

## Blending Factors in Mexico: The S&P/BMV Quality, Value & Growth Index

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### EXECUTIVE SUMMARY

As factor-based investing gains momentum, many market participants are increasingly moving beyond single factors and are constructing multi-factor portfolios. This progression is not surprising given that combining factors that have low or negative correlation can potentially result in a more diversified portfolio.

However, one should note that different factors have varying performance patterns depending on market conditions, economic cycles, or investor sentiment.<sup>1</sup> While every factor strategy aims to earn higher risk-adjusted returns than the broad market over a long-term investment horizon, factors can go through long periods of underperformance.

Therefore, factor-based investing involves the potential for relative underperformance. At the same time, timing factors dynamically is difficult to implement and can be costly.<sup>2</sup> Therefore, the appeal of a multi-factor strategy lies in its ability to provide potentially smoother risk/return patterns than single-factor strategies, while addressing the issue of choosing between factors.

In light of this rationale, S&P Dow Jones Indices (S&P DJI) launched the [S&P/BMV Quality, Value & Growth Index](#) in August 2017. The index is designed to measure the performance of securities in the [S&P/BMV IPC](#) that exhibit high quality, value, and growth characteristics. In this paper, we introduce the performance of those factors, our rationale for combining them, the index construction, and the methodology behind the index.

Before diving deeper into the multi-factor strategy, it is important to understand the evolution of the implementation of factor strategies in passive investing. Factor strategies such as value, quality, and growth have existed for decades and have been utilized by active management as part of the security selection and the investment processes. Passive offerings of factor strategies began with the introduction of growth and value investment styles and later extended to factors such as quality, momentum, and low volatility.

<sup>1</sup> Ung, Daniel and Priscilla Luk, S&P Dow Jones Indices, "[What Is in Your Smart Beta Portfolio? A Fundamental and Macroeconomic Analysis](#)," 2016.

<sup>2</sup> Innes, Andrew, S&P Dow Jones Indices, "[The Merits and Methods of Multi-Factor Investing](#)," 2018.

The metrics used to represent factors can vary from one market participant to another. In Exhibit 1, we outline the economic intuition behind each factor used in the S&P/BMV Quality, Value & Growth Index, as well as the metrics representing them.

Exhibit 1: An Overview of Factors Under Consideration in Mexico		
FACTOR	ECONOMIC INTUITION	FUNDAMENTALS
Quality	Aims to capture the effect in which companies with higher quality profits tend to outperform those with lower quality profits. Presumes that the market has underestimated the long-term persistence of quality stocks' profits.	Operating ROA
		Accruals Ratio
		Financial Leverage Ratio
Value	Seeks to capture the effect in which securities that are trading at low multiples relative to their fundamentals tend to outperform those with higher multiples over the long term.	Book Value-to-Price Ratio
		Operating Income to Enterprise Value
Growth	Attempts to capture long-term price appreciation of companies with earnings growth potential	3-Year Sales Per Share Growth Rate
		3-Year Operating EBIT Growth
		Momentum

Source: S&P Dow Jones Indices LLC. Table is provided for illustrative purposes.

*Metrics that focus on operational performance are gaining more acceptance in emerging markets.*

Metrics that focus on operational performance are gaining more acceptance in markets such as Mexico because they rely less on accounting value-based fundamentals, which can be subject to manipulation. Relying solely on accounting-based data has the potential to weaken a metric's overall reliability and open the door for misrepresentation of earnings data due to external effects such as foreign exchange gains or losses.

*Operational focus is more stable than the traditional approach.*

Moreover, our research shows that focusing on operating earnings-based measures is more stable than those using net income. To demonstrate, we analyzed two profitability measures (return on equity [ROE] and return on assets [ROA]) for securities in the S&P/BMV IPC over the 10-year period ending Aug. 31, 2018. We found that roughly 92% of the securities had higher ROE dispersion than ROA. Using relatively unstable fundamentals to define a factor, especially in an emerging market such as Mexico, can lead to unnecessary turnover, thereby potentially increasing the cost of replicating the index.

