Active Investment Management and Time-Varying Investor Risk Premium

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ABSTRACT

A common misconception is that efficient markets cannot be predictable. The classic argument states the stock market follows a random-walk and prices reflect all known information. As such, future stocks prices cannot be forecast and active asset management as a result cannot add value to a portfolio. This paper illustrates how markets may be predictable and efficient. The key is recognizing investor risk premiums vary. By understanding risk premiums change with market conditions, it may be possible to employ tactical asset allocation strategies to improve investment returns.

INTRODUCTION

When it comes to investment management, there are generally two categories of people – those who believe active management can add value and those who don't. For passive management advocates, the argument centers on the belief that markets are efficient. Prices follow a random walk, or so the thesis normally goes, and all pertinent information is reflected in current valuations at any given time. Therefore forecasting is pointless. If this is true, then buy-and-hold is the only viable investment approach – with proper diversification, of course. If the market declines, investors just need to have patience, as prices always come back and in the end everyone wins. This seems pretty neat and tidy. But if the world is really this straight-forward, why is active management even an option? Quite simply, things are not this simple. In fact there is a wealth of information that suggests an active approach is well worth a closer look, putting aside for the moment whether a successful strategy can actually be developed and implemented.

IT'S NOT ALL ABOUT THE GAINS

Consider the notion that markets always recover. With the benefits of hindsight and a two hundred year data set, it might be a reasonable conclusion. But the question isn't whether markets always come back; it's whether they come back *within an investor's timeframe*. On March 10th, 2000 the NASDAQ composite reached a high of 5048.62. Ten-years later, the index is still down over 50%. Unfortunately, this isn't the only "lost-decade". From December 1968 to August 1982, the S&P 500 Index measured a loss of 1.18%. In other words, after a fourteen year commitment to the stock market, you had *less* money than when you started. Even worse, from March of 1999 through March of 2009, a period now all too familiar to present-day investors, the S&P 500 posted a loss of nearly 40%. These are buy-and-hold returns. And they can be hard to stomach. If a typical investment horizon is twenty years, a ten-year drought consumes half of the available time for making money. So if ten years in, we're break-even (not to mention possibly down 40%), an 8% annual growth assumption for equities now needs to be bumped up to 16% per year just to stay on track, not including the effects of compounding, which only work to make matters worse. This is a tall order. And unfortunately this type of market activity is not that rare. The table below highlights the various S&P 500 bear markets since 1900. Historically, when the S&P 500 has declined 20% or more it has taken on average 6.5 years to reach a new equity peak. And with fourteen occurrences over the past 110 years, we might come to expect such a market environment about every eight years.

Bear Market	*Decline*	*New Market High*	*Duration (Months)*
Oct. 1902-Oct. 1903	-29.3%	Mar. 1905	31
Oct. 1906-Nov. 1907	-37.7%	Aug. 1909	36
Jan. 1910-Jun. 1921	-38.0%	Dec. 1924	181
Sep. 1929-Jun. 1932	-86.0%	Sep. 1954	301
Mar. 1937-Apr. 1942	-57.7%	Jan. 1946	107
Jun. 1946-Feb. 1948	-27.0%	Sep. 1950	52
Aug. 1956-Dec. 1957	-19.0%	Sep. 1958	26
Jan. 1962-Jun. 1962	-23.5%	Aug. 1963	20
Dec. 1968-Jun. 1970	-32.9%	May 1972	42
Jan. 1973-Sep. 1974	-46.2%	Jul. 1980	91
Dec. 1980-Jul. 1982	-23.8%	Dec. 1982	25
Sep. 1987-Nov. 1987	-30.2%	Jul. 1989	23
Sep. 2000-Sep. 2002	-46.3%	May 2007	82
Oct. 2007-Mar. 2009	-56.8%	*	*

Table 1: S&P 500 bear market woes since 1900.

So it is clear that while we look to the equity markets to capture gains, the potential for loss deserves some attention. It is almost certain the last bear market won't be the last bear market. Or to put it another way, it's not all about the gains.

