Aon Hewitt
Retirement and Investment

Asset Allocation through Changing Market Environments

Varying Asset Allocation with Risk Premiums

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Key Points

- Asset allocation is well known to be one of the most influential determinants of portfolio risk and return. Key factors that help investors determine their preferred asset allocation include the investor's risk tolerance and risk preference, and the expected risk premiums available in the capital markets.
- Research has demonstrated that expected risk premiums[1] vary substantially across time and asset classes. This suggests that investors could benefit from rotating their asset allocations as market conditions evolve.
- Investors do not need certainty about the future direction of markets in order to benefit from allocation changes. Investors need only believe that *expected* risk premiums will change; thus, their asset allocation changes could reflect a better risk-return tradeoff.
- There are several practical ways to implement an approach with varying asset allocations. Long-term strategic asset allocation targets can continue to be the backbone of an investment policy, with increasing flexibility to shift the asset allocation and risk exposures as market conditions change.
- Though we expect these strategies are more likely to perform well than poorly, there is certainly some chance of underperformance. A key to success is having strong governance structures that are likely to weather periods of underperformance without abandoning the strategy.

Introduction

Nearly every investor knows that asset allocation is exceptionally important. There is an often-cited study that asset allocation drives over 90% of the variation in portfolio returns[2], clearly articulating why asset allocation is a critical decision for investors. There are many types of analysis used to evaluate asset allocation, almost all of which are influenced by the risk premium the investor expects from risky investments. One simplistic way to clearly illustrate the role of expected risk premiums is to create a risk-reward curve with some measure of reward (such as expected returns) on the vertical axis and a measure of risk (often portfolio volatility, either in absolute terms or incorporating the investor's liabilities) on the horizontal axis. The investor can use this graph to identify the asset allocation that balances risk and potential reward to best meet its circumstances.

This approach, like most other approaches for determining asset allocation, is heavily dependent on the investor's view of the expected risk premium. And that is logical—all else equal, if an asset class has a higher expected risk premium, investors *should* want more of it. Figure 1 illustrates this by showing two possible risk-reward curves with different slopes. The steeper curve (with a higher expected risk premium) provides more incremental expected return for each unit of risk; an investor whose capital market expectations are illustrated by the steeper risk-reward curve should be willing to take more risk than an identical investor whose capital market expectations are consistent with the less-steep risk-reward curve.

[1] "Risk premium" is the return on an investment in excess of the risk-free rate of return. It can be stated ex-ante ("expected risk premium") or ex-post ("realized risk premium").
[2] Brinson, Hood, and Beebower 1986.

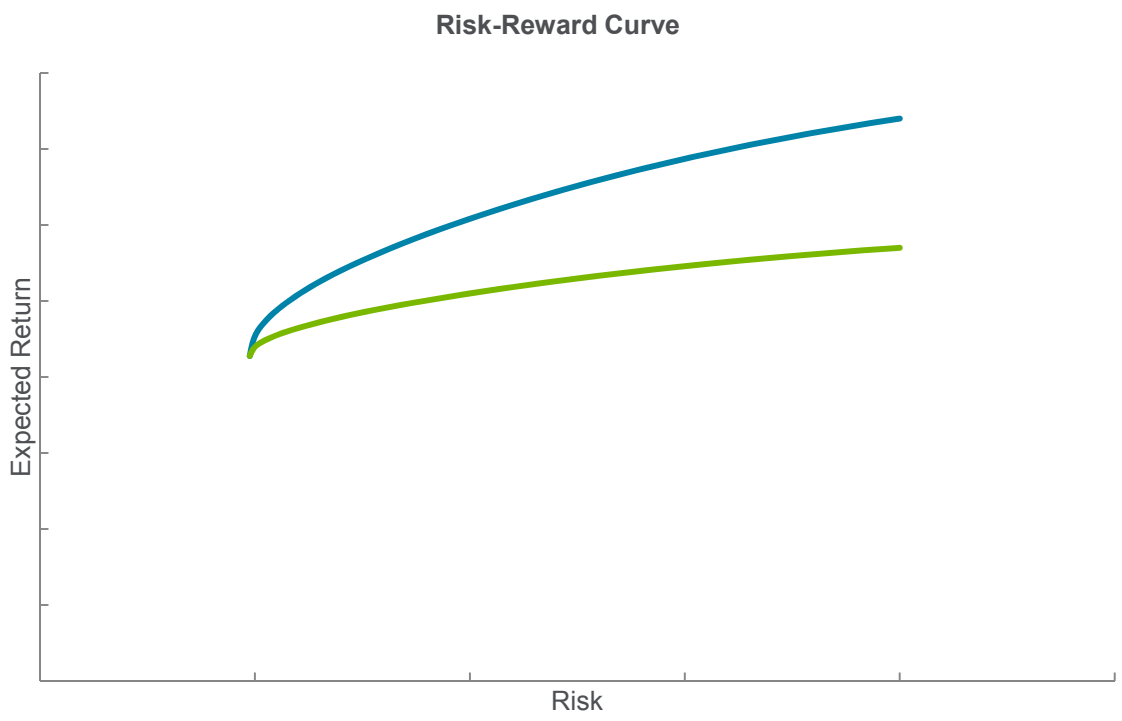


Figure 1

Because the investor's beliefs about the expected risk premium are so instrumental in determining the asset allocation, it is critical to be thoughtful when formulating views about the expected risk premium. How, then, do investors develop their beliefs about expected risk premiums and incorporate them into their portfolio selection, and how should they?

