

Simplicity Is Also Beautiful in Brazil: The S&P/B3 Low Volatility High Dividend Index

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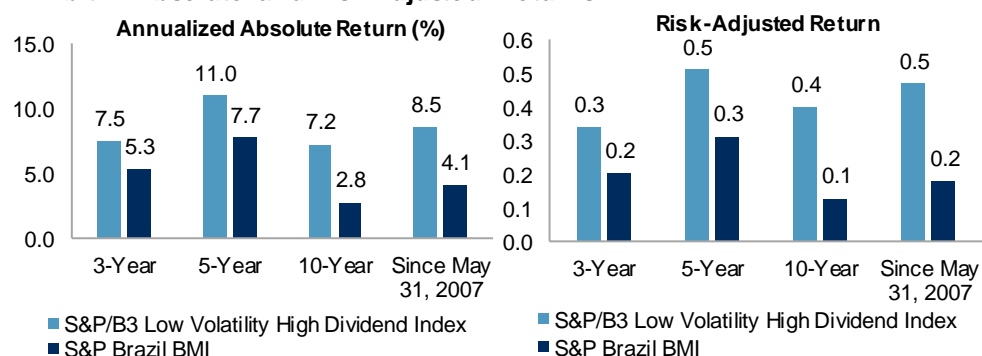
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EXECUTIVE SUMMARY

For investors who seek higher dividend yield and lower volatility for better risk-adjusted returns, S&P Dow Jones Indices has proposed a two-step constituent screening method.¹ In this paper, we discuss how this analysis can be applied to Brazilian equity markets using the [S&P/B3 Low Volatility High Dividend Index](#).

- The low volatility screen acts as a quality measure to avoid high-yield stocks with sharp price drops and seeks to capture the low volatility factor for the S&P/B3 Low Volatility High Dividend Index.
- The S&P/B3 Low Volatility High Dividend Index delivered a higher absolute and risk-adjusted return than the benchmark, the [S&P Brazil BMI](#), from May 31, 2007, to March 31, 2020 (see Exhibit 1).
- The index outperformed the S&P Brazil BMI 83% of the time in down markets and underperformed 68% of the time in up markets. However, the outperformance in down markets was more pronounced than the underperformance in up markets.
- Compared with its benchmark, the S&P/B3 Low Volatility High Dividend Index historically delivered higher dividend yield.

Exhibit 1: Absolute and Risk-Adjusted Returns



Source: S&P Dow Jones Indices LLC. Data from May 31, 2007, to March 31, 2020. Index performance based on total return in BRL. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and 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.

¹ Luk, Priscilla and Qu, Xiaoya, [“The Beauty of Simplicity: The S&P 500® Low Volatility High Dividend Index,”](#) 2019, S&P Dow Jones Indices.

In this paper, we examine the potential advantage of adding a low volatility screen to a high-dividend-yield portfolio in the Brazilian market...

...and compare the S&P/B3 Low Volatility High Dividend Index to two other dividend indices.

Historically in Brazil, the percent of dividend payers has ranged 71%-92%, making it a favorable environment for dividend-focused strategies.

1. INTRODUCTION

Almost one year after launching the S&P/B3 Low Volatility High Dividend Index, we examine the potential advantage of incorporating a low volatility screen into a high-dividend-yield portfolio. We also compare the S&P/B3 Low Volatility High Dividend Index to other S&P Dividend Indices in the Brazilian equity market across various aspects such as sector composition, dividend yield, and historical return, among others.

Historically, the percentage of dividend payers in Brazil has ranged between 71% and 92%,² making it a favorable environment for implementing dividend-focused strategies. In Brazil, S&P Dow Jones Indices has three different dividend-focused strategies, using different constructions and targeting different objectives:

- The [S&P Dividend Aristocrats® Brasil Index](#) is designed to measure the performance of 30 stocks in the S&P Brazil BMI that maintain increasing or stable dividends.
- The [S&P Brazil Dividend Opportunities](#) is designed to measure the performance of 40 of the highest-yielding stocks in the S&P Brazil BMI that demonstrate profitability.
- The [S&P/B3 Low Volatility High Dividend Index](#) is designed to measure the performance of the least-volatile stocks among a specified group of high-dividend-yielding constituents of the S&P Brazil BMI that trade on the B3.

The highest-yielding stocks in high-yield strategies often come with greater portfolio volatility,³ and Brazil is no exception. Therefore, an income strategy may require some form of volatility management for portfolio construction.

² Source: S&P Dow Jones Indices LLC. Data for the S&P Brazil BMI from Dec. 31, 2007, to March 31, 2020.

³ Luk, Priscila and Qu, Xiaoya, Ibid.

2. LOW VOLATILITY MEETS HIGH DIVIDEND YIELD IN THE S&P/B3 LOW VOLATILITY HIGH DIVIDEND INDEX

2.1 Performance of Dividend-Paying Stocks with Different Dividend Yields and Volatilities

Low volatility high-dividend strategies aim to provide yield at a low-risk level compared with the benchmark.

Low volatility high-dividend strategies aim to provide yield at a low-risk level compared with the benchmark. In this section, we review the characteristics of dividend-paying stocks in Brazil based on yield and based on volatility. The second section of the analysis focuses on the breakdown of high-yielding stocks based on volatility.

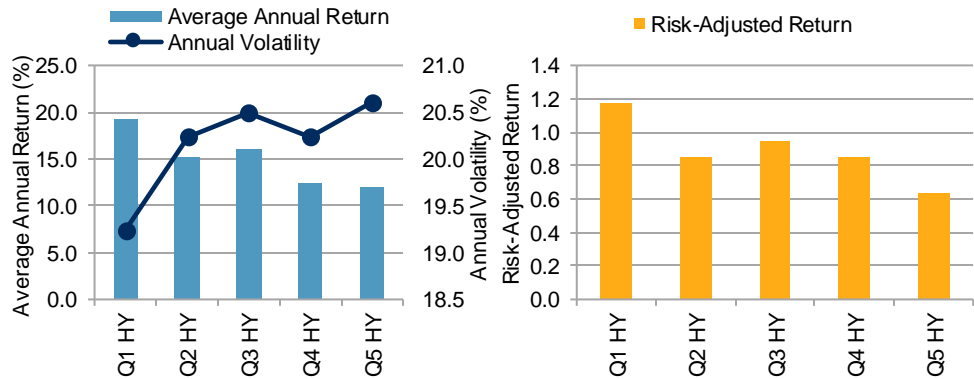
To review the characteristics of dividend-paying stocks in Brazil based on yield, we separated dividend payers from the S&P Brazil BMI universe into hypothetical quintile portfolios based on yield. Securities in each quintile were equal weighted and held for 12 months. Hypothetical portfolios were rebalanced annually on the last business day of January, assuming the last business day of December as a reference date. Our results showed that the securities in the first quintile (Q1 HY), the quintile with the highest-dividend-yielding stocks, had the highest average 12-month returns; the average volatilities of Q2 HY and Q3 HY were higher compared with lower quintiles such as Q4 HY. The outperformance of Q1 HY compared with the other four quintiles remained intact when adjusted for risk (see Exhibit 2).

We reviewed the characteristics of dividend-paying stocks in Brazil based on yield and based on volatility.

To further examine the performance of dividend-paying stocks with different volatilities, we divided the dividend payers into five hypothetical volatility-sorted portfolios maintaining the same rebalance schedule and equally weighted. Volatility is based on the dividend-paying stocks' historical 252-day daily return volatility. The first quintile (Q1 LV) had the lowest volatility and Q5 LV the highest. The results showed that, on a risk-adjusted basis, Q1 LV performed better than all the others (see Exhibit 3), which is consistent with the well-documented low volatility anomaly, whereby high volatility stocks tend to underperform low volatility stocks on a risk-adjusted basis.

Exhibit 2: Average Annual Returns, Volatility, and Risk-Adjusted Return of the Dividend-Yield-Sorted Quintile Portfolios

Separating Brazilian dividend payers into hypothetical quintiles based on yield, we found that Q1 HY had the highest average 12-month returns.

