

U.S. LOW VOLATILITY EQUITY Mandate Search

Recommended:

That State Street Global Advisors (SSgA) be appointed as a manager for a U.S. low volatility equity mandate. SSgA will be managing 10% of the Diversified Equity Fund with their U.S. Managed Volatility Strategy. The strategy will be benchmarked to the Russell 3000 Index.

Rationale:

- SSgA's U.S. Managed Volatility Strategy has one of the longest live track records for this type of strategy (more than four years).
- SSgA's product has met expectations in terms of risk reduction with a standard deviation of returns that is approximately 40% lower than its benchmark.
- SSgA's strategy is well-designed to take advantage of the low-volatility anomaly by being low cost and by not focusing on return expectations.
- SSgA would handle the transition from the S&P 500 Hedged strategy that they currently manage. This will make the transition easier and cheaper.
- SSgA will take existing assets into consideration, which will result in lower fees than competitors and also lower fees than with another index replication strategy.
- There are no licensing fees to be paid to SSgA for managing the strategy, unlike for any of the three low volatility indexes.
- The currency hedging would be integrated with the strategy.
- By going with SSgA, there would be no need to hire an additional manager.

BACKGROUND

At its December 3, 2012 meeting, the Joint Pension Board (JPB) approved a 10% allocation to a U.S. low volatility equity strategy. The JPB expressed a preference for a passive strategy. The JPB defines passive management as investing in low-cost investment products designed to efficiently capture the risk premium associated with an asset class such as equity, fixed income, commodities, or real estate. Passive strategies include “classic beta”, which is the replication of a broad market index, but also other beta drivers such as fundamental and alternative indexing.

The following strategies were reviewed:

- 1) Strategies ranked Hire by Russell Investments
 - a. Intech Investment Management
 - b. PanAgora Asset Management Inc.
 - c. Jacobs Levy Equity Management Inc.
 - d. J.P. Morgan Investment Management Inc.
- 2) Low Volatility U.S. Equity Market Indexes
 - a. S&P 500 Low Volatility Index
 - b. Russell 1000 Defensive Index
 - c. MSCI USA Minimum Volatility Index
- 3) State Street Global Advisors U.S. Managed Volatility

Strategies in the first category are active, while strategies in categories 2 and 3 are passive. The three strategies in category 2 are traditional passive strategies that involve replicating an index, while the strategy managed by SSgA meets the revised definition of passive investing adopted by the Joint Pension Board in its Statement of Investment Beliefs.

The first section of this report reviews four managers ranked by Russell and provides an overview of their investment process and the fees they would charge on a \$45 million mandate. The next section compares the three U.S. low volatility equity indexes and compares their methodology, constraints, portfolio composition and performance. Risk and return metrics reviewed include annual and annualized returns, standard deviation of returns, semi-standard deviation of returns, betas, Sharpe ratios, drawdown and capture ratios. The following section presents the same information for the SSgA U.S. Managed Volatility Strategy. The final section contains a fee comparison between various strategies.

RUSSELL’S HIRE RANKED MANAGERS

Investment Manager	Benchmark	Investment Process	Fees (Based on a \$45 MM Investment)¹
Intech Investment Management	Russell 1000 or Russell 1000 Defensive Index	Intech uses a forecasted covariance matrix to select stocks that will minimize the risk of the portfolio. They either use the Russell 1000 Index or the Russell 1000 Defensive Index as their universe.	55 bps
PanAgora Asset Management Inc.	Russell 1000 Defensive Index	PanAgora selects stocks from the Russell 1000 Defensive Index by constructing an expected return based on factors that fall	50 bps

¹ Excluding Currency hedging

Investment Manager	Benchmark	Investment Process	Fees (Based on a \$45 MM Investment) ¹
		<p>under the four following themes:</p> <ol style="list-style-type: none"> 1. Management capability (management's honesty, shareholder alignment and effectiveness) 2. Industry specific factors 3. External forces (macroeconomic environment, industry competitiveness and customer model) 4. Market intelligence (valuation, news sentiment, analyst behaviour and cross-market indicators) 	
Jacobs Levy Equity Management Inc.	Russell 1000 Defensive Index	Jacobs Levy selects stocks from the Russell 1000 Defensive Index by forecasting alpha using a broad cross-section of predictive models focused on a wide variety of factors that are expected to drive stock returns. Some of these factors include valuation, momentum, earnings quality and fundamental changes.	50 bps
J.P. Morgan Investment Management Inc.	Russell 1000 Defensive Index	J.P. Morgan uses a dividend discount model, which incorporates both the current price of a stock and J.P. Morgan's analysts' estimates to derive the stock's dividend discount rate. Securities are then ranked from highest to lowest volatility-adjusted dividend discount rate and divided into five quintiles. They use an optimizer to maximize expected return based on a desired level of portfolio risk. The portfolio is quantitatively optimized to the Russell 1000 Defensive Index.	40.6 bps

U.S. LOW VOLATILITY EQUITY BENCHMARKS

Index Methodology

1) S&P 500 Low Volatility Index

To be eligible for inclusion in the index, stocks must be constituents of the S&P 500 Index and have traded on all 252 trading days in the last 12 months leading up to the rebalancing date.

The selection of index constituents is done as follows:

- The volatilities of the 500 constituents of the S&P 500 are calculated using daily data for the past year. Constituents are then ranked in ascending order based on the inverse of the realized volatility. The top 100 securities with the least volatility form the index.