Review of Finance Research on Expected Risk Premiums

Expected risk premiums are a concept that is central to setting both capital market assumptions and asset allocation. Naturally, finance researchers have studied risk premiums extensively for several decades, and the academic literature includes a significant amount of analysis of this issue.

There are numerous ways to develop and analyze expected risk premiums, varying by investment type as well as preferred methodology. When we reviewed the range of studies, there was a recurring theme: Expected risk premiums change significantly over time. Some market environments are correlated with higher expected returns, while others are correlated with lower expected returns.

This is consistent with the idea that market returns are related to valuation levels. That is, when fundamental valuation levels (such as dividend yields) suggest that valuation levels are low/(high), expected risk premium returns are higher/(lower) than when valuation levels are high/(low). This can be thought of as a more technical rationale for a buy-low/sell-high approach. Many of the studies on risk premiums describe markets with this property using the word "predictable." While that word seems strong,

it doesn't imply that investors can know the direction of markets with certainty, but simply that markets are not completely random either.

This research was highlighted with the 2013 Nobel Prize in Economics. The Royal Swedish Academy of Sciences, which selects the Nobel Laureates, described the key findings of this research as follows:

"There is no way to predict the price of stocks and bonds over the next few days or weeks. But it is quite possible to foresee the broad course of these prices over longer periods, such as the next three to five years. These findings, which might seem both surprising and contradictory, were made and analyzed by this year's Laureates, Eugene Fama, Lars Peter Hansen and Robert Shiller[3]."

A summary of several of the studies of risk premiums follows:

Study	Finding
Shiller [1981]	Stock markets are too volatile to be justified by changes in expectations about future dividends.
Shiller [1984]	High dividend-price and earnings-price ratios were correlated with higher-than-average future stock returns.
Fama and French [1988a]	Dividend yields have some predictive power for future equity returns.
Fama and French [1988b]	Mean reversion in stock prices is weak for daily and weekly holding periods, but stronger for long-horizon returns. Price variation due to mean reversion accounts for about 25%–40% of return variances over a three- to five-year horizon.
Poterba and Summers [1988]	There is evidence that stock returns have momentum characteristics over short horizons and mean-revert over long horizons.
Campbell and Viceira [1999]	The optimal portfolio for investors who face a time-varying risk premium involves adjusting their asset allocations over time.
Campbell and Cochrane [1999]	A model is presented reconciling the long-horizon predictability of stock prices due to mean-reversion with rational investors: investors fear stocks primarily because they do poorly in recessions, causing predictable pro-cyclical behavior of stock prices. In effect, the "price" of equity risk changes with economic conditions.
Cochrane [2001]	Over a one-year period, the dividend-price ratio explains 15% of the variation in excess returns. For a five-year period, the explanatory power was as high as 60%.

[3] The Royal Swedish Academy of Sciences 2013.

Study	Finding
Torous, Valkanov, and Yan [2004]	There is reliable evidence that dividend yield, book-to-market ratios, short-term rate of interest, and term and default spreads influence future equity returns over short horizons.
Campbell [2008]	A method is developed for estimating the equity risk premium by allowing it to vary based on the behavior of valuation ratios, linking stock prices to the level of the equity premium.
Cochrane [2011]	A 1% change in dividend-price ratios is estimated to change annualized expected returns by about 4% over both one- and five-year horizons.
Davis, Aliaga-Diaz, and Thomas [2012]	The predictive power of several metrics on equity returns is examined. It was found that price-earnings ratios explain about 40% of the time variation in real returns for 10-year horizons. Dividend yields were found to have lower, but still positive predictive power.

Predicting Market Returns when Markets are Unpredictable

How can we reconcile the academic research suggesting that markets are predictable with conventional wisdom that people cannot predict where the markets are going? Does the idea of market predictability conflict with the theory of efficient markets? What does it mean to say that markets are predictable, though they cannot be predicted?

A look at history can help illuminate the answers to these questions. We reviewed realized historical equity risk premiums to see if there is a relationship between them and valuation metrics such as dividend yields and cyclically adjusted price earnings. In the following exhibits, the graph on the left shows average one-year equity risk premiums for different levels of dividend yields, and the graph on the right shows a similar analysis for different levels of cyclically adjusted price earnings[4].

[4] The cyclically adjusted price-earnings ratio, also known as CAPE, P/E 10, and Shiller P/E, is price divided by the average of 10 years of earnings, adjusted for inflation. The source for the data on CAPE and dividend yields underlying figures 2-5 is http://www.econ.yale.edu/~shiller/data.htm.