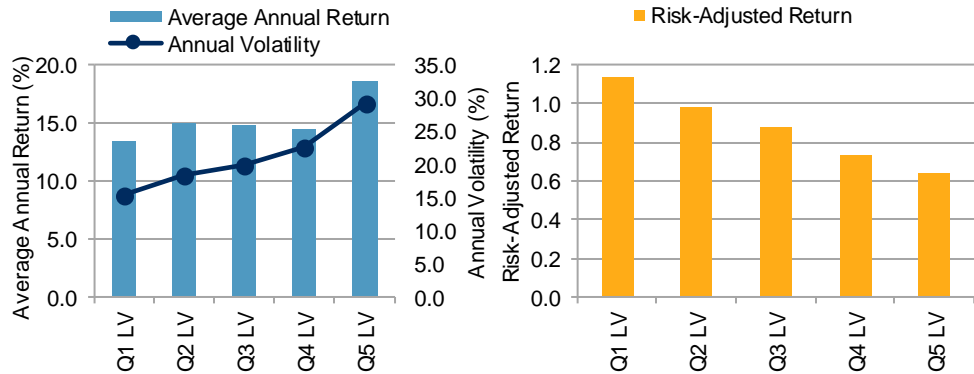


All portfolios are hypothetical.

Source: S&P Dow Jones Indices LLC. Data from March 31, 2008, to March 31, 2020. Index performance based on total return in BRL. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and 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.

Exhibit 3: Average Annual Return, Volatility, and Risk-Adjusted Return of the Volatility-Sorted Quintile Portfolios

After dividing them into volatility-sorted quintiles, Q1 LV outperformed the other portfolios on a risk-adjusted basis.



All portfolios are hypothetical.

Source: S&P Dow Jones Indices LLC. Data from March 31, 2008, to March 31, 2020. Index performance based on total return in BRL. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and 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.

For the second part of the analysis, there were not sufficient stocks in Q1 HY to be broken down into volatility quintiles. We used tertiles to take a closer look at the breakdown of high-yield stocks based on volatility to link the analysis to the S&P/B3 Low Volatility High Dividend Index. Dividend-paying stocks from the S&P Brazil BMI were broken into hypothetical tertile portfolios based on yield; the highest-yielding tertile portfolio is denoted T1 HY. Then, to review the high-dividend-yielding stocks with different volatilities, we divided T1 HY into three hypothetical, volatility-sorted tertile subportfolios and measured their returns (T1HY-T1LV, T1HY-T2LV, and T1HY-T3LV).

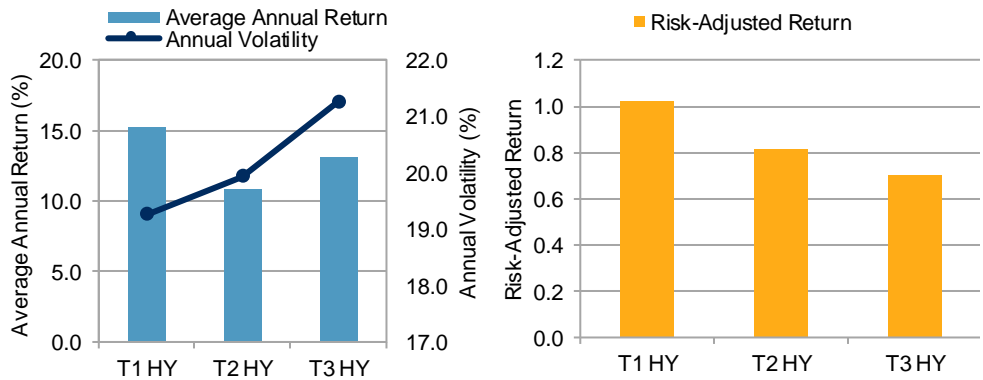
Results for the securities in the first tertile (T1 HY) were aligned with the results of Exhibit 2. The highest-dividend-yielding stocks had the highest

average 12-month holding period return and risk-adjusted return (see Exhibit 4). The volatility-sorted tertile subportfolios showed that portfolios with historically high volatility (T1HY-T2LV and T1HY-T3LV) had more volatile returns on average.

The higher volatility, high-yield subportfolios (T1HY-T2LV and T1HY-T3LV) underperformed the lower volatility, high-yield subportfolio (T1HY-T1LV) on a risk-adjusted basis (see Exhibit 5). This result is again consistent with the low volatility anomaly and implies that simply excluding high volatility stocks from a high-dividend-yield portfolio may improve portfolio return on a risk-adjusted basis.

Dividing the T1 HY portfolio into tertile subportfolios based on dividend yield, the highest-dividend-yield subportfolio had the highest returns.

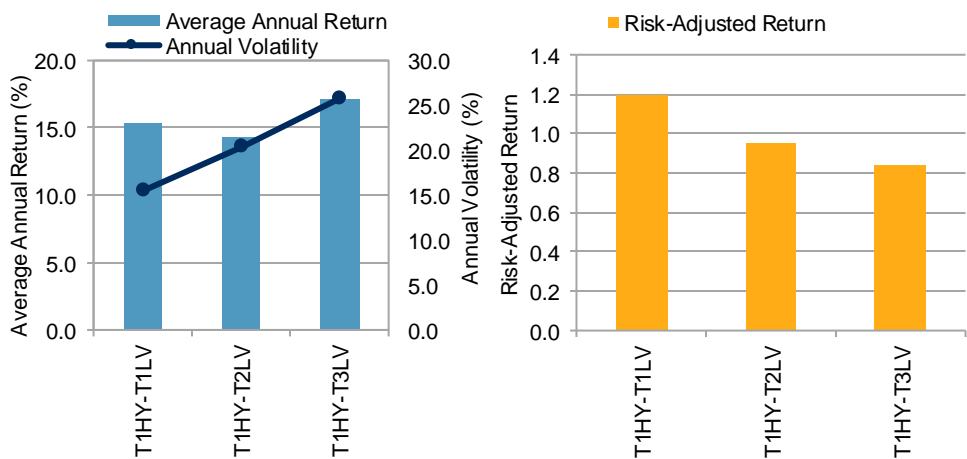
Exhibit 4: Average Annual Return, Volatility, and Risk-Adjusted Return of the High-Yield Sorted by Dividend Yield Tertile Subportfolios



All portfolios are hypothetical.

Source: S&P Dow Jones Indices LLC. Data from March 31, 2008, to March 31, 2020. Index performance based on total return in BRL. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and 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.

Exhibit 5: Average Annual Return, Volatility, and Risk-Adjusted Return of the High-Yield Sorted by Volatility Tertile Subportfolios



All portfolios are hypothetical.

Source: S&P Dow Jones Indices LLC. Data from March 31, 2008, to March 31, 2020. Index performance based on total return in BRL. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and 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.

When sorting them based on volatility, the lowest volatility high-yield subportfolio outperformed on a risk-adjusted basis.

2.2 Adapting a Low Volatility Strategy to a High-Dividend-Yielding Portfolio

The S&P/B3 Low Volatility High Dividend Index excludes high volatility stocks from a high-dividend-yield portfolio, rather than using fundamental measures like company earnings or dividend growth to filter high-dividend stocks. The index selects its members based on two simple screens—volatility and dividend yield.

The S&P/B3 Low Volatility High Dividend Index selects its members based on two simple screens—volatility and dividend yield.

To demonstrate possible benefits of our approach, we created three hypothetical portfolios based on the dividend payers of the S&P Brazil BMI and measured their historical returns from May 31, 2007, to March 31, 2020.

1. High-Yield Portfolio: The top 50% of stocks with the highest dividend yield of the dividend payers in the S&P Brazil BMI eligible universe.
2. Low Volatility High-Yield Portfolio: The top 50% of stocks with the lowest volatility selected from the high-yield portfolio (target strategy).
3. High Volatility High-Yield Portfolio: The top 50% of stocks with the highest volatility selected from the high-yield portfolio (complement of the target portfolio).

We created three hypothetical portfolios: the high-yield portfolio, low volatility high-yield portfolio, and high volatility high-yield portfolio.

All portfolios were rebalanced in January and all portfolio members were equally weighted.

Taking the high-yield portfolio as a reference, one can notice that the least-volatile stocks had better risk-adjusted returns for all periods as of March 31, 2020; while the most-volatile stocks had the worst risk-adjusted returns for all periods.

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This strategy has presented some sector bias compared with the benchmark...

...as certain sectors have more high-dividend-paying stocks than others.

