



## Executive Summary

With the increasing accessibility to dividends as a standalone investment, we believe a basic framework for identifying dividends as their own asset class can be established. Currently, due to the lack of yield available in today's fixed income market, many investors purchase dividend stocks to generate income, but are risking their principal in the process. Recent financial innovation has begun to address this investor need more dynamically, providing investors the ability to express preference and obtain dividends without stock price risk. For that reason, we think it is important for investors to understand the characteristics that dividends exhibit when separated from the underlying price risk. The majority of the analysis below uses long-term historical data to explain our view on the following topics:

1. Why dividends have exhibited low volatility;
2. How dividends may have historically contributed to portfolio diversification;
3. How dividends have been an effective hedge against inflation;
4. Low correlation of dividends with many other asset classes; and
5. Dividend expectations and investing in them today

This is a research paper of observational and mathematical analysis and not meant to forecast any particular outcome or provide investment advice.

Rick Sandulli  
201.683.8324  
rsandulli@metaurus.com

Jamie Greenwald  
201.683.5674  
jgreenwald@metaurus.com

Don Callahan  
201.683.8320  
dcallahan@metaurus.com

Sean Dillon  
201.683.5961  
sdillon@metaurus.com

Brendan Greenwald, CFA  
201.683.8323  
bgreenwald@metaurus.com

## Less Volatility Than Equities

### Dividend Payout Policy is Favorable

When a company chooses to pay out or increase their dividend, it is perceived as a signal of confidence for its future. Companies are likewise reluctant to reduce dividends unless management deems it absolutely necessary (typically a last resort), making them "sticky"<sup>1</sup> and exhibit low downside volatility. To this point, there have been only three years in the past 45 where dividend growth was negative (Exhibit 1).

### P/E Multiple Expansion/Contraction Risk Removed

Dividend payouts have historically been relatively stable over time as companies tend to target payouts as a percentage of earnings. As a result, dividend growth is directly linked to aggregate earnings, and correlation between the two can be clearly demonstrated. As the economy improves, both earnings and dividends increase. On the other hand, dividends are not subject to the price/earnings (P/E ratio<sup>2</sup>) expansion/contraction cycles exhibited by stocks. Over the long term, change in the P/E multiple has added surprisingly little return to the S&P 500 (Exhibit 2) while producing a disproportionately large amount of stock volatility. Since dividends are not subject to P/E volatility, dividends have exhibited a favorable risk/return profile relative to stocks.

### Modern Portfolio Theory: Diversifying Characteristics of an Asset

Since dividends have historically exhibited lower volatility than equities, the addition of dividends to a portfolio should provide diversification benefits. Using the Sharpe Ratio to compare asset classes on a risk-adjusted basis, dividend growth produced the highest return per unit of risk from 1973-2017 (Exhibit 3).

Exhibit 1: Annual S&P 500 Dividend Growth (1973-2017)

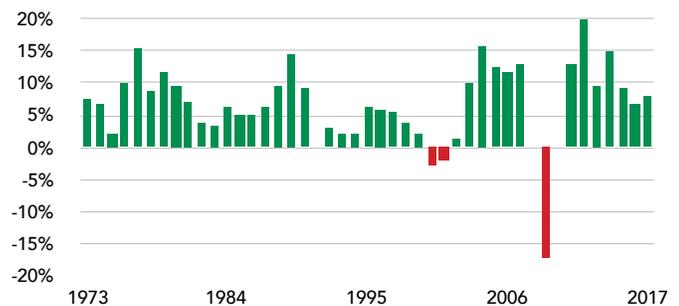


Exhibit 2: S&P 500 Sources of Return

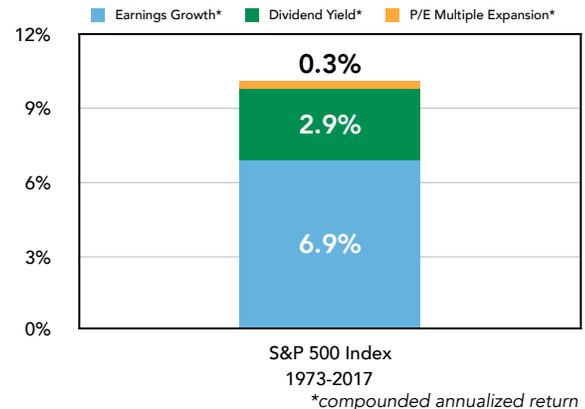


Exhibit 3: Risk/Return Profile (1973-2017)