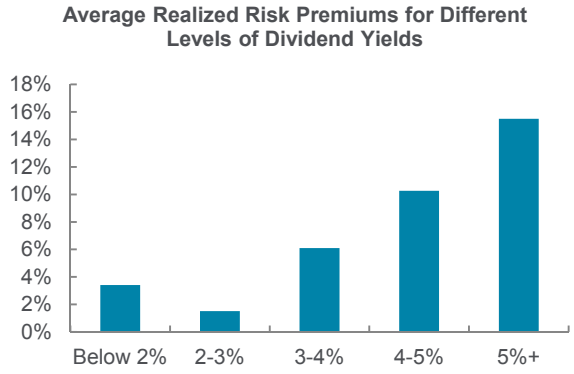


Figure 2

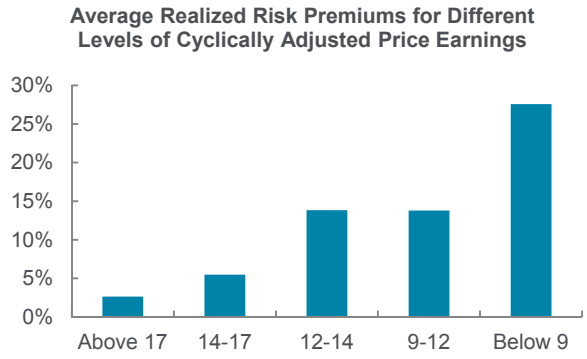
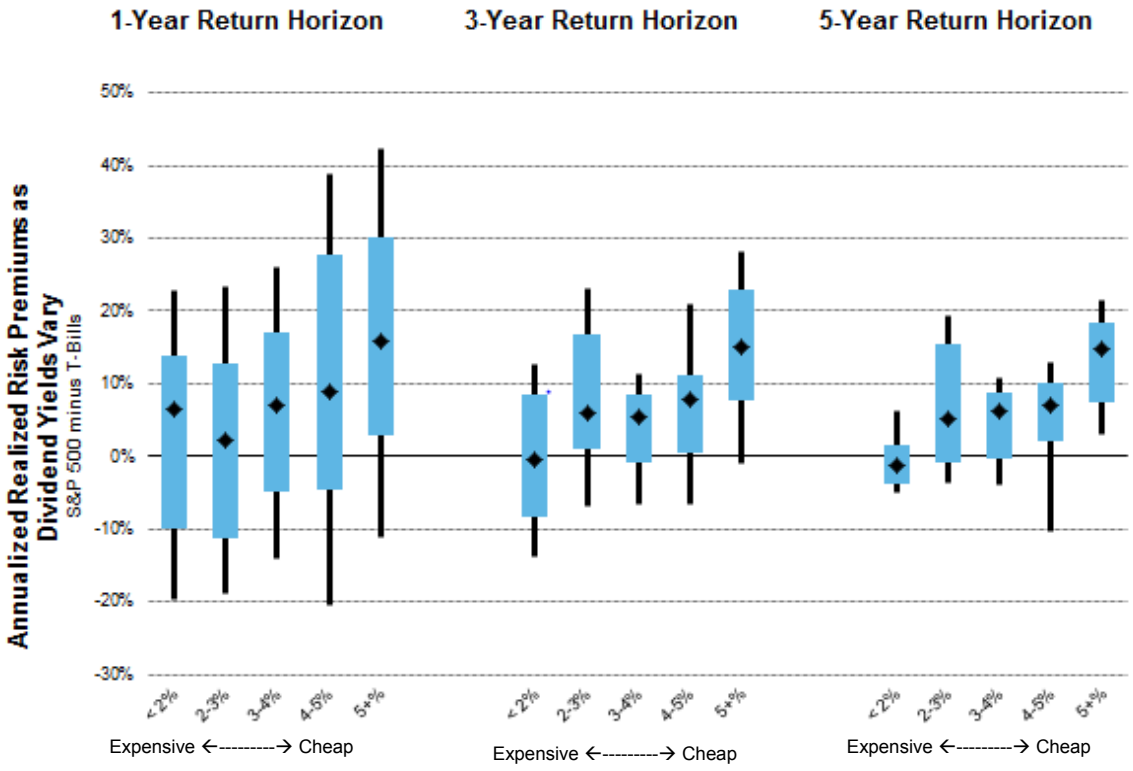


Figure 3

There has been a clear relationship between average realized equity risk premiums and these valuation measures. This is remarkable not just because of how the equity risk premium changed, but how so much of its predictability is based on relatively simple valuation measures. Rather than holding a constant strategic asset allocation, long-term investors would have been better off increasing their allocation to equities when valuations were cheap, and decreasing their exposures when valuations were expensive. While simple rules-based strategies can help investors improve performance, a skilled tactical investor may be able to further add value by identifying attractive and unattractive asset classes—both in broader asset class decisions (e.g., equity versus fixed income) and relative value decisions within asset classes (e.g., large versus small cap equity). This doesn't mean the concept of long-term strategic asset allocation targets should be abandoned, but that additional flexibility to deviate from the targets can improve performance. This might be as simple as having wider allowable bands around asset allocation targets.

While valuation measures correlated with average performance, averages do not tell the full story—we must look at the range of outcomes. Figures 4 and 5 do that, and they also incorporate multiple horizons for annualized risk premiums. These figures paint a more colorful picture of the relationship between valuation measures and future returns. While the trends we observed in the averages remain, there is a significant potential for variation in specific situations. In Figure 4, we see that for the most expensive category of dividend yields shown (below 2%), the 10th and 90th percentiles of realized one-year risk premiums ranged from -20% to +23%, and over a five-year period the annualized figures were -5% to +6%. Clearly, expensive valuation measures do not guarantee poor returns.