- At each rebalancing, the weight, w , for each index constituent, i , is set inversely proportional to its volatility.

$$w_i = \frac{\frac{1}{Volatility_i}}{\sum_{i=1}^{100} \frac{1}{Volatility_i}}$$

Rebalancing takes place on the third Friday of February, May, August and November. The index has 100 constituents through time.

2) Russell 1000 Defensive Index

- To be eligible for inclusion in the index, stocks must be constituents of the Russell 1000 Index.
- Five specific fundamentals are used to determine whether a stock will be in the defensive or dynamic index: Debt/Equity, Return on Assets, Earnings Variability and Total Return Volatility (52 week and 60 month).
- The three accounting base indicators (Debt/Equity, Return on Assets, Earnings Variability) are assigned an equal weight in the calculation of the quality score. The quality score accounts for 50% of the stability probability.
- The two volatility measures are also assigned an equal weight in the calculation of the volatility score. The volatility score accounts for the other 50% of the stability probability.
- A company may be included in both the defensive and dynamic indexes.
- The index generally has 400-500 constituents through time.

3) MSCI USA Minimum Volatility Index

- To be eligible for inclusion in the index, stocks must be constituents of the MSCI USA Index.
- The Barra Open Optimizer determines the portfolio with the lowest total risk, based on the factor exposure for all the securities in the MSCI USA Index and an estimated security covariance matrix, subject to a number of constraints.
- The index generally has under 100 constituents through time.

Constraints

1) S&P 500 Low Volatility Index

- Stock must have traded on all 252 trading days in the last 12 months leading up to the rebalancing date.
- There are no sector constraints.

2) Russell 1000 Defensive Index

- No additional constraints

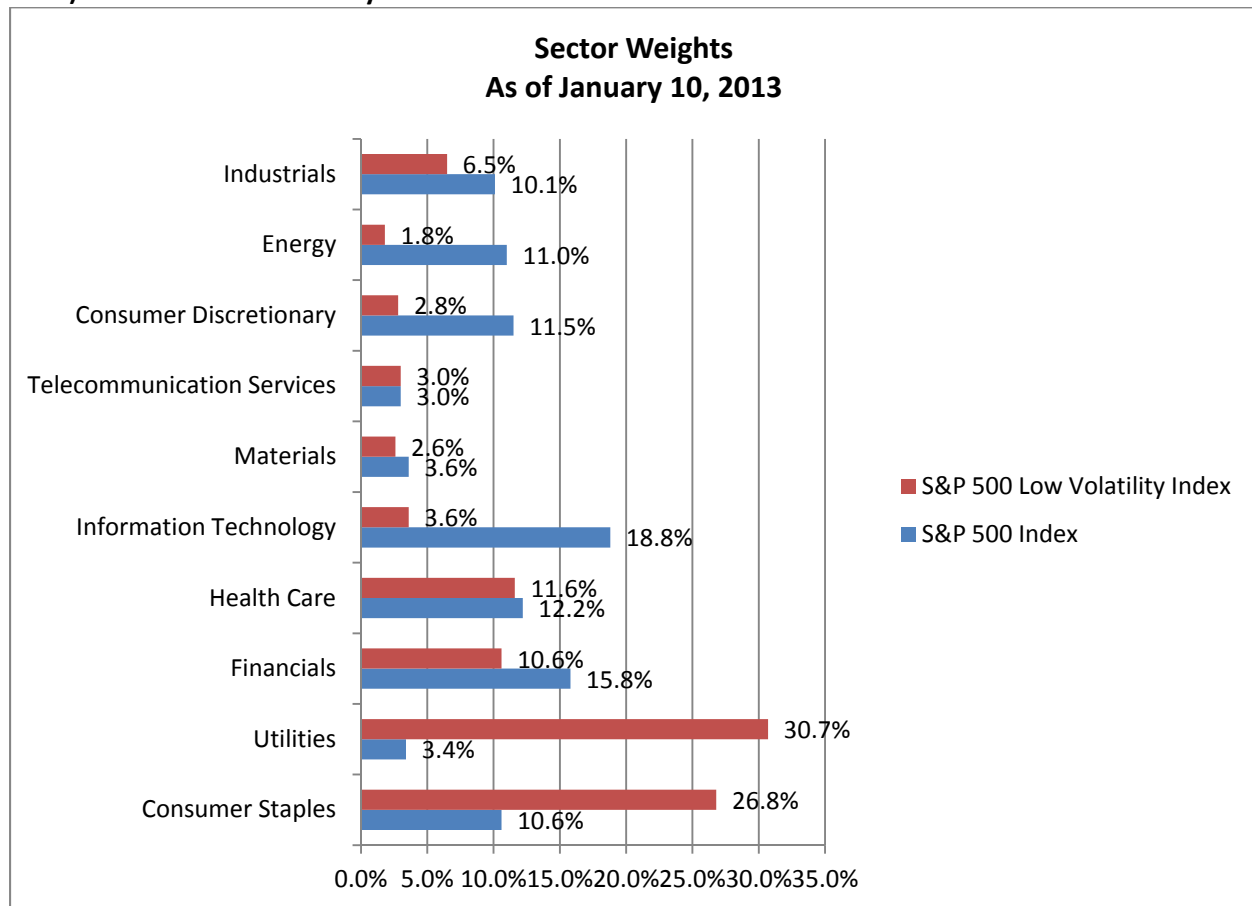
3) MSCI USA Minimum Volatility Index

- The maximum weight of an index constituent will be restricted to the lower of 1.5% or 20 times the weight of the security in the MSCI USA Index.
- The minimum weight of an index constituent will be 0.05%.
- The sector weights of the MSCI USA Minimum Volatility Index will not deviate more than +/-5% from the sector weights of the MSCI USA Index.

