

# Take 5 Views

## Volatility Management and Fixed Income Outlook



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### A lesson on volatility metrics and risk, and a review of the global fixed-income markets

This issue of *Take 5 Views* begins with the first of a two-part Special Report on volatility management, with information about investor behavior, the origins of risk metrics, and when a simple balanced allocation may not be a sufficient to hedge against volatility.

Although many, if not most, individuals prefer to “set it and forget it” when it comes to their retirement funds, the current investment climate demonstrates why that may not be a good idea. In fact, since the Financial Crisis of 2007 to 2009, the financial markets have exhibited patterns that are outside historical ranges. Has the world entered a “new normal” state, as PIMCO’s Mohammed El-Erian famously maintains? Or will the market eventually revert to the mean—return to its longtime trend—as others believe?

Traditionally, investors have used a number of strategies to manage volatility in their portfolios, from simply waiting out the price swings, to allocating between asset classes that tend to move in opposite directions, or even using various derivative financial instruments to offset the damage brought by gyrating prices. One investment manager summarized the range of volatility management goals and the importance of various tools to meeting them along a continuum, as follows:

| Philosophy      | Descriptions  | Primary Tool           |                |
|-----------------|---|------------------------|----------------|
|                 |   | Portfolio Construction | Hedging        |
| Just Allow Time | *Buy-and-hold mentality<br>*Use long-term forecasts   | More Important         | Less Important |
| Just In Time    | *Response mentality<br>*Adjust portfolio as market environment changes  | ↑                      | ↑              |
| Just In Case    | *Insurance mentality<br>*Focus on what “could” occur, as opposed to what one “expects” to occur<br>*Preserve flexibility during times of great stress |                        |                |

Source: Courtesy of Wellington Management *Viewpoints*, May 2010.

Try not to let the jargon scare you off. This material may be heady, but at AXA Equitable Funds Management Group, we hope our investors will take the time to understand the basics of this important investment strategy.

To bring the discussion back to earth, we close with a couple of recent articles on the fixed-income outlook.●

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## Origins of Risk Metrics

By Wylie Tollette and Sean Tarte, *Global Investment Risk and Performance*, Franklin Templeton Investments

### FROM STATS TO QUANTS

To manage risk, you must be able to quantify it. For this reason, the origins of risk management are found in the earliest attempts to measure outcomes and assign probabilities to them. Risk management subsequently grew into a distinct discipline with twentieth century breakthroughs in financial theory and information technology.

### Quantifying chance

Long before that, though, there was gambling. With a potent set of built-in motivators, gambling spurred Renaissance-era mathematicians to begin looking at the frequency of past events and developing the first notions of probability. Subsequent efforts in the 1700s discovered that the probabilities associated with a large group of observations—such as the results in games of chance—were distributed around their average value, forming a curve. Values similar to the average were likely to occur more frequently, and those much higher or lower were less prevalent, tapering off the farther from the average. The mathematical expression of this dispersion of data around its mean (or average) is called standard deviation and can be visualized as the area underneath the curve.

Later contributions to the developing field of statistics centered on heredity. In the late 1800s, statisticians working on questions about heredity developed a formula to express the “co-relation” between two variables, such as the height of a parent and their child. Correlation, as it came to be known, is calculated by dividing the covariance between a series of results by their respective deviations and is often noted as “R.”

Standard deviation and correlation are just two of the many measures developed for the purpose of describing the probability of certain outcomes. In later years, metrics with an absolute view of risk—such as value at risk and expected shortfall—were joined by metrics associated with relative risk and the probability of underperformance—such as tracking error, Sharpe ratio, information ratio, alpha and beta (see page 6 for definitions). These expressions provided the mathematical language for financial theories ultimately aimed at better understanding and managing portfolio risk. Correlation and standard deviation are fundamental to the work of the financial economists (most notably Harry Markowitz) who developed modern portfolio theory (MPT). By considering an investment’s volatility of returns (standard deviation) and the

relationship between its returns and those of other investments (correlation), MPT demonstrated the potential benefit of asset allocation. It demonstrated (based on historical data) that assets could be mixed in such a way to enhance the blended portfolio’s performance potential for a given level of volatility, or that the portfolio’s overall volatility potentially could be reduced in pursuit of a given level of return.<sup>1</sup>

Markowitz’s work and an emphasis on a particular risk measure—beta—led to the development of the capital asset pricing model (CAPM) by William Sharpe and others. According to Sharpe’s work, unsystematic (or idiosyncratic) risk, meaning the risk specific to a particular asset, can be reduced by diversification, but systematic risk cannot. Consequently, systematic risk (beta) should have a central role in determining the risk premium for a security or a portfolio, which is what CAPM attempts to model.