For the cheapest category of dividend yields shown (above 5%), the 10th and 90th percentiles of realized one-year risk premiums ranged from -11% to +42%, and over a five-year period the annualized figures were +3% to +22%. Cheap valuation measures do not guarantee great returns, especially over a short horizon. Further, the correlation between realized future performance and valuations appears strongest in extreme environments. Similar trends can be observed by looking at Figure 5, which replaces dividend yields with cyclically adjusted price earnings.


1-Year Return Horizon
3-Year Return Horizon
5-Year Return Horizon
Annualized Realized Risk Premiums as Dividend Yields Vary
S&P 500 minus T-Bills
50%
40%
30%
20%
10%
0%
-10%
-20%
-30%
<2%
2-3%
3-4%
4-5%
5+%
Expensive ←---------→ Cheap
Expensive ←---------→ Cheap
Expensive ←---------→ Cheap

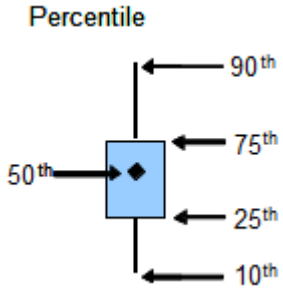

Percentile
90th
75th
50th
25th
10th

Figure 4

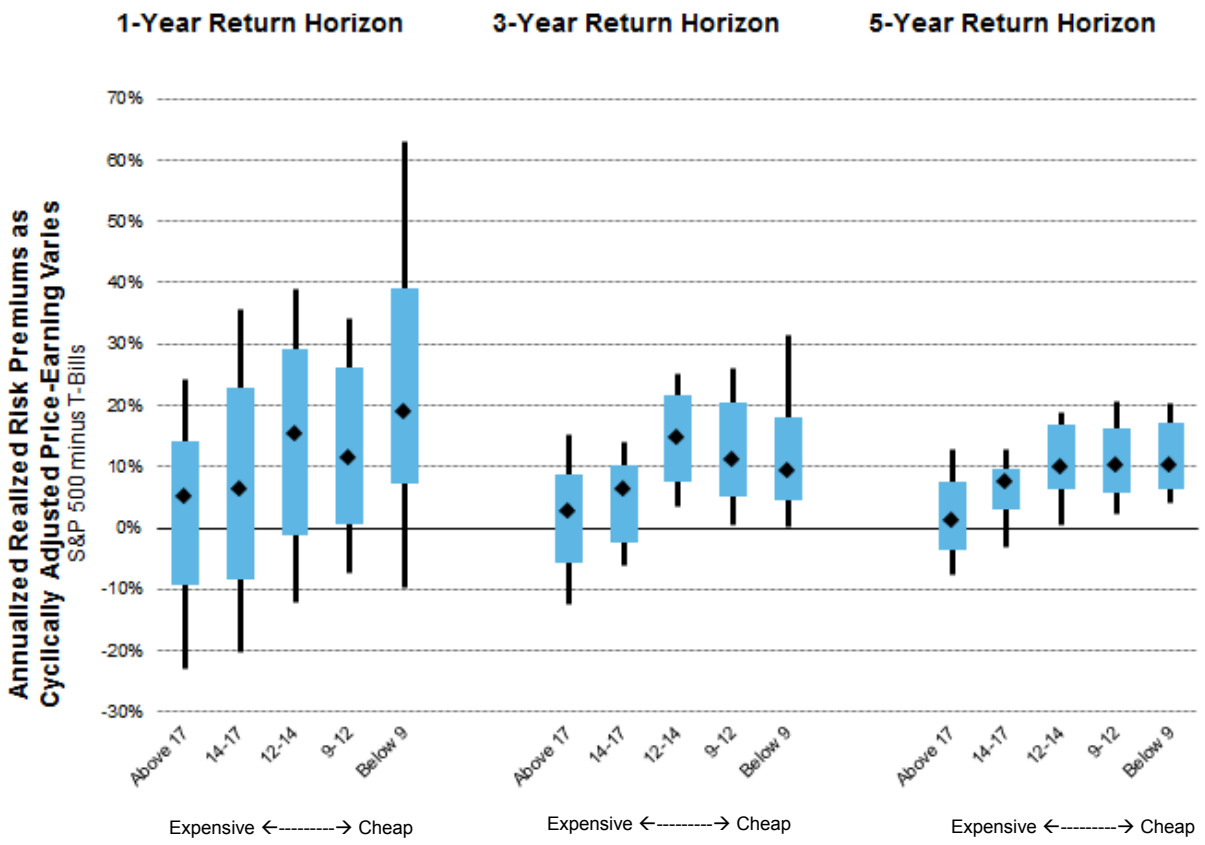


Figure 5

When considering the appropriate portfolio, it is important to note that low valuations increase the likelihood and magnitude of equities outperforming Treasury bills, though there are no guarantees.

This phenomenon doesn't just exist for equities; similar evidence exists for other asset classes and risk factors, as summarized in the following table.

Asset Class/Risk Factor	Finding
Interest Rates	Yield curve shape predicts bond returns. Fama and Bliss [1987], Campbell and Shiller [1991], and Piazzesi and Swanson [2008]
Credit	Variation in credit spreads predicts returns. Fama [1996] and Duffie and Berndt [2011]
Currency	Carry trade and momentum predict returns. Hansen and Hodrick [1980] and Fama [1984]
Inflation	The inflation risk premium embedded in TIPS pricing varies and can be estimated in real time, suggesting some predictability for TIPS returns. Grishchenko and Huang [2012]

The academic research on market predictability and conventional wisdom do not conflict. It is impossible to predict what markets will do, but there appears to be strong evidence that markets in some environments are more conducive to favorable expected returns.

