

## S&P GIVI<sup>®</sup> Japan and Major Single Factors 2016 Review

### S&P GIVI JAPAN PERFORMANCE

The [S&P GIVI \(Global Intrinsic Value Index\) Japan](#) underperformed its benchmark index, the [S&P Japan BMI](#), by 14 bps in the fourth quarter of 2016 and by 26 bps for the year.<sup>1</sup> Since its launch in March 2012, the S&P GIVI Japan has outperformed its benchmark index by 1.43% per year, with a tracking error of 2.46%.

Japanese equities, as measured by the S&P Japan BMI, produced a strong return of 14.9% in the fourth quarter of 2016. After strengthening for most of the year, the Japanese yen weakened sharply in November and December due to a widening of the expected interest rate differential between the U.S. and Japan, especially since the U.S. election. In Q4 2016, the financials sector continued its rebound that started in the middle of the year and led the other sectors with a return of 30.0%. Defensive sectors, such as consumer staples and health care, were among the largest detractors to return in the quarter.

Throughout 2016, the performance divergence of the intrinsic value leg and the low beta leg of the S&P GIVI Japan widened. The three-year correlation between the excess return of the two legs dropped to reach a level as low as -0.77 (see Exhibit 2). Due to the application of a low beta screen prior to weighting stocks by intrinsic value, the S&P GIVI Japan tends to be more sensitive to the low beta leg (see Exhibit 3). These two points help to explain why the index underperformed its benchmark in 2016, even though the intrinsic value leg outperformed the benchmark.

Since its launch in March 2012, the S&P GIVI Japan has outperformed the S&P Japan BMI by 1.43% on an annualized basis. There has been a larger contribution from the low beta component (0.97%) than from the intrinsic value component (0.55%). The sequential combination of low beta and intrinsic value appears to have added value. In terms of risk-adjusted performance, the S&P GIVI Japan had a risk-adjusted return of 0.99, versus 0.84 for its benchmark, due to the reduction in volatility. The annualized alpha for the S&P GIVI Japan was 2.24%, with a beta of 0.93 against its benchmark.

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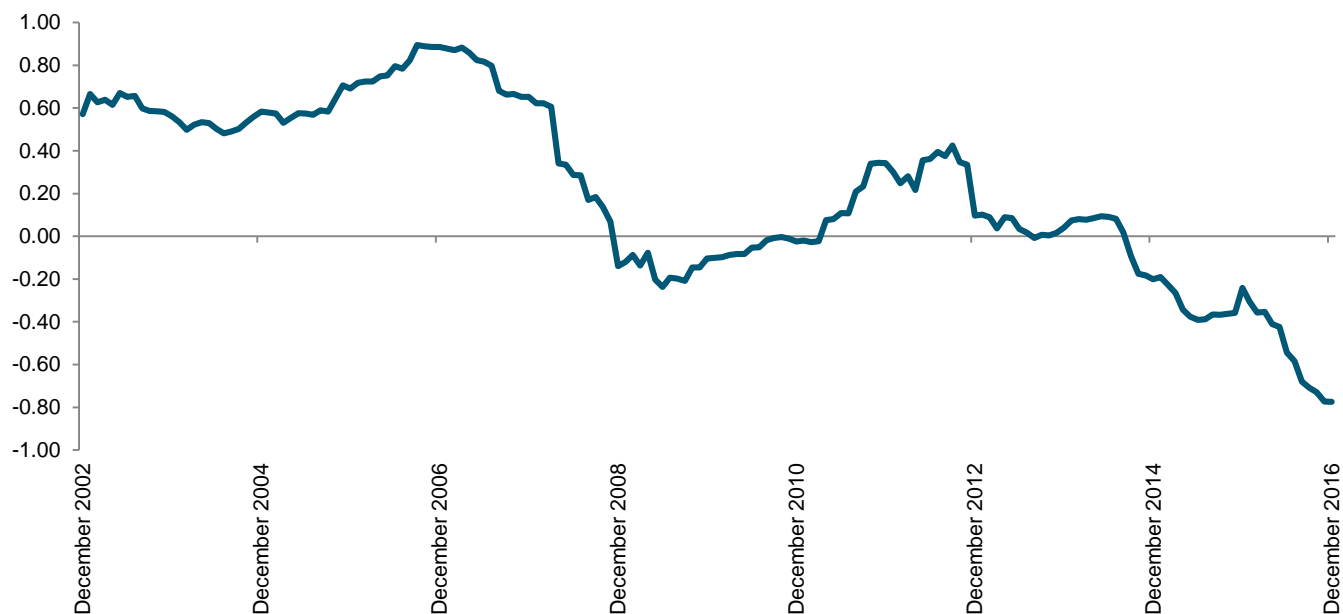
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<sup>1</sup> The S&P GIVI Japan is a strategy index constructed from the S&P Japan BMI, which serves as its benchmark index. The tracking error between the S&P GIVI Japan and its benchmark represents the difference between the strategy returns and the benchmark returns, reflecting the risk associated with the exposure to certain factors. Tracking error is the annualized standard deviations of monthly excess returns. It is not possible to invest directly in an index.