Pricing was also the goal of work done by Fischer Black, Myron Scholes and Robert Merton focusing on options. Their model captured data for time, prices, interest rates and volatility to value options. The calculation that came to be known as the Black-Scholes formula also has wide applicability across other financial products. It has played a crucial role in the dramatic growth of derivatives and their use to hedge risk exposures or simply speculate.

Of course, it should always be remembered that any financial or risk measurement model is a tool based on historical data and the statistical probability of certain outcomes based on that historical data. As is often repeated in the investment world, past performance does not guarantee future results.

### Leveraging computational capacity

Finally, financial modeling got an early boost from an unlikely source. In the 1940s, physicists working on nuclear weapons projects at the Los Alamos National Laboratory coined the term Monte Carlo to describe a computational algorithm that relies on repeated random samplings to produce results. The use of randomness and the repetitive nature of the process are analogous to the activities of casinos (like the Casino de Monte-Carlo in Monaco) where roulette, dice and slot machines exhibit random behavior. The Monte Carlo technique is particularly useful for modeling phenomena characterized by uncertainty. As applied to an investment portfolio, it uses historical risk and return data to create multiple trial runs, called simulations, for the purpose of estimating the probabilities associated with certain outcomes.●

1. Asset allocation and diversification do not guarantee a profit or protect against a loss.

## Volatility Provides Insights On Investment Behavior

By Paul Goldwhite, Director, Research, First Quadrant, LP

The linkage between expected volatility and financial asset prices is well established in economic theory. Volatility is an important component of the discount rates used to establish value for financial assets. The dividend discount model used to value equity securities, for example, applies discount rates to future dividends. The discount rate is made up of a default-free interest rate such as the long-term government bond yield, plus an equity risk premium to compensate investors for the uncertain value of future dividends. The value of future dividends depends on many unknown factors and the greater the uncertainty, the higher the equity risk premium and the higher the discount rate, which causes the equilibrium or 'fair' value of equity securities to be lower. When the level of uncertainty is changing rapidly, stock prices will also be changing, and volatility will be high.

The CBOE Volatility Index (the "VIX")<sup>1</sup> is sometimes called the 'fear index' because when the VIX increases, there is an expectation that stock market volatility will be rising, and many investors are unsettled by rising volatility.<sup>2</sup> Rapidly rising volatility in broad markets is more often associated with bad news than good news. We suggest a couple of reasons for this; there may be others. Positive developments at the broad market level tend to take place over an extended period of time. These may be related to rising productivity and earnings, and they unfold over a number of quarters and years. On rare occasions when there is a positive event that affects the entire market, such as an unexpectedly favorable new tax law, there is volatility as the market rapidly adjusts upwards. Positive shifts in volatility, however, are a small minority of market events. Bad news, or the market's realization of bad news, tends to be reflected in markets rapidly. Bad news may come from an exogenous shock, such as war, surprise attack (e.g., 9/11), coups (e.g., Russian coup in 1991), disease (e.g., SARS, 2002-03), or severe weather. It may come from the distress or failure of a highly leveraged institution (e.g., LTCM), which threatens other institutions and the economy at large. In some cases, destructive forces have been building up for a while out of plain view, but are revealed suddenly, causing a rapid rise in risk aversion.

Another reason for the asymmetric reaction is that investors have a greater aversion to losing a given

amount than the benefit they perceive from gaining that same amount. Most investors feel good after they gain 40%, but they feel a great deal worse when they lose 40%. For many investors, as soon as they fear loss, they flee into low risk assets and/ or seek insurance by, for example, buying options. Investors tend to be more aggressive about avoiding loss than they are about seeking gains. The asymmetry is shown by the connection between changes in the level of risk aversion and returns in the equity market. A rapid increase in risk aversion is more likely to be associated with a sharp market decline than a rapid drop in risk aversion is associated with a sharp market rise. ●

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*1. The VIX is the Chicago Board of Options Exchange Volatility Index, and a key measure of market expectations of near-term volatility conveyed by S&P 500 stock index option prices.*

