the balance of 2009, consistent with what you would expect after a major market bottom.

We will base the study of Adaptive Rebalancing on this NAAIM Survey.

Market data to be studied with our tactic will be:

- The S&P 500 Index with data from Morningstar's Principia database dated September 30, 2009.
- The Barclay's Aggregate Bond Index, using as a proxy the iShares Barclay's Aggregate Bond Index ETF, symbol AGG with data from Morningstar's Principia database dated September 30, 2009.

The Tactic To Be Studied

In its most basic form, traditional asset allocation often calls for a mix of 60% stocks and 40% bonds. Although many investors use a different allocation, it is generally believed that this is one of the most common allocations in use, so we will use it as our SAA model to compare performances with the studied tactic.

No allocation to cash will be used in this study.

The tactic employed within the TAA model in this study will be to periodically adjust the TAA target stock allocation to the NAAIM Survey average, thereby adapting to the current market environment. We will allocate the balance of the investment to bonds. It is assumed that the total of stock and bond investments will always equal 100%.

Normal rebalancing schedules for SAA plans range from quarterly to annually. We will look at a quarterly rebalancing, adapting our TAA allocation to the equity exposure indicated by the NAAIM Survey.

Due to NAAIM members' widely varying investment styles, weekly results can fluctuate widely from the trend. For the purpose of this study, on the last day of each quarter, stock allocations will be adapted to the average NAAIM Survey allocation for the previous 13 weeks. The balance of the investment will be allocated to bonds.

Stock and bond allocations will be held for one quarter and then rebalanced on the last day of that quarter to the then previous quarter's NAAIM Survey average.

The SAA model will also be rebalanced back to 60% stocks, 40% bonds on the last day of each quarter.

The first rebalancings were made on September 30, 2006 based upon the NAAIM Survey for the 13 weeks ending with the September 27, 2006 Survey.

Gains and losses are calculated each quarter, beginning October 1, 2006, for a hypothetical $100,000 investment invested between stocks and bonds as outlined above.

Conclusions

Tactical Asset Allocation using the NAAIM Survey equity allocations proved itself to be superior to the fixed ratio Strategic Asset Allocation model in every metric measured for the three year period ending September 30, 2009.

Nominal returns increased from a 3-year loss of .56% for the 60/40 mix to a 9.06% gain using adaptive rebalancing TAA over the three year period of the study, providing an annualized increase of 3.2% per year.

On a risk adjusted basis, the increase in returns was even more striking since virtually every risk measurement – Sharpe ratio, standard deviation and even maximum draw down – shows dramatically reduced risk of holding stocks using the NAAIM allocation.

Maximum drawdown (Q3 2007 through Q1 2009) was reduced by half, from -27.18% to -13.65%, by adapting TAA rebalancing using the NAAIM allocation.

Volatility, as measured by Standard Deviation of our TAA model, declined by one third – dropping from 6.30% to 4.03%.

The Ulcer Index (UI), a measure of downside-only volatility, declined by half—dropping from 4.23 using SAA to 2.38 for the TAA model. Lower is better using UI.

The Ulcer Performance Index, which measures how many units of return are earned for each unit of UI, became positive using TAA. Higher is better when using UPI.

Significantly, the NAAIM allocation was profitable in the 4th quarter of 2008 during the stock market crash associated with the banking crisis. It is believed that many investors would have welcomed positive performance in that market environment.

This study strongly supports the premise that investors who want greater returns with lower risk should consider adaptive rebalancing of their portfolios.

Table I

NAAIM Survey Adaptive Allocations

Date	13 Week Stock Mkt Exposure	Average Balance in Bonds
27-Sep-06	39.68%	60.32%
27-Dec-06	79.06%	20.94%
28-Mar-07	69.28%	30.72%
27-Jun-07	70.47%	29.53%
26-Sep-07	47.10%	52.90%
26-Dec-07	68.32%	31.68%
26-Mar-08	35.46%	64.54%
25-Jun-08	54.28%	45.72%
24-Sep-08	21.65%	78.35%
31-Dec-08	11.82%	88.18%
25-Mar-09	20.22%	79.78%
24-Jun-09	43.01%	56.99%

High Equity Exposure 79%
Low Equity Exposure 12%

Table II

Performance Data

	Next Quarter Returns	
Date	S&P 500	AGG
Q4 2006	6.70%	1.15%
Q1 2007	0.64%	1.35%
Q2 2007	6.28%	-0.70%
Q3 2007	2.03%	3.01%
Q4 2007	-3.33%	2.82%
Q1 2008	-9.45%	2.29%
Q2 2008	-2.73%	-1.12%
Q3 2008	-8.37%	-0.64%
Q4 2008	-21.94%	7.37%
Q1 2009	-11.01%	-1.94%
Q2 2009	15.93%	1.67%
Q3 2009	15.61%	3.73%

