



Improving on Buy and Hold: Tactical Asset Allocation

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“Diversification alone is no longer sufficient to temper risk. In the past year, we saw virtually every asset class hammered. You need something more to manage risk well.” - Mohamed El-Erian (Kiplinger’s, March 2009)

2008 was a devastating year for buy-and-hold investors. The classic barometer of stocks, the S&P 500 Index, declined 36.77%, and the normal benefits of diversification disappeared as many non-correlated asset classes experienced simultaneous large declines. Commodities, REITs, and foreign stock indices all suffered losses over 35%.

While many global asset classes in the 20th century produced spectacular gains for individuals who bought and held those assets for long periods, most asset classes also experienced regular and painful drawdowns like those that characterized 2008. Drawdown is an investment’s peak-to-trough decline, and we calculate it here on a monthly basis.

In this century, every market in G-7 countries has experienced at least one period that saw stocks lose at least 75% of their value. The unfortunate mathematics of a 75% decline mean an investor must realize a 300% gain just to get back to even – the equivalent of compounding at 10% for fifteen years.

Consequently, individuals are usually not invested for a sufficiently long time frame to recover from large drawdowns in risky asset classes.

My 2006 article, “[A Quantitative Approach to Tactical Asset Allocation](#),” outlines a trend-following model that uses the S&P 500 Index and four other diverse asset classes, including the Morgan Stanley Capital International EAFE Index (MSCI EAFE), the Goldman Sachs Commodity Index (GSCI), the National Association of Real Estate Investment Trusts Index (NAREIT), and United States government 10-year Treasury bonds.



My simple trading model works in the vast majority of markets most of the time. The results suggest that a market-timing solution is a risk-reduction technique rather than return-enhancement one— an investor just needs an approach that signals when they should exit a risky asset class in favor of risk-free Treasury bills.

Since 1973 the model has delivered equity-like returns with bond-like volatility and drawdowns, and 35 consecutive years of positive returns, including 2008.

The system

For the model to be simple enough for investors to follow and mechanical enough to preclude subjective decision-making, a few features are necessary:

1. Simple, purely mechanical logic.
2. The same model and parameters for all five asset classes.
3. Based only on prices

The resulting system is very easy to grasp. Investors should buy an asset class when its monthly price is greater than its 10-month simple moving average (SMA), and sell when it is less. Further:

1. All entry and exit prices are on the day of the signal at the market's close. The model is only updated once a month, on the last day of the month. Any activity during the rest of the month is ignored.
2. All data series are total-return series, including dividends, updated monthly.
3. Cash returns are estimated with 90-day Treasury bills, and margin rates (for leveraged models to be discussed later) are estimated with the broker call rate.
4. Taxes, commissions, and slippage are excluded (see "practical considerations" section later in the paper).

S&P 500 from 1900 - 2008

To demonstrate the logic and characteristics of the timing system, one can test it on the S&P 500 back to 1900. Figure 1 presents the yearly returns for the S&P 500 and for my timing method on the S&P 500 over the past 108 years. The timing solution improved compounded returns while reducing risk. It was invested in the market approximately 70% of the time, and it made less than one round-trip trade per year.



