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VIX – mirror or crystal ball?

Newsflash

A new month and the 70th issue of Viewpoint from FP.

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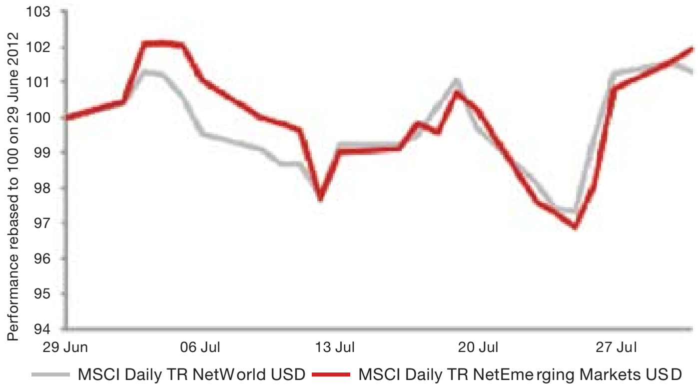
Equity markets traced a W-shaped path in July, as investors rapidly adjusted their expectations in response to news from the US and Europe. Emerging markets moved in tight formation with their developed counterparts, falling over the first two weeks of the month, rallying, dipping anew, before ultimately finishing with a flourish.

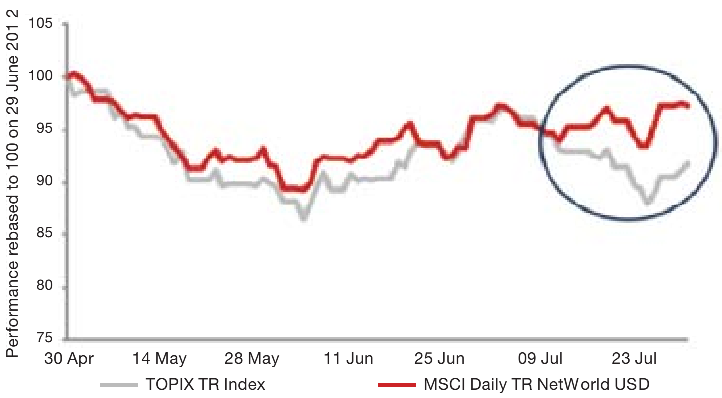
Figure 1: Paths of developed and emerging market equities in July



Equities hit their most recent floor in early June. The subsequent rally has seen traditional 'defensive' sectors, such as consumer staples and health care, outperform cyclicals. This may reflect the fact that macroeconomic data has continued to disappoint, whilst the overall market enjoys a favourable tailwind from factors such as low government bond yields and the upside risk posed by central bank intervention. Alternatively, it may be indicative of investors 'playing it safe', as they choose to increase their equity exposure via higher quality, high yielding defensive sectors.

Despite recurrent bouts of anxiety, the S&P 500 index has enjoyed its best start to a year since 2003, up by 10.6% including reinvested dividends. Asia Pacific excluding Japan is now the best performing region in 2012, after adding 6.6% last month. Japan was the only region to lose ground in July, declining by 4.4% in yen terms, after decoupling from other major markets during the middle of the month.

Figure 2: Underperformance of Japanese equities

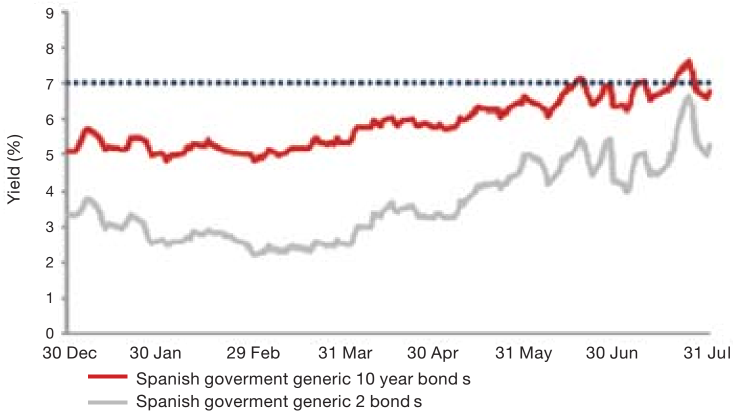


Global government bonds added 1.0% last month. Investment grade corporate debt proved to be the sweet spot for fixed income investors on both sides of the Atlantic during July, as spreads narrowed by circa 25 basis points (0.25%). US dollar denominated emerging market bonds rallied by 4.4% to bring year to date returns to 11.6%.