*2. We chose S&P 500 volatility as the basis for analysis because the S&P 500 is representative of markets globally, it is convenient to look at a single market and the US equity market has a long history of index options. While the ideal indicator of market risk aversion would combine data from equity and credit markets globally, and from other markets as well, our analysis shows that the VIX does a good job of capturing the effects we seek to measure.*

*Another question worth asking is why we look at changes in expectations for volatility, VIX, rather than observed S&P 500 volatility? The answer is that while much of the time we would get similar results, the VIX does a better job of capturing market concerns about extreme events – the events at the negative tail of the return distribution. Investors with exposure to the US equity market can buy put options on the S&P 500 to protect themselves. The amount that they are willing to pay – reflected in the VIX – tells us something about the probability they assign to an extreme negative outcome. Also, because the VIX is forward-looking, it is quicker to reflect investor's concerns about risk.*

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## SPECIAL REPORT

### A Balanced Allocation May Behave in Different Ways

By AllianceBernstein

The discomfort that investors suffer during market downturns illustrates a broader problem: the tendency for the risk profile of any fixed asset mix to stray

in terms of risk. One asset class—equities—drives the lion’s share of portfolio volatility. Since stocks are three to four times more volatile than bonds, they generate an average of about 90% of the performance variability of the typical 60/40 portfolio. So, when equity-market volatility ebbs and flows, it tends to take the whole portfolio along with it.

#### The Volatility of a Balanced Account Has Fluctuated Widely



Source AllianceBernstein, 30 years ended December 31, 2010. **Past performance is no indication of future results.**

\*\*Refers to the standard deviation of a portfolio comprised of 60% in the MSCI All Country World Index and 40% in the Barclays Global Aggregate Treasury Index, rebalanced monthly.

**Barclays Capital Global Aggregate Treasury Index** is an unmanaged index considered representative of the market for fixed-rate local currency government debt of investment grade countries. The index represents the Treasury sector of the Global Aggregate Index and currently contains issues from 37 countries denominated in 23 currencies.

**MSCI AC World Index (Net)** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets.

materially from investors’ expectations. Over the past four decades, the 60/40 portfolio—an asset allocation designed to suit an investor with a moderate tolerance for risk—has at times displayed the volatility of an all-bond portfolio and at other times been as volatile as an all-equity portfolio.

Any major shift in volatility alters the range of returns that an investor is likely to experience. For example, a portfolio with an expected return of 7% and an expected volatility of 9% (which is how the 60/40 mix tends to behave over the long run) should generate returns somewhere between a gain of 25% and a loss of 11% in a given year, only exceeding an 11% loss about once in 40 years.

If volatility shot up to 15%, this would substantially increase both the upside and downside potential of the portfolio, to a gain of 37% on one hand and a loss of 23% on the other. It’s unlikely that an investor with a moderate profile would be comfortable with that degree of uncertainty. It seems counterintuitive that a “balanced” portfolio should behave in such different ways. The fact is that even though a 60/40 mix is balanced in terms of asset allocation, it is concentrated

Mitigating the threat of a disconnect between investors’ expectations and actual portfolio outcomes is most important during periods of high or rising volatility, which usually coincide with bear markets. At these times, investors are likely to be feeling severe pressure in other areas that affect their investment plans. For example:

- Individuals are more likely to lose their jobs and income;
- Foundations and endowments are likely to face declines in charitable contributions;
- Pension funds are likely to see their funding capacity decline as public plans are hit by falling tax revenues and private plans face underfunding due to declining corporate profits;
- Assets become illiquid and access to credit dries up.

In short, equity-market misery is often compounded by other factors that can make a bear market even more painful. These realities argue for a more flexible approach to asset allocation—one that can enhance a long-term strategy by providing a smoother pattern of returns. ●

## Fixed Income Outlook in Selected Bond Sectors

By Robert Hall, Institutional Fixed Income Portfolio Manager, MFS Investment Management

**Duration/Rates:** The big story in the U.S. fixed-income markets over the past month was the move higher in US Treasury yields. Persistently better macro data, coupled with declining expectations for more quantitative easing by the U.S. Federal Reserve Board (Fed), pushed Treasury yields higher, causing them to break out of the relatively tight range they had held for the previous four months. As a result, we appear to have entered a new and higher, but still relatively narrow, range for Treasuries in which yesterday's ceiling has become today's floor.