One explanation for this comes from Paul Samuelson, who theorized that markets are "micro efficient" but "macro inefficient." That is, security prices are mostly efficient because investors use available information and analysis to determine appropriate prices for assets, and trade where actual prices deviate from their view of fair value. In the aggregate, this causes prices to move in line with where they should be. Markets, on the other hand, have enormous capacity to absorb investor flows and resist arbitrage, and as a result can remain "irrationally" priced for long periods of time.

Another explanation is that markets are efficient, but with an expected risk premium that varies over time. This rationale might indicate that the risk tolerance of the average investor changes, driving the "price" of risky assets up and down.

Regardless of the explanation, these environments can be identified with relatively simple valuation methods, implying that investors do not need extraordinary skill to improve their risk-return profiles by rotating their asset allocation across different environments. Of course, skill may allow investors to forecast returns with greater accuracy, but it is not needed to improve on a static asset allocation.

Practical Investment Implications

The practical implication for investors is that they can improve their strategies by adjusting their asset allocations over time, rotating emphasis when and where expected risk premiums are more favorable, and scaling back exposures that are less desirable. In the most basic terms, this can be thought of as a buy-low/sell-high strategy.

It is important to note that this does not imply eliminating a long-term policy allocation. There is still merit for investors in having long-term policy targets based on their long-term views of market opportunities, but the policies should have enough flexibility to let risk exposures vary over time in a risk-controlled way. Such flexibility can be designed to allow changes in four major ways, which we've ordered from most effective to least effective.

1. **Explicitly changing the asset allocation.** Investment policy statements are typically written with both target allocations and "bands" around those allocations. The investor can rotate allocations within the guidelines of those bands. Investors can tailor the width of the bands to the amount of flexibility they want. In practice, investors can implement their views directly by moving money from one strategy to another, or in smaller amounts by using cash inflows, outflows, and rebalancing decisions to affect portfolio tilts. Appendix A includes an example of a typical asset allocation policy and how it could be adjusted to allow more flexibility.
2. **Incorporating an "opportunity allocation."** This is not an investment in and of itself; rather, it is flexibility in the investment policy statement that allows for investments that may not fit within the asset allocation targets. This can be for "exotic" investments that don't fit in another bucket, or a way to overweight asset classes with favorable valuation levels—either approach would shift the beta exposures of the portfolio itself. Opportunity allocations are often structured to have a range rather than a target allocation, and it is common to include a minimum of 0%. For additional details, see "The Opportunity Allocation: A Tool to Provide Maximum Flexibility with Implementation" [Kumar and Penter, 2013].

3. **Using multi-asset mandates.** These are often structured to allow managers to rotate between different asset classes. Some are simply broader versions of traditional mandates, such as an all-cap global equity mandate, while others may include extremely different asset classes such as a "global macro" hedge fund that can rotate between equities, bonds, commodities, currencies, and other asset types.
4. **Using traditional active management.** Most investment managers have mandates requiring them to stay within a single asset class, so they are limited in the positions they can take. However, active managers can change exposures within an asset class by rotating between sectors with low exposure to equity beta (such as utilities and consumer staples) and high exposure to equity beta (such as financials and materials). An equity manager with overweight positions to sectors with low beta exposures is implicitly reducing its exposure to the equity risk premium, while an equity manager with overweight positions to sectors with high beta exposures is increasing its exposure to the equity risk premium. Similarly, a fixed income manager often has the flexibility to rotate between sectors with different exposures to credit. Although we have observed that many managers do this, it is last on our list because these mandates are typically constrained within a narrow type of security, and thus have the least flexible abilities to adjust risk exposures.

Each of the portfolio tools above can be used to adjust risk exposures and improve portfolios, and they can be used in combination with one another. Further, the merits of each should be considered in view of each investor's specific governance structure and what the investor can implement successfully. For example, some investors may have full-time staff and/or an advisor to assist, while others may not. Some investors may have boards with significant turnover, making it difficult to weather an unlucky streak with certain types of implementation. These types of factors will influence which of the possible approaches, if any, work best for an investor.

Simulating Market Experience

The market dynamic for expected risk premiums is a nuanced situation. To understand it better, we'll analyze it with a simplified simulation model illustrated with Aon Hewitt Investment Consulting's capital market assumptions, based on only two asset classes: global equities and U.S. aggregate bonds[5]. The expected equity risk premium in our "Normal" market scenario, represented by the difference between the 7.4% expected return on equities and the 4.0% expected return on fixed income, is meaningful at 3.4%. However, for our simulation results in a single year, there is only a 56.3% probability that equities will outperform bonds. While many institutional investors hold equities in search of higher returns, they will fail to achieve them in many individual years. Over the long term, the probability of equities outperforming bonds on a cumulative basis increases, but investors should be patient and have reasonable expectations about the bumpy ride from equities.