## ESTABLISHING FACTOR PREMIUM

To establish whether there are positive excess returns associated with factors in Mexico, we formed hypothetical single-factor portfolios from the underlying universe of the S&P/BMV IPC. We first ranked the universe by each factor, took the top 40<sup>th</sup> percentile, and then equal weighted the securities. We rebalanced the portfolio semiannually on the third Friday of June and the third Friday of December.

*We formed hypothetical single-factor portfolios to determine if there are positive excess returns associated with factors in Mexico.*

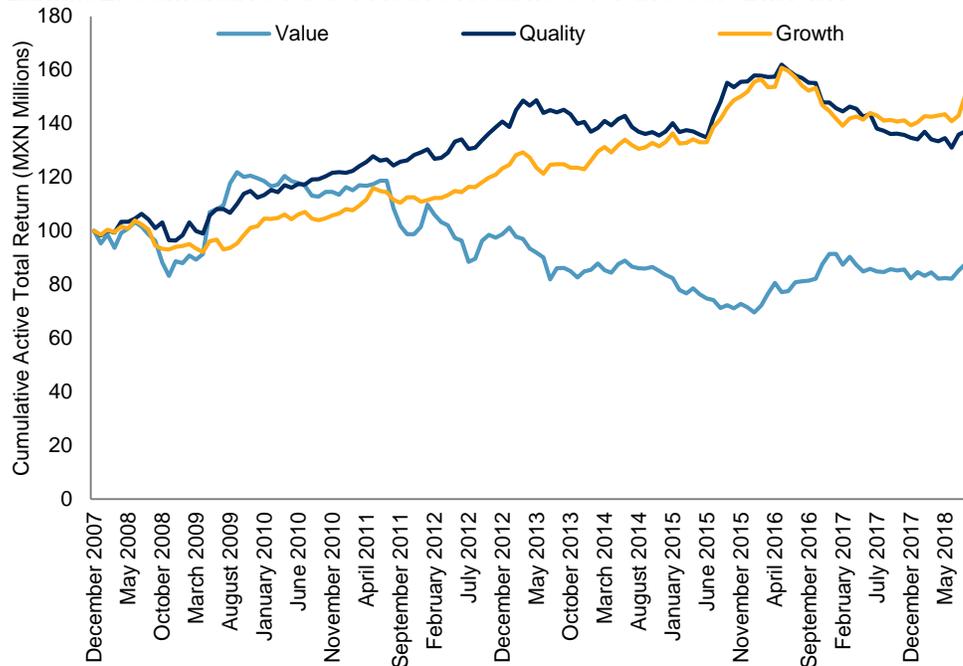
*The portfolios were equal weighted to ensure that they do not have a size bias or concentration issue.*

By equal weighting the portfolios, we ensure that they do not have a size bias or concentration issue. The factors—quality, value, and growth—follow the definitions in Exhibit 1.

We subtracted the market returns from the factor portfolios to get excess returns. Exhibit 2 shows the cumulative excess returns of each factor portfolio over the benchmark in Mexico. The back-tested performance shows that value was the worst-performing factor, while quality and growth were the best-performing factors.

*We looked at the excess return correlation between value, growth, and quality.*

**Exhibit 2: Cumulative Factor Active Returns Over the S&P/BMV IRT**



Source: S&P Dow Jones Indices LLC. Quality, value, and growth single factors are based on hypothetical portfolios. Data from Dec. 31, 2007, to Aug. 31, 2018. Index performance based on total return in MXN. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

*Value and growth had the lowest correlation, followed by value and quality.*

Next, we looked at the excess return correlation between the three factors. We can see that value and growth had the lowest correlation, followed by value and quality (see Exhibit 3). Given that a multi-factor concept aims to exploit diversification benefits by combining factors with negative or low correlations, a multi-factor index could potentially work effectively in the Mexican market.

*Multi-factor portfolios combine factors of negative and low correlation.*

This finding is consistent with those from our prior research studies. Our previous paper, "[Value and Momentum Strategies in Latin America](#)," also finds that strong value and momentum have been effective in Latin America.