Global property securities outperformed equities for the fourth month in a row during July. Investors are now paying over sixteen times last year's earnings for property companies (including publically listed property companies and interests in property investment funds) compared to an average of 14.9 times for the broad market.

Finally turning to commodity markets, oil rallied by 14.9% last month with Brent crude prices for delivery in September rising by 7 dollars to USD 104.9 per barrel. Agricultural commodities added 9.9%, driven by the worst drought in the US Midwest in half a century.

Investor anxiety grew at the start of July, as several Spanish regions turned to the central government for financial aid. Yields on Spanish 10 year government bonds climbed to over 7.5% and, perhaps more worryingly in light of the fact that much of the European Central Bank's (ECB) funding support to date has been focused on the short end of government yield curves, two year borrowing rates approached 7%, double their level at the start of the year:



Once more anxiety triggered a response from policymakers. The key turning point was ECB President Mario Draghi's speech in London a few days before the month end, which included two key comments; namely that "the ECB will do whatever it takes to preserve the euro – and believe me it will be enough", and "to the extent that the size of these sovereign premia hampers the functioning of the monetary policy transmission channel, they come within our mandate". This statement of intent from the Central Bank prompted a sharp fall in peripheral bond yields, as investors looked forward to imminent intervention.

A week later and Mr. Draghi had softened his rhetoric. The ECB's failure to implement secondary market purchases of Spanish bonds or announce a firm action plan to help reduce these aforementioned 'sovereign premia' disappointed investors. Markets initially sold off, but within a couple of days the risk on pattern re-emerged, as further analysis of the ECB statement showed that the Bank is willing to support

Source: Lipper Hindsight / Bloomberg. Returns in US dollars unless otherwise stated. July 2012.

peripheral countries by buying their bonds, on the condition that they first apply for assistance from the Eurozone. Whilst implementation risks remain, the Bank has moved a long way in the past two months, a welcome sign for investors given the importance of the institution to Europe's attempts to navigate a path out of its debt crisis. While the ECB cannot solve the underlying problems in the region, it can buy countries time to address their fiscal imbalances.

Despite no bond purchases having taken place to date and Spain is still to apply for a bailout. The stage has been set, however, for both these outcomes in the coming weeks. Spanish two year bond yields have halved since 24 July to 3.5%. The time bought by the ECB's actions must be used to embed structural reforms. With much of Europe mired in recession, the ECB's new stance does not represent a panacea. Given the time reforms are likely to take to bed-in, periodic 'stress-intervention' inflections in markets are expected to continue.

US jobs growth exceeded expectations at the end of July, helping to underpin further gains for equity markets in recent weeks. Whilst investors should be wary of placing too much emphasis on a single data point (and one which has been subject to large revisions in the past) the balance of probabilities continues to support a low but positive growth path for the US economy, rather than a recessionary one, with the private sector acting to offset the cutbacks in the public sector which are expected to continue for many years to come. Investors remain confident that US policymakers will take the necessary steps to address issues such as the government debt ceiling and the 'fiscal cliff', with the House of Representatives so far having moved to extend the Bush-era tax cuts for another year.

The next few weeks will see markets continue to focus on events in the Eurozone, starting with the German constitutional court's hearing to approve the European Stability Mechanism (Europe's permanent bailout facility) in September, and the announcement of a bank supervisor to oversee a European banking union also expected next month.

Source: Lipper Hindsight / Bloomberg. Returns in US dollars unless otherwise stated. July 2012.