- No constraint will be applied on the exposure of the MSCI USA Minimum Volatility Index to the Barra Volatility risk index factor. Exposure to all other Barra risk index factors will be restricted to +/- 0.25 standard deviations relative to the MSCI USA Index.
- The one way turnover of the MSCI USA Minimum Volatility Index is constrained to a maximum of 10%.

Portfolio Composition

1) S&P 500 Low Volatility Index

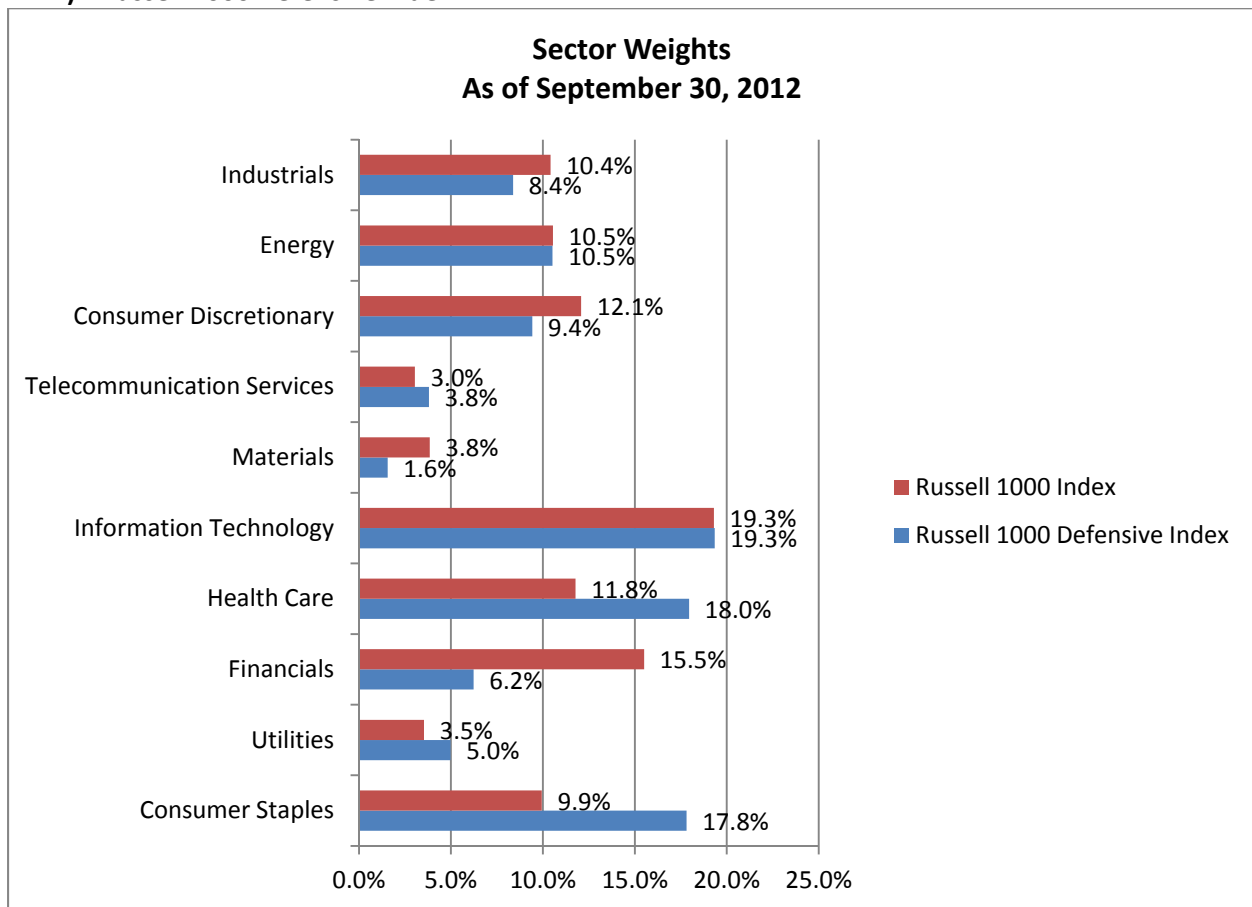


The S&P 500 Low Volatility Index has a significant exposure to the Utilities and Consumer Staples sectors, with more than 57% of the index in those two sectors as of January 10, 2013.

Top 10 Holdings (As of November 30, 2012)

Company	Weight
Clorox Co	1.43%
Southern Co	1.39%
General Mills Inc	1.33%
Kimberly-Clark	1.33%
Johnson & Johnson	1.29%
Consolidated Edison Inc	1.27%
Dominion Resources Inc	1.24%
PepsiCo Inc	1.27%
Duke Energy Corp	1.21%
Wisconsin Energy Corp.	1.19%