*A multi-factor index could work effectively in the Mexican market.*

FACTORS	QUALITY	VALUE	GROWTH
QUALITY	1	0.25	0.59
VALUE	0.25	1	0.20
GROWTH	0.59	0.20	1

Source: S&P Dow Jones Indices LLC. Quality, value, and growth single factors are based on hypothetical portfolios. Correlation is based on the monthly active returns versus the S&P/BMV IPC from Dec. 31, 2007, to Aug. 31, 2018. Index performance based on total return in MXN. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

*To form a multi-factor portfolio, we used the S&P/BMV IPC as our underlying universe.*

## BLENDING THE FACTORS

There are a few different ways to form multi-factor portfolios; one approach is a bottom-up “stock-level” selection process in which securities are chosen based on their combined exposure to desired factors. S&P DJI’s previous research paper, [“The Merits and Methods of Multi-Factor Investing,”](#) shows that using a bottom-up approach may increase overall exposure to the desired factor.

This approach is also optimal when there is a sufficient number of securities to systematically select the top quartile of the blended factor scores. However, in a universe with a small number of securities, such as Mexico, forming individual factor portfolios may not be an ideal approach. The portfolios would have a small number of securities, resulting in potential concentration, replicability, and investability issues.

*Because Mexico is a universe with a smaller number of securities...*

Our approach uses the integration method. We used the S&P/BMV IPC as our underlying universe, as the index consists of the largest and most liquid stocks listed on the Bolsa Mexicana de Valores.<sup>3</sup> It has 35 constituents as of the rebalancing dates on the third Friday of March and September.

The construction of the S&P/BMV Quality, Value & Growth Index is as follows.

1. **Constituent Selection:** We calculate the quality, value, and growth z-scores for each of the eligible stocks in the universe. A security must have at least one fundamental z-score for each factor (quality, value, and growth) to be included in the index. A stock is ineligible if any of the factor scores are among the four lowest-ranked securities by factor.
2. **Weighting Mechanism:** At each rebalancing date, all securities eligible for inclusion are weighted by their final multi-factor score, which is the simple average of the underlying quality, value, and growth scores.

*...we chose the integration method to form the portfolio.*

<sup>3</sup> Stocks must have a median daily traded value (MDTV) of at least MXN 50 million (MXN 30 million for current constituents) over the prior three-month and six-month periods. Stocks must have an annualized median traded value ratio (MTVR) of at least 25% (15% for current constituents) over the prior three-month and six-month periods. Eligible stocks are ranked, in descending order, based on a combined ranking of VWAP float-adjusted market capitalization and six-month MDTV.

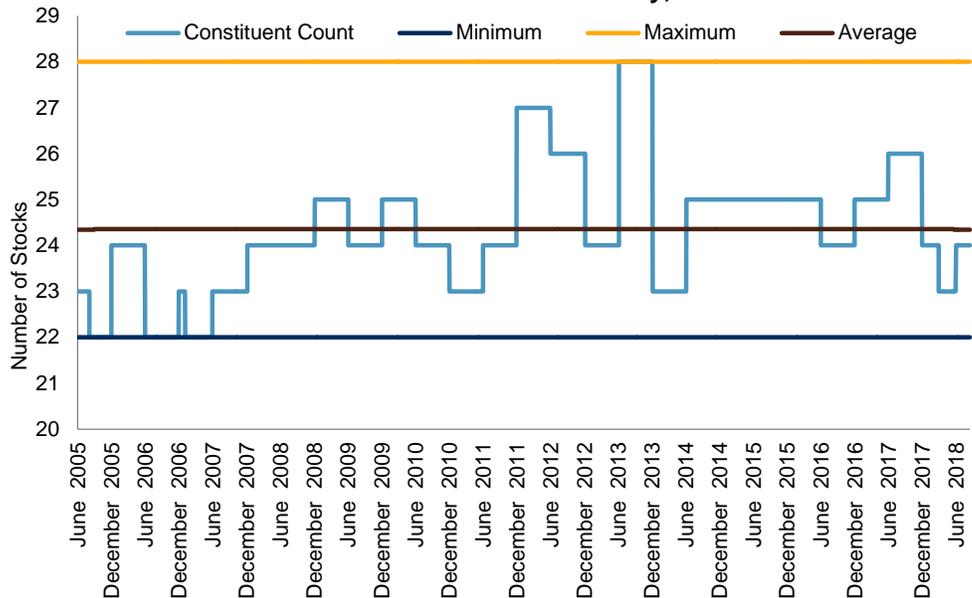
For further information, see the S&P/BMV Quality, Value & Growth Index section in the [S&P/BMV Indices Methodology](#).