Asset Class Performances

Asset Class/Region	Index	To 31 July 2012 Currency	Month	Year to date
Developed Markets Equities				
United States	S&P 500 NR	USD	1.4%	10.6%
United Kingdom	FTSE All Share TR	GBP	1.3%	4.7%
Continental Europe	MSCI Europe ex UK NR	EUR	4.2%	8.6%
Japan	Topix TR	JPY	-4.4%	2.3%
Asia Pacific (ex Japan)	MSCI AC Asia Pacific (ex Japan) TR	USD	6.6%	12.9%
Global	MSCI World NR	USD	1.3%	7.3%
Emerging Market Equities				
Emerging Europe	MSCI EM Europe NR	USD	2.1%	8.8%
Emerging Asia	MSCI EM Asia NR	USD	2.0%	7.1%
Emerging Latin America	MSCI EM Latin America NR	USD	1.3%	0.8%
BRICs	MSCI BRIC NR	USD	1.3%	1.7%
Global Emerging Market	MSCI EM (Emerging Markets) NR	USD	2.0%	6.0%
Bonds				
US Treasuries	JP Morgan United States Government Bond Index TR	USD	1.1%	2.7%
US Treasuries (inflation protected)	Barclays Capital U.S. Government Inflation Linked TR	USD	2.0%	6.3%
US Corporate (investment grade)	Barclays Capital U.S. Corporate Investment Grade TR	USD	2.9%	7.7%
US High Yield	Barclays Capital U.S. High Yield 2% Issuer Cap TR	USD	1.9%	9.3%
UK Gilts	JP Morgan United Kingdom Government Bond Index TR	GBP	2.1%	3.9%
UK Corporate (Investment grade)	BofA Merrill Lynch Sterling Non Gilts TR	GBP	3.9%	9.1%
Euro Government Bonds	Citigroup EMU GBI TR	EUR	1.6%	5.3%
Euro Corporate (investment grade)	Barclays Capital Euro Aggregate Corporate TR	EUR	2.4%	8.3%
Euro High Yield	BofA Merrill Lynch Euro High Yield Constrained TR	EUR	2.1%	14.0%
Japanese Government	JP Morgan Japan Government Bond Index TR	JPY	0.4%	1.8%
Australian Government	JP Morgan Australia GBI TR	AUD	0.0%	5.3%
Global Government Bonds	JP Morgan Global GBI	USD	1.0%	1.4%
Global Bonds	Citigroup World Broad Investment Grade (WBIG) TR	USD	0.9%	2.3%
Global Convertible Bonds	UBS Global Convertible Bond	USD	0.8%	6.9%
Emerging Market Bonds	JP Morgan EMBI +	USD	4.4%	11.6%

Source: Lipper Hindsight. July 2012.

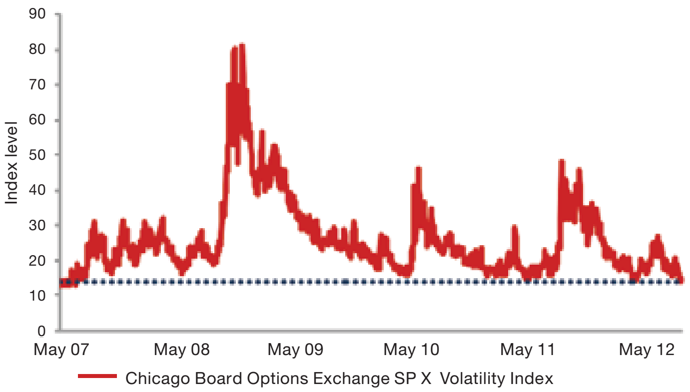
		To 31 July 2012		
Asset Class/Region	**Index**	**Currency**	**Month**	**Year to date**
Property				
US Property Securities	MSCI US REIT TR	**USD**	1.9%	16.5%
UK Property Securities	FTSE EPRA/NAREIT United Kingdom TR	**GBP**	5.3%	20.2%
Europe ex UK Property Securities	FTSE EPRA/NAREIT Developed Europe ex UK TR	**EUR**	6.2%	17.6%
Australian Property Securities	FTSE EPRA/NAREIT Australia TR	**AUD**	5.5%	23.0%
Asia Property Securities	FTSE EPRA/NAREIT Developed Asia TR	**USD**	5.9%	25.2%
Global Property Securities	FTSE EPRA/NAREIT Developed TR	**USD**	3.6%	19.5%
Currencies				
Euro		**USD**	-3.0%	-5.1%
UK Pound Sterling		**USD**	-0.1%	0.8%
Japanese Yen		**USD**	2.2%	-1.5%
Australian Dollar		**USD**	2.7%	2.6%
South African Rand		**USD**	-0.4%	-1.7%
Commodities				
Commodities	RICI TR	**USD**	5.8%	0.3%
Agricultural Commodities	RICI Agriculture TR	**USD**	9.9%	9.7%
Oil	ICE Crude Oil CR	**USD**	14.9%	-1.2%
Gold	Gold index	**USD**	1.5%	5.9%
Hedge Funds	HFRX Global Hedge Fund	**USD**	0.5%	1.8%
Interest Rates			**Current rate**	**Change at meeting**
United States	1 August 2012	**USD**	0.25%	-
United Kingdom	2 August 2012	**GBP**	0.50%	-
Eurozone	2 August 2012	**EUR**	0.75%	-
Japan	11 July 2012	**JPY**	0.10%	-
Australia	7 August 2012	**AUD**	3.50%	-
South Africa	19 July 2012	**ZAR**	5.00%	-0.50%

Source: Lipper Hindsight. July 2012.