2) Russell 1000 Defensive Index

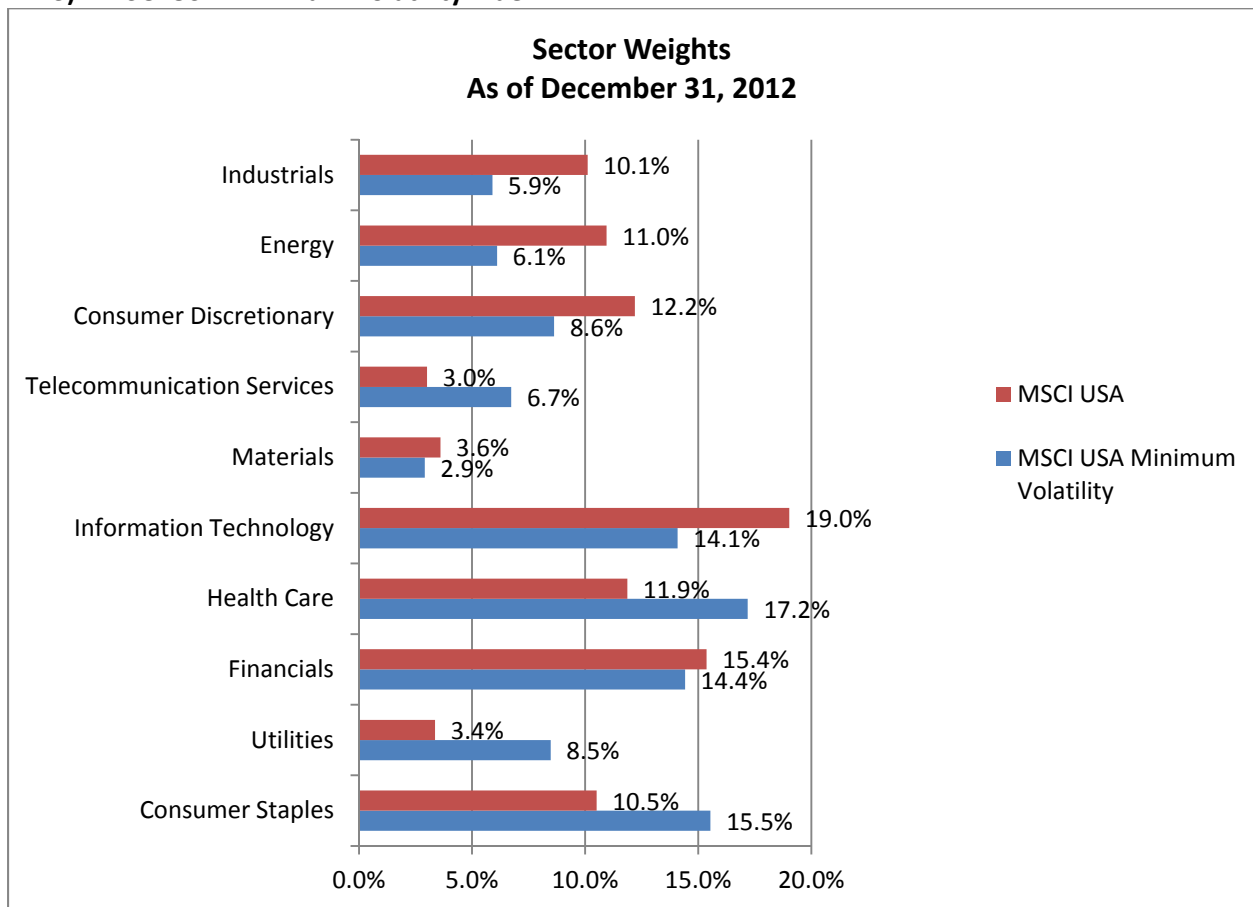


The Russell 1000 Defensive Index has much broader diversification than the S&P 500 Low Volatility Index, although there's still a large overweight to Consumer Staples. The index doesn't have any sector constraints, but the large number of constituents provides additional diversification.

Top 10 Holdings (As of December 31, 2012)

Company	Weight
Exxon Mobil Corp.	N/A
Chevron Corp.	N/A
IBM	N/A
Microsoft Corp.	N/A
Johnson & Johnson	N/A
Pfizer Inc.	N/A
Procter & Gamble Co.	N/A
Berkshire Hathaway Inc.	N/A
AT&T Inc.	N/A
Coca Cola Co.	N/A

3) MSCI USA Minimum Volatility Index



The MSCI USA Minimum Volatility Index has the most stringent sector constraints of the three low volatility indexes. It also has an overweight to Utilities and Consumer Staples.

Top 10 Holdings (As of December 31, 2012)

Company	Weight
Duke Energy Corp.	1.56%
American Tower Corp.	1.56%
Eli Lilly & Co.	1.56%
Abbott Laboratories	1.55%
Automatic Data Process	1.54%
McDonald's Corp.	1.53%
Century Link	1.53%
Consolidated Edison	1.52%
Bristol-Myers Squibb Co.	1.51%
IBM Corp.	1.51%

Performance (All Returns are in U.S. Dollars)

1) S&P 500 Low Volatility Index

	Calendar Returns					
	2012	2011	2010	2009	2008	2007
S&P 500 Low Volatility Index	10.30%	14.78%	13.36%	19.22%	-21.41%	0.58%
S&P 500 Index	16.00%	2.11%	15.06%	26.46%	-37.00%	5.49%
<i>Value Added</i>	-5.70%	12.67%	-1.70%	-7.24%	15.59%	-4.91%
	Calendar Returns					
	2006	2005	2004	2003	2002	
S&P 500 Low Volatility Index	19.69%	2.20%	17.69%	22.75%	-7.16%	
S&P 500 Index	15.79%	4.91%	10.88%	28.68%	-22.10%	
<i>Value Added</i>	3.89%	-2.71%	6.80%	-5.93%	14.94%	

The S&P 500 Low Volatility Index has provided significant value added over the S&P 500 Index when broad index returns are negative. The low volatility index tends to underperform when broad index returns are large (greater than 10%).