### INDEX CHARACTERISTICS

*The S&P/BMV Quality, Value & Growth Index targets a floating number of constituents.*

The S&P/BMV Quality, Value & Growth Index targets a floating number of constituents. Exhibit 4 shows the number of securities in the index historically. On average, the index has had roughly 24 constituents throughout history, with a maximum constituent count of 28 and minimum count of 22 (see Exhibit 4).

**Exhibit 4: Constituent Count in the S&P/BMV Quality, Value & Growth Index**



*On average, the index has had about 24 constituents...*

*...with a maximum count of 28 and minimum of 22.*

Source: S&P Dow Jones Indices LLC. Data from June 17, 2005, to Aug. 31, 2018. 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.

On average, the maximum weight in a single stock was 6.75% over the period studied. This figure is relatively low compared to its underlying benchmark, the S&P/BMV IPC, where the largest stock weight was over 19%. Based on back-tested data over the past 10 years, the average dividend yield of the S&P/BMV Quality, Value & Growth Index was 2.57%, compared with the S&P/BMV IPC average dividend yield of 1.53%.

*On average, the maximum weight in a single stock was 6.75% over the period studied.*

Factor-based strategies tend to deviate away from their underlying benchmarks in order to generate higher exposure to the desired factor. Unlike the market-cap-weighted underlying benchmark, which undergoes turnover due to corporate action events, factor strategies usually rebalance more frequently. Therefore, the 10-year average turnover for the S&P/BMV Quality, Value & Growth Index (67%), was much higher than the benchmark, which had an average annual turnover of roughly 15% over the past 10 years.

Exhibit 5 compares the fundamental characteristics of the multi-factor strategy versus the benchmark. On average, the multi-factor strategy had more desirable quality characteristics such as lower leverage, higher operating ROA, and a similar accruals ratio. It also had a higher tilt toward value metrics.

*The multi-factor strategy had more desirable quality characteristics...*

**Exhibit 5: Fundamental 10-Year Average Characteristics**

FACTOR	FUNDAMENTAL	S&P/BMV IPC	S&P/BMV QUALITY, VALUE & GROWTH INDEX
Quality	Operating ROA	0.109	0.122
	Accruals Ratio	0.125	0.117
	Financial Leverage Ratio	1.351	0.857
Value	Book Value-to-Price	0.421	0.485
	EBIT (Net Interest Income) / Enterprise Value	0.075	0.093
Growth	3-Year EBIT (Net Interest Income) Growth	0.793	1.039
	3-Year Growth Sales Per Share	0.383	0.510
	1-Year Risk-Adjusted Momentum	6.512	7.877

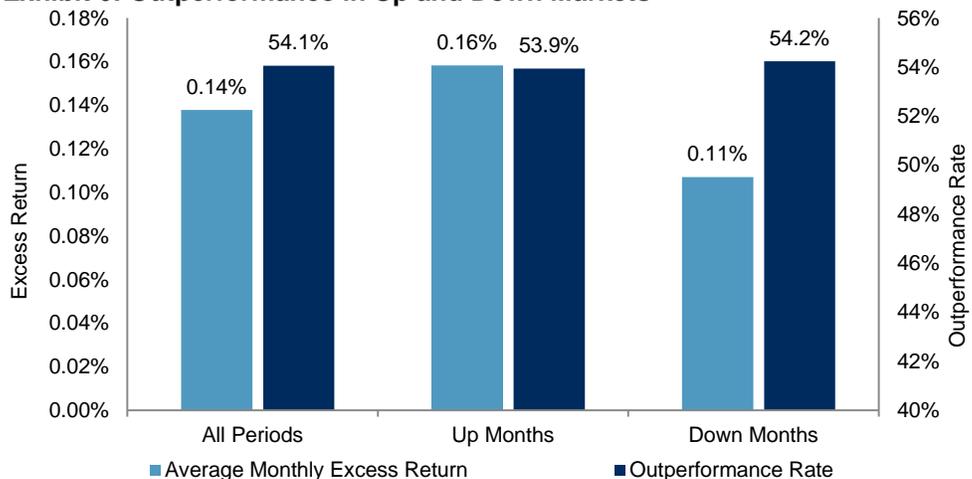
Source: S&P Dow Jones Indices LLC. Data as of July 31, 2018. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