Exhibit 4: Risk/Return Summary of the Hypothetical High-Dividend Portfolios

PERIOD	HIGH-YIELD PORTFOLIO	LOW-VOLATILITY HIGH-YIELD PORTFOLIO	HIGH-VOLATILITY HIGH-YIELD PORTFOLIO
ANNUALIZED RETURN (%)			
3-Year	8.92	12.81	4.74
5-Year	15.96	14.96	15.27
10-Year	9.77	11.58	6.94
Since May 31, 2007	12.70	13.64	10.79
ANNUALIZED VOLATILITY (%)			
3-Year	24.05	20.78	28.41
5-Year	25.93	20.34	32.26
10-Year	20.80	16.94	25.69
Since May 31, 2007	21.94	18.54	26.51
RETURN/RISK			
3-Year	0.37	0.62	0.17
5-Year	0.62	0.74	0.47
10-Year	0.47	0.68	0.27
Since May 31, 2007	0.58	0.74	0.41
MONTHLY DRAWDOWN			
Maximum Draw down (%)	-41	-37	-51
Peak Date	May 30, 2008	May 30, 2008	Jan. 31, 2013

All portfolios are hypothetical.

Source: S&P Dow Jones Indices LLC. Data as of March 31, 2020. Index performance based on total return in BRL. 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.

3. PERFORMANCE CHARACTERISTICS OF THE S&P/B3 LOW VOLATILITY HIGH DIVIDEND INDEX

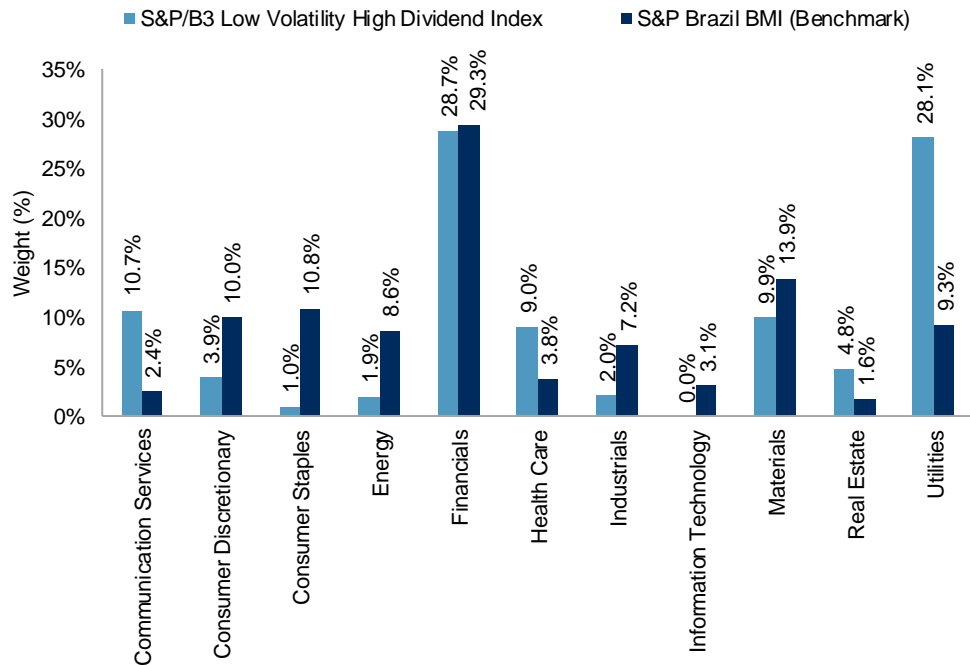
The S&P/B3 Low Volatility High Dividend Index seeks to measure the performance of the 60% least-volatile stocks among the top 50% of high-dividend-yielding constituents from the S&P Brazil BMI, subject to diversification and tradability requirements. Index constituents are weighted by dividend yield.

3.1 Sector Exposure

This strategy has presented some sector bias compared with the benchmark, as there are certain sectors with more high-dividend-paying stocks than other sectors. As of March 31, 2020, the S&P/B3 Low Volatility High Dividend Index had higher concentrations in the Utilities and Communication Services sectors in terms of absolute weight and relative to the S&P Brazil BMI, since companies from these sectors have historically paid higher dividends. In contrast, the index had much lower weighting in the Consumer Staples, Energy, and Industrials sectors than the

benchmark. The index did not have any allocations to the Information Technology sector as of March 31, 2020. We noted that the benchmark had only five Information Technology stocks at the time of the December 2019 rebalance and two of them did not pay any dividends, two others paid significantly small dividends, and the fifth was highly volatile (see Exhibit 7).

Exhibit 7: Sector Weights



As of March 2020, the low volatility high-dividend index had higher concentrations in Utilities and Communication Services...

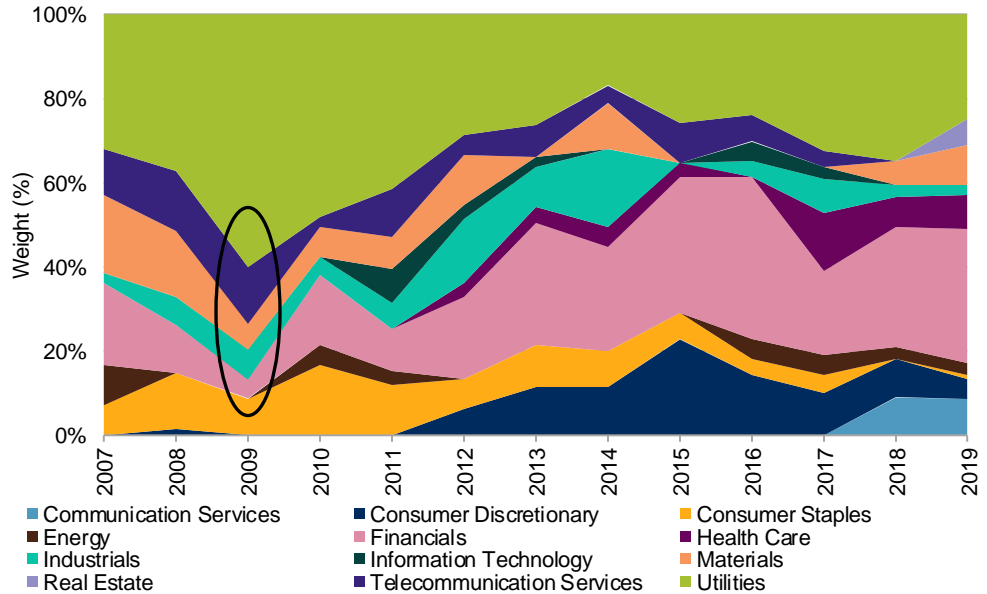
...and lower concentrations in Consumer Staples, Energy, and Industrials.

The sector allocation of the index has changed more dynamically than that of a typical high-dividend-yield strategy in Brazil due to its low volatility screen.

Source: S&P Dow Jones Indices LLC. Data as of March 2020. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

The sector allocation of the index has changed more dynamically than that of a typical high-dividend-yield strategy in Brazil due to its low volatility screen. The weighting of the Financials sector was reduced significantly during the global financial crisis in 2008-2009, as these were times when Financials stocks experienced high volatility and severe price drops. At the same time, not surprisingly, exposure to the Utilities sector increased significantly, as Utilities stocks have traditionally paid dividends and exhibited low volatility (see Exhibit 8).

Exhibit 8: Historical Sector Weights of the S&P/B3 Low Volatility High Dividend Index



The weighting of the Financials sector was reduced significantly during the global financial crisis in 2008-2009...

Source: S&P Dow Jones Indices LLC. Data from December 2007 to December 2019. 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.

...as these were times when Financials stocks experienced high volatility and severe price drops.

3.2 Dividend Yield and Daily Rolling Volatility

The S&P/B3 Low Volatility High Dividend Index has historically offered a high dividend yield. From December 2007 to December 2019, the index had a long-term median dividend yield of 5.4% and stayed above 3.8%—higher than the S&P Brazil BMI, which had a long-term median dividend yield of 3.0% and a maximum yield of 4.3% during the same period. The dividend yield gap between the two indices ranged from 1.4% to 4.0%, with a median value of 2.0% (see Exhibit 9). Moreover, the S&P/B3 Low Volatility High Dividend Index consistently delivered lower volatility⁴ compared with its benchmark.