We do not think that the recent rise in yields heralds the beginning of a "bond bubble," however. Instead, we believe that future moves in Treasury yields are likely to be data dependent and subject to potential swings in market sentiment driven by changing perceptions of tail risks. Indeed, some softer second-tier data releases in late March caused a partial retracement of the selloff. This retracement highlights how difficult it may be for yields to move significantly higher just yet. A number of factors seem likely to constrain the degree to which rates can rise (e.g., uncertainties around the eurozone crisis, Chinese growth prospects, higher oil prices, the looming "fiscal cliff" in the U.S., accommodative Fed policy, etc.). As a result, we expect increased rate volatility but probably not markedly higher rates in the near term. Despite the recent selloff we continue to see Treasuries as significantly overvalued. Our core expectation is that rates should gradually drift higher on positive economic fundamentals. However, our level of conviction in the potential for an imminent move higher of any magnitude is tentative enough to keep us close to neutral duration in those portfolios where we have the freedom to take interest rate risk versus a benchmark.

**Investment-grade corporates:** Improved market sentiment, solid corporate fundamentals, and negative real yields on "safe" assets have all supported risk taking in U.S. high-grade corporate bonds. While we feel it is too soon to call the end of the "risk-on/risk-off" paradigm that has characterized the markets over the past two years, we would agree that the risk environment appears at least modestly better than it was six months ago. In the meantime, U.S. corporate profit growth has slowed somewhat but credit metrics and balance sheets have remained sound. With yields on risk-free assets so low, many investors have looked to solve the income generation dilemma by moving down in credit quality.

The recent rally in high-grade corporates was led by financials, which benefited not only from the European Central Bank's actions to provide liquidity to European banks, but also from favorable bank "stress test" results in the United States. Given that financials trade wide to the rest of high-grade credit, we think their spreads may still have some room to compress. Enough uncertainty surrounds the future prospects of the sector, however, that an early return to pre-crisis spread levels or historical spread relationships versus other high-grade sectors is highly unlikely.

Though the potential for further capital appreciation in high-grade corporates appears relatively limited in the short term, we are content to "clip coupons" for now, believing that this scenario will still offer relatively attractive risk/reward versus many other asset classes.

**High-yield corporates.** The recent rally notwithstanding, high-yield bond spreads over US Treasuries remain wide versus historical averages, suggesting to some observers that high-yield bonds still offer good value and additional potential for capital appreciation. In our view, however, spreads have become a less relevant measure of valuation than all-in yields and bond prices because spreads are calculated with reference to an asset that has become grossly overvalued (US Treasuries). With yields in the high-yield sector near all-time lows and average bond prices north of par, we have become cautious on valuation.

With little room for further price gains and a growing risk that at least a portion of recent gains could be forfeited, we see carry as the asset class' primary attraction. It should be borne in mind that excess yield will come at the cost of relatively high volatility. Of all fixed-income assets, high-yield bonds are likely to be the most vulnerable to worries about higher oil prices and other threats to global growth such as slowing growth in China, the risk of further turmoil in the eurozone, or the approaching fiscal cliff in the U.S.

We are trying to guard against the left tail risk, i.e., events that could precipitate credit concerns, by deploying cautiously in the lower credit tiers. Simultaneously, we have also been attempting to protect against the right tail risk, i.e., the macro accelerates to a surprising degree and makes rising interest rates a serious threat, by seeking opportunities to reduce portfolio duration without much sacrifice of yield. Our core macro expectation remains one of continued modest growth with relatively low default risk — an environment in which carry should carry the day. With our relatively defensive view on high-yield bonds, we have been modestly underweighted in risk relative to our peer group, preferring to wait for volatility to create valuation opportunities before adding more exposure. ●

## Fear, Bank Lending, and Fed Frustrations

By Milton Ezrati, Senior Economist and market Strategist, Lord Abbett

The Federal Reserve recently released the results of its latest survey of senior bank officers. Like the economy, and not coincidentally, the bankers' attitudes were mixed. Things have improved over the past year. Bankers on balance have shown a greater willingness to extend credit. But still, they remain very cautious. Understandable after the losses of 2008–09, this lingering reluctance to lend offers yet another explanation as to why this economy's recovery has proceeded so slowly to date, and will likely continue to do so for some time to come.