Focus: VIX – mirror or crystal ball?

Recently the VIX index has fallen to a five year low, which provides an opportunity to reassess what insight the index brings to investors. Large volumes of copy have been dedicated to this topic, much of which includes speculation as to what the breaching of such a psychological barrier means for investors, although there appears to be little substance to many of the articles.

Figure 1: Implied volatility at five year low

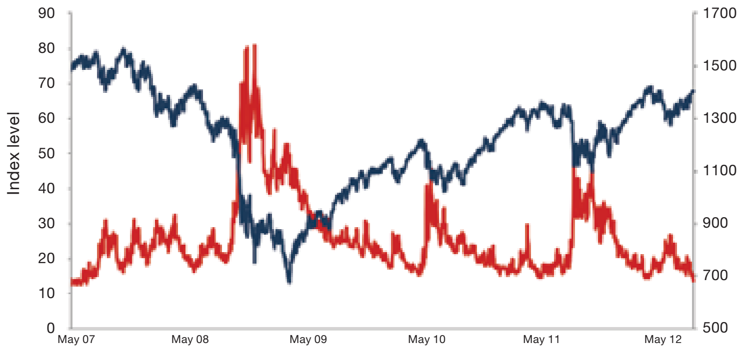


The VIX index is a popular measure of expected equity market volatility. It is an implied volatility figure derived from option prices on the S&P 500 by the Chicago Board Options Exchange (CBOE), rather than being an ex post measure calculated from historical index returns. At any point in time, VIX represents a measure of the market's implied volatility for the S&P 500 for the next 30 days.

As VIX is a forward looking measure, it is often referred to as the 'fear index', as implied volatility spikes at moments of investor anxiety. Although this is interesting to note, it is not in itself particularly insightful. The use of ex post measures would often enable investors to draw the same conclusion, and so at the outset questions must be asked of the authenticity of such an index. In the years following the financial crisis the VIX has become almost a tool for journalists and market commentators to graphically display what participants in the markets can intuitively feel on a daily basis, namely that the anxiety of their peers has risen.

Aside from a graphical illustration of one of the inputs to options pricing, what else could the VIX be used for? Many assume the VIX has a degree of forecasting power, but this is not necessarily the case. Figure 2 shows that the S&P 500 and the VIX index tend to move in opposite directions. Intuitively this makes sense because the latter is based on the price of derivatives of the former.

Figure 2: VIX and S&P 500



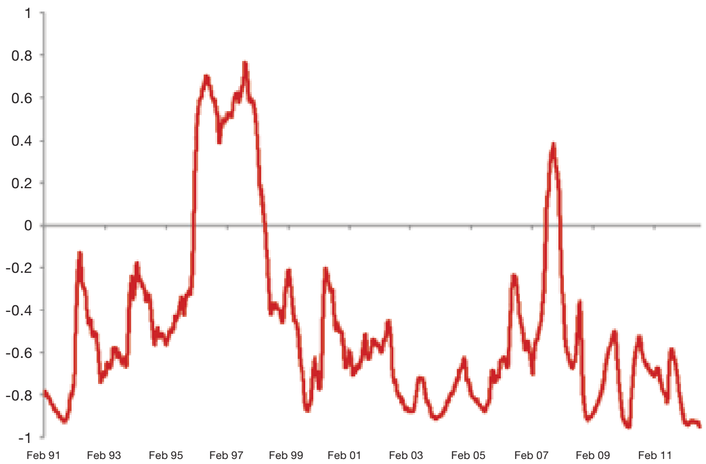
Furthermore, Figure 3 shows the extent of the rise of the VIX, whilst the S&P 500 has been in a large drawdown during the same period. This corroborates the view that the VIX tends to move in the opposite direction to the S&P 500 especially, at times of market stress. It should also be noted that whilst the direction of change is consistent, the relative magnitudes of change clearly are not.

