Market Insights

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2011: A Year of Correlation Extremes

Correlation across assets is the new risk

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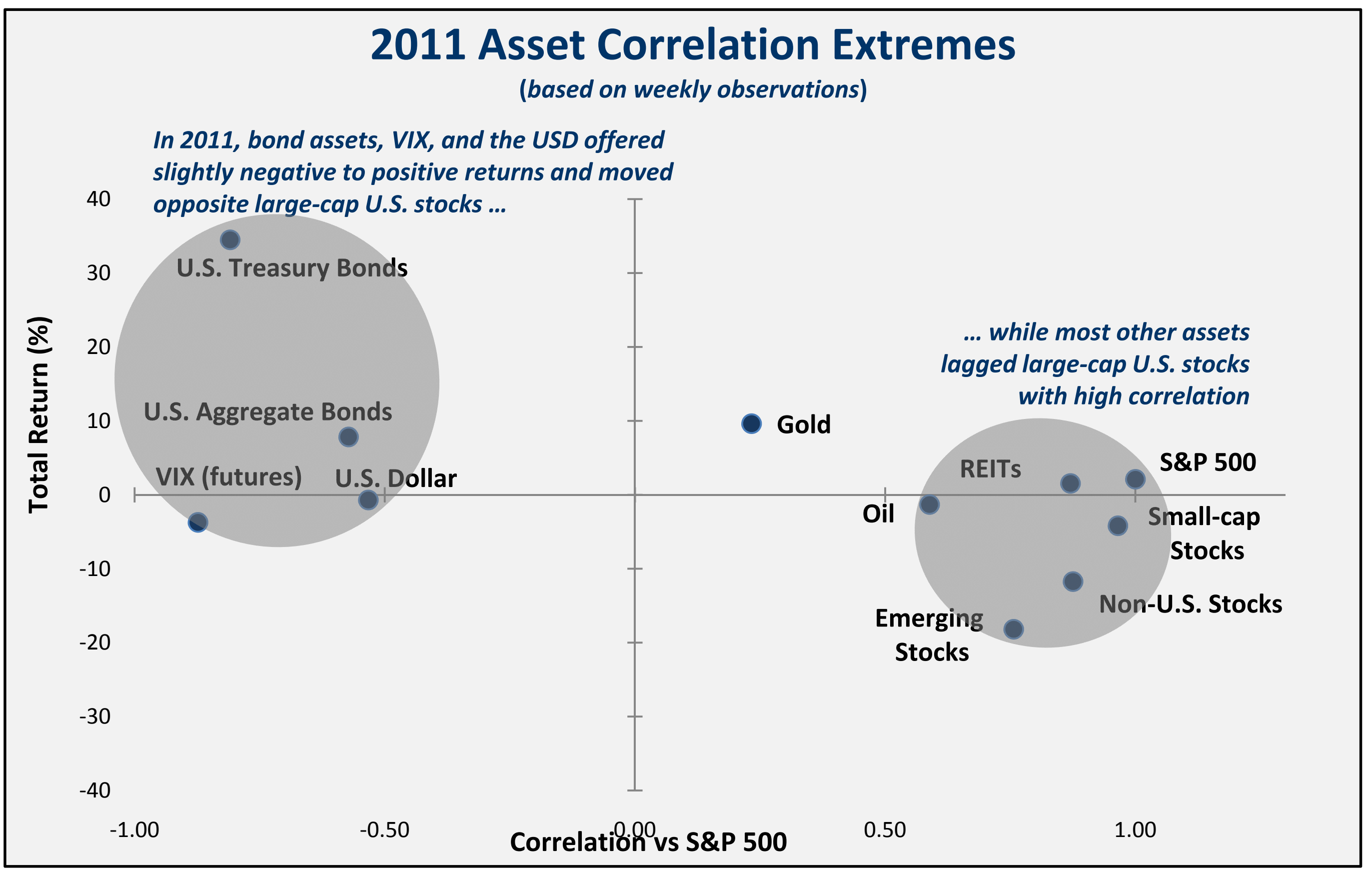
- 2011 was a year of extremes for cross-asset correlations:
  - U.S. Treasury Bonds vs. S&P 500 correlation was -0.81, a 13-year low
  - The U.S. Dollar vs. S&P 500 correlation was -0.53, nearing a 30-year low
  - The correlation between large-cap U.S. stocks and other stock segments (small-cap U.S., non-U.S., emerging, value and growth stocks) continued to rise, approaching +1 in many instances
- Rising correlations among portfolio holdings can reduce diversification benefits and increase overall portfolio volatility
- Given continued uncertainty in European and U.S. markets, investors expecting heightened market volatility in 2012 should expect correlation extremes to persist