Because expected risk premiums change over time, we'll define two alternative market conditions and analyze them in this simulation model. For simplicity, we'll define "Favorable" markets as those in which the expected equity risk premium is twice that of "Normal" environments, and "Unfavorable" markets as those in which the expected equity risk premium is half what it is in Normal markets, leaving all other assumptions unchanged. These assumptions are intended to help us discover how the results from our simulation model will change with these different market environments.

[5] The assumptions for normal markets are based on AHIC's 30-year capital market assumptions for the third quarter of 2014. Global equities have an expected return of 7.4% and volatility of 20.0%, while U.S. aggregate bonds have an expected return of 4.0% and volatility of 5.0%. The correlation between global equities and aggregate bonds is 0.03.

Market Conditions	Global Equities	U.S. Aggregate Fixed Income	Expected Equity Risk Premium
Normal	Expected return = 7.4% Volatility = 20.0%	Expected return = 4.0% Volatility = 5.0%	7.4% – 4.0% = 3.4%
Favorable	Expected return = 10.8% Volatility = same as Normal	Same as Normal markets	10.8% – 4.0% = 6.8%
Unfavorable	Expected return = 5.7% Volatility = same as Normal	Same as Normal markets	5.7% – 4.0% = 1.7%

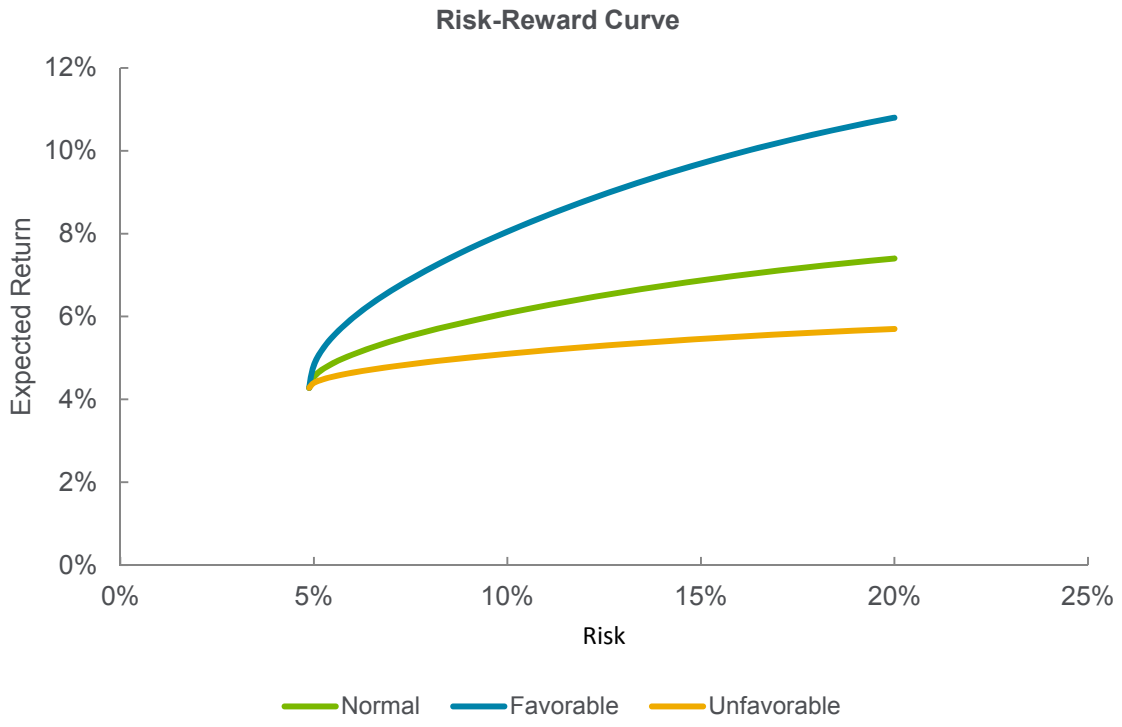


Figure 6

It is intuitive to think that investors would benefit from having higher equity allocations in Favorable markets and lower equity allocations in Unfavorable environments, all else being equal—which we see in the following table.

Market Conditions	Probability of Equity Return Exceeding Bond Return
Normal	56.3%
Favorable	63.3%
Unfavorable	52.9%

However, while favorable market environments offer better odds for equities, investors who shift their asset allocation to reflect changing risk premiums still have a significant likelihood of getting it wrong.

It is notable that shifting asset allocation does not always increase expected returns. For example, in the Unfavorable market environment described earlier, the expected return on equities is still higher than the expected return on bonds. So reducing equity exposure reduces expected returns. Can an investor make a case for reducing its equity exposure even though it will reduce expected returns? Of course. It is appropriate for risk management because the risk-return tradeoff for equities in the Unfavorable environment is worse than what was needed to justify a 60% allocation to equities. Therefore, adjusting asset allocation with market conditions can improve expected returns, risk management, or possibly both.

With the lack of guarantee of better performance, it is worth asking a key question: Should a changing risk premium affect the asset allocation?

Yes! Investors take risk in search of returns, so if the risk-return tradeoff changes, investors should change their behavior. When conditions warrant, investors should make adjustments to their long-term target allocations in a risk-controlled manner. An investor with a 60/40 target asset allocation may want to shift to a 70/30 or 50/50 allocation, depending on market conditions, but it is less likely that such an investor would want to massively shift its allocation to 0/100 or 100/0[6]. Similarly, investors may want to rotate within equity categories and fixed income categories, or add new asset classes that are attractive. Investors should recognize that they will not make money off every trade, but the odds are in their favor over the long term.