Exhibit 1: S&P GIVI Japan Live Performance and Attribution							
PERFORMANCE	GROSS TOTAL RETURN (%)				RETURN IN EXCESS OF THE S&P JAPAN BMI (%)		
	S&P GIVI JAPAN	S&P INTRINSIC VALUE WEIGHTED JAPAN INDEX	S&P LOW BETA JAPAN INDEX	S&P JAPAN BMI	S&P GIVI JAPAN	S&P INTRINSIC VALUE WEIGHTED JAPAN INDEX	S&P LOW BETA JAPAN INDEX
Q4 2016	14.75	18.11	12.06	14.89	-0.14	3.22	-2.83
H2 2016	22.40	29.00	17.02	22.77	-0.38	6.22	-5.76
2016	0.42	2.14	-1.00	0.68	-0.26	1.46	-1.68
Since March 2012 (Annualized)	16.61	15.73	16.16	15.18	1.43	0.55	0.97
PERFORMANCE SINCE LAUNCH (ANNUALIZED AGAINST THE S&P JAPAN BMI)							
Volatility (%)	16.78	18.72	16.24	17.99	-	-	-
Return/Volatility	0.99	0.84	0.99	0.84	-	-	-
Tracking Error (%)	2.46	1.93	3.17	-	-	-	-
Alpha (%)	2.24	0.06	2.28	-	-	-	-
Beta	0.93	1.04	0.89	-	-	-	-

Source: S&P Dow Jones Indices LLC. Index performance is based on total returns in JPY. Data from March 31, 2012, to Dec. 31, 2016. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects 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. Notes: Tracking error is the annualized standard deviations of monthly excess returns, relative to the primary and secondary benchmarks. Alpha and beta are defined by the regression equation  $R_{i,t} = \alpha + \beta \cdot RBMI_{i,t} + \epsilon_t$ ; where  $R_{i,t}$  is the index return series and  $RBMI_{i,t}$  is the benchmark index return series.

### Exhibit 2: Rolling Three-Year Correlation Between the Intrinsic Value Leg and the Low Beta Leg of the S&P GIVI Japan



Source: S&P Dow Jones Indices LLC. Index performance is based on total returns in JPY. Data from Dec. 31, 1999, to Dec. 31, 2016. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects 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.

INDEX	COEFFICIENT	T STAT
Intercept	0.16%	4.70
S&P Intrinsic Value Weighted Japan	0.36	11.79
S&P Low Beta Japan	0.56	16.83

Source: S&P Dow Jones Indices LLC. Index performance is based on total returns in JPY. Data from Dec. 31, 1999, to Dec. 31, 2016. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects 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.

## Performance of Single Factors in the Japanese Market

We examined the returns of five common single factors in the Japanese equity market that have demonstrated the ability to earn a persistent premium over long periods of time: low volatility, value, quality, momentum, and buyback. The returns of these factors are represented by the performance of our systematic rules-based indices.