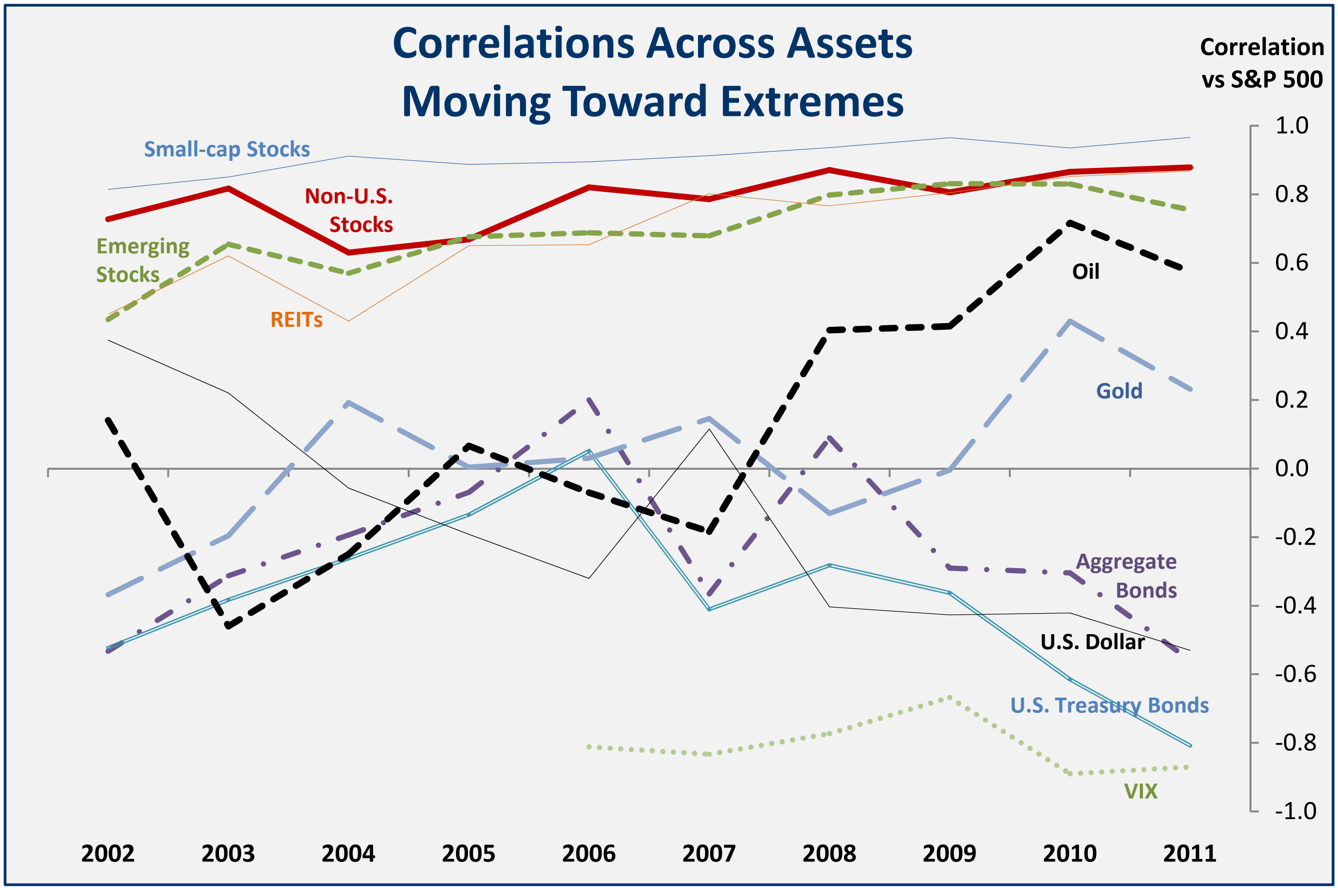
Exhibit 1



Source: Factor Advisors, Bloomberg

Past performance is no guarantee of future results.