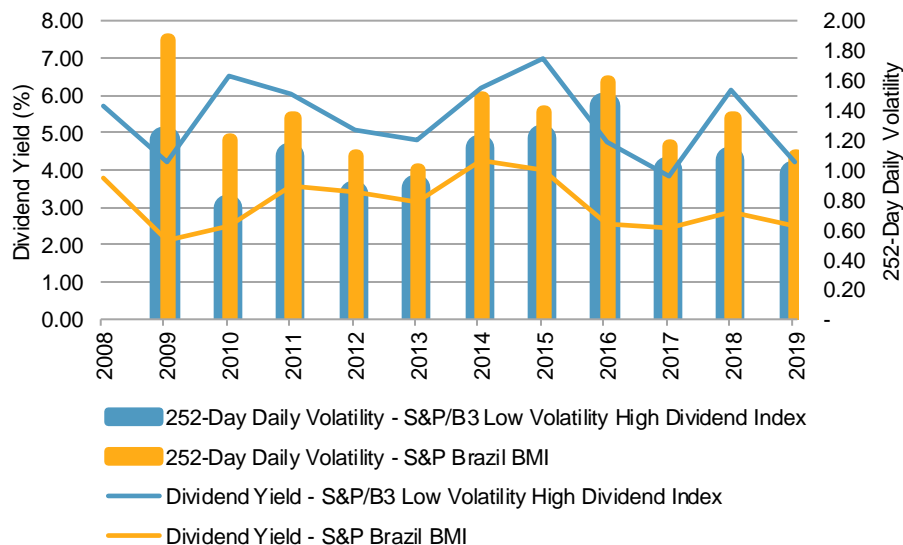
⁴ In this case, volatility is measured as the standard deviation of the daily total returns in Brazilian reais over the past 252 days.

The S&P/B3 Low Volatility High Dividend Index has historically offered a high dividend yield compared with its benchmark ...

...with a long-term median dividend yield of 5.4%, while the S&P Brazil BMI averaged 3.0%.

The dividend yield gap between the two indices ranged from 1.4% to 4.0%, with a median value of 2.0%.

Exhibit 9: Historical Dividend Yield and 252-Day Daily Volatility of the S&P Brazil BMI and S&P/B3 Low Volatility High Dividend Index



Source: S&P Dow Jones Indices LLC. Data from December 2007 to December 2019. 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.

3.3 Performance History

Based on total return performance from May 31, 2007, to March 31, 2020, the S&P/B3 Low Volatility High Dividend Index outperformed the S&P Brazil BMI by 3.5% annually, with an 18.3% volatility reduction and smaller maximum drawdown in the total return. The index delivered a higher risk-adjusted return than the S&P Brazil BMI for the entire reviewed period. Even based on price returns excluding the compounding effect of dividend income, the S&P/B3 Low Volatility High Dividend Index delivered slightly better risk-adjusted returns than the S&P Brazil BMI for the entire period studied, with lower volatility and reduced maximum drawdown (see Exhibit 10).

Exhibit 10: Return/Risk Summary of the S&P Brazil BMI and S&P/B3 Low Volatility High Dividend Index

PERIOD	PRICE RETURN		TOTAL RETURN	
	S&P/B3 LOW VOLATILITY HIGH DIVIDEND INDEX	S&P BRAZIL BMI	S&P/B3 LOW VOLATILITY HIGH DIVIDEND INDEX	S&P BRAZIL BMI
ANNUALIZED RETURN (%)				
3-Year	2.0	2.6	7.5	5.3
5-Year	5.2	5.1	11.0	7.7
10-Year	1.5	0.3	7.2	2.8
Since May 31, 2007	2.9	1.7	8.5	4.1
ANNUALIZED VOLATILITY (%)				
3-Year	22.1	24.6	22.0	26.0
5-Year	21.6	24.0	21.5	24.8
10-Year	18.1	20.6	18.1	21.4
Since May 31, 2007	18.2	22.3	18.3	22.9
RETURN/RISK				
3-Year	0.1	0.1	0.3	0.2
5-Year	0.2	0.2	0.5	0.3
10-Year	0.1	0.0	0.4	0.1
Since May 31, 2007	0.2	0.1	0.5	0.2
MONTHLY DRAWDOWN				
Maximum Draw down (%)	-37	-50	-27	-50
Peak Date	April 30, 2012	May 30, 2008	May 30, 2008	May 30, 2008
Second-Largest Draw down (%)	-28	-16	-25	-15
Peak Date	May 30, 2008	April 30, 2018	Aug. 29, 2014	April 30, 2018

Source: S&P Dow Jones Indices LLC. Data from May 31, 2007, to March 31, 2020. Index performance based on total return in BRL. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

As the S&P/B3 Low Volatility High Dividend Index has had less-volatile performance than the S&P Brazil BMI, it is expected to provide a level of downside reduction during bear markets at the cost of underperforming in bull markets. Based on monthly total returns starting in May 2007, the strategy outperformed the S&P Brazil BMI 76% of the time during down markets, but it underperformed 70% of the time during up markets. As the level of underperformance during up markets (1.6%) was much less than the level of outperformance during down markets (2.3%), the strategy outperformed its benchmark over the long term (see Exhibit 11).

Exhibit 11: Capture Ratios and Average Monthly Return of the S&P Brazil BMI and S&P/B3 Low Volatility High Dividend Index

PERIOD	NUMBER OF MONTHS	AVERAGE MONTHLY EXCESS RETURN (%)	OUTPERFORMANCE RATE (%)
Up Months	83	-1.55	30
Down Months	72	2.27	76
All Periods	155	0.23	52

Source: S&P Dow Jones Indices LLC. Data from May 31, 2007, to March 31, 2020. Index performance based on total return in BRL. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

Historically, the S&P/B3 Low Volatility High Dividend Index outperformed the S&P Brazil BMI by 3.5% annually...

...with an 18.3% volatility reduction and smaller maximum drawdown in the total return.

As the index is less volatile than its benchmark, it has provided downside reduction in bear markets but underperformed in bull markets.

4. COMPARISON WITH OTHER S&P DIVIDEND INDICES IN BRAZIL

Quality measures can help market participants interested in dividend strategies to avoid dividend-yield traps.

In this section, we compare the S&P/B3 Low Volatility High Dividend Index to other S&P Dividend Indices focused on Brazil.

4.1 Index Objectives and Stock-Selection Mechanisms

Besides screening for high-dividend-yielding stocks, quality measures can help market participants interested in dividend strategies to avoid dividend-yield traps. Historical dividend policy, dividend growth, dividend payout ratios, and other fundamental ratios that measure companies' earnings and financial strengths are commonly employed in dividend strategies.

In Brazil, S&P Dow Jones Indices has three different dividend-focused strategies.

1. The **S&P Dividend Aristocrats Brasil Index** is designed to measure the performance of 30 stocks in the S&P Brazil BMI that maintain increasing or stable dividends.
2. The **S&P Brazil Dividend Opportunities** is designed to measure the performance of 40 of the highest-yielding stocks in the S&P Brazil BMI that demonstrate profitability.
3. The **S&P/B3 Low Volatility High Dividend Index** is designed to measure the performance of the least-volatile stocks among a specified group of high-dividend-yielding constituents of the S&P Brazil BMI that trade on the B3.

The three indices are high-yield oriented and the main difference is in the eligibility criteria and member selection.

The three strategies are high-yield oriented, which means that constituents' weights are determined by their 12-month dividend yield, subject to concentration constraints. The main difference between them is in the eligibility criteria and the member selection (see Exhibit 12).

Due to differences in their stock-selection criteria and member weighting methods, the S&P Dividend Indices offer different ranges of dividend yields.

Exhibit 12: Methodology Comparison between S&P Dividend Indices – Eligibility and Selection

CATEGORY	S&P DIVIDEND ARISTOCRATS BRAZIL INDEX	S&P BRAZIL DIVIDEND OPPORTUNITIES	S&P/B3 LOW VOLATILITY HIGH DIVIDEND INDEX
Eligibility Criteria	<ul style="list-style-type: none"> Dividend Stability: the rolling three-year moving average, computed over the past five years of dividend payments, must be stable or increasing 	<ul style="list-style-type: none"> Profitability: earnings-per-share (EPS) over the latest 12-month period must be positive Earnings Growth: three-year earnings growth must be positive* 	<ul style="list-style-type: none"> Dividend Payment: stocks must have a 12-month trailing dividend yield
Member Selection Factors	Highest-dividend-yielding stocks from the S&P Brazil BMI	Highest-dividend-yielding stocks from the S&P Brazil BMI	From the 50% highest-dividend-yield stocks, the 60% with lowest realized return volatility from the S&P Brazil BMI actively trading on the B3 as a local listing.
Rebalance Frequency	Annual, with secondary review	Semiannual	Semiannual

* Existing index stocks will only be removed from the index after failing the earnings growth criteria for two consecutive rebalancing dates.