	Annualized Returns (As of December 31, 2012)					
	1-Yr	2-Yr	3-Yr	4-Yr	5-Yr	6-Yr
S&P 500 Low Volatility Index	10.30%	12.52%	12.80%	14.37%	6.10%	5.16%
S&P 500 Index	16.00%	8.84%	10.87%	14.58%	1.66%	2.29%
<i>Value Added</i>	-5.70%	3.68%	1.92%	-0.21%	4.44%	2.87%
	Annualized Returns (As of December 31, 2012)					
	7-Yr	8-Yr	9-Yr	10-Yr	11-yr	
S&P 500 Low Volatility Index	7.12%	6.50%	7.68%	9.10%	7.51%	
S&P 500 Index	4.12%	4.22%	4.94%	7.10%	4.05%	
<i>Value Added</i>	3.00%	2.28%	2.75%	2.00%	3.47%	

The S&P 500 Low Volatility Index has outperformed the S&P 500 Index over most horizons, as of December 31, 2012.

	Standard Deviation (As of December 31, 2012)		
	3-Yr	5-Yr	10-Yr
S&P 500 Low Volatility Index	8.85%	12.70%	10.19%
S&P 500 Index	15.30%	19.04%	14.77%
<i>Volatility Reduction</i>	-42.2%	-33.3%	-31.0%

Depending on the period the S&P 500 Low Volatility Index has provided significant volatility reduction over the S&P 500 Index, ranging from 31% to 42%.

	Semi-Standard Deviation (As of December 31, 2012)		
	3-Yr	5-Yr	10-Yr
S&P 500 Low Volatility Index	4.18%	9.34%	6.98%
S&P 500 Index	9.16%	13.93%	10.27%
<i>Volatility Reduction</i>	-54.4%	-33.0%	-32.0%

The reduction in downside volatility (volatility calculated for returns below 0%) was even greater over the period, ranging from 32% to 54%.

	Beta (As of December 31, 2012)		
	3-Yr	5-Yr	10-Yr
S&P 500 Low Volatility Index	0.49	0.60	0.61
S&P 500 Index	1.00	1.00	1.00
<i>Systematic Risk Reduction</i>	-51.4%	-40.0%	-38.6%

The S&P 500 Low Volatility Index has provided a significant reduction in systematic risk compared to the S&P 500 Index. The beta of the S&P 500 Low Volatility Index was lower by 39% to 51%.

	Sharpe Ratio (As of December 31, 2012)		
	3-Yr	5-Yr	10-Yr
S&P 500 Low Volatility Index	1.35	0.38	0.67
S&P 500 Index	1.03	0.02	0.33
R_f	0.85%	1.29%	2.26%

The Sharpe ratio (a measure of risk-adjusted return) was much higher with the S&P 500 Low Volatility Index.

	Drawdown (As of December 31, 2012)		
	3-Yr	5-Yr	10-Yr
S&P 500 Low Volatility Index	-6.46%	-28.51%	-28.51%
S&P 500 Index	-16.26%	-41.82%	-41.82%
Drawdown Reduction	-60.3%	-31.8%	-31.8%

The drawdown (the maximum loss from peak to trough) was much lower with the S&P 500 Low Volatility Index.

	Capture Ratios (As of December 31, 2012)					
	3-Yr		5-Yr		10-Yr	
	Up	Down	Up	Down	Up	Down
S&P 500 Low Volatility Index	60.6%	28.8%	65.8%	51.9%	72.0%	53.0%

Capture ratios are very attractive for the S&P 500 Low Volatility Index with downside capture ratios significantly smaller than 100%. A downside capture ratio of 52% implies that when the broad market drops by 1%, the S&P 500 Low Volatility Index drops by approximately 0.52%.

2) MSCI USA MINIMUM VOLATILITY INDEX

	Annual Returns (As of December 31)						
	2012	2011	2010	2009	2008	2007	2006
MSCI USA Low Volatility Index	11.19%	12.87%	14.70%	18.36%	-27.52%	5.43%	12.41%
MSCI USA Index	16.13%	1.99%	15.45%	27.14%	-37.14%	6.03%	15.32%
<i>Value Added</i>	-4.95%	10.88%	-0.75%	-8.79%	9.61%	-0.60%	-2.90%
	Annual Returns (As of December 31)						
	2005	2004	2003	2002	2001	2000	1999
MSCI USA Low Volatility Index	5.77%	14.01%	19.00%	-15.69%	-6.45%	6.03%	7.31%
MSCI USA Index	5.72%	10.71%	29.11%	-22.71%	-12.03%	-12.54%	22.38%
<i>Value Added</i>	0.05%	3.29%	-10.12%	7.02%	5.59%	18.57%	-15.07%

The MSCI USA Minimum Volatility Index has provided significant value added over the MSCI USA Index when broad index returns are negative. The low volatility index tends to underperform when broad index returns are large (greater than 10%).

	Annualized Returns (As of December 31, 2012)						
	1-Yr	2-Yr	3-Yr	4-Yr	5-Yr	6-Yr	7-Yr
MSCI USA Minimum Volatility Index	11.19%	12.02%	12.91%	14.25%	4.31%	4.49%	5.59%
MSCI USA Index	16.13%	8.83%	10.99%	14.83%	1.79%	2.49%	4.23%
<i>Value Added</i>	-4.95%	3.19%	1.92%	-0.58%	2.51%	2.01%	1.36%
	Annualized Returns (As of December 31, 2012)						
	8-Yr	9-Yr	10-Yr	11-yr	12-Yr	13-Yr	14-Yr
MSCI USA Low Volatility Index	5.61%	6.51%	7.70%	5.33%	4.29%	4.43%	4.63%
MSCI USA Index	4.41%	5.10%	7.28%	4.13%	2.68%	1.42%	2.79%
<i>Value Added</i>	1.20%	1.42%	0.42%	1.20%	1.62%	3.01%	1.84%

The MSCI USA Minimum Volatility Index has outperformed the MSCI USA Index over most horizons, as of December 31, 2012.