Exhibit 2



Source: Factor Advisors, Bloomberg, based on rolling 52-week correlations with S&P 500

Most of the ten asset classes shown in Exhibit 2 (above) are at either the highest or lowest correlations to the S&P 500 in the last ten years. With correlations moving toward relative extremes, either strongly positive or strongly negative, assets can be defined as either "risk on" or "risk off" assets.

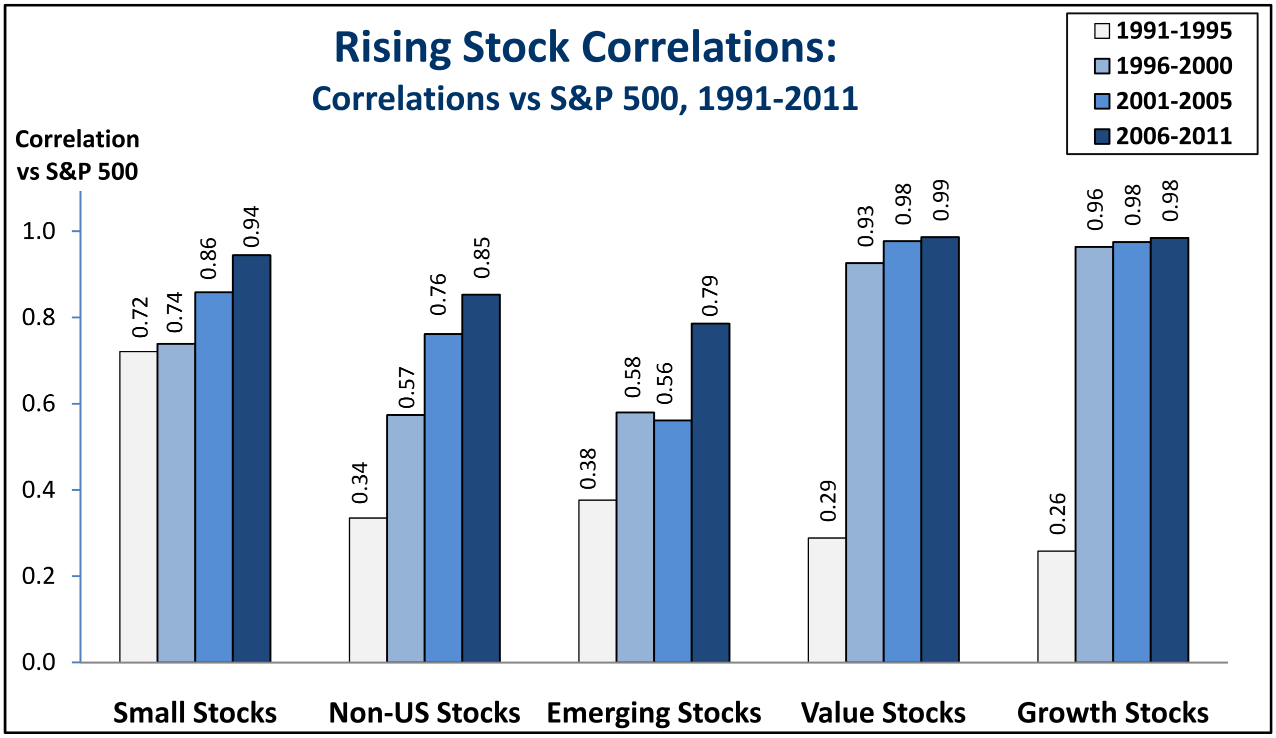
"Risk on" assets are positively correlated to large cap U.S. stocks and follow similar price paths in the short run. For "risk on" assets:

- When large-cap U.S. stocks decline, it is likely that "risk on" assets such as small-cap stocks, non-U.S. stocks and emerging stocks will also decline. Conversely, when large-cap U.S. stocks rise, "risk on" assets are also likely to rise.
- For the second straight calendar year, oil exhibited a strong positive correlation with stocks. Throughout much of 2011, oil prices moved in tandem with prices of other "risk on" assets.

In 2011, "risk off" assets, including bonds, VIX and the U.S. Dollar, generally moved opposite large-cap U.S. stocks and were used by investors to hedge a stock portfolio due to their strong negative correlations with large-cap U.S. stocks.