Recall, a buy-and-hold investment strategy is based on the idea that over the long-run, or more correctly over the investor's timeframe, markets appreciate. Proponents of this investment style would state the key factor is the investor's strategic (*read static*) asset mix, and if you buy and hold a particular stock or mutual fund you are assured to never miss any of the gains. However, what's often glossed over is the fact that buy-and-hold investors are also assured to never miss any of the worst days. This leads to the question, if it's not all about the gains, what is the true value of missing losses? One simple way to look at this is to compare the impact of missing the 10 best days to the improvement in returns from missing the 10 worst days. Table 2 shows exactly how this would look for the time period covering 1981 to 2009. Missing the best market days leads to a 39% drop in the annual percentage rate. Ouch. However, when we miss the worst days the APR increases by 52%. That's promising. Clearly no one can know precisely when the best or worst days will occur, but these data highlight an important concept – returns are asymmetric. It takes a 100% return to recover from a 50% loss. So maybe there's value in avoiding some of the 50% loss in the first place, even at the risk of missing out on some of the gains. This is one area where an active investment approach can look to add value.

Scenario	*APR*	*Value of $1k*
S&P 500 Index	6.60%	$6,378
Missing 10 Best Days	4.00%	$3,076
Missing 10 Worst Days	10.00%	$16,595

Table 2: Value of missing losses 1981-2009.

INVESTOR RISK PREMIUMS VARY

From the previous section, there should be no question missing losses is valuable. But is it feasible? How do we get around the idea that if markets are efficient, one should be able to do no better than buy-and-hold? Certainly one alternative is to simply believe markets are inefficient, at least at some level. Market efficiency is a hard thing to prove or disprove, so nobody could reasonably fault that view. Another is to revisit the random walk argument. Whether it is appreciated or not, those who argue the markets are efficient because prices follow a random walk are making a subtle but important assumption - namely that expected returns do not vary with time. Or more plainly, that investor views toward risk are constant. If we think of excess stock market returns as a regression equation, we can better see what's going on:

$$R^e_{t+1} = a + bx_t + \varepsilon_{t+1}$$

If returns are not predictable, then b=0. In other words no information known today (time t) can be useful in estimating tomorrow's return (time $t+1$). So what does a random walk proponent say about today's expectations for tomorrow's return?

$$E_t[R^e_{t+1}] = a + bx_t$$

Which of course if b=0 becomes:

$$E_t[R^e_{t+1}] = a$$

And hence the conclusion expected returns are constant across time. But is that realistic? Did investors really feel the same about equity risk in April of 1999 as they did in October 2008? And how does this relate to equity prices, which after all is what matters for someone with a stock portfolio? To fully grasp this we need to gain a better appreciation for realized return and expected return. Say we purchased a stock one year ago. Assume today the stock pays a dividend, D and is trading at some price, P. If we sold the stock, we would realize the following return, R:

$$R_{today} = \frac{P_{today} + D_{today}}{P_{year\ ago}} - 1$$

Now, we can extend this train of thought and consider buying the stock today, with an expectation of what the dividend and price might be one year from now. In this case, our expected return would be:

$$R_{Next\ Year} = \frac{P_{Next\ Year} + D_{Next\ Year}}{P_{today}} - 1$$

Recall at the time we buy the stock (i.e. today) we don't know for sure what the future dividend and price will be, we can only work with our expectations about future values. To highlight the fact we don't know certain values at this point, we often use E_t[*], reflecting our expectation at time t of some future parameter value (i.e. the format introduced above). Bringing in a little more tractable notation and re-arranging the above equation, we can arrive at a formula for today's stock price:

$$P_t = \frac{E_t[D_{t+1}] + E_t[P_{t+1}]}{1 + E_t[R_{t+1}]}$$

Note this formula only considers one period. Most stocks exist well beyond one period. In reality, we can substitute future price (dropping the *E*[*] for clarity):

$$P_{t+1} = \frac{D_{t+2} + P_{t+2}}{1 + R_{t+2}}$$

in the above formula to get:

$$P_t = \frac{D_{t+1}}{1 + R_{t+1}} + \frac{D_{t+2}}{(1 + R_{t+1})(1 + R_{t+2})} + \frac{P_{t+2}}{(1 + R_{t+1})(1 + R_{t+2})}$$