*...such as lower leverage, higher operating ROA, and a similar accruals ratio.*

**RISK/RETURN CHARACTERISTICS**

In this section, we compare the back-tested performance of the S&P/BMV Quality, Value & Growth Index against the S&P/BMV IRT, the total return version of the S&P/BMV IPC. The S&P/BMV Quality, Value & Growth Index outperformed the benchmark roughly 54% of the time in both up and down markets, providing an average monthly excess return of 0.16% during up market periods and 0.11% in down market periods (see Exhibit 6).

**Exhibit 6: Outperformance in Up and Down Markets**

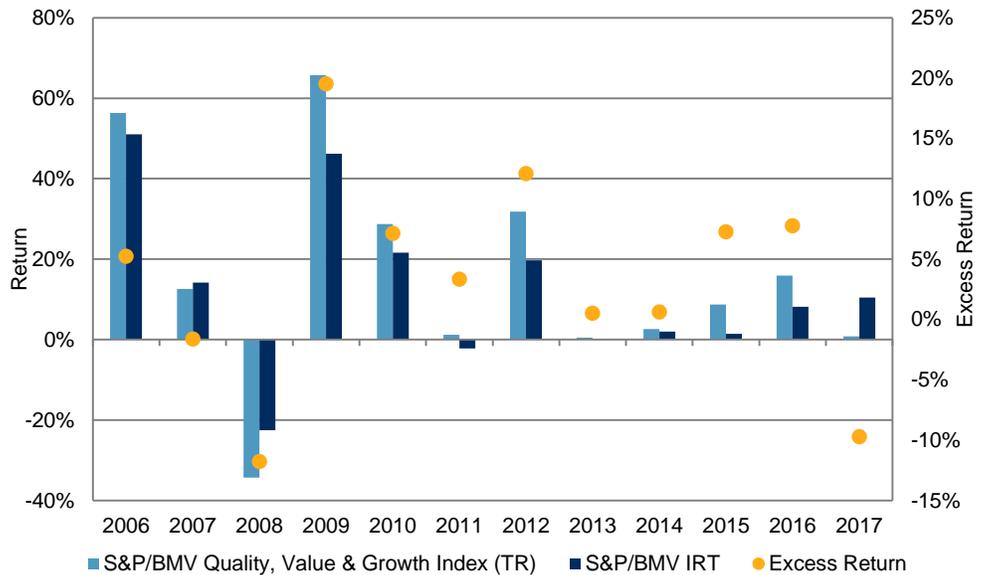


*The S&P/BMV Quality, Value & Growth Index outperformed the benchmark roughly 54% of the time in both up and down markets.*

Source: S&P Dow Jones Indices LLC. Data from June 17, 2005, to Aug. 31, 2018. Index performance based on total return in MXN. 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.