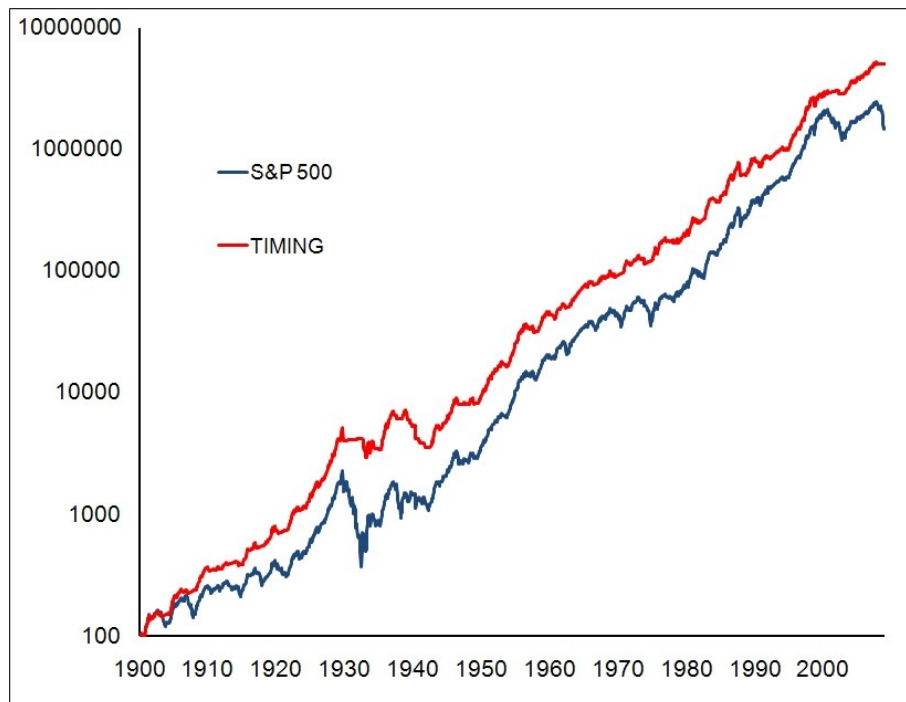
Figure 1: S&P 500 Total Returns vs. Timing Total Returns (1900-2008)

	S&P 500	Timing
Return	9.21%	10.45%
Volatility	17.87%	12.02%
Sharpe (4%)	0.29	0.54
Maximum drawdown	(83.66%)	(50.31%)
Best Year	52.88%	52.40%
Worst Year	(43.86%)	(26.87%)

The timing system achieved these superior results despite under-performing the index in roughly 45% of years since 1900.

Figure 2 (drawn with a logarithmic scale) shows that timing was superior to buy-and-hold over the past century, and that it largely avoided the significant bear markets of the 1930s and 2000s. Timing would not have left the investor completely unscathed by the market crash that heralded the Great Depression, but it would have reduced the drawdown from a catastrophic 83.66% to a more manageable 42.24%.

Figure 2: S&P 500 Total Returns vs. Timing Total Returns (1900-2008)



Viewing the results in more detail, a few features of the timing model become evident. First, a trend-following model will underperform buy-and-hold during a



roaring bull market like the US equity markets of the 1990s. The timing model's ability to add value can only be recognized over the course of an entire business cycle. Similarly, the timing model will not participate in a lengthy and protracted bear market. Using the timing model, an investor would have exited the market in October of 2000 and avoided two of the three consecutive years of losses from 2000-2003. The 44.73% drawdown buy-and-hold investors experienced during that bear market was a substantially milder 16.52% using the timing model.

Testing across asset classes

Given the ability of this very simplistic market-timing rule to add value to various asset classes, it is instructive to examine how the returns would look in the context of an investor's entire, diversified portfolio. The returns for a buy-and-hold allocation are equally weighted and rebalanced monthly across the five asset classes described above: the S&P 500, the Morgan Stanley Capital International Developed Markets Index (MSCI EAFE), Goldman Sachs Commodity Index (GSCI), National Association of Real Estate Investment Trusts Index (NAREIT), and United States Government 10-Year Treasury Bonds. The timing model treats each asset class independently – it is either long a particular asset class or that class' 20% allocation of the funds is in cash.

Figure 3 below shows the results of buying and holding the five asset classes equally weighted and of using the timing portfolio. The buy-and-hold returns are quite respectable on a stand-alone basis and exhibit the benefits of diversification. The timing approach reduces volatility to single-digit levels, and it holds drawdowns to single-digits as well. The investor's funds are almost always 60-100% invested.