- Data from Morningstar Principia
- Dividends are included
- No fees or taxes considered
- No trading costs considered

Table III

Strategic Asset Allocation – 60/40 Mix - Results

Date	S&P 500 Gain	Bonds Gain	Combined Gain	Hypothetical $ $ 100,000
Q4 2006	4.02%	0.46%	4.48%	$ 104,479
Q1 2007	0.38%	0.54%	0.92%	$ 105,444
Q2 2007	3.77%	-0.28%	3.49%	$ 109,121
Q3 2007	1.22%	1.20%	2.42%	$ 111,764
Q4 2007	-2.00%	1.13%	-0.87%	$ 110,790
Q1 2008	-5.67%	0.92%	-4.75%	$ 105,526
Q2 2008	-1.64%	-0.45%	-2.08%	$ 103,327
Q3 2008	-5.02%	-0.26%	-5.28%	$ 97,873
Q4 2008	-13.17%	2.95%	-10.22%	$ 87,872
Q1 2009	-6.61%	-0.78%	-7.38%	$ 81,385
Q2 2009	9.56%	0.67%	10.23%	$ 89,706
Q3 2009	9.36%	1.49%	10.86%	$ 99,445

Nominal Gain/Loss	-0.56%
Nominal Annual ROR	-0.19%

Volatility	
Standard Deviation	6.30%
Ulcer Index	4.22

Risk Adjusted Return Measurements	
Sharpe Ratio	-0.24
Ulcer Perf Index (UPI)	-0.28
Maximum Drawdown	27.18%

Table IV

NAAIM Survey Adaptive Allocation Results

Date	S&P 500 Gain	Bonds Gain	Combined Gain	Hypothetical $ $100,000
Q4 2006	2.66%	0.69%	3.35%	$ 103,351
Q1 2007	0.51%	0.28%	0.79%	$ 104,167
Q2 2007	4.35%	-0.22%	4.13%	$ 108,473
Q3 2007	1.43%	0.89%	2.32%	$ 110,989
Q4 2007	-1.57%	1.49%	-0.08%	$ 110,903
Q1 2008	-6.45%	0.73%	-5.73%	$ 104,552
Q2 2008	-0.97%	-0.72%	-1.69%	$ 102,785
Q3 2008	-4.54%	-0.29%	-4.84%	$ 97,814
Q4 2008	-4.75%	5.77%	1.02%	$ 98,815
Q1 2009	-1.30%	-1.71%	-3.01%	$ 95,839
Q2 2009	3.22%	1.33%	4.55%	$ 100,203
Q3 2009	6.71%	2.13%	8.84%	$ 109,058

Nominal Gain/Loss	9.06%
Nominal Annual ROR	3.02%

Volatility	
Standard Deviation	4.03%
Ulcer Index	2.38

Risk Adjusted Return Measurements	
Sharpe Ratio	2.00
Ulcer Perf Index (UPI)	1.26
Maximum Drawdown	13.65%

Table V

Quantitative Differences – SAA vs. TAA (NAAIM Allocation)

Metric	Favoring	Amount	Relationship
Nominal Gain/Loss	TAA	9.61%	Greater Total Return
Nominal Annual ROR	TAA	3.20%	Greater Annualized Return
Volatility			
Standard Deviation	TAA	-2.27%	Lower Volatility
Ulcer Index	TAA	56.36%	Lower Ulcer Index
Risk Adjusted Return Measurements			
Sharpe Ratio	TAA	2.25	Higher Sharpe Ratio
Ulcer Perf Index(UPI)	TAA	1.54	Positive UPI
Maximum Drawdown	TAA	½	the Drawdown of SAA

This report is available online at *www.HepburnCapital.com/PR/Adaptive_Rebalancing.pdf*

Hepburn Capital Management, LLC, is a Registered Investment Adviser, located at 2069 Willow Creek Road in Prescott, AZ 86301.

Hepburn Capital specializes in active investment management. However, its equity and income strategies use methodologies different from the adaptive rebalancing described in this study. Hepburn Capital strategic allocations are used as inputs to the weekly NAAIM *Survey of Manager Sentiment*.

The author of this study is Will Hepburn, President of Hepburn Capital Management, LLC, and past President and current chairman of NAAIM, the National Association of Active Investment Managers (*www.NAAIM.org*). He is the developer of the *NAAIM That Trend Survey of Manager Sentiment* which may be seen at *http://www.naaim.org/newsroom.php* .

Will Hepburn may be reached by emailing *Will@HepburnCapital.com*, by calling (928) 778-4000, by writing to 2069 Willow Creek Road in Prescott, AZ 86301, or by visiting our web site at *www.HepburnCapital.com*.