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

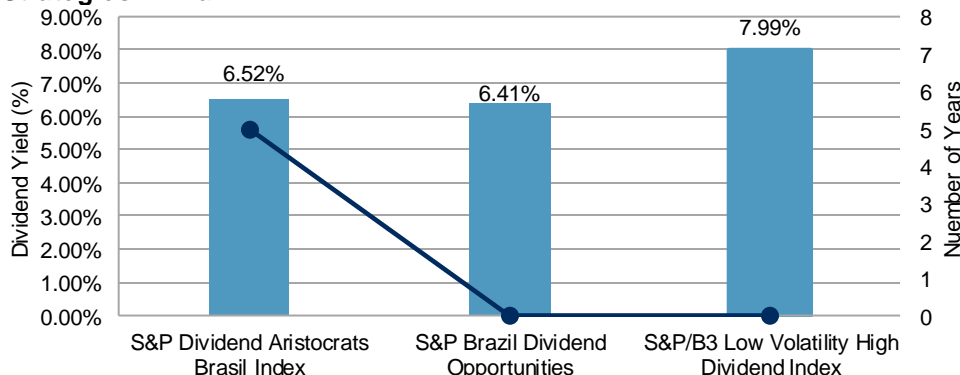
The S&P Brazil Dividend Opportunities and S&P Dividend Aristocrats Brasil Index had dividend yields of 6.52% and 6.41%, respectively...

4.2 Dividend Yield and Volatility

Due to differences in their stock-selection criteria and member weighting methods, the S&P Dividend Indices offer different ranges of dividend yields. In Brazil, the profitability criteria of the S&P Brazil Dividend Opportunities also affects the index dividend yield. As the S&P Brazil Dividend Opportunities has the strictest profitability criteria, it had a dividend yield of 6.41%. The S&P Dividend Aristocrats Brasil Index, which most strongly emphasizes consistent dividend history, had a dividend yield of 6.52% as of March 31, 2020. In contrast, the S&P/B3 Low Volatility High Dividend Index, which selects members based on a low volatility screen, offered the highest dividend yield compared with other dividend indices in Brazil. The index offered a dividend yield of 7.99% (see Exhibit 13).

...whereas the S&P/B3 Low Volatility High Dividend Index offered the highest dividend yield, at 7.99%.

Exhibit 13: Dividend History Requirement and Yield of the Dividend Strategies in Brazil



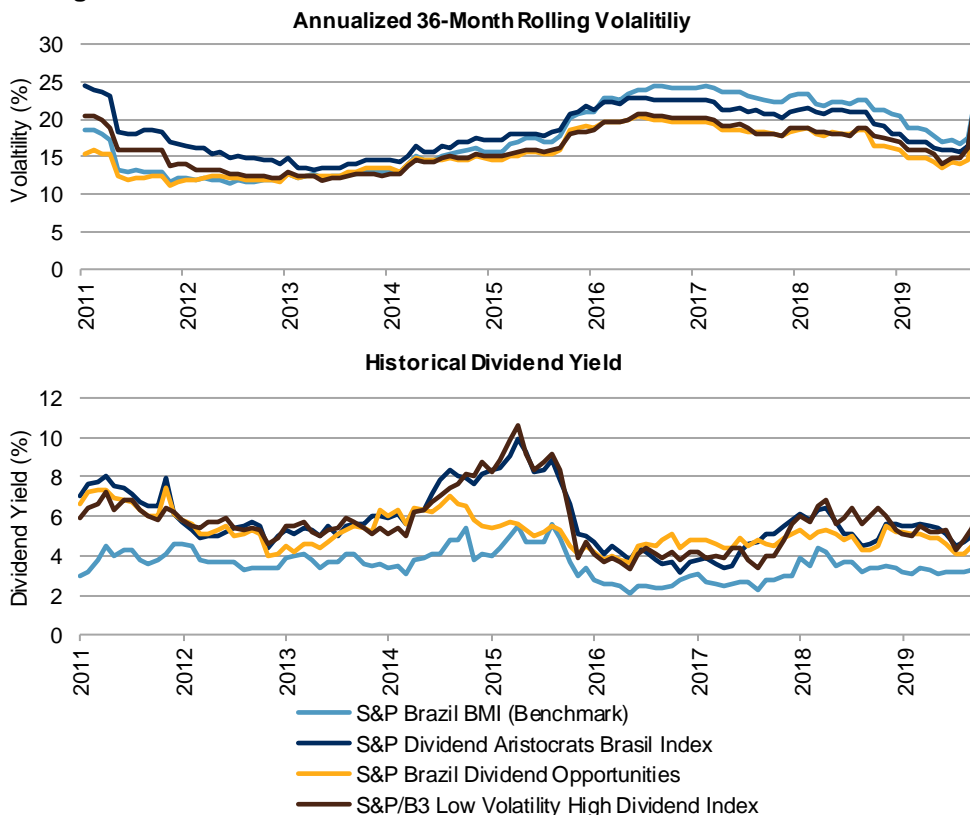
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The historical performance of the S&P Dividend Indices in Brazil evidences the low volatility screen’s effect on the S&P/B3 Low Volatility High Dividend Index, consistently delivering the lowest volatility among other dividend strategies and the benchmark, without sacrificing dividend yield (see Exhibit 14).

Thanks to the low volatility screen, the S&P/B3 Low Volatility High Dividend Index delivered the lowest volatility...

...without sacrificing dividend yield.

Exhibit 14: Dividend History Requirement and Dividend Yield of the Dividend strategies in Brazil



Source: S&P Dow Jones Indices LLC. Data as of March 31, 2020. Index performance based on monthly total return in BRL. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and reflect hypothetical historical. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

4.3 Historical Performance

Different index mechanics can lead to different risk/return profiles. Over the 5- and 10-year periods, the three indices were shown to add value compared with their benchmark, and the dividend yield achieved was about double that of the S&P Brazil BMI. The S&P/B3 Low Volatility High Dividend Index showed the most contained maximum drawdown over all the observed period from April 30, 2008, to March 31, 2020. Based on monthly price returns over the same period, the S&P/B3 Low Volatility High Dividend Index did not stand out as the best performer for the historical absolute or risk-adjusted returns compared with other S&P Dividend Indices in Brazil, with the exception of the five-year risk-adjusted return. However,

Different index mechanics can lead to different risk/return profiles.

this was the strategy with lowest realized volatility over all periods (see Exhibit 15).

Over the 5- and 10-year periods, the three indices were shown to add value compared with their benchmark ...

...and the dividend yield achieved was about double that of the S&P Brazil BMI.

Based on price returns, the S&P/B3 Low Volatility High Dividend Index did not stand out as the best performer for the historical absolute or risk-adjusted returns.

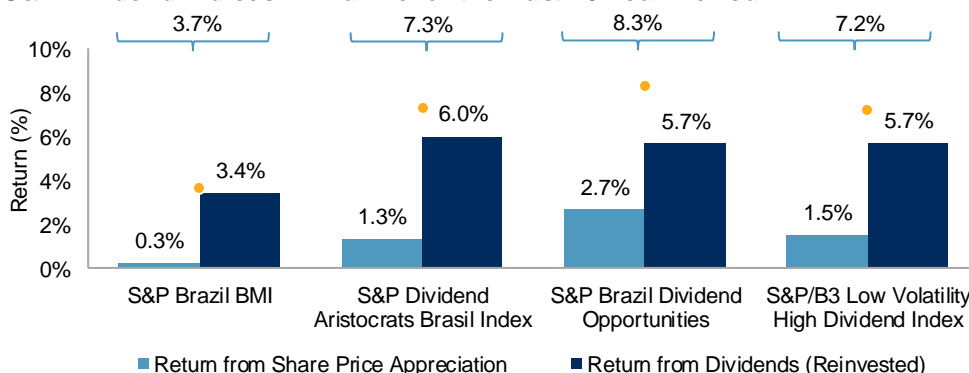
Exhibit 15: Risk/Return Summary of S&P Dividend Indices in Brazil (Before Inclusion of Dividend Reinvestment Income)

PERIOD	BENCHMARK	DIVIDEND INDICES		
	S&P BRAZIL BMI	S&P DIVIDEND ARISTOCRATS BRASIL INDEX	S&P BRAZIL DIVIDEND OPPORTUNITIES	S&P/B3 LOW VOLATILITY HIGH DIVIDEND INDEX
ANNUALIZED RETURN (%)				
3-Year	2.57	3.74	0.25	1.97
5-Year	5.09	5.85	4.56	5.18
10-Year	0.25	1.30	2.65	1.51
Since April 30, 2008	-0.36	1.11	3.61	2.24
ANNUALIZED VOLATILITY (%)				
3-Year	24.66	24.37	24.84	22.05
5-Year	24.05	25.03	23.17	21.60
10-Year	20.66	20.46	19.43	18.06
Since April 30, 2008	22.23	20.88	20.38	18.14
RETURN/RISK				
3-Year	0.10	0.15	0.01	0.09
5-Year	0.21	0.23	0.20	0.24
10-Year	0.01	0.06	0.14	0.08
Since April 30, 2008	-0.02	0.05	0.18	0.12
MONTHLY DRAWDOWN				
Maximum Draw down (%)	-50.16	-50.90	-38.84	-37.44
Peak Date	May 30, 2008	Feb. 2, 2012	May 30, 2008	April 30, 2012

Source: S&P Dow Jones Indices LLC. Data from April 30, 2008, to March 31, 2020. Index performance based on price return in BRL. 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.