If we repeatedly substitute for future prices, we get the end result:

$$P_t = \sum_{k=1}^{\infty} \frac{D_{t+k}}{(1 + R_{t+1})...(1 + R_{t+k})}$$

In other words, today's stock price is the sum of all future dividends discounted at the expected future returns. And to be clear, this is a definition – not a theory. So now we have a direct link between stock prices, dividends and expected returns. Observing the above formula, stock prices will go up if expected future dividends (the *D*'s in the numerator) go up, or if expected future returns (the *R*'s in the denominator) go down[1]. Random walkers say expected returns are constant, so stock price variation must be due to changing dividend expectations. The data, however, say something different. Through some fairly straight-forward regression tests (see *Asset Pricing* by John Cochrane for a thorough treatment) what we find is that stock price variation is due almost exclusively to changing expected returns not to dividends. More importantly these changes in expected returns can be forecast. This does not necessarily mean markets are inefficient. If people's views towards risk are slow moving, and investors dislike risk in bad times (i.e. they demand higher expected returns during recessionary periods), then there may well be times when it is more favorable to hold stocks and times when it is more favorable to have less equity exposure. These changing risk premiums do not represent an arbitrage opportunity, or a means to quick guaranteed profits. But if we can exploit this newfound understanding, we might find it useful in positioning a portfolio tactically during certain market environments as a means to reduce losses or capitalize on potential gains.

THE RIGHT DATA UNIVERSE

So where does this leave us? We now know if investor risk premiums are rising (i.e. expected returns are increasing) equity prices will tend to decline. Similarly if investor risk premiums are falling and market participants are becoming more risk tolerant, equity prices will tend to rise. This is coming directly from the discounted dividend framework explained previously. It seems reasonable to expect if we favor equities during periods of falling risk premiums and move away from equities when expected returns are rising, we should see positive impacts to an investment portfolio. However, before we can get to that point there are a couple other considerations. The biggest is that we cannot directly observe expected returns. We know they exist, and from historical data, we know they are time varying. But as we stand here today, we can't pull up our favorite financial data source and tell if expected returns are currently, say, 8.1% or 6.4%, etc. The good news is we don't need a precise estimate, but rather a sense of the future direction. But to establish that view, we're going to need to some proxies. More on that in a minute. The other consideration is deciding what we're going to invest in when we're in equities and what we're going to invest in when we're looking to be defensive.

With some reflection, it should be clear the idea of changing risk premiums is a broad-based concept. Investor return expectations certainly apply to individual stocks, though if we go this route we have idiosyncratic (i.e. company specific) risk to deal with as well. For a tactical asset allocation strategy, what we're most interested in is whether investors *as a whole* are feeling better or worse about the stock market *as a whole*. Therefore it should make sense that when we want equity exposure in a portfolio, a reasonable choice would be a broad-based stock market index product, such as an S&P 500 or Russell 2000 exchange trade fund (ETF) or mutual fund. When we want to be defensive with a portfolio, however, there are three basic choices – cash, inverse stock market funds or U.S. treasuries. The benefits of cash are obvious – no losses. The risk of inverse stock market funds should be equally clear. If we're effectively short the equity market (by being long an inverse ETF, for example) and the market rallies, it can be costly. Certainly if we have a tactical strategy that is highly accurate, shorting the market

[1] Another way to look at expected return is to consider that it is sometimes referred to as *required* return. So investors will be willing to pay *P* such that they expect to get return *R*. As their risk tolerance declines, they will bid a lower *P* so that they expect to get a higher *R*.

when we want to be defensive would inevitably be the right place to be. But in the business of active investment management we're happy to be right 60% of the time. Therefore we leave inverse ETFs for the gunslingers. This leaves U.S. treasuries. The benefits include potential for yield above cash. However, unlike cash, there is also the potential for loss. To decide if it's worth it, Table 3 below shows the average monthly returns for stocks and bonds during recessions (recession dates source NBER).