Figure 3: VIX as a bear market hedge during the ten largest drawdowns of the S&P 500 index since 2000

Start	End	S&P 500	VIX Index
29/082008	27/10/ 2008	-34.7%	287.7%
28/05/2002	23/07/2002	-26.4%	121.2%
10/02/2009	09/03/2009	-22.2%	6.4%
06/11/2008	20/11/2008	-21.0%	27.0%
03/08/2001	21/09/2001	-20.9%	114.5%
31/01/2001	04/04/2001	-19.7%	54.7%
25/07/2011	08/08/2011	-16.8%	148.1%
12/09/2002	09/10/2002	-14.6%	12.3%
15/01/2003	11/03/2003	-14.1%	31.8%
26/04/2010	07/06/2010	-13.7%	109.3%

This observation in respect of correlation is not unique to periods of market stress; not only do these indices seem to move in a manner that opposes one another, they are more often than not highly negatively correlated. This is evidenced in Figure 4, which depicts the rolling 300 day correlation, and is negative the majority of the time.

Figure 4: Rolling 300 day correlation between VIX and S&P 500 index

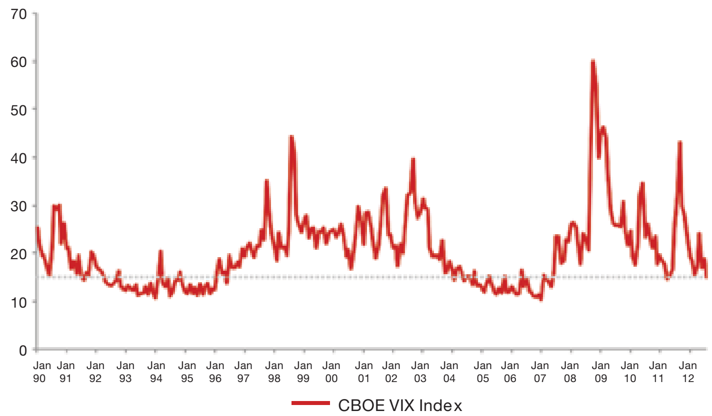


Given this observation and the fact that the VIX is presently at a five year low, are there any clear signals for investors at this juncture? If the logic that negative correlation as a forecast for the S&P is taken further, it would suggest that the equity market is 'due' a sell off, but research presented later in this document suggests that this is not necessarily the case. This is premised on the observation that the VIX does seem to have a 'floor', around its present level, but as can be determined from 2007, isolated increases in the VIX from the floor do not necessarily mean that equity markets should retreat.

As Figure 1 suggests, today's VIX level is low relative to its recent history and even to the period between 2003 and 2007. It shows why some investors consider the recent choppy levels of implied volatility unusual, and that today's low level is more appropriate, rather than believing it is due to increase.

This is not necessarily the case, however. If attention is turned to a longer time series, such as shown at Figure 5, different conclusions may be drawn. This data series demonstrates that the history of implied volatility is a varied one and that periods of high volatility are as common as periods of low volatility. Indeed in the period from 1990 to date, the recent volatility appears more 'normal' than the preceding period between 2003 and 2007, where volatility remained stubbornly low.

Figure 5: VIX since inception



Using daily VIX data back to 2000, the VIX has spent 84% of days above its present level, confirming that the present level is lower than average. The mean average level over this period is 22.2. Furthermore, using monthly data back to 1990, the VIX index has spent 72% of months above its present level, and has a mean average level of 20.5.

The VIX may or may not be a good indicator of future index moves, although the reality is that it is probably a better measure of present anxiety. It would be fair to assume that as the VIX falls, the market is relatively more comfortable compared to periods of when it is higher. Therefore, if one presumes the VIX is indeed a 'fear index', periods that see it fall to low levels should bode well for the equity markets.

However, this is not necessarily the case, as the average 30 day return immediately following a day when the VIX closes below 15 is a mere 0.1%, hardly an emphatic return given the VIX index spends over 80% of the time above this level. This implies that the largest component of long run equity returns is generated when the VIX is at higher levels. The 30 day return of 0.1% suggests that there is little to provide conviction either way, as it is far from an emphatic return given VIX hitting an unusually low level. What is evident, however, is that when VIX is below 15, there is a reasonable likelihood that it will increase from that level. The only period in recent history where this did not occur during a protracted period was between 2003 and 2007.