Although gold is sometimes categorized as a "risk off" asset with a flight-to-quality story, its historical correlation with stocks averages zero. Despite several months of strong negative correlation in 2011, gold's correlation with large-cap U.S. stocks finished the year at +0.23.

Exhibit 3



Source: Factor Advisors, Bloomberg

Correlation is a statistical measure of how two securities or assets move in relation to each other, ranging between -1 (move perfectly in opposite directions) and +1 (move perfectly in the same direction), with a correlation of 0 indicating a random relationship. For many investor portfolios, a low correlation among holdings may offer diversification benefits and lower overall portfolio volatility.

Observing five-year periods of correlation over the last two decades (as highlighted above), all five equity segments (small-cap U.S. stocks, non-U.S. stocks, emerging, value, growth) experienced a consistent rise in correlation compared to large-cap U.S. stocks.

In 2011, these correlations continued to approach +1. As a result, the benefit of diversifying in other equity segments was greatly reduced. If this trend persists, investors may want to consider non-stock investments in 2012 in order to potentially improve portfolio efficiency.

It is also worth noting in 2011 that:

- Large-cap U.S. stocks were the only equity segment that posted positive returns (2.1%); small-cap U.S. stocks lagged large-cap U.S. stocks by over 6%.
- Non-U.S. and Emerging stocks also exhibited strong positive correlations to large-cap U.S. stocks, but their performance was worse; both segments experienced double digit declines.
- Volatility was high across equity assets, yet large-cap U.S. stocks were less volatile than small-caps (see Exhibit 4).