	S&P 500 Dividends (12mo Offset)	S&P 500 TR	10-Year US T-Bond	Commodity Basket (custom)*
Compounded Ann. Return	6.35%	10.28%	6.92%	6.24%
Standard Deviation	6.22%	17.26%	9.90%	29.42%
Sharpe Ratio	0.698	0.480	0.497	0.144

Past performance is no guarantee of future results.

\*Data Source: The World Bank - basket constructed w/ 60% energy & 40% non-energy commodities.

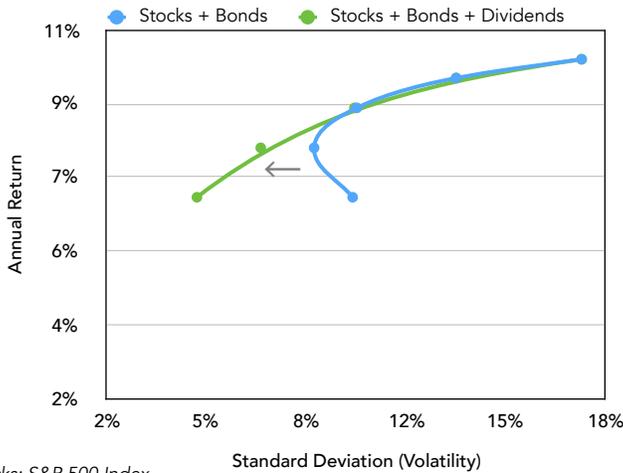
Exhibit 3a: Risk/Return Profile (2000-2017)

	S&P 500 Dividends (12mo Offset)	S&P 500 TR	Bloomberg Barclay US Agg Bond
Compounded Ann. Return	7.60%	6.28%	4.74%
Standard Deviation	8.45%	17.86%	2.96%
Sharpe Ratio	0.662	0.240	0.926

Past performance is no guarantee of future results.

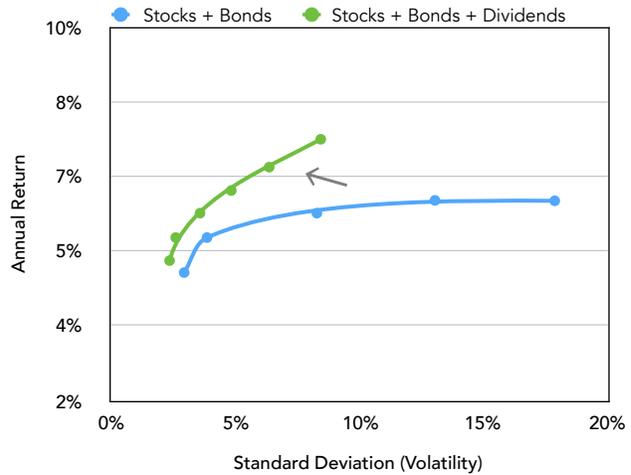
The impact of adding dividends to a portfolio can be seen by observing their effect on the efficient frontier<sup>3</sup>. With respect to the period from 1973 to 2017, Exhibit 4 illustrates that adding dividends as a separate asset class may have significantly reduced the volatility of a portfolio with a return range below 9%. With respect to the more current period from 2000 to 2017, Exhibit 4a shows a more pronounced effect over a wider range of returns. We note that dividends were not easily investable as an asset class on a standalone basis during this period. Certainly the price at which an investment in dividends was entered/exited would have impacted these results. This concept will be expanded upon later in this analysis.