Governance Implications

As with most investment programs, successful implementation requires a governance structure that is conducive to executing the strategy as intended. Though the “buy-low/sell-high” approach discussed in this paper may seem reasonable or even obvious on paper, behavioral tendencies can make it harder to implement. For example, it is often challenging for investors to increase their allocation to risky investments after a massive market crash (such as 2008), just as it is difficult for investors to reduce risk after an extended bull market (such as the late 1990s).

[6] In some regulatory regimes, there are consequences to changing asset allocation, which can be another factor to consider when evaluating this type of investment strategy.

In addition, investors may have to endure pain, since their portfolio decisions may not be profitable over extended periods. As an example, consider an investor who reduced equity exposure on January 1, 1997, when dividend yields were at 2.0% and the cyclically adjusted price-earnings ratio was over 28—both indicating that the equity market was expensive. That investor would have underperformed for more than three years before the S&P 500 peaked on March 24, 2000 and subsequently split in half over the following two-and-a-half years[7].

There are several characteristics that facilitate effective implementation of this type of strategy:

- A decision-making process tied to analysis, investment fundamentals, and advice from experts, rather than driven by emotional factors or external pressures.
- A decision-making entity that is sufficiently nimble to execute the strategy as market conditions change. For many institutional investors, this might require the investment committee to meet more frequently, form subcommittees, delegate some authority to staff or advisors, or implement by hiring investment managers to change the portfolio exposures as needed.
- Low turnover of committee members, who will understand and remember the rationale for the strategy throughout the market cycle.
- A long-term performance horizon with the ability to withstand short-term pain, since not every decision will prove to be a winner—and certainly not over short horizons.

How an investor stacks up on these characteristics should influence how, and even if, the investor implements the types of strategies discussed in this paper. Though rotating asset allocation based on market conditions can add value, we also caution that investors who are not set up to implement it effectively may be likely to destroy value with poor execution. “Know thyself” is a rule to seriously consider with this type of strategy, just as it is for many other aspects of investment strategies.

Conclusions

Although meaningful rotation of asset allocation is not the norm among institutional investors, it is consistent with the patterns risk premiums have historically exhibited. It is notable that rotating asset allocation with market conditions does not require investors to believe markets are inefficient; it requires only that investors believe expected risk premiums change over time, possibly due to factors as simple as changing investor preferences for risk. In that sense, asset allocation rotation is easier to support than traditional active management from security selection, as the latter requires investors to reject the efficient market hypothesis.

For investors with strong governance structures, maintaining a static asset allocation when the market environment changes is not an optimal way to manage risk exposures; shifting risk exposures can improve portfolio risks and returns. All investment decisions—whether to change a portfolio or not—reflect investor positioning for risks and opportunities, and should change when the odds change. Investors should be realistic and not expect to “win” every bet. Good decision making and risk management, a long horizon, and a little luck are most likely to produce investment success.

[7] The S&P 500 dropped 47.4% from March 2000 to September 2002.

Appendix A

Below is an example of the typical level of flexibility for asset allocation in an investment policy statement and an updated version with more flexibility.

	Typical Policy	More Flexible
U.S. Public Equity		
Minimum	15%	10%
Target	17.5%	17.5%
Maximum	20%	25%
Non-U.S. Public Equity		
Minimum	15%	10%
Target	17.5%	17.5%
Maximum	20%	25%
Return-Seeking Fixed Income		
Minimum	3%	0%
Target	5%	5%
Maximum	7%	10%
Real Estate		
Minimum	7%	4%
Target	10%	10%
Maximum	13%	16%
Hedge Funds		
Minimum	7%	4%
Target	10%	10%
Maximum	13%	16%
Private Equity		
Minimum	7%	4%
Target	10%	10%
Maximum	13%	16%
Risk-Reducing Fixed Income		
Minimum	25%	15%
Target	30%	30%
Maximum	35%	45%
Opportunity Allocation		
Minimum	n/a	0%
Target	n/a	0%
Maximum	n/a	10%

References

Barbaris, Nicholas. “Investing for the Long Run when Returns are Predictable.” *Journal of Finance* 55, (2000): 225-264. http://faculty.som.yale.edu/nicholasbarberis/alloc_jnl.pdf

Brinson, Gary P., L. Randolph Hood, and Gilbert L. Beebower. “Determinants of Portfolio Performance.” *Financial Analysts Journal* (July/August 1986).

Campbell, John Y. “Estimating the Equity Risk Premium.” *Canadian Journal of Economics* 41(1) (2008): 1-21. http://www.nber.org/papers/w13423

Campbell, John Y. and John H. Cochrane. “By Force of Habit: A Consumption-Based Explanation of Aggregate Stock Market Behavior. *Journal of Political Economy* Volume 107, Issue 2 (April 1999): 205-251.
http://faculty.chicagobooth.edu/john.cochrane/research/papers/Campbell_Cochrane_By_Force_of_Habit_(JPE).pdf

Campbell, John Y. and Robert J. Shiller. “Yield Spreads and Interest Rate Movements: A Bird’s Eye View.” *Review of Economic Studies* 58 (1991): 495-514. http://www.nber.org/papers/w3153.pdf

Campbell, John Y. and Luis M. Viceira. “Consumption and Portfolio Decisions when Expected Returns are Time-Varying.” *The Quarterly Journal of Economics* (May 1999): 433-495.
http://www.jstor.org/stable/2587014.