	Standard Deviation (As of December 31, 2012)		
	3-Yr	5-Yr	10-Yr
MSCI USA Minimum Volatility Index	9.77%	14.66%	11.55%
MSCI USA Index	15.42%	19.09%	14.82%
<i>Volatility Reduction</i>	-36.6%	-23.2%	-22.1%

Depending on the period the MSCI USA Minimum Volatility Index has provided significant volatility reduction over the MSCI USA Index, ranging from 22% to 37%.

	Semi-Standard Deviation (As of December 31, 2012)		
	3-Yr	5-Yr	10-Yr
MSCI USA Minimum Volatility Index	4.95%	10.79%	8.02%
MSCI USA Index	9.25%	13.98%	10.30%
Volatility Reduction	-46.6%	-22.8%	-22.1%

The reduction in downside volatility (volatility calculated for returns below 0%) was even greater over the period, ranging from 22% to 47%.

	Beta (As of December 31, 2012)		
	3-Yr	5-Yr	10-Yr
MSCI USA Minimum Volatility Index	0.57	0.72	0.73
MSCI USA Index	1.00	1.00	1.00
Systematic Risk Reduction	-43.0%	-27.9%	-27.2%

The MSCI USA Minimum Volatility Index has provided a significant reduction in systematic risk compared to the MSCI USA Index. The beta of the MSCI Low Volatility Index was lower by 27% to 43%.

	Sharpe Ratio (As of December 31, 2012)		
	3-Yr	5-Yr	10-Yr
MSCI USA Minimum Volatility Index	1.23	0.21	0.47
MSCI USA Index	0.66	0.03	0.34
R_f	0.85%	1.29%	2.26%

The Sharpe ratio (a measure of risk-adjusted return) was much higher with the MSCI USA Low Volatility Index.

	Drawdown (As of December 31, 2012)		
	3-Yr	5-Yr	10-Yr
MSCI USA Minimum Volatility Index	-7.36%	-37.21%	-37.21%
MSCI USA Index	-16.41%	-46.40%	-46.40%
Drawdown Reduction	-55.1%	-19.8%	-19.8%

The drawdown (the maximum loss from peak to trough) was much lower with the MSCI USA Low Volatility Index.

	Capture Ratios (As of December 31, 2012)					
	3-Yr		5-Yr		10-Yr	
	Up	Down	Up	Down	Up	Down
MSCI USA Minimum Volatility Index	66.2%	40.8%	72.9%	66.9%	76.8%	68.9%

Capture ratios are very attractive for the MSCI USA Minimum Volatility Index with downside capture ratios significantly smaller than 100%.

3) RUSSELL 1000 DEFENSIVE INDEX

	Annual Returns (As of December 31)					
	2012	2011	2010	2009	2008	2007
Russell 1000 Defensive Index	12.74%	9.00%	10.30%	18.87%	-29.15%	3.65%
Russell 1000 Index	16.42%	1.51%	16.10%	28.42%	-37.60%	5.77%
<i>Value Added</i>	-3.68%	7.49%	-5.80%	-9.55%	8.45%	-2.12%

The Russell 1000 Defensive Index has provided significant value added over the Russell 1000 Index when broad index returns are negative. The low volatility index tends to underperform when broad index returns are large (greater than 10%).

	Annualized Returns (As of December 31, 2012)					
	1-Yr	2-Yr	3-Yr	4-Yr	5-Yr	6-Yr
Russell 1000 Defensive Index	12.74%	10.86%	10.67%	12.66%	2.68%	2.84%
Russell 1000 Index	16.42%	8.71%	11.12%	15.21%	1.91%	2.55%
<i>Value Added</i>	-3.68%	2.15%	-0.45%	-2.55%	0.77%	0.30%

The Russell 1000 Defensive Index outperformed over horizons greater than five years although with less value added than other low volatility indexes.

	Standard Deviation (As of December 31, 2012)	
	3-Yr	5-Yr
Russell 1000 Defensive Index	12.18%	15.35%
Russell 1000 Index	15.63%	19.45%
<i>Volatility Reduction</i>	-22.1%	-21.1%

Depending on the period the Russell 1000 Defensive Index has provided significant volatility reduction over the Russell 1000 Index, at around 21%-22%.

	Semi-Standard Deviation (As of December 31, 2012)	
	3-Yr	5-Yr
Russell 1000 Defensive Index	6.98%	11.30%
Russell 1000 Index	9.41%	14.23%
Volatility Reduction	-25.8%	-20.6%

The reduction in downside volatility was similar in magnitude to the reduction in absolute volatility.

	Beta (As of December 31, 2012)	
	3-Yr	5-Yr
Russell 1000 Defensive Index	0.76	0.77
Russell 1000 Index	1.00	1.00
Systematic Risk Reduction	-24.2%	-23.0%

The Russell 1000 Defensive Index has provided a significant reduction in systematic risk compared to the Russell 1000 Index. The beta of the Russell 1000 Defensive Index was lower by 23% to 24%.

	Sharpe Ratio (As of December 31, 2012)	
	3-Yr	5-Yr
Russell 1000 Defensive Index	0.81	0.09
Russell 1000 Index	0.66	0.03
R_f	0.85%	1.29%

The Sharpe ratio (a measure of risk-adjusted return) was higher with the Russell 1000 Defensive Index.