The reinvestment of the dividend captures in the total return had more than double the results of the capital gains represented by the price return over the 10-year period. Exhibit 16 shows a result consistent with the dividend yields shown in the Section 4.2.

Exhibit 16: Annualized Price Return and Dividend Income of the S&P Dividend Indices in Brazil over the Past 10-Year Period



Source: S&P Dow Jones Indices LLC. Data as of March 31, 2020. Index performance based on price return in BRL. 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 17: Risk/Return Summary of S&P Dividend Indices in Brazil
(After Inclusion of Dividend Reinvestment Income)**

PERIOD	BENCHMARK	DIVIDEND INDICES		
	S&P BRAZIL BMI	S&P DIVIDEND ARISTOCRATS BRASIL INDEX	S&P BRAZIL DIVIDEND OPPORTUNITIES	S&P/B3 LOW VOLATILITY HIGH DIVIDEND INDEX
ANNUALIZED RETURN (%)				
3-Year	5.96	9.49	5.28	7.49
5-Year	8.58	11.72	9.88	10.96
10-Year	3.68	7.29	8.31	7.21
Since April 30, 2008	2.99	6.81	9.21	7.92
ANNUALIZED VOLATILITY (%)				
3-Year	24.65	24.59	24.96	22.02
5-Year	24.02	25.07	23.20	21.50
10-Year	20.64	20.49	19.39	18.08
Since April 30, 2008	22.27	20.99	20.40	18.20
RETURN/RISK				
3-Year	0.24	0.39	0.21	0.34
5-Year	0.36	0.47	0.43	0.51
10-Year	0.18	0.36	0.43	0.40
Since April 30, 2008	0.13	0.32	0.45	0.43
MONTHLY DRAWDOWN				
Maximum Draw down (%)	-49.54	-39.57	-37.93	-26.94
Peak Date	May 30, 2008	May 30, 2008	May 30, 2008	May 30, 2008

Source: S&P Dow Jones Indices LLC. Data from April 30, 2008, to March 31, 2020. Index performance based on total return in BRL. 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.

When dividend income reinvestment return was accounted for, the S&P/B3 Low Volatility High Dividend Index delivered the best absolute returns in the short- and mid-term periods, as well as the best historical risk-adjusted return in the longer periods (see Exhibit 17). Its historical volatility was less than that of the three other indices, including the benchmark, and its historical maximum monthly drawdown was the lowest.

Historically, up markets such as those seen in 2009, 2012, and 2016-2019 have not provided the best environment for the S&P/B3 Low Volatility High Dividend Index, as it is a defensive strategy that seeks to provide downside protection during down markets, like those seen in 2011 and 2013-2015. Exhibit 18 reinforces what we saw in Exhibit 11 and compares the index with other dividend strategies.

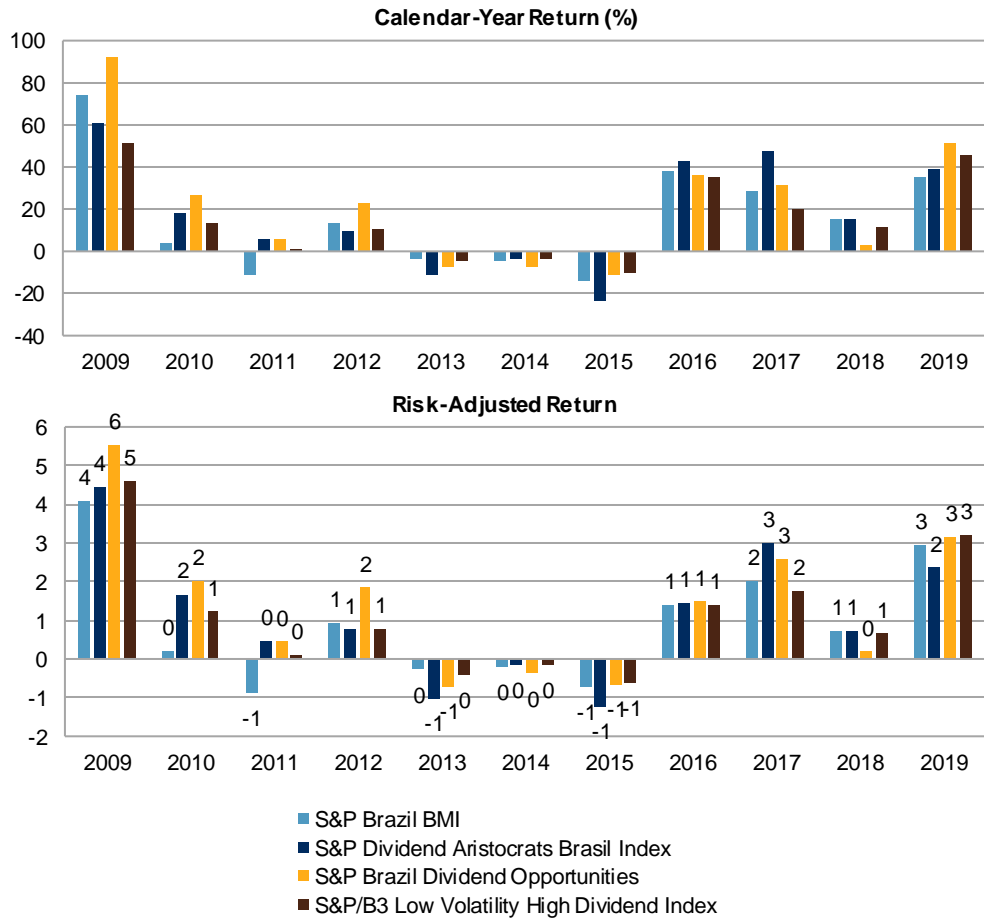
The reinvestment of the dividend captures in the total return had more than double the results of the capital gains represented by the price return over the 10-year period.

When dividend income reinvestment return was accounted for, the S&P/B3 Low Volatility High Dividend Index delivered the best absolute returns in the short and mid terms...

...as well as the best historical risk-adjusted return in the longer periods.

Exhibit 18: Absolute and Risk-Adjusted Calendar-Year Return of the S&P Dividend Indices in Brazil

In up markets like 2009, 2012, and 2016-2019, the S&P/B3 Low Volatility High Dividend Index did not outperform the other indices...



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 2008, to Dec. 31, 2019. Index performance based on total return in BRL. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and 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.

...as it is a defensive strategy that seeks to provide downside protection during down markets like 2011 and 2013-2015.

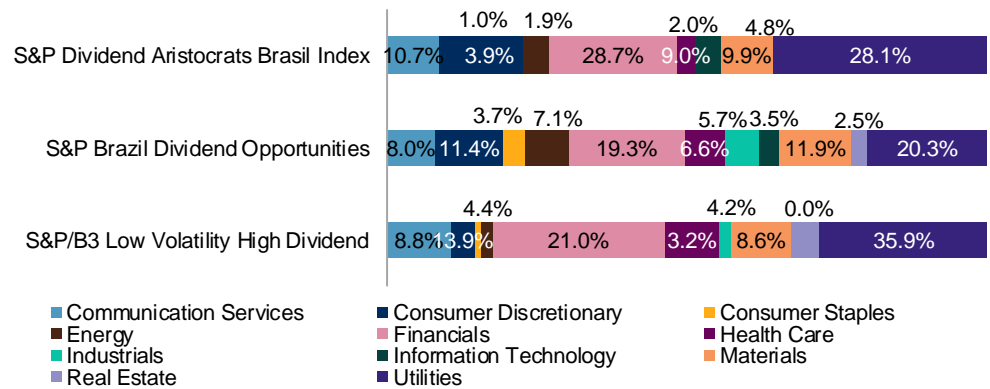
4.4 Sector Exposure

Exhibit 19 displays how the S&P/B3 Low Volatility High Dividend Index differs from the other S&P Dividend Indices in terms of sector weighting as of March 2020.

