STRATEGY 201 | U.S.

Limiting Risk Without Limiting Equity Exposure

CONTRIBUTOR

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Market volatility can be a powerful enemy of long-term performance. Traditional indexing generally allows investors to diversify individual company risk and still enjoy exposure to 100% of the market return. However, this approach also exposes investors to 100% of the market's volatility, which accounts for the high cost of volatility in a well-diversified equity portfolio. During times of heightened volatility, there is greater demand for broad equity market exposure with built-in control over market volatility.

S&P Dow Jones Indices offers a variety of investment solutions that can help investors attempt to mitigate market volatility while still seeking equity exposure at the same time. These indices provide a new level of innovation for investors looking to gain exposure to the large-cap U.S. equity market. In this piece, we will focus on the following indices, each of which has a distinct approach to limiting market risk:

S&P Dow Jones Indices offers a variety of investment solutions to mitigate market risk while still seeking equity exposure.

- S&P 500® Risk Control Index Series
- S&P 500 Low Volatility Index
- S&P 500 Dynamic VEQTOR Index

The **S&P 500 Risk Control Index** seeks to maintain an established volatility target by dynamically allocating between the S&P 500 and cash, according to a current measure of realized volatility in the equity market. The index increases its allocation to cash when the risk level is too high, and uses leverage when the risk level is too low. The target risk levels available for this index series are 5%, 10%, 12% and 15%. Exposure to the underlying index and cash is adjusted on a daily or monthly basis, depending on the subindex.

The **S&P 500 Low Volatility Index** seeks to control risk through stock selection and alternative weighting. The index consists of the 100 least volatile stocks in the S&P 500, with each stock weighted relative to the inverse of its realized volatility; the least-volatile stocks receive the highest weights. The realized volatilities of the constituents of the S&P 500 are calculated using daily price data for the prior year. These volatilities are used to rank the 500 constituents to determine eligibility for the S&P 500 Low Volatility Index. The index is rebalanced quarterly.

The **S&P 500 Dynamic VEQTOR Index** attempts to hedge equity portfolio tail risk using derivative overlay techniques. It dynamically allocates between the S&P 500 and the S&P 500 VIX Short-Term VIX Futures Index, according to the realized volatility of the equity market and the implied volatility of the S&P 500 options. The allocation is evaluated and adjusted daily. A stop-loss feature is also included to limit downside risk. If the index loses more than 2% in a week, the index allocates 100% to cash.

Exhibit 1 compares the three investment solutions.

Exhibit 1: Comparison of S&P 500 Volatility-Controlled Equity Indices

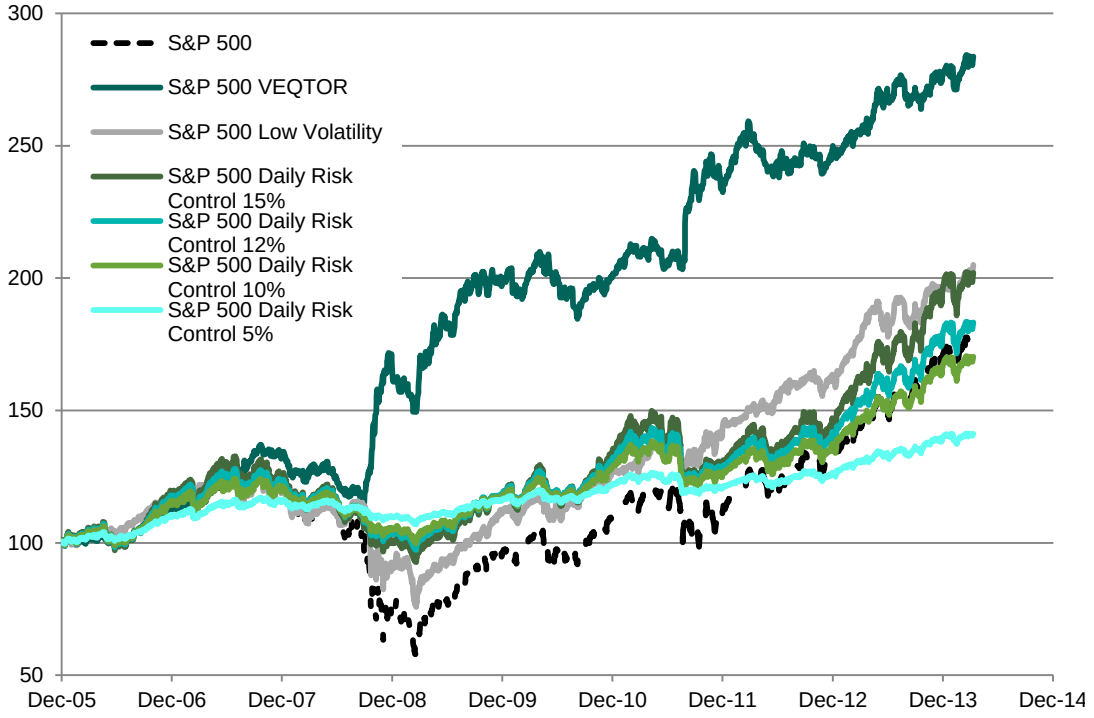
Features	S&P 500 Risk Control Indices	S&P 500 Low Volatility Index	S&P 500 Dynamic VEQTOR Index
Underlying Investments	S&P 500 and cash	100 stocks in the S&P 500	S&P 500, S&P 500 VIX Short-Term VIX Futures Index and cash
Volatility-Control Techniques	Adjusts allocation to equity and cash to maintain the target volatility	Selects the least-volatile stocks and gives them weights that are inversely proportional to their volatilities	Uses the S&P 500 VIX Short-Term VIX Futures Index to hedge equity exposure
Fixed-Volatility Target	Yes	No	No
Stop-Loss Feature	No	No	Yes
Rebalancing Frequency	Daily or monthly	Quarterly	Daily