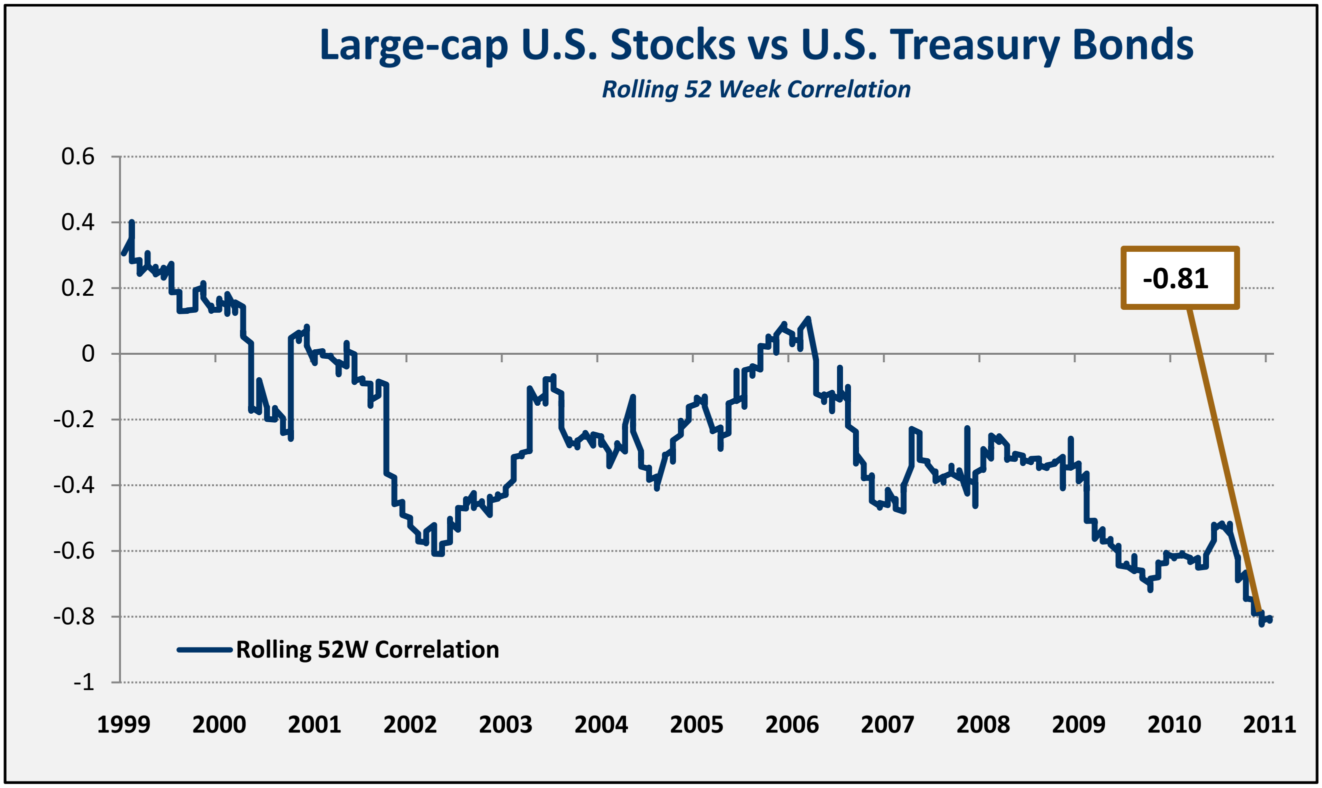
Exhibit 4

2011 Scorecard	Correlation*	Return (%)	Volatility (%)
Large U.S. Stocks	1.00	2.1	21.4
Small U.S. Stocks	0.97	-4.2	28.9
Non-U.S. Stocks	0.88	-11.7	24.4
Emerging Stocks	0.75	-18.2	27.1

** vs S&P 500*

Source: Factor Advisors, Bloomberg

Exhibit 5



Source: Factor Advisors, Bloomberg

Observing a 52-week horizon in Exhibit 5 (above), large-cap U.S. stocks and U.S. Treasury Bonds finished 2011 at a 13 year low (-0.81).

While the relationship between large-cap U.S. stocks and U.S. Treasuries has been negative for much of the last decade, the second half of 2011 showed an unprecedented negative correlation. In spite of the U.S. downgrade in August, investors increasingly looked to U.S. Treasury Bonds as a flight-to-quality play while stocks were under duress.

With correlations moving deeper into negative territory, U.S. Treasury Bonds are becoming an increasingly attractive hedging alternative for a portfolio; they are likely to remain a popular alternative to stocks in volatile markets which suggests this negative correlation may persist.

Other bond categories performed similarly in 2011. For example, Aggregate Bonds exhibited a strong negative correlation to the S&P 500 (-0.57) while providing investors higher returns and lower risk (See Exhibit 6).

Exhibit 6

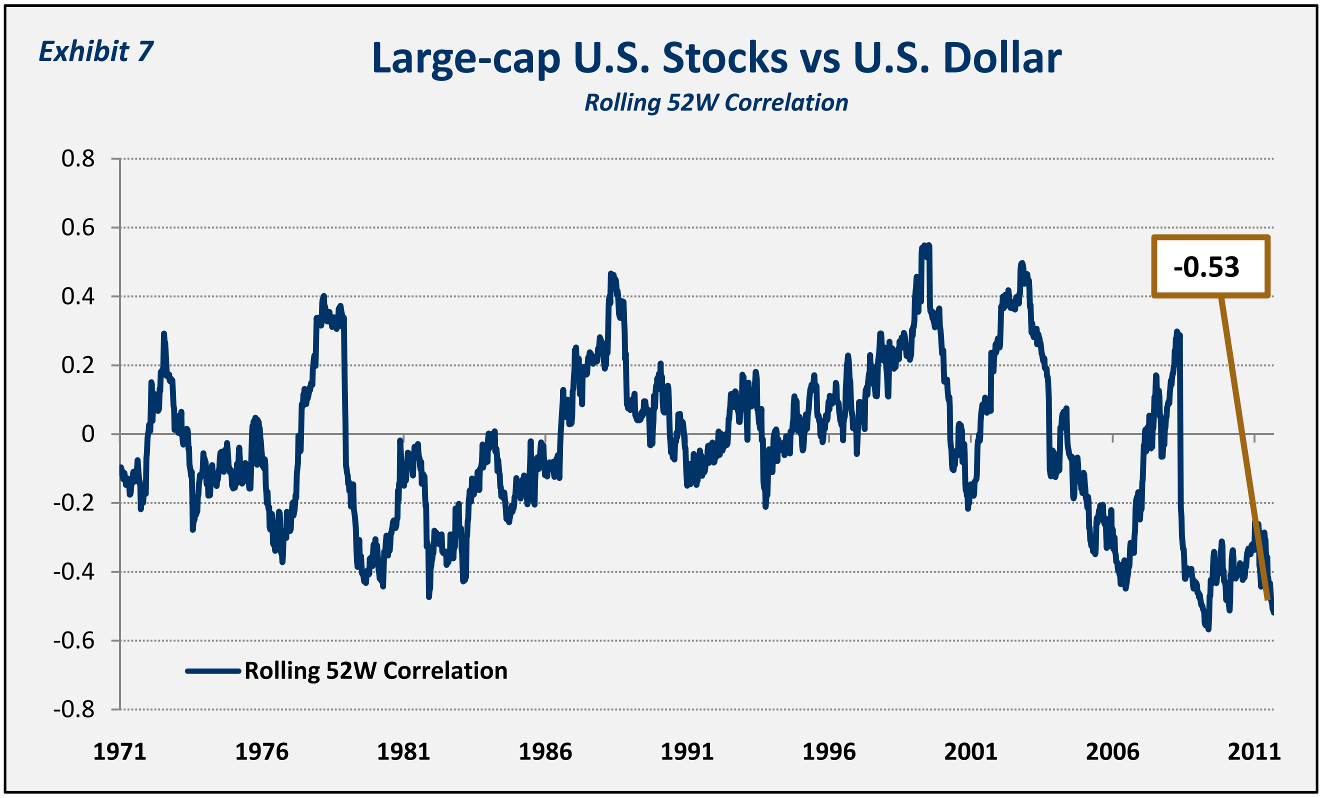
2011 Scorecard	**Correlation***	**Return (%)**	**Volatility (%)**
Large U.S. Stocks	1.00	2.1	21.4
Aggregate Bonds	-0.57	7.8	3.6
U.S. Treasury Bonds	-0.81	34.5	17.5