Market Environment (1981-2008)	Average Monthly Return				
	Large Cap	Mid Cap	Small Cap	10-Yr Bond	5-Yr Bond
Recessions	-0.83%	-0.42%	-0.52%	1.55%	1.31%
Front Half of Recession	-1.56%	-1.04%	-2.08%	0.71%	0.82%
Back Half of Recession	0.03%	0.31%	1.32%	2.54%	1.88%

Table 3: Cyclical changes in returns 1981-2008.

Two things should jump out. First, potential bond returns are material. The possibility of clipping 155 bps a month in a 10-year treasury fund during an economic downturn is attractive. Second, on average bonds outperform stocks in both the front half and back half of a recession. This means that while our objective is to be tactical, and to try and avoid losses during sustained market declines, the fact we get outperformance in both halves means we don't have to be overly precise in deciding where we are in the business cycle. For a tactical allocation manager, this is good news. So for those looking for the most conservative vehicle, cash is king as they say. But for potential yield pick-up, U.S. treasuries can also be effective. For our tactical allocation program at Good Harbor Financial, we use the latter.

Let's get back to the proxies. We know we're after an active strategy aimed at avoiding prolonged market declines without giving up all the potential upside. We know we're going to take equity index exposure in some form when we want stock market risk and U.S. treasury exposure when we want to be defensive. We know we're going to link the allocation process to the concept of changing investor risk premiums. And we know we can't observe these risk premiums directly. So now what? It is important to understand the expected return demanded by an investor is really a reflection of the compensation they are requiring to accept equity risk. This compensation is likely to be higher when people are worried about staying employed, when they see their asset values falling and when economic headwinds are strong. This leads to the natural extension that changes in expected returns are likely to be linked to the business cycle. This gives us a clue as to the types of proxies that might be effective in assessing the direction of investor risk premiums.

A SYSTEMATIC APPROACH

To give a sense for whether it's possible to take these ideas and create an effective investment strategy, consider the Good Harbor U.S. Tactical Allocation model. This is a fully objective program that formulates a view on expected returns by analyzing three main categories of information; momentum measures, yield curve dynamics and economic conditions. These data are used to determine the investment portfolio allocation to equities and fixed income, with a more specific breakdown between large, mid and small cap equity indices and short and long term bond funds. The momentum measures are designed to provide a read on strength in stock and bond prices, and the relative strength between them. Similarly monitoring the U.S. treasury yield curve can provide insights into investor sentiment and aggregate demand for capital. As the economy starts to enter a difficult period, changes in the shape and levels of treasury yields, whether through government policy intervention or classic flight to quality effects, can be valuable information. Economic data designed to measure the output level and growth rate of the U.S. economy further complete the picture by providing direct business cycle readings. Table 4 below lists back-test results for the U.S. Tactical Allocation strategy from 1981 through 2009. What immediately stands out, aside from the fact the hypothetical performance overall looks pretty favorable is that the outperformance comes with lower volatility (i.e. a standard deviation of 11.83% vs. 15.37% for the S&P 500).

1/2/1981-12/31/2009	*Good Harbor (Net-of-Fees)*	*S&P 500*
Best Month	14.13%	13.18%
Worst Month	-12.32%	-21.76%
Best 12 Months	56.61%	52.94%
Worst 12 Months	-13.21%	-44.76%
Worst Drawdown	-20.61%	-56.78%
Effective APR	12.71%	7.52%
Average Annual Return	13.03%	9.18%
Standard Deviation	11.83%	15.37%
Sharpe Ratio (1% R_f)	1.01	0.47
Information Ratio	0.36	*
Beta	0.53	*
Upside Capture	80%	*
Downside Capture	43%	*

Table 4: Good Harbor tactical model net-of-fee results.

This suggests if viewed as a potential core equity replacement, there may be an opportunity to further enhance returns by utilizing some amount of leverage, at the cost of increasing risk. Table 5 presents the back-test results for the same underlying allocation model but with a leverage overlay designed to let portfolio volatility increase to approximately the level of the S&P 500 index.