- Low volatility: Represented by the [S&P Japan 500 Low Volatility Index](#).
- Value: Represented by the [S&P Enhanced Value Japan LargeMidCap Index](#).
- Momentum: Represented by the [S&P Momentum Japan LargeMidCap](#).
- Quality: Represented by the [S&P Quality Japan LargeMidCap](#).
- Buyback: Represented by the [S&P Japan 500 Buyback Index](#).

As Japanese equities gained in the fourth quarter of 2016, the enhanced value, quality, and buyback indices outperformed the benchmark, the [S&P Japan BMI](#). The enhanced value index showed the highest outperformance of more than 12% in the quarter. The momentum index underperformed the benchmark by the most, at 7.6%. This is not unexpected when sectors rotate. Low volatility was the second-worst performer, underperforming the benchmark by 3.8%.

Over the three-year period, the low volatility factor was the top performer in terms of absolute return. It outperformed the benchmark by 5.05% per year. The index's volatility was 12.5%, versus 16.7% for the benchmark. As a result, the annual risk-adjusted return was even higher compared with the benchmark—100 bps versus 44 bps, respectively. Nevertheless, if the Japanese equities market continues to increase, low volatility could be expected to underperform given its low beta against the broad market.

<b>Exhibit 4: Performance of the Five Factors in Japan</b>						
<b>PERIOD</b>	<b>S&amp;P JAPAN 500 LOW VOLATILITY INDEX</b>	<b>S&amp;P ENHANCED VALUE JAPAN LARGEMIDCAP INDEX</b>	<b>S&amp;P QUALITY JAPAN LARGEMIDCAP</b>	<b>S&amp;P MOMENTUM JAPAN LARGEMIDCAP</b>	<b>S&amp;P JAPAN 500 BUYBACK INDEX</b>	<b>S&amp;P JAPAN BMI</b>
<b>CUMULATIVE RETURN (%)</b>						
1-Month	4.37	6.81	4.60	3.52	5.20	3.54
2-Month	8.25	17.62	9.08	4.37	8.14	9.24
3-Month	11.14	26.93	15.82	7.33	15.55	14.89
2016	0.97	2.71	6.10	-8.03	0.91	0.68
<b>ANNUAL RETURN (%)</b>						
1-Year	0.97	2.71	6.10	-8.03	0.91	0.68
3-Year	12.42	7.67	10.93	2.70	9.21	7.37
5-Year	19.08	16.83	19.94	16.36	18.74	18.33
10-Year	5.11	4.85	2.77	-3.43	3.10	0.94
<b>ANNUAL VOLATILITY (%)</b>						
3-Year	12.45	22.42	16.48	16.80	17.16	16.65
5-Year	14.22	22.21	17.14	18.30	17.87	18.07
10-Year	13.68	23.48	19.66	20.58	18.39	19.38
<b>ANNUAL RETURN/ANNUAL VOLATILITY</b>						
3-Year	1.00	0.34	0.66	0.16	0.54	0.44
5-Year	1.34	0.76	1.16	0.89	1.05	1.01
10-Year	0.37	0.21	0.14	-0.17	0.17	0.05
<b>12-MONTH MAXIMUM DRAWDOWN (%)</b>						
10-Year	-25.61	-46.77	-49.62	-55.51	-42.90	-46.32

Source: S&P Dow Jones Indices LLC. Index performance based on total returns in JPY. Data from Dec. 31, 2006, to Dec. 31, 2016. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects 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.