* *vs S&P 500*

Source: Factor Advisors, Bloomberg

Correlations between alternative investments and large-cap U.S stocks were mixed in 2011. Oil exhibited strong positive correlation with the S&P 500 throughout 2011 (+0.57), often moving in lock-step with stocks on a day-to-day basis. Gold finished 2011 with a correlation of (+0.23). Its 3-month correlation with large-cap U.S. stocks oscillated, and temporarily headed deep into negative territory in late summer as gold reached new highs and stocks sold off. On 9/8/2011, gold vs. S&P 500 3-month correlation was -0.52.

Exhibit 7



Source: Factor Advisors, Bloomberg

For correlation observers, the U.S. Dollar is perhaps the most interesting asset in 2011. As highlighted in Exhibit 7 above, similar to U.S. Treasuries, the U.S. Dollar is near all-time lows in its correlation to large-cap U.S. stocks (-0.53). This strong negative correlation indicates that investors view the U.S. Dollar as a strong currency relative to the Euro and the British Pound, whose correlations with large U.S. stocks have risen simultaneous with the Dollar's decline in correlation.

VIX continued its very strong negative correlation with stocks (-0.87), serving investors as a tactical hedge against short-term stock declines. In 2011, REITs recorded their highest correlation to the S&P 500 in the last decade (+0.87).