1/2/1981-12/31/2009	*Good Harbor Leveraged (Net-of-Fees)*	*S&P 500*
Best Month	18.45%	13.18%
Worst Month	-15.13%	-21.76%
Best 12 Months	81.29%	52.94%
Worst 12 Months	-16.69%	-44.76%
Worst Drawdown	-25.17%	-56.78%
Effective APR	17.57%	7.52%
Average Annual Return	18.31%	9.18%
Standard Deviation	15.53%	15.37%
Sharpe Ratio (1% Rf)	1.06	0.47
Information Ratio	0.72	*
Beta	0.69	*
Upside Capture	106%	*
Downside Capture	54%	*

Table 5: Tactical model results with leverage, net-of-fees.

As before, the results look promising. Checking for statistical significance against the standard factor models (CAPM, Fama-French 3-Factor Model, Carhart 4-Factor Model) leads to the net-of-fee results shown in Table 6 for the unleveraged model through 2008 (including the effects of leverage or the 2009 performance only makes the story better). From the t-statistics and alpha values one would conclude the results are both statistically and economically significant.

	E(α) %	*t-stat*	*E(R) %*	*t-stat*
CAPM	3.6	1.9	7.3	3.7
Fama French 3-Factor	3.6	2.4	*	*
Carhart 4-Factor	3.9	2.2	*	*

Table 6: Good Harbor model return and alpha statistics.

At Good Harbor we've been managing accounts to the U.S. Tactical strategy since 2003. One of the key benefits to a model based approach is the ability to compare actual results to model numbers. This out-of-sample performance comparison allows a manager to assess first and foremost if the strategy appears to be working (i.e. are the results good?). It can also help detect any execution issues (i.e. are the model results good but the actual numbers disappointing?). Figure 1 compares actual net-of-fee results to model generated data for the Good Harbor U.S. Tactical Core composite for the period 5/31/2003 through 12/31/2009.

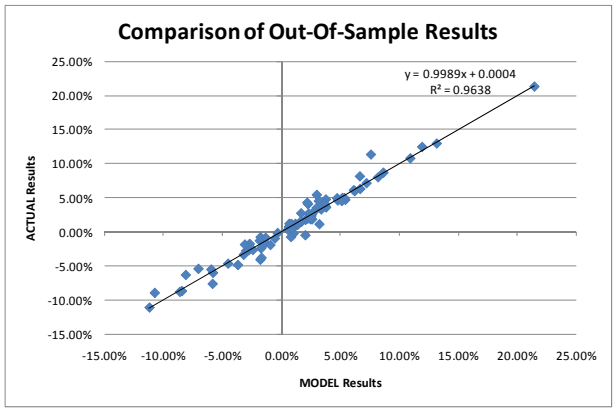

Figure 1: Good Harbor out-of-sample comparison

If the fit were perfect, the slope would be 1 and R^2 would be 1. So an actual slope of 0.9989 and an R^2 of 0.96 certainly suggest, at least as of this snapshot, things appear to be on track. That is to say, the results achieved through actual trading line up well with those estimated by the model. This does not imply positive results going forward. In fact the close fit suggests if the model falters it is very likely actual trading performance will also suffer. However, the fit does give us confidence that we are able to effectively execute the strategy.

CONCLUSION

So will this work going forward? Only time will tell. We all know past performance does not guarantee future results. It could be the future will look so radically different from the past that this approach ceases to provide value. But then, the same could be said of any strategy. Even buy-and-hold can't escape this possibility. The point is not to argue the Good Harbor tactical allocation model is the be-all-and-end-all to active investment strategies, but rather to point out that active investment strategies can be worth considering. If an active investment strategy is well conceived, is based on underlying economic principals and has a decent track record, hypothetical or real-time, it's worth a second look. Effective active managers will exercise judgment and expertise to improve a strategy's odds of performing in the future. This goes for those managers who favor model-based approaches as well as those who focus on fundamental research. Beyond that, we're at the mercy of price action and the whims of the markets!