Figure 3: Asset allocation buy-and-hold vs. timing model, 1973-2008

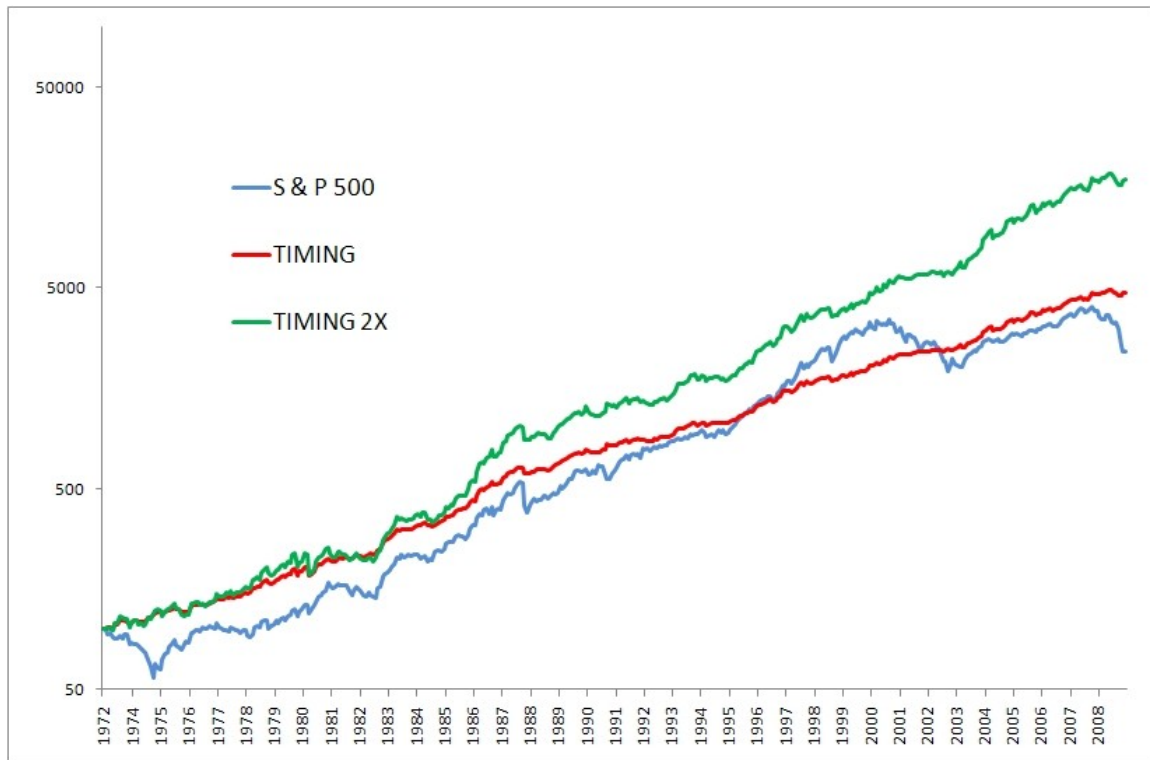
	B&H	TIMING	TIMING 2x	SP500	EAFE	10 YR	GSCI	NAREIT
Return	9.79%	11.33%	15.40%	9.26%	9.04%	8.75%	8.73%	8.54%
Volatility	9.71%	6.87%	13.78%	15.55%	17.18%	9.05%	20.48%	17.06%
Sharpe (6%)	0.39	0.78	0.68	0.21	0.18	0.30	0.13	0.15
Maximum Drawdown	(35.67%)	(9.53%)	(21.91%)	(44.73%)	(49.21%)	(18.79%)	(62.16%)	(58.78%)
Best Year	26.58%	26.20%	46.12%	37.58%	69.94%	44.28%	74.96%	48.97%
Worst Year	(29.76%)	1.46%	(5.40%)	(36.77%)	(43.06%)	(7.51%)	(46.49%)	(42.23%)

Returns for 2006-2008 are not included in this sample because my original paper was published in early 2006, and that data ended in 2005. The results in this article include the post-publication years of 2005-2008. Last year was one of the strongest relative outperformances for the timing model — it was up 1.6% while the buy-and-hold allocation was down 30%.



This approach can also be extended by applying leverage to generate excess returns. Figure 4 shows the equity curves for the two timing models (leveraged and non-leveraged) and for the S&P 500.

Figure 4: S&P 500 vs. timing model and leveraged model, 1973-2008



The two-times leveraged model does not produce double returns, because the investor must borrow funds to finance his leverage at the broker call rate, but it does outperform the buy-and-hold portfolio by over 500 basis points with lower drawdowns. Its volatility, however, is higher at approximately 14%.