Campbell, John Y. and Luis M. Viceira. “The Term Structure of the Risk-Return Tradeoff.” NBER working paper, 2005. http://www.nber.org/papers/w11119

Cochrane, John. *Asset Pricing*. Princeton University Press, 2001.

Cochrane, John. “Presidential Address: Discount Rates.” *The Journal of Finance* (August 2011): 1047-1108.

Davis, Joseph, Roger Aliaga-Diaz, and Charles J. Thomas. “Forecasting Stock Returns: What Signals Matter, and What Do They Say Now?” Vanguard Research, October 2012.
https://personal.vanguard.com/pdf/s338.pdf

Duffie, Darrell and Antje Berndt. “Explaining Corporate Debt Returns,” working paper, Stanford University and Northwestern University, 2011.

Fama, Eugene F. “Term Premiums and Default Premiums in Money Markets.” *Journal of Financial Economics* 17 (1986): 175-196. http://www.sciencedirect.com/science/article/pii/0304405X86900103

Fama, Eugene F. and Robert R. Bliss. “The Information in Long-Maturity Forward Rates.” *American Economic Review* 77 (1987): 680-692. http://links.jstor.org/sici?sici=0002-8282%28198709%2977%3A4%3C680%3ATIILFR%3E2.0.CO%3B2-9

Fama, Eugene F., and Kenneth R. French. “Dividend Yields and Expected Stock Returns.” *Journal of Financial Economics* 22 (1988a): 3-25.

Fama, Eugene F., and Kenneth R. French. “Permanent and Temporary Components of Stock Prices.” *Journal of Political Economy* 96 (1988b): 246-273. http://ideas.repec.org/a/ucp/jpolec/v96y1988i2p246-73.html

Fama, Eugene F., and Kenneth R. French. “Business Conditions and Expected Returns on Stocks and Bonds.” *Journal of Financial Economics* 25 (1989): 23-49.

Golez, Benjamin. “Expected Returns and Dividend Growth Rates Implied by Derivative Markets.” *Review of Financial Studies* 27 (3) (2014): 790-822. http://rfs.oxfordjournals.org/content/27/3/790.abstract

Gourinchase, Pierre-Oliver and Helene Ray. “International Financial Adjustment.” *Journal of Political Economy* 115 (2007): 665-703.

Grishchenko, Olesya V. and Jing-zhi Huang. “Inflation Risk Premium: Evidence from the TIPS Market,” 2012. http://www.federalreserve.gov/pubs/feds/2012/201206/201206pap.pdf

Hansen, Lars Peter and Robert J. Hodrick. “Forward Exchange Rates as Optimal Predictors of Future Spot Rates: An Econometric Analysis.” *Journal of Political Economy* 88 (1980): 829-853.

Kothari, S.P., and Jay Shanken. “Book-to-Market, Dividend Yield, and Expected Market Returns: A Time-Series Analysis.” *Journal of Financial Economics* 44 (1997): 169-203.

Kumar, Satya and Bob Penter. “The Opportunity Allocation: A Tool to Provide Maximum Flexibility with Implementation,” May 2013. http://www.hekblog.com/wp-content/uploads/2013/05/2013_05_06-IDF_Opportunity-Allocation.pdf

Lamont, Owen. “Earnings and Expected Returns.” *Journal of Finance* 53 (1998): 1563-1587. http://www.nber.org/papers/w5671

Lewellen, Jonathan. “Predicting Returns with Financial Ratios.” *Journal of Financial Economics* 74 (2004): 209-235. http://faculty.tuck.dartmouth.edu/images/uploads/faculty/jonathan-lewellen/FinancialRatios.pdf

Piazzesi, Monika and Eric Swanson. “Futures Prices as Risk-Adjusted Forecasts of Monetary Policy.” *Journal of Monetary Economics* 55 (2008): 677-691. http://www.stanford.edu/~piazzesi/fff.pdf

Poterba, James M. and Lawrence H. Summers. “Mean Reversion in Stock Returns: Evidence and Implications.” *Journal of Financial Economics* 22 (1988): 27-60. http://dspace.mit.edu/bitstream/handle/1721.1/63837/meanreversionins00pote.pdf?sequence=1

The Royal Swedish Academy of Sciences. “Prize in Economic Sciences 2013: Popular Science Background,” 2013. http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2013/popular-economicsciences2013.pdf

Shiller, Robert J. “Do Stock Prices Move too Much to Be Justified by Subsequent Changes in Dividends?” *American Economic Review* 71 (1981): 421-436. http://www.aeaweb.org/aer/top20/71.3.421-436.pdf

Shiller, Robert J. “Stock Prices and Social Dynamics.” *Brookings Papers on Economic Activity* 2 (1984): 457-498. http://www.econ.yale.edu/~shiller/pubs/p0616.pdf

Torous, Walter, Rossen Valkanov, and Shu Yan. “On Predicting Stock Returns with Nearly Integrated Explanatory Variables.” *Journal of Business* 77 (2004): 937-966.
http://www.jstor.org/stable/10.1086/422634

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