IMPORTANT DISCLOSURES

Performance numbers for actual results (Figure 1) are presented in U.S. dollars and are net-of-fees and trading expenses and reflect the reinvestment of dividends and capital gains. No current or prospective client should assume future performance of any specific investment strategy will be profitable or equal to past performance levels. All investment strategies have the potential for profit or loss. Changes in investment strategies, contributions or withdrawals may cause the performance results of a client's portfolio to differ materially from the reported composite performance. Different types of investments involve varying degrees of risk, and there can be no assurance that any specific investment will either be suitable or profitable for a client's investment portfolio. Historical performance results for market indices and/or categories, generally do not reflect the deduction of transaction and/or custodial charges or the deduction of an investment-management fee, the incurrence of which would have the effect of decreasing historical performance results. Economic factors, market conditions, and investment strategies will affect the performance of any portfolio and there are no assurances that it will match or outperform any particular benchmark. Portfolios in the Good Harbor U.S. Tactical Core composite utilize levered index products (i.e. leveraged mutual funds or leveraged ETFs).

Back-testing was used in calculating results shown in Figures 4,5,6 as well as the model data used in Figure 1. Back-testing involves a hypothetical reconstruction, based on past market data, of what the performance of a particular account would have been had the adviser been managing the account using a particular investment strategy. Back-tested performance results are purely hypothetical and do not reflect actual trading in clients' accounts. Model results have inherent limitations, particularly the fact that these results do not represent actual trading and may not reflect the impact that material economic and market factors might have placed on the adviser's decision-making if the adviser were actually managing the client's money. These results should not be viewed as indicative of the adviser's skill and do not reflect the performance results that were achieved by any particular client. Good Harbor has been utilizing this strategy since 2003. The model that gave rise to these back-tested performance results is one that the adviser is now using in managing clients' accounts.

Information presented is believed to be factual and up-to-date, but we do not guarantee its accuracy and it should not be regarded as a complete analysis of the subjects discussed. All expressions of opinion reflect the judgment of the author as of the date of publication and are subject to change. Information presented does not involve the rendering of personalized investment advice, but is limited to the dissemination of general information on products and services. It should not be construed as an offer to buy or sell, or a solicitation of any offer to buy or sell the securities mentioned herein.

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APPENDIX A: VARIABLE DEFINITIONS

$E(.)$	Expectation (i.e average or mean).
$E(R_M)$	Expected return on the market.
σ_M^2	Variance of market returns.
R_M^e	Market excess-return (i.e. market return less the risk-free rate.
R_i	1-period return on investment i.
$E\left(R_i^e\right)$	Expected excess-return from investment i.
β_i	Loading for the market factor.
α_i	Unconditional mean of investment i.
ε_t	Regression error term at time t.
$R_{M,t}^e$	Excess return of the market at time t.

Sharpe Ratio: A ratio developed by William F. Sharpe defined as return above the risk-free rate divided by standard deviation. It is meant to provide a risk-adjusted measure of investment performance. Higher Sharpe Ratio is better, all else being equal. When comparing investment approaches using the Sharpe Ratio it is important to use the same risk-free rate in both calculations.

Information Ratio: A ratio designed to provide a risk-adjusted measure of investment performance. It is defined as the excess return relative to a specified benchmark (not necessarily the risk-free rate as is used in the Sharpe Ratio) divided by the tracking error (i.e. the standard deviation of the differences between strategy returns and benchmark returns). Higher information ratio is better.

Upside Capture: A ratio defined as the average return of a strategy during the positive months of a specific benchmark divided by the average return of the benchmark during those same positive months. An Upside Capture ratio of 100% suggests an investment strategy is earning the same average return as the benchmark during the benchmark's positive months. All else being equal, higher Upside Capture ratios are desirable.

Downside Capture: A ratio defined as the average return of a strategy during the negative months of a specific benchmark divided by the average return of the benchmark during those same negative months. A Downside Capture ratio of 100% suggests an investment strategy is earning the same average return as the benchmark during the benchmark's negative months. All else being equal, lower Downside Capture ratios are desirable

APPENDIX B: REFERENCES

[1] Fama, E.F., and K.R. French (1992). "Multifactor Explanations of Asset Pricing Anomalies", Journal of Finance Volume 51, Issue 1:55-84.

[2] Carhart, M.M. (1997). "On persistence in mutual fund performance", Journal of Finance Volume 52, Issue 1:57-82.

[3] Cochrane, J.H. (2005). Asset Pricing (Princeton University Press, New Jersey).

[4] mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

[5] Lhabitant, F.S. (2004). Hedge Funds Quantitative Insights (John Wiley & Sons, England).