Figure 5 below shows an example of easily tradable ETFs for each of the five asset classes.

Figure 5: ETFs

US Stocks	VTI, SPY
Foreign Stocks	VEU, EFA
US Govt Bonds	IEF, AGG
REITs	VNQ, IYR
Commodities	DBC, GSP

Practical considerations & taxes

Investors must take into account a few practical issues before putting these models to work in the real world: management fees, taxes, commissions, and slippage.

Expense ratios for the ETFs or mutual funds should be identical in the buy-and-hold and timing models, and they will vary depending on the instrument used for investing. Using ETFs and no-load mutual funds would cost approximately 20-100 basis points in fees.

Commissions should be minimal because of the model's low turnover. On average, the investor would make 3-4 round-trip trades per year for the entire portfolio, and less than one round-trip trade per asset class per year. Slippage, the difference between the expected price of a trade and the actual execution price of the trade, likewise should be negligible, as there are numerous mutual funds (zero slippage) and liquid ETFs from which an investor can choose.

Taxes, on the other hand, are a very important consideration. Many institutional investors, like endowments and pension funds, enjoy tax-exempt status. Individuals can trade this system in a tax-deferred account like an IRA or a 401(k). Because different investors face different capital gains rates and tax rates vary across time, it is difficult to estimate the hit an investor would suffer trading this system in a taxable account. Most investors rebalance their holdings periodically — introducing some turnover to the portfolio — and it is reasonable to assume normal turnover of approximately 20%. The system has average turnover per year of almost 70%.

Gannon and Blum (2006) analyzed after-tax returns for individuals in the highest tax bracket who invested in the S&P 500. They estimate that an increase in



turnover from 20-70% would have resulted in, approximately, an additional 50 basis point hit to after-tax performance, decreasing the results of the timing model for taxable investors.

There is a bright note, however, for those who have to trade this model in a taxable account. The nature of the system results in a high number of short-term capital gains losses and a large percentage of long-term capital gains, which might reduce the tax burden.

Conclusion

A simple-to-follow model can manage risk for an asset class and, consequently, for a portfolio of assets, with limited to no impact on returns. Since 1973, an investor could have increased his or her risk-adjusted returns by diversifying his assets and employing a market timing solution. In addition, the investor would have side-stepped 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 drawdown, and over thirty five consecutive years of positive performance.

In *Reminiscences of a Stock Operator*, Jesse Livermore states, “A loss never bothers me after I take it. I forget it overnight. But being wrong – not taking the loss – that is what does damage to the pocketbook and to the soul.”

References

Faber, Mebane T., A Quantitative Approach to Tactical Asset Allocation. *Journal of Wealth Management*, Spring 2007.

Gannon, Niall, and Michael Blum. “After Tax Returns on Stocks versus Bonds for the High Tax Bracket Investor”, *The Journal of Wealth Management*, Fall 2006.

Lefevre, Edwin. *Reminiscences of a Stock Operator*, Doran and Co., 1923.

Data

All data are total return series, and are updated monthly.

S&P 500 Index – A capitalization-weighted index of 500 stocks that is designed to mirror the performance of the United States economy. Total return series is provided by Global Financial Data and results pre-1971 are constructed by GFD.



Data from 1900-1971 uses the S&P Composite Price Index and dividend yields supplied by Cowles Commission and from S&P itself.

MSCI Developed Market Index (EAFE) – A market-capitalization-weighted index that is comprised of 20 countries outside of North America. Total return series is provided by Morgan Stanley.

US Government 10-Year Bonds – Total return series is provided by Global Financial Data.

Goldman Sachs Commodity Index (GSCI) – Represents a diversified basket of commodity futures that is unlevered and long only. The returns include the collateral yield an investor would receive if invested in the index. Total return series is provided by Goldman Sachs.

National Association of Real Estate Investment Trusts (NAREIT) – An index that reflects the performance of publicly traded REITs. Total return series is provided by the NAREIT.

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