Still, there are tentative signs that the environment is easing, certainly enough to support a recovery of sorts. In large part, this caution among bankers has for some time thwarted the Fed's efforts to push the economy forward. Monetary policymakers, in order to accelerate the recovery, have given the system ample financial resources for years now. From August 2008 (at the beginning of the crisis) to the present, near zero short-term interest rates and two quantitative easing programs have expanded the Fed's balance sheet hugely and poured liquidity into the financial system. Bank reserves, a key liquidity metric, have expanded during this time an astronomical 3,428%, or 281.4% a year on average. The monetary base, another liquidity measure, which counts currency in circulation along with bank reserves, expanded at a rapid 39.2% annual rate during the same time. But because the banks have shown such a reluctance to lend, little of this massive infusion of liquidity has reached the general economy.

Initially, bankers' fears almost entirely thwarted the Fed. While policy turned the flow of Fed-provided liquidity into a tidal wave, banker reluctance kept it from getting through to businesses and consumers. Lending overall, already down substantially during the recession, continued to fall, dropping an additional 8.3% annual rate in 2009 and 2010 and remaining stagnant during the first half of 2011. Banker reluctance has kept the Fed's liquidity flow so bottled up that even today a disproportionate 94.2% of total reserves stand in excess of what the banks need to support their existing loan and deposit levels. But even in the face of continued banker caution, this most recent survey, coupled with recent modest expansions in lending, suggests that matters are beginning to change, slowly to be sure, but easing nonetheless. The Fed's regular surveys in 2010 and 2011 did show a moderate movement by bankers in favor of lending.

Late last year, fears emanating out of Europe kept banks cautious. Of the 56 major banks surveyed by the

Fed during fourth quarter 2011, 53 reported no further easing in lending criteria, while three said that they had "tightened somewhat." But with the source of this recent turn to caution easing, especially with the European Central Bank (ECB) beginning to take a hand in supporting European financial markets, American banks going forward should resume and perhaps accelerate the incipient easing trend that had developed. What is perhaps most important to this equation is that lending has shown signs of advancing. The first signs appeared in earnest last summer. Between June 2011 and January this year (the most recent time for which data are available), total loans and leases extended by American banks increased at an annual rate of 4.5%. As 2011 turned into 2012, the pace slowed modestly, no doubt reflecting the caution alluded to by bankers in the latest Fed survey, but the expansion has nonetheless continued at an annual rate approaching 3.0%.

The most significant and most encouraging aspect of the picture, at least where the economy is concerned, is the recent rise in commercial and industrial lending. From last June until the end of this January, it expanded at an annual rate of more than 12%, indicating not just greater willingness to extend credit among bankers but also a greater demand for funds among businesses. Because such lending mostly supports the medium and small-sized businesses that also do most of the hiring in this economy, this trend, however tentative, stands as particularly significant.

The dark side of the lending picture, not surprisingly, remains real estate. Overall, such lending fell at a 1.2% annual rate between last June and year-end 2011, a welcome relief from the near free fall of earlier years, but a decline nonetheless. A modest 0.3% uptick in January's real estate lending (3.6% at an annual rate) offers the hint of a turn, but one month does not a trend make. Even with all the caveats and pauses, the admittedly modest turn in lending does give reason to look for the economy at last to show a more thorough response to the Fed-provided liquidity of past years. Money growth offers one sign of that turn. While the liquidity remained bottled up and unable to reach depositors and borrowers, money growth remained modest. But in the last six months, as bank lending has increased, it has expanded at almost a 12% annual rate.

This recent movement of liquidity from reserves into the economy signals that past Fed policy efforts should at last begin to have the broader effect going forward that the Fed has long sought. Perhaps as this change becomes more evident and secure, Fed chairman Ben Bernanke and his fellow policymakers will see less need for a third quantitative easing. ●

**Past performance is not a guarantee of future results.**

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**Tracking Error:** A measure of the degree of deviation between a portfolio and an index or composite. Historical tracking error is calculated by subtracting the benchmark return from the portfolio return for each monthly period and finding the population standard deviation of the resulting series.

**Sharpe Ratio:** A measure of an investment's risk-adjusted returns. It is calculated by dividing an investment's returns in excess of the risk-free rate (i.e., Treasury bill rates) by the investment's standard deviation.

**Information Ratio (IR):** An assessment of the value generated by active management of the portfolio. It is calculated by subtracting the benchmark return from the portfolio return and dividing by the tracking error.

**Alpha:** A measure of risk-adjusted performance, or the value added by a portfolio manager. It is calculated as the difference between the portfolio's historical performance for a time period and its expected performance (defined as the return of a diversified market portfolio at the same level of systematic risk over that period).

**Beta:** A measure of an investment's sensitivity to market movements; it is used to assess market-related, or systematic, risk.

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