Whether the VIX is a useful predictor of the S&P remains moot, and arguably the relationship between the S&P and the VIX may be in reality far more coincidental than genuinely a causal one. This underscores why investors must not place too great a reliance on any single measure when assessing the potential opportunities reflected in investment markets. It is imperative to remain broadly based from an analytical perspective in order to ensure that an adequate but not overwhelming amount of data is enlisted for the investment decision process.

The VIX level may not be a good indicator of future volatility in isolation. Over the past three years, the market has moved outside of the expected range derived from options prices on more than 75% of occasions, suggesting little predictive accuracy. For example, in the 30 day return data which generates the 0.1% return in the above analysis, the outcomes range from +8.0% to -17.3%.

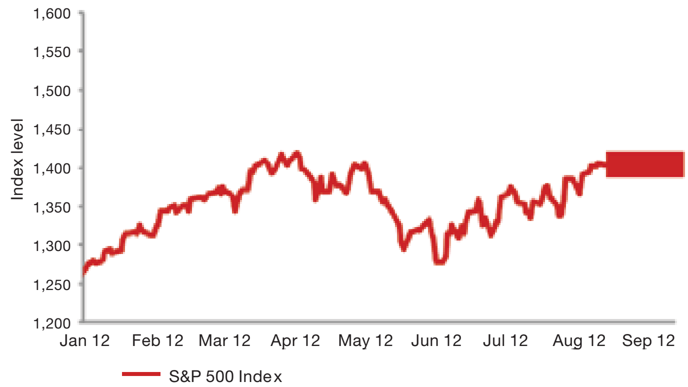
And so to the future.

The following findings have been drawn from using the VIX as an implied means of deriving the likely outcomes of the S&P 500 for the next 30 days.

As of the time of writing, the VIX implies that the return on the S&P 500 index, the most widely quoted index of US stocks, is expected to remain within ± 13.7% (on an annualised basis) of its current level. Assuming this annualised level is correct, one may infer that in approximately thirty days time the S&P 500 index is expected to be within ±1.1% of its level today, based on the price of options traded on the Chicago Board Options Exchange.

Figure 6 depicts these potential outcomes and a striking feature of the graph is how narrow the window of potential outcomes appears. Of course, as the VIX increases so does the fan chart of potential outcomes, and so this apparent certainty of potential outcomes is a consequence of today's low VIX. Perhaps then, the key observation to make from VIX is that where the absolute level is low, the investment and analyst community are expecting a narrow potential range of outcomes from today's S&P 500 level. From the cursory analysis undertaken above, it is suggested that the VIX has little genuine predictive power given the average 30 day gain of 0.1% within a range of over 25% and so perhaps what it highlights is simply periods when the investment community have an unfounded belief that they have a better handle on what is going on – complacency perhaps?

Figure 6: Implied path of S&P 500 by VIX



In such circumstances investors tend to underestimate the magnitude of potential outcomes from a particular point and therefore perhaps this is a time for the circumspect to be cautious. When the VIX is at such a level it is a certainty for investors that the price of options is relatively low and perhaps, given the actual uncertainty with respect to potential outcomes from here, it would be prudent to establish portfolio insurance strategies with options while they remain cheap. The ability to do this depends on the individual investor mandate, and using these securities requires skill and deep knowledge of the market.

It is clear that there is a strong and generally negative correlation between the VIX and the S&P 500. While this relationship is generally a moderate to strong negative correlation, this relationship can experience bouts of positive correlation too, immediately reducing the use of VIX as a hedge for the S&P 500 and also bringing into question its predictive power.

A further issue with respect to this is that ex post correlation is not a predictive tool per se and rather this data simply describes the tendency of two data series to have moved together in the past. The fact that there is generally a negative relationship between the two makes sense as the VIX is designed to have a negative correlation with the S&P. The VIX is essentially derived from the price of derivatives on the S&P 500 and so for there to be little or no correlation between the two series would be a surprise. As a result, it is perhaps better to think of the VIX as an excellent mirror, unfortunately, rather than a good crystal ball.

This finding suggests that investors must remain broadly focused when it comes to asset allocation inputs. As valuation driven investors, we believe that value is the key determinant of long term returns, but we are also pragmatic and ensure that we are alive to the possibility of different signals provided by technical sources, for example. By remaining open to many different inputs rather than myopically focused on a few, investors have the best chance of generating returns over the long term.

James Klempster, CFA, Multi Asset Portfolio Manager
Source: Bloomberg, July 2012.

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