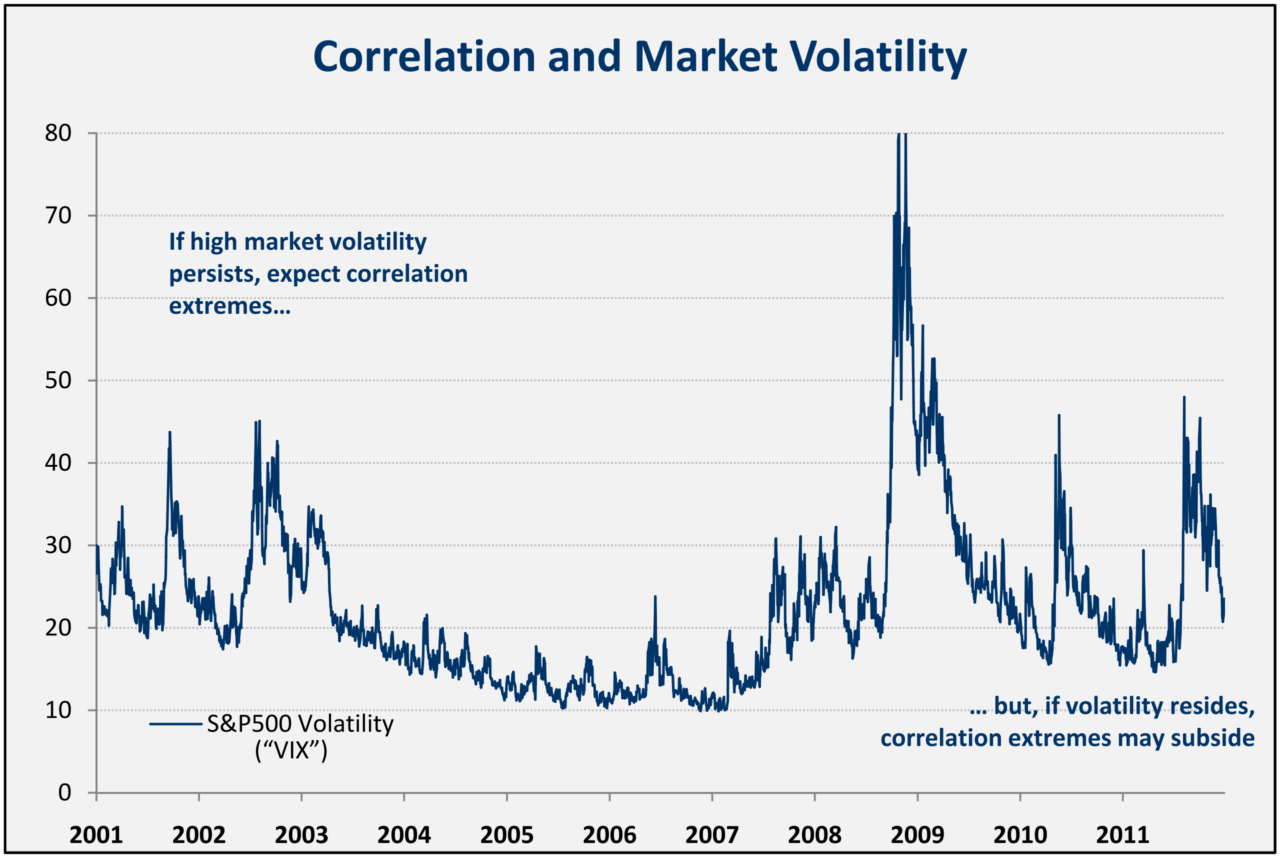
Exhibit 8

2011 Scorecard	Correlation*	Return (%)	Volatility (%)
Large U.S. Stocks	1.00	2.1	21.4
Gold	0.23	9.6	21.7
Oil	0.57	-1.3	32.0
REITs	0.87	1.6	24.0
VIX	-0.87	-3.7	76.2
U.S. Dollar	-0.53	-0.7	10.0

* *vs S&P 500*

Source: Factor Advisors, Bloomberg

Exhibit 9



Historically, correlation across assets increases when broad market volatility also increases.

If the sovereign debt turmoil heightens in Europe in 2012, or if other geopolitical events incite defensive selling in stocks, correlations for "risk on" assets will likely remain high and correlations for "risk off" assets may remain low.

If many assets, including alternatives, continue to move in tandem, portfolio volatility may remain high. Investors in 2012 may want to consider assets exhibiting low or possibly negative correlation to traditional holdings in their portfolios.

With cross-asset correlation in 2011 at relative extremes, it should be noted that correlations historically do not remain at extremes. If volatility subsides, it can be anticipated that correlations would revert back to historical averages. Given continued uncertainty in European and U.S. markets, however, investors should be prepared for more volatility in 2012 and high correlation across many "risk on" asset classes.