Compared to the S&P 500, volatility-controlled equity indices have outperformed during certain periods on a risk-adjusted basis.

HISTORICAL PERFORMANCE

Compared to the S&P 500, volatility-controlled equity indices have outperformed during certain periods on a risk-adjusted basis (see Exhibits 2 and 3).

Exhibit 2: Performance History (12/20/2005 – 3/31/2014)



Source: S&P Dow Jones Indices. Indices are normalized to 100 as of Dec. 20, 2005. Data is current through Mar. 31, 2014. Charts are provided for illustrative purposes. Past performance is no guarantee of future results. This chart may reflect hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

Volatility-controlled equity indices have outperformed the broad equity market in a bear market and underperformed in a bull market.

Exhibit 3: Performance and Volatility Statistics (1/1/2006 – 3/31/14)

	S&P 500	S&P 500 VEQTOR	S&P 500 Low Vol	S&P 500 Daily RC 15%	S&P 500 Daily RC 12%	S&P 500 Daily RC 10%	S&P 500 Daily RC 5%
Annual Return							
2006	15.79%	14.15%	19.69%	20.26%	18.28%	16.13%	10.66%
2007	5.49%	17.20%	0.58%	5.02%	4.70%	4.54%	5.13%
2008	-37.00%	21.29%	-21.41%	-18.98%	-14.91%	-12.14%	-5.02%
2009	26.46%	23.39%	19.22%	17.20%	13.73%	11.43%	5.77%
2010	15.06%	1.65%	13.36%	14.50%	11.68%	9.79%	5.03%
2011	2.11%	17.41%	14.78%	-3.43%	-2.50%	-1.93%	-0.73%
2012	16.00%	3.54%	10.30%	10.52%	8.52%	7.17%	3.71%
2013	32.39%	14.31%	23.59%	39.31%	30.70%	25.14%	12.08%
Q1 2014	1.81%	1.20%	3.28%	0.22%	0.14%	0.15%	0.12%
Annual Volatility							
2006	10.03%	7.50%	7.77%	13.61%	11.59%	9.67%	4.83%
2007	16.03%	9.55%	14.29%	15.82%	13.30%	11.35%	5.66%
2008	41.01%	16.16%	29.96%	16.47%	13.17%	10.97%	5.48%
2009	27.25%	14.32%	17.13%	12.04%	9.63%	8.03%	4.01%
2010	18.07%	10.28%	12.75%	14.59%	11.67%	9.54%	4.86%
2011	23.37%	10.78%	16.50%	17.06%	13.63%	11.35%	5.66%
2012	12.74%	8.15%	8.40%	13.50%	10.80%	9.00%	4.50%
2013	11.07%	7.68%	10.20%	14.55%	11.66%	9.71%	4.86%
Q1 2014	12.03%	8.10%	10.12%	15.68%	12.77%	10.63%	5.31%
Maximum Drawdown							
	-55.25%	-17.90%	-40.40%	-30.15%	-24.00%	-19.67%	-8.58%
Number of Calendar Days to Recover from Maximum Drawdown							
	1120	31	665	641	605	401	302
Tickers	SPTR	SPVQDTR	SP5LVIT	SPXT15UT	SPXT12DT	SPXT10UT	SPXT5UT

Source: S&P Dow Jones Indices. Data from Jan. 1, 2006 through Mar. 31, 2014. Charts are provided for illustrative purposes. Past performance is no guarantee of future results. This chart may reflect hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

With reduced volatility, the indices highlighted in Exhibits 2 and 3 have outperformed the broad equity market in a bear market (2007 – 2008) and underperformed in a bull market with moderate or high volatility (2009 – 2010). When the market has risen steadily (2012-2013), however, the S&P 500 Daily Risk Control 15% Index has outperformed by taking extra risk.

Although the S&P 500 Risk Control Indices did not hit their volatility targets every year, their realized volatilities did fluctuate around the targets. Furthermore, fluctuating tightly around a volatility target smoothens out the returns of the index. The S&P 500 Daily Risk Control 5% Index has a smoother return than the other three risk control indices.

In general, the S&P 500 Low Volatility Index participated in broad equity market trends, but with a lower level of volatility. When the market declined in 2008, the S&P 500 Low Volatility Index declined as well, but at a much lower rate. The index tends to also participate in bull markets. It outperformed the S&P 500 in the first quarter of 2014.