	Drawdown (As of December 31, 2012)	
	3-Yr	5-Yr
Russell 1000 Defensive Index	-11.10%	-38.30%
Russell 1000 Index	-17.07%	-46.94%
Drawdown Reduction	-35.0%	-18.4%

The drawdown (the maximum loss from peak to trough) was lower with the Russell 1000 Defensive Index.

	Capture Ratios (As of December 31, 2012)			
	3-Yr		5-Yr	
	Up	Down	Up	Down
Russell 1000 Defensive Index	77.1%	70.6%	75.3%	75.7%

The downside capture ratios of the Russell 1000 Defensive Index are attractive, but are weaker than with the other two low volatility indexes.

STATE STREET GLOBAL ADVISORS U.S. MANAGED VOLATILITY STRATEGY

Investment Process

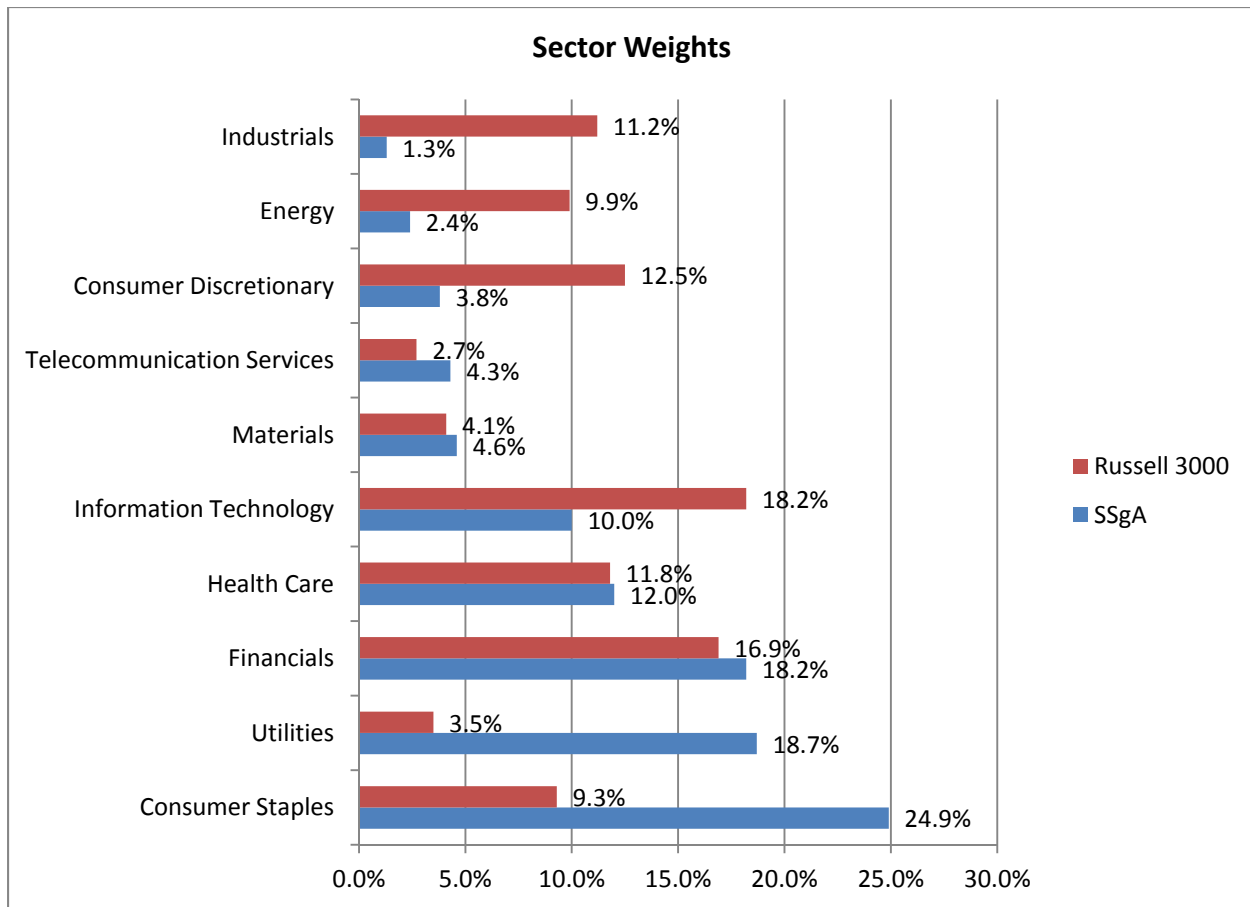
SSgA starts with the Russell 3000 Index as a universe. They use a multi-factor fundamental risk model to decompose returns into common factors and stock specific characteristics. The model is licensed from Axioma, a firm that develops factor-based risk models and portfolio construction tools. Common factors include 1) Style factors: market sensitivity, momentum, exchange-rate sensitivity, liquidity, size, leverage, growth, volatility and value; 2) Industry factors: which account for a company's particular business. The Canadian model breaks down the universe into 37 industries. 3) Country and currency factors. Total portfolio risk is calculated based common factor risks, the correlation between factors and stock specific risk. Then, the portfolio optimization process seeks to minimize the expected total risk subject to constraints.

Constraints

- Maximum security weight the lower of 1%
- Maximum sector weight of 25%
- Maximum industry weight of 10%
- Control for size: +/- 50% standard deviation of risk model's risk factor relative to the Index
- Liquidity: 20% of 20-day ADV trade limit, per security

Portfolio Composition (As of December 31, 2012)

- Number of securities: 137



The portfolio's main overweights are in Utilities and Consumer Staples.