Compared with the S&P Dividend Aristocrats Brasil Index, which requires at least five years of dividend payments, and the S&P Brazil Dividend Opportunities, the S&P/B3 Low Volatility High Dividend Index had higher weighting in Financials, Real Estate, and Health Care, and less weight in Consumer Discretionary, Energy, and Information Technology. The S&P/B3 Low Volatility High Dividend Index’s sector weighting was most in contrast to the S&P Dividend Aristocrats Brasil Index.

Compared with the other dividend indices, the S&P/B3 Low Volatility High Dividend Index had higher weighting in Financials, Real Estate, and Health Care...

Exhibit 19: Sector Composition of the S&P Dividend Indices in Brazil

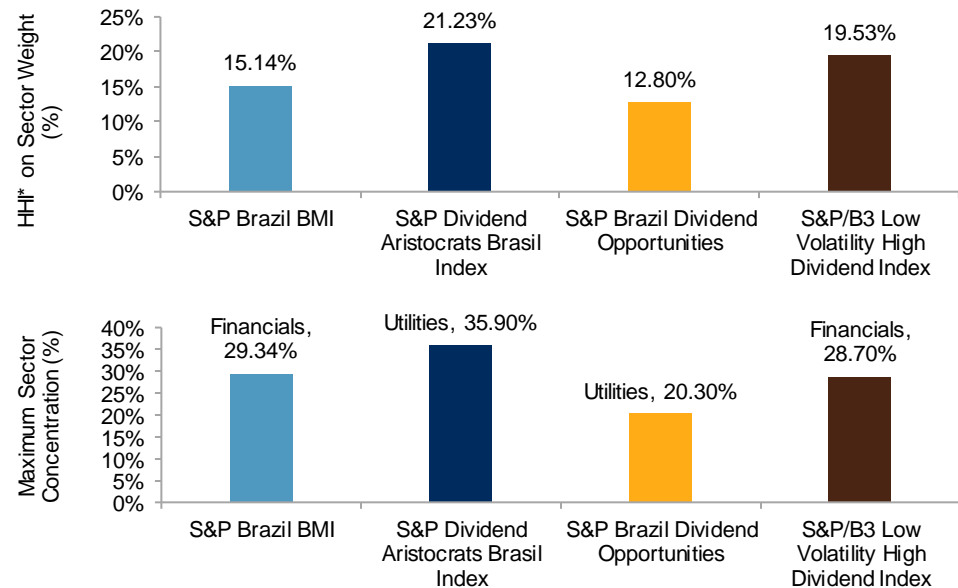


Source: S&P Dow Jones Indices LLC. Data as of March 31, 2020. Index performance based on total returns in BRL. Chart is provided for illustrative purposes.

...and less weight in Consumer Discretionary, Energy, and Information Technology.

Based on its sector composition as of March 2020, the S&P/B3 Low Volatility High Dividend Index had a moderate level of sector concentration risk. The index had a Herfindahl-Hirschman Index (HHI)⁵ of 19.5%, which was lower than that of the S&P Dividend Aristocrats Brasil Index at 21.3%. This implies that the strategy exhibits lower sector bias compared with the S&P Dividend Aristocrats Brasil Index. It had a maximum single-sector exposure of 28.7% in Financials, lower than the 35.9% concentration in Utilities in the S&P Dividend Aristocrats Brasil Index.

Exhibit 20: Sector Concentration of the S&P Dividend Indices in Brazil



* The Herfindahl-Hirschman Index (HHI) is calculated as the sum of the square of the 11 sectors' weighting. A higher number implies lower diversification (higher concentration) and vice versa. Source: S&P Dow Jones Indices LLC. Data as of March 31, 2020. Index performance based on total returns in BRL. Charts are provided for illustrative purposes.

⁵ Note: The Herfindahl-Hirschman Index (HHI) is calculated as the sum of the square of the 11 sectors' weighting. A higher number implies lower diversification (higher concentration) and vice versa.

4.5 Factor Exposure

When comparing the S&P/B3 Low Volatility High Dividend Index to the momentum, value, market, and size factors, we saw that it had significant market exposure...

Since the Fama-French Four Factor model doesn't have explicit values for the Brazilian market, we ran regression of monthly returns of the S&P/B3 Low Volatility High Dividend Index with monthly returns of four different benchmarks that represent the momentum, value, market, and size factors, respectively: the [S&P/B3 Momentum Index](#), [S&P/B3 Enhanced Value Index](#), S&P Brazil BMI, and [S&P Brazil SmallCap](#) (see Exhibit 21).

The results showed that the S&P/B3 Low Volatility High Dividend Index had significant market exposures, but lower than the S&P Dividend Aristocrats Brasil Index and S&P Brazil Dividend Opportunities Index. The S&P/B3 Low Volatility High Dividend Index also presented small value bias, which could be a consequence of the low volatility screen that excludes deep value stocks produced by sharp price drops from the index.

Exhibit 21: Regression Factor Loadings of the S&P Dividend Indices in Brazil

FACTOR*	S&P DIVIDEND ARISTOCRATS BRASIL INDEX	S&P BRAZIL DIVIDEND OPPORTUNITIES INDEX	S&P B3 LOW VOLATILITY HIGH DIVIDEND INDEX
Market	0.93	0.9	0.84
<i>t-stat</i>	43.70	40.08	39.52
Size	-0.03	-0.05	-0.03
<i>t-stat</i>	-0.41	-0.6	-0.31
Value	0.01	0.04	0.03
<i>t-stat</i>	0.11	0.69	0.63
Momentum	0	0	-0.02
<i>t-stat</i>	-0.02	0.02	-0.35
R-Squared	0.94	0.92	0.92

* Note: the market factor is represented by the S&P Brazil BMI, the size factor is represented by the S&P/B3 SmallCap, the value factor is represented by the S&P/B3 Enhanced Value Index, and the momentum factor is represented by the S&P/B3 Momentum Index.

Source: S&P Dow Jones Indices LLC. Data for the S&P/B3 Low Volatility High Dividend Index and S&P Brazil Dividend Opportunities from June 29, 2007, to March 31, 2020. Data for the S&P Dividend Aristocrats Brasil Index from Aug. 29, 2008, to March 31, 2020. Table is provided for illustrative purposes and reflects historical hypothetical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

...and presented small value bias compared with other dividend strategies, possibly due to the low volatility screen.

There are various ways in which the low volatility high-dividend strategy can be implemented in a portfolio.

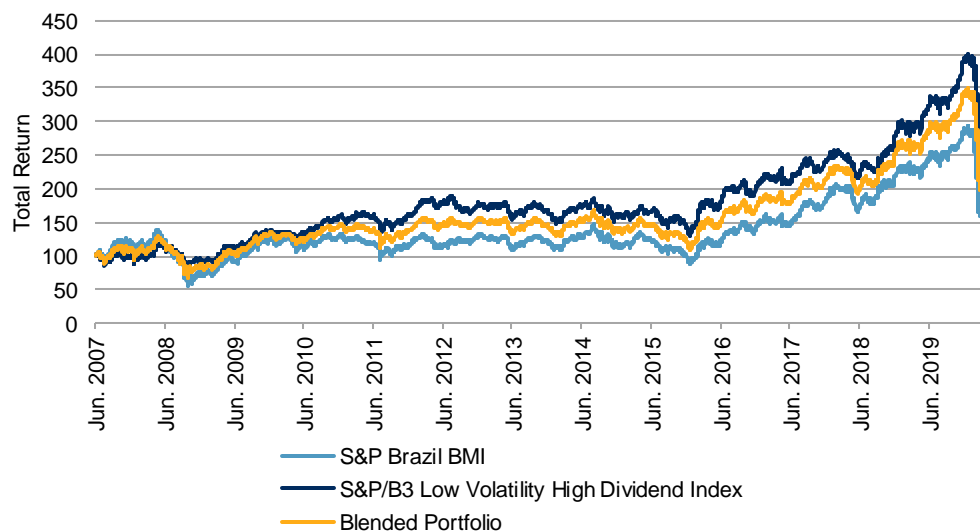
We constructed a blended portfolio of 50% S&P Brazil BMI and 50% S&P/B3 Low Volatility High Dividend Index...