**Exhibit 4: Efficient Frontier with Dividends (1973-2017)**



Stocks: S&P 500 Index  
 Bonds: 10-Year US T-Bond (Exhibit 4) & Bloomberg Barclay US Agg Bond Index (Exhibit 4a)  
 Dividends: S&P 500 Dividends

**Exhibit 4a: Efficient Frontier with Dividends (2000-2017)**

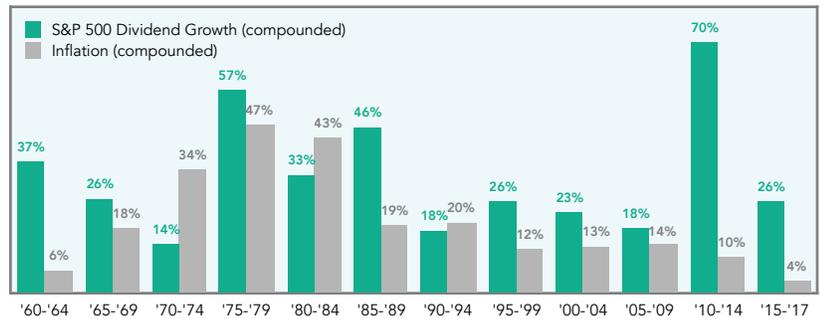


## Inflation Hedge

### Historically Correlated with Inflation

Over the last 60 years, dividend growth has been correlated with inflation (CPI) while outpacing it by over 200bps on a compound annual basis. We believe this intuitively makes sense as dividends are directly proportional to nominal company earnings, and inflation is reflected in earnings. To illustrate this, Exhibit 5 shows compound dividend growth compared to inflation since 1960.

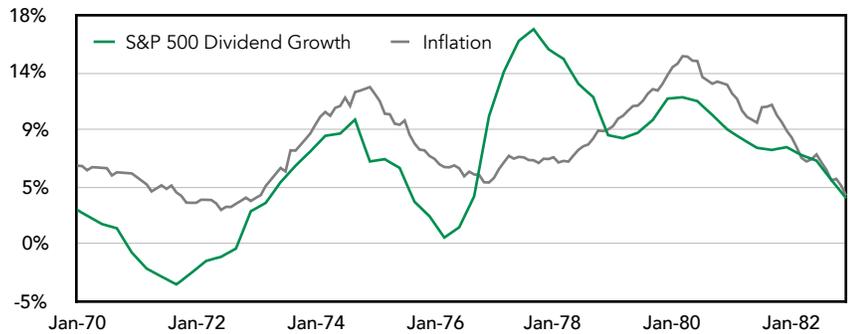
**Exhibit 5: Historically Effective Inflation Hedge**



### Scenario Analysis: Inflationary Period 1970-1980

During one of the greatest inflationary periods in recent US history, the S&P 500 and 10-year Treasury Bond both underperformed their long-term averages and exhibited a high level of volatility. Commodities performed very well, as one might expect, albeit with significant volatility (Exhibit 6). Unlike equities and bonds, dividends outperformed their long-term average during this time, with much less volatility, resulting in an attractive Sharpe Ratio<sup>4</sup> (and about 1/5 the volatility of the S&P 500).

**Exhibit 7: Dividend Growth vs. Inflation (1970-1982)**



Data Source: Robert Shiller

During the 70's, dividend growth and inflation were significantly correlated at about 60% (Exhibit 7). Inflation averaged a little above 8% while dividend growth annualized at 8%. Since interest rates typically move in tandem with inflation, and this period was no different, then we can conclude that dividend growth was an effective hedge for the inflationary and rising rate environment of the 1970s.

**Exhibit 6: Inflationary Period 1970-1980 (Ann. Inflation of 8.43%)**

	S&P 500 Dividends (12mo Offset)	S&P 500 TR	10-Year US T-Bond	Commodity Basket (custom)*
Compounded Ann. Return	8.00%	8.34%	3.79%	27.08%
Standard Deviation	3.93%	20.38%	5.12%	48.29%
Sharpe Ratio	1.527	0.311	0.349	0.519

Past performance is no guarantee of future results.