**Exhibit 7: Calendar Year Performance**

*Year-over-year returns fluctuated over the long-term investment horizon.*

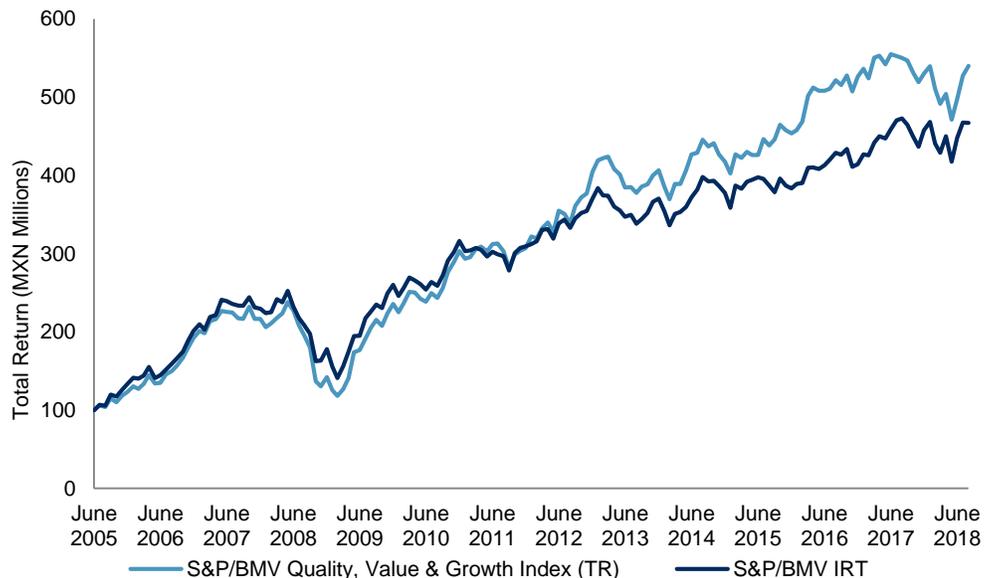


Source: S&P Dow Jones Indices LLC. Data from June 17, 2005, to Aug. 31, 2018. Index performance based on total return in MXN. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance

While year-over-year returns may have fluctuated over the long-term investment horizon (see Exhibit 7), the multi-factor strategy had higher cumulative returns than the S&P/BMV IRT (see Exhibits 8 and 9).

**Exhibit 8: S&P/BMV Quality, Value & Growth Index Total Returns**

*However, over the long term, the multi-factor strategy had higher cumulative returns than the S&P/BMV IRT index.*



Source: S&P Dow Jones Indices LLC. Data from June 17, 2005, to Aug. 31, 2018. Index performance based on total return in MXN. 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.

<b>Exhibit 9: Risk/Return Profiles</b>		
<b>PERIOD</b>	<b>S&amp;P/BMV QUALITY, VALUE &amp; GROWTH INDEX (TR)</b>	<b>S&amp;P/BMV IRT</b>
<b>ANNUALIZED RETURN (%)</b>		
Past 3-Year	7.20	6.48
Past 5-Year	7.41	6.68
Past 7-Year	8.61	6.69
Past 10-Year	10.69	8.40
<b>ANNUALIZED VOLATILITY (%)</b>		
Past 3-Year	10.83	11.29
Past 5-Year	10.88	11.08
Past 7-Year	11.71	11.27
Past 10-Year	17.60	15.53
<b>RETURN/RISK</b>		
Past 3-Year	0.67	0.57
Past 5-Year	0.68	0.60
Past 7-Year	0.74	0.59
Past 10-Year	0.61	0.54

*As the S&P/BMV Quality, Value & Growth Index delivered higher risk-adjusted returns than the S&P/BMV IRT...*

Source: S&P Dow Jones Indices LLC. Data as of Aug. 31, 2018. Index performance based on total return in MXN. 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.

## CONCLUSION

Using the S&P/BMV IPC as our underlying universe for Mexico, we tested whether quality, value, and growth earned higher risk-adjusted returns than the market benchmark over a long-term investment horizon. Our analysis indicates that the factors have had negative correlations with each other. Therefore, combining them in a multi-factor portfolio could potentially result in higher risk-adjusted returns than the traditional benchmark. As our study shows, the S&P/BMV Quality, Value & Growth Index delivered higher risk-adjusted returns than the S&P/BMV IRT over the long-term investment horizon. Our analysis demonstrates that a multi-factor implementation in Mexico is possible.

*...a multi-factor portfolio implementation can work in Mexico.*

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The S&P/BMV Quality, Value & Growth Index was launched August 2, 2017. 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. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. Complete index methodology details are available at [www.spdji.com](http://www.spdji.com). 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.

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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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