...and we observed that the blended portfolio outperformed the S&P Brazil BMI over the studied period.

5. STRATEGY IMPLEMENTATION

There are various ways in which the low volatility high-dividend strategy can be implemented in a portfolio. We constructed a hypothetical blended portfolio consisting of 50% S&P Brazil BMI and 50% S&P/B3 Low Volatility High Dividend Index for the period from June 29, 2007, to March 31, 2020. We rebalanced the blended portfolio at the end of every June until 2019, maintaining the blend of 50%-50% of each index, allowing the blended portfolio to move along with the market between the rebalancing periods. We observed that the blended portfolio showed improved performance over the S&P Brazil BMI over the studied period (see Exhibit 22).

Exhibit 22: Cumulative Growth of a Blended Portfolio



The blended portfolio is a hypothetical portfolio. Source: S&P Dow Jones Indices LLC. Data from June 29, 2007, to March 31, 2020. Index performance based on total return in BRL. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects historical hypothetical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

The risk/return profile as of March 31, 2020, showed higher absolute returns and lower volatility for the blended portfolio compared with the benchmark, resulting in higher risk-adjusted returns across all time horizons (see Exhibit 23).

Exhibit 23: Risk/Return Profile of the Blended Portfolio

PERIOD	S&P/B3 LOW VOLATILITY HIGH DIVIDEND INDEX	S&P BRAZIL BMI	BLENDED PORTFOLIO
ANNUALIZED RETURN (%)			
1-Year	-7.03	-20.78	-13.98
3-Year	7.49	5.84	6.82
5-Year	10.96	8.50	9.87
10-Year	7.21	3.64	5.53
Since Inception	8.03	4.75	6.57
ANNUALIZED VOLATILITY (%)			
3-Year	22.02	24.66	23.03
5-Year	21.50	23.99	22.42
10-Year	18.08	20.63	18.92
Since Inception	18.23	22.40	19.69
RETURN/RISK			
3-Year	0.34	0.24	0.30
5-Year	0.51	0.35	0.44
10-Year	0.40	0.18	0.29
Since Inception	0.44	0.21	0.33
RISK STATISTICS SINCE INCEPTION			
Maximum Draw down (%)	-31.06	-49.54	-38.16
Best Monthly Return (%)	16.88	15.71	16.33
Worst Monthly Return (%)	-26.85	-29.80	-28.28
Average Monthly Return (%)	0.79	0.61	0.70
Minimum Rolling 12-Month Return (%)	-18.49	-43.23	-31.47
Maximum Rolling 12-Month Return (%)	51.08	75.70	61.29

The blended portfolio had higher absolute returns and lower volatility compared with the benchmark ...

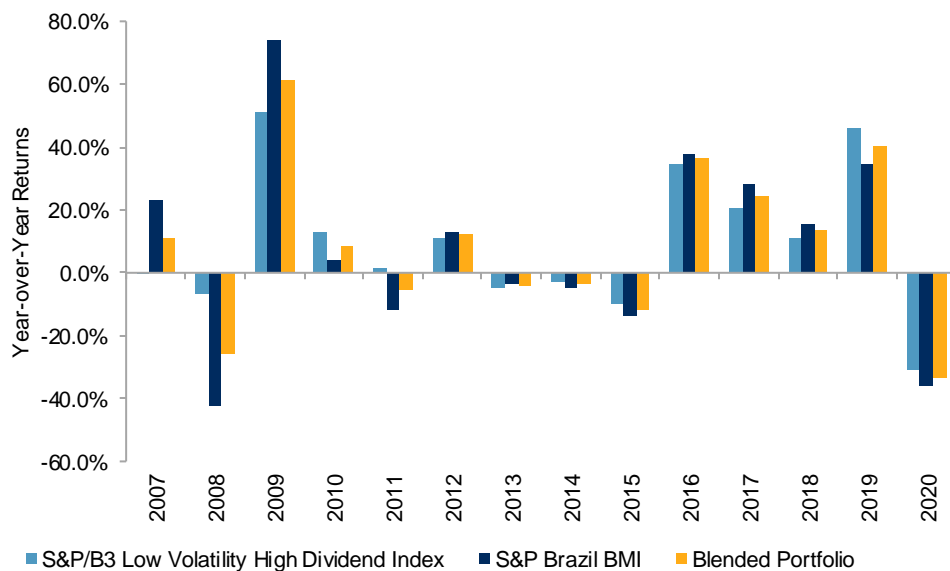
...resulting in higher risk-adjusted returns across all time horizons.

Source: S&P Dow Jones Indices LLC. Data from June 29, 2007, to March 31, 2020. Index performance based on total return in BRL. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects historical hypothetical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

The blended portfolio also demonstrated some of the defensive characteristics from the S&P/B3 Low Volatility High Dividend Index, presenting lower maximum drawdown than the S&P Brazil BMI, as well as providing downside protection in five of the six years when the benchmark was negative (see Exhibit 24).

Exhibit 24: Year-over-Year Returns of the Blended Portfolio

The blended portfolio demonstrated some of the defensive characteristics from the low volatility high-dividend strategy...



...providing downside protection in five of the six years the benchmark was negative.

The Blended Portfolio is a hypothetical portfolio.
 Source: S&P Dow Jones Indices LLC. Data from June 29, 2007, to March 31, 2020. Index performance based on total return in BRL. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects historical hypothetical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

6. CONCLUSION

Introducing the S&P/B3 Low Volatility High Dividend Index to the dividend strategy offerings in Brazil, with its simple two-step constituent screening method accounting for price volatility and dividend yield, has captured the potential benefits of high-dividend and low volatility strategies.

Even though each of the S&P Dividend Indices in Brazil has different characteristics, the low volatility high-dividend strategy has achieved higher dividend yield and better risk-adjusted returns compared with the other dividend indices. The strategy can be used in a portfolio of its own or blended with other portfolios to provide potential downside protection. The S&P/B3 Low Volatility High Dividend Index shows the beauty of a simple and effective index.

APPENDIX A

Base Dates and History Availability				
INDEX	METHODOLOGY	LAUNCH DATE	FIRST VALUE DATE	BASE DATE
S&P/B3 Low Volatility High Dividend Index	S&P/B3 Indices Methodology	Aug. 7, 2019	May 31, 2007	May 31, 2007
S&P Dividend Aristocrats Brasil Index	S&P Brazil Dividend Indices Methodology	Aug. 1, 2012	April 18, 2008	April 18, 2008
S&P Brazil Dividend Opportunities	S&P Brazil Dividend Indices Methodology	Feb. 8, 2013	April 30, 2007	April 30, 2007

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

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PERFORMANCE DISCLOSURE/BACK-TESTED DATA

The S&P/B3 Low Volatility High Dividend Index was launched August 7, 2019. The S&P Brazil Dividend Opportunities was launched February 8, 2013. The S&P Dividend Aristocrats Brasil Index was launched April 1, 2012. 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.spglobal.com/spdji. Past performance of the Index is not an indication of future results. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results. Please refer to the methodology for the Index 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. Back-tested performance is for use with institutions only; not for use with retail investors.

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 to a fixed value for calculation purposes. The Launch Date designates the date when 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 data feed 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.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate S&P DJI's ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using "Backward Data Assumption" (or pulling back) of ESG data for the calculation of back-tested historical performance. "Backward Data Assumption" is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as "product involvement") were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on "Backward Data Assumption" please refer to the [FAQ](#). The methodology and factsheets of any index that employs backward assumption in the back-tested history will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used.

Index returns shown do not represent the results of actual trading of investable assets/securities. S&P Dow Jones Indices maintains the index and calculates the index levels and performance shown or discussed but does not manage actual assets. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the Index or investment funds that are intended to track the performance of the Index. The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the Index performance shown. As a simple example, if an index returned 10% on a US \$100,000 investment for a 12-month period (or US \$10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US \$1,650), the net return would be 8.35% (or US \$8,350) for the year. Over a three-year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US \$5,375, and a cumulative net return of 27.2% (or US \$27,200).

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