The S&P 500 Dynamic VEQTOR Index enjoyed the hedging benefit of the VIX futures in a bear market but suffered from the cost of hedging in a bull market. It was the only index that showed positive returns during the distressed market of 2008, and it had the best performance in 2011. However, it underperformed in 2010, 2012, 2013 and the first quarter of 2014. Its annualized volatility is comparable to and sometimes even slightly lower than that of the S&P 500 Low Volatility Index. Since 2006, the S&P 500 Dynamic VEQTOR Index has had a lower maximum drawdown than others, excluding the S&P 500 Daily Risk Control 5% Index. After the maximum drawdown occurred on September 15, 2008, it recovered to its previous peak in only 31 calendar days and started gaining profit afterwards. The other indices, however, didn't stop their losing streak until March 9, 2009, and it took much longer for them to restore to previous peak values.

CONCLUSIONS

Historically, volatility-controlled equity indices have generally outperformed the broad equity market on a risk-adjusted basis while still providing exposure to the equity market at a lower risk level.

Historically, volatility-controlled equity indices have generally outperformed the broad equity market on a risk-adjusted basis while still providing exposure to the equity market at a lower risk level. An allocation to these indices has tended to achieve a better risk-return trade-off than core equity indices have provided.

Due to their distinct methodology and performance features, the indices we have explored suit different investment risk/return objectives.

- The S&P 500 Risk Control Indices have specific volatility targets as well as a variety of subindices for different risk objectives.
- The S&P 500 Low Volatility Index invests in low-volatility stocks across sectors and, in general, follows the market trend. The index is useful as a benchmark for those seeking market participation at a reduced risk level.
- The S&P 500 Dynamic VEQTOR Index invests in all S&P 500 constituents but also has a built-in derivatives hedge which has performed well in periods of market downturn.

Exhibit 4: Investment Products Linked to S&P 500 Volatility-Controlled Equity Indices

Underlying Index	Product Name	Ticker
S&P 500 Low Volatility Index	PowerShares S&P 500 Low Volatility ETF	SPLV
S&P 500 Dynamic VEQTOR Index	Barclays ETN+ S&P VEQTOR ETN	VQT
S&P 500 Dynamic VEQTOR Index	PowerShares S&P 500 Downside Hedged Portfolio	PHDG
S&P 500 Dynamic Rebalancing Risk Control 15% Index	Direxion S&P 500 RC Volatility Response Shares	VSPY

S&P Dow Jones Indices does not sponsor, promote or endorse any investment product linked to any of our indices. The above is a complete list of all products that are currently linked to the indices discussed in this report.

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Performance Disclosure

The launch date of the S&P 500 Daily Risk Control 5% Index, S&P 500 Daily Risk Control 15% Index and the S&P 500 Monthly Risk Control 12% Index was September 9, 2010, at the market close. All information presented prior to the index launch date is back-tested. The back-test calculations are based on the same methodology that was in effect when the index was officially launched. Complete index methodology details are available at www.spdji.com.

The launch date of the S&P 500 Daily Risk Control 10% Index was May 13, 2009, at the market close. All information presented prior to the index launch date is back-tested. The back-test calculations are based on the same methodology that was in effect when the index was officially launched. Complete index methodology details are available at www.spdji.com.

The launch date of the S&P 500 Daily Risk Control 12% Index was April 21, 2010, at the market close. All information presented prior to the index launch date is back-tested. The back-test calculations are based on the same methodology that was in effect when the index was officially launched. Complete index methodology details are available at www.spdji.com.

The launch date of the S&P 500 Dynamic Rebalancing Risk Control 15% Index was January 3, 2012, at the market close. All information presented prior to the index launch date is back-tested. The back-test calculations are based on the same methodology that was in effect when the index was officially launched. Complete index methodology details are available at www.spdji.com.

The launch date of the S&P 500 Low Volatility Index was April 4, 2011, at the market close. All information presented prior to the index launch date is back-tested. Back-tested performance is not actual performance, but is hypothetical. The back-test calculations are based on the same methodology that was in effect when the index was officially launched. Complete index methodology details are available at www.spdji.com.

The launch date for the S&P 500 Dynamic VEQTOR Index was November 18, 2009 at the market close. The launch date for the S&P 500 Dynamic VEQTOR Mid-Term Index was February 17, 2011 at the market close. The launch date for the S&P 500 Dynamic VEQTOR X Index was September 13, 2010 at the market close. All information presented prior to the index launch date is back-tested. Back-tested performance is not actual performance, but is hypothetical. The back-test calculations are based on the same methodology that was in effect when the index was officially launched. Complete index methodology details are available at www.spdji.com.

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Another limitation of back-tested hypothetical information is that generally the back-tested calculation is prepared with the benefit of hindsight. Back-tested data reflect the application of the index methodology and selection of index constituents in hindsight. No hypothetical record can completely account for the impact of financial risk in actual trading. For example, there are numerous factors related to the equities (or fixed income, or commodities) markets in general which cannot be, and have not been accounted for in the preparation of the index information set forth, all of which can affect actual performance.

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