\*Data Source: The World Bank - basket constructed w/ 60% energy & 40% non-energy commodities.

## Low Correlation to Traditional Asset Classes

One of the most important considerations when determining the potential portfolio diversification benefits of an asset class is its correlation to other asset classes. Assets with relatively low or even negative correlations may provide diversification benefits to an overall investment portfolio. Dividends have historically exhibited this low correlation (Exhibit 8a). Key points to note from this matrix:

- Dividends have historically been a lagging indicator by about 12 months, so correlation calculations appear to be more accurate when they are offset by 12 months as shown here. Inflation (as represented by the Consumer Price Index) is treated similarly.
- Dividends have a similar risk/return profile to fixed income while being negatively correlated to the asset (ie when bond returns are negative, dividend growth is positive).
- Modest correlation to equities reflects the low volatility nature of dividends.
- Higher correlation does not necessarily preclude categorization as different asset classes. For instance, REITs are more highly correlated to the S&P 500 (0.436) than dividends (0.329), yet they are considered their own asset class.
- Dividends and inflation have exhibited positive correlation over the long term. More importantly, they have demonstrated even higher correlation during inflationary periods.

## Dividends as an Investable Asset

In the United States, investors have only been able to invest in dividends via the derivatives markets using swaps<sup>5</sup> and, more recently, dividend futures<sup>6</sup>. Since swaps data is typically proprietary and the dividend futures have only been in existence for a few years, we can only draw from limited historical data. However, the dividend futures markets are more developed internationally, and several research pieces have been published that support the idea of dividends as a distinct, investable asset class. In Europe, where more historical data exists, we see the addition of dividends to a portfolio to clearly expand the efficient frontier. While parallels can be drawn, it cannot be assumed that our research regarding US dividends, relying upon historical dividend data, is wholly representative of how a historical investment in solely dividends would have performed, as there was not an easy way to directly invest in them during this period. A more accurate measure would be reflected in the expectations of dividend growth (the dividends that an investor expects to be paid in the future) relative to the actual dividends that end up being paid.

### Dividend Futures Market

When investing in dividends via futures, there are certain growth expectations of dividends already being priced in by the market. Therefore, one will only have profit/loss on dividend futures positions based on any changes in these expectations reflected in the futures prices over time. For example, a snapshot of dividend futures pricing in Exhibit 9 reflects that the 2018 contract is pricing in 10.08% growth in dividends (expecting \$53.95 to be paid in 2018 dividends, versus \$49.01 paid in 2017), so by purchasing that futures contract, one would only realize a gain/loss if the expected dividends to be paid goes up/down relative to the price at the time of taking a position in the 2018 S&P 500 Dividend Futures contract. The next 10 years of annual dividend contracts show the expected annual dividend growth rates priced into the market are lower for each consecutive contract expiry out through 2027. With long term dividend growth averaging 6.35% since 1973, it is worth noting that the market is currently pricing in (expecting) dividend growth for 2018-2027 to be only 4.1% per year, which is significantly below this average. Mean reversion would suggest that those futures contracts may be underpriced.

**Exhibit 8a: Dividend Correlations (1976-2017)**

	S&P 500 Dividends (12mo offset)
S&P 500 Dividends (12mo offset)	1.000
Inflation* (CPI) (12mo offset)	0.454
S&P 500 TR	0.329
10-Year US T-Bond	-0.218
Commodity Basket (custom)**	0.113

\*Inflation correlation calculations are an average of four 10-year periods of correlation for each pair of assets. This is to reduce the effect of smoothed data used in inflation calculations.

\*\*Data Source: The World Bank - basket is constructed w/ 60% energy & 40% non-energy commodities.