Glossary*

- **Bonds:** A debt investment in which an investor loans money to an entity (corporate or governmental) that borrows the funds for a defined period of time at a fixed interest rate. Bonds are represented by the Barclays U.S. Aggregate Bond Index, a broad base index maintained by Barclays Capital, often used to represent investment grade bonds being traded in United States.
- **Correlation:** A statistical measure of how two securities or indices move in relation to each other, with a range between -1 (a perfect negative co-movement) and +1 (a perfect positive co-movement).
- **Emerging Stocks:** Stocks from a nation that is progressing toward becoming advanced. Investments in emerging markets come with much greater risk due to political instability, domestic infrastructure problems, currency volatility and limited equity opportunities (large companies may still be "state-run" or private) but also have the potential for high returns. Emerging stocks are represented by the MSCI Emerging Markets Daily Gross USD Index, a sub-index of the MSCI Emerging Market Index. It is a free float-adjusted market capitalization index that is designed to measure equity market performance in the global emerging markets.
- **Gold:** Gold is represented by the S&P GSCI Gold Index, a sub-index of the S&P GSCI. It provides investors with a reliable and publicly available benchmark tracking the COMEX gold futures.
- **Growth Stocks:** Shares in a company whose earnings are expected to grow at an above-average rate relative to the market. Growth stocks are represented by the Russell 1000 Growth Index, which measures the performance of the large-cap growth segment of the U.S. equity universe.
- **Large-Cap U.S. Stocks:** U.S. companies with a market capitalization value of more than $10 billion. Large-cap U.S. stocks are represented by the S&P 500 Index which is a capitalization-weighted index of 500 stocks intended to be a representative sample of leading companies in leading industries within the U.S. economy.
- **Non-U.S. Stocks:** International stocks. Non-U.S. stocks are represented by the MSCI EAFE Daily TR Gross USD, a sub-index of the MSCI EAFE that measures international equity performance. It comprises the MSCI country indices that represent developed markets outside of North America: Europe, Australia and the Far East.
- **Oil:** Oil is represented by the S&P GSCI Oil Index, a sub-index of the S&P GSCI. It provides investors with a reliable and publicly available benchmark for investment performance in the oil commodity markets.
- **Real Estate Investment Trust (REITs)**: A security that sells like a stock on the major exchanges and invests in real estate directly, either through properties or mortgages. REITs receive special tax considerations and typically offer investors high yields, as well as a highly liquid method of investing in real estate. REITs are represented by the Dow Jones U.S. Real Estate Index, which measures the stock performance of REITs and real estate operating companies.
- **Small-Cap U.S. Stocks:** U.S. companies with a market capitalization value between $300M - $2 billion. Small-cap U.S. stocks are represented by the Russell 2000 Index **,** which measures the performance of the small-cap segment of the U.S. equity universe.
- **Total Return Indices:** Measures an index's whole market performance, including price performance and income from dividend or interest payments.
- **U.S. Treasury Bonds:** A marketable, fixed-interest U.S. government debt security with a maturity of more than 10 years. Treasury bonds make interest payments semi-annually and the income that holders receive is only taxed at the federal level. Treasury Bonds are represented by the iBoxx $ Treasuries 20Y+ Index**,** which represents the overall USD sovereign debt issued by the U.S. government.
- **U.S. Dollar:** The U.S. Dollar is represented by the S&P U.S. Dollar Index® Futures Index, a leading benchmark for the international value of the U.S. Dollar and the world's most widely-recognized trading currency index. It enables market participants to monitor moves in the value of the U.S. Dollar relative to a basket of world currencies, as well as hedge their portfolios against the risk of a move in the U.S. Dollar.
- **Value Stocks:** A stock that tends to trade at a lower price relative to it's fundamentals (i.e. dividends, earnings, sales, etc.) and thus considered undervalued by a value investor. Common characteristics of such stocks include a high dividend yield, low price-to-book ratio and/or low price-to-earnings ratio. Value stocks are represented by the Russell 1000 Value Index, which measures the performance of the large-cap value segment of the U.S. equity universe.
- **VIX:** VIX is represented by the S&P 500 VIX Short Term Futures Index which is designed to provide access to equity market volatility through CBOE Volatility Index® (the "VIX Index") futures. It offers exposure to a daily rolling long position in the first and second month VIX futures contracts and reflects the implied volatility of the S&P 500® Index at various points along the volatility forward curve.
- **Volatility:** The relative rate at which the price of a security moves up and down. Volatility is found by calculating the annualized standard deviation of daily change in price. If the price of a stock moves up and down rapidly over short time periods, it has high volatility. If the price almost never changes, it has low volatility.

**All indices included in the entries above are total return indices, which includes interest and re-invested dividends as applicable.*

Exhibit/ Summary Table Information:

Exhibit 7 – Chart uses U.S. Dollar Index (USDX) spot rate
Exhibit 9 – Chart uses CBOE SPX Volatility Index (VIX)
Summary Table notes: Correlations represent the 52-week correlation to the S&P 500

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