Top 10 Holdings (As of December 31, 2012)

Stock	Portfolio Weight
Newmont Mining Corp.	1.1%
SBA Communications Corp.	1.0%
Bofi Holding Inc.	1.0%
Capitol Federal Financial Inc.	1.0%
Eli Lilly & Co.	1.0%
Retail Opportunity Inv. Corp.	1.0%
Kellogg Co.	1.0%
DaVita Healthcare Partners	1.0%
ConAgra Foods Inc.	1.0%
McCormick & Co. Inc.	1.0%

Performance

	Annual Returns (As of December 31)			
	2012	2011	2010	2009
SSgA U.S. Managed Volatility	10.25%	10.18%	13.61%	10.09%
Russell 3000 Index	16.43%	1.02%	16.93%	28.33%
<i>Value Added</i>	-6.18%	9.16%	-3.32%	-18.24%

The SSgA U.S. Managed Volatility Strategy has outperformed the Russell 3000 Index when the market did poorly (2011) and it underperformed when broad market returns were large (greater than 10%), as expected.

	Annualized Returns (As of December 31, 2012)			
	1-Yr	2-Yr	3-Yr	4-Yr
SSgA U.S. Managed Volatility	10.25%	10.21%	11.33%	11.02%
Russell 3000 Index	16.43%	8.45%	11.21%	15.26%
<i>Value Added</i>	-6.18%	1.76%	0.13%	-4.24%

The strategy has underperformed the broad index over a four-year horizon, which is in line with the low-volatility indexes previously reviewed, due to the market rebound of 2009. The strategy outperformed the Russell 3000 Index every month when market returns were negative during the financial crisis.

	Standard Deviation (As of December 31, 2012)	
	3-Yr	4-Yr
SSgA U.S. Managed Volatility	9.17%	11.06%
Russell 3000 Index	15.95%	17.71%
<i>Volatility Reduction</i>	-42.5%	-37.6%

The SSgA U.S. Managed Volatility Strategy has achieved its risk reduction objective, with volatility lower than the benchmark by 38% and 43% over three and four year horizons.

	Semi-Standard Deviation (As of December 31, 2012)	
	3-Yr	4-Yr
SSgA U.S. Managed Volatility	4.57%	7.08%
Russell 3000 Index	9.63%	10.78%
<i>Volatility Reduction</i>	-52.6%	-34.4%

SSgA also achieved a significant reduction in downside volatility over three and four year horizons.

	Beta (As of December 31, 2012)	
	3-Yr	4-Yr
	SSgA U.S. Managed Volatility	0.50
Russell 3000 Index	1.00	1.00
Systematic Risk Reduction	-49.7%	-44.5%

The beta of SSgA's low volatility strategy is much smaller than one, which means that the systematic risk of the fund is lower than the market.

	Sharpe Ratio (As of December 31, 2012)	
	3-Yr	4-Yr
	SSgA U.S. Managed Volatility	1.14
Russell 3000 Index	0.65	1.13
R_f	0.85%	0.79%

Despite underperforming over a four-year horizon, SSgA's strategy achieved a higher Sharpe ratio due to its much lower risk.

	Drawdown (As of December 31, 2012)	
	3-Yr	4-Yr
	SSgA U.S. Managed Volatility	-6.94%
Russell 3000 Index	-17.75%	-46.97%
Drawdown Reduction	-60.9%	-39.7%

The reduction in drawdown over the past three or four years was significant, with a reduction of 40% to 61% over the Russell 3000 Index.

	Capture Ratios (As of December 31, 2012)			
	3-Yr		4-Yr	
	Up	Down	Up	Down
SSgA U.S. Managed Volatility	60.7%	36.5%	59.7%	48.9%

The capture ratios for SSgA's strategy are attractive with downside capture ratios of 37% and 49% over horizons of three and four years.

FEES

The table below shows a breakdown of the total fees charged for the various strategies. For the index replication strategies the portfolio manager is listed in parentheses.

Investment Management Fees²				
Strategy	Management Fee	Licensing Fee	Currency Hedging	Total
Intech Investment Management	0.55%	0.00%	0.04%	0.59%
PanAgora Asset Management Inc.	0.50%	0.00%	0.04%	0.54%
Jacobs Levy Equity Management Inc.	0.50%	0.00%	0.04%	0.54%
J.P. Morgan Investment Management Inc.	0.41%	0.00%	0.04%	0.45%
S&P 500 Low Volatility Index (SSgA)	0.17%	0.03%	0.04%	0.24%
MSCI USA Minimum Volatility Index (SSgA)	0.17%	0.06%	0.04%	0.27%
Russell 1000 Defensive Index (SSgA)	0.17%	0.08%	0.04%	0.29%
SSgA U.S. Managed Volatility Strategy	0.13%	0.00%	0.04%	0.17%
MSCI USA Minimum Volatility Index (BlackRock) ³	0.15%	0.00%	0.04%	0.19%

At 0.17%, the SSgA U.S. Managed Volatility Strategy is the cheapest of all the strategies reviewed. This compares to 0.06% that is currently charged by SSgA for all the University's assets benchmark to the S&P 500 Index, including those managed for the Operating & Endowment Fund.

² Assuming a \$45 million investment

³ Although BlackRock doesn't currently offer the product to Canadian investors, they are proposing to have Western invest in the iShares MSCI U.S. Minimum Volatility ETF until their assets under management reach \$100 million for the strategy, then they will transition to a normal portfolio with fees of 5 bps.