## APPENDIX

Exhibit 5: Performance of Smart Beta Indices and Benchmarks in Japan											
PERIOD	SMART BETA INDICES IN JAPAN				BENCHMARKS IN JAPAN						
	S&P GIVI JAPAN	FTSE RAFI JAPAN INDEX	MSCI JAPAN VALUE WEIGHTED INDEX	MSCI JAPAN MINIMUM VOLATILITY INDEX	JPX-NIKKEI INDEX 400*	MSCI JAPAN INDEX	NIKKEI 225	TOPIX	MSCI JAPAN IMI	S&P JAPAN BMI	
<b>CUMULATIVE RETURNS (%)</b>											
1-Month	4.09	3.77	4.31	3.50	3.28	3.38	4.55	3.47	3.52	3.54	
2-Month	9.18	11.89	12.80	7.63	9.03	9.39	9.87	9.15	9.09	9.24	
3-Month	14.75	19.01	19.75	10.56	14.93	15.01	16.38	14.95	14.70	14.89	
2016	0.42	2.03	1.73	0.94	-2.42	-0.40	2.38	0.31	0.44	0.68	
<b>ANNUAL RETURN (%)</b>											
1-Year	0.42	2.03	1.73	0.94	-2.42	-0.40	2.38	0.31	0.44	0.68	
3-Year	9.64	7.77	7.96	10.97	4.98	6.45	7.38	7.42	7.25	7.37	
5-Year	19.26	18.42	18.69	17.84	15.34	17.86	19.91	18.26	18.23	18.33	
10-Year	0.42	2.03	1.73	0.94	-2.42	-0.40	2.38	0.31	0.44	0.68	
<b>ANNUAL VOLATILITY (%)</b>											
3-Year	15.25	19.00	19.42	12.85	16.96	17.49	17.47	16.98	16.76	16.65	
5-Year	16.75	20.05	20.18	14.72	17.74	18.73	18.41	18.29	18.18	18.07	
10-Year	17.33	21.06	21.02	15.02	21.02	19.93	20.74	19.40	19.44	19.38	
<b>ANNUAL RETURN/ANNUAL VOLATILITY</b>											
3-Year	0.63	0.41	0.41	0.85	0.29	0.37	0.42	0.44	0.43	0.44	
5-Year	1.15	0.92	0.93	1.21	0.86	0.95	1.08	1.00	1.00	1.01	
10-Year	0.17	0.08	0.10	0.21	-0.03	0.03	0.14	0.05	0.05	0.05	
<b>12-MONTH MAXIMUM DRAWDOWN (%)</b>											
10 Years	-40.70	-45.89	-46.20	-34.31	-47.47	-47.11	-47.84	-45.69	-46.29	-46.32	

Source: S&P Dow Jones Indices LLC, MSCI, FTSE, TSE. \*Performance of the JPX/Nikkei 400 based on price returns in JPY, and performance for all others based on total return in JPY. Data from Dec. 31, 2006 to Dec. 31, 2016. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects 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.

## PERFORMANCE DISCLOSURE

The S&P GIVI Japan was launched on March 19, 2012. The S&P Intrinsic Value Weighted Japan Index and S&P Low Beta Japan Index were launched on May 8, 2014. The S&P Japan 500 Low Volatility Index was launched on June 8, 2015. The S&P Enhanced Value Japan LargeMidCap Index was launched on April 27, 2015. The S&P Quality Japan LargeMidCap was launched on June 8, 2014. The S&P Momentum Japan LargeMidCap was launched on Nov. 18, 2014. The S&P Japan 500 Buyback Index was launched on Oct. 17, 2014. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance. The back-test calculations are based on the same methodology that was in effect on the index Launch Date. Complete index methodology details are available at [www.spdji.com](http://www.spdji.com).

S&P Dow Jones Indices defines various dates to assist our clients in providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the Index is set at a fixed value for calculation purposes. The Launch Date designates the date upon which the values of an index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P Dow Jones Indices defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its datafeed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index's public release date.

Past performance of the Index is not an indication of future results. Prospective application of the methodology used to construct the Index may not result in performance commensurate with the back-test returns shown. The back-test period does not necessarily correspond to the entire available history of the Index. Please refer to the methodology paper for the Index, available at [www.spdji.com](http://www.spdji.com) for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Another limitation of using back-tested information is that the back-tested calculation is generally prepared with the benefit of hindsight. Back-tested information reflects 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, 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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