**Exhibit 8b: Dividends, S&P 500 & 10-yr US Treasury Bond Correlation Matrix (1976-2017)**

	S&P 500 Dividends (12mo offset)	S&P 500 TR	10-Year US T-Bond
S&P 500 Dividends (12mo offset)	1.000		
S&P 500 TR	0.329	1.000	
10-Year US T-Bond	-0.218	-0.022	1.000

**Exhibit 9: S&P 500 Dividend Growth Expectations (2018-2027)**

S&P 500 Dividend Futures Contract	Year End	Dividends Expected (Contract Price)	Expected YoY Div Growth
ASDZ7 Index	2017	49.01	
ASDZ8 Index	2018	53.95	10.08%
ASDZ9 Index	2019	56.80	5.28%
ASDZ0 Index	2020	59.60	4.93%
ASDZ1 Index	2021	61.90	3.86%
ASDZ22 Index	2022	64.00	3.39%
ASDZ23 Index	2023	65.95	3.05%
ASDZ24 Index	2024	67.85	2.88%
ASDZ25 Index	2025	69.60	2.58%
ASDZ26 Index	2026	71.45	2.66%
ASDZ27 Index	2027	73.35	2.66%

**10-Year Compounded Annual Growth Rate: 4.11%**

Historical Annual Growth Rate: 6.35%

as of 7/31/18

Past performance is no guarantee of future results.

### An Index for Dividend Growth Expectations

With the inception of S&P 500 Dividend Futures contracts with annual expirations out to 2027, Metaurus Advisors worked with Solactive to create the Solactive US Cumulative Dividends Index—Series 2027 that tracks the present value of the 10-year strip of dividend futures (Exhibit 10). The index's value represents the present value of the expected dividends to be paid by S&P 500 companies for a ten-year period from 2018 through 2027. The index value changes as dividend expectations change (as represented by changes in the dividend futures prices) and/or when there is a change in the Treasury rate used to discount the expected dividend payments. This index may act as a consistent and transparent yardstick for assessing investing in dividends and how expected dividend growth might be tracked and subsequently replicated as an investable asset for investors in the retail market.

### Making the Case for Owning Dividends Today

To see if any of the research around dividends is being demonstrated in the active market via the SOIDIV27 Index, we looked at the period of rising rates between 9/7/17 and 5/17/18 (Exhibit 11). During this period, the 10-year Treasury rate increased by 107 bps. As one might expect in a rising rate environment, the Bloomberg Barclay US Aggregate Bond Index fell 3.3%. However, the SOIDIV27 Index rose 2.22%, suggesting that owning dividends in this period would have provided a diversification benefit relative to owning bonds which were negatively impacted by higher interest rates.

### Next Steps...

While early research on European markets seems to point to the potential diversification benefits of dividends, more trading information will be needed to obtain a clear picture in the U.S. Prior to the listing of S&P 500 Dividend Futures on the Chicago Mercantile Exchange (CME) in 2015, dividends were only investible via an opaque dealer swap market. As publicly traded dividend futures and related cash products continue to evolve, investors will be better able to assess how well the market prices future dividends over different market cycles. While only time will tell, we anticipate further analysis over time to support the classification of dividends as a distinct asset class and establish direct investment in dividends as a valued tool for diversification, inflation hedging and optimization of the mean variance<sup>6</sup> efficient frontier.

### Exhibit 10: Index Performance History

Solactive US Cumulative Dividends Index—Series 2027 (SOIDIV27)					
as of 07/31/2018	3M	YTD	1Y	3Y	Inception (Cum.)
SOIDIV27	0.94	0.43	5.90	-	<b>11.58</b>
Bloomberg Barclay US Agg Bond Index	0.61	-1.59	-0.80	-	<b>1.89</b>

SOIDIV27 Inception Date: 12/30/2016. Past performance is no guarantee of future results.

### Exhibit 11: A Potential Diversifying Asset for Rising Rate Environments

Performance Period	# of Days	Change in 10-Year US Treasury Rate	SOIDIV27 Total Return	Bloomberg Barclay US Agg Bond Index Total Return
9/7/17 - 5/17/18	252	↑ 107 bps	<b>2.22%</b>	<b>-3.32%</b>

Past performance is no guarantee of future results.

## Footnotes

<sup>1</sup>“Sticky” - A general economics term that can apply to any financial variable that is resistant to change.

<sup>2</sup>Price-Earnings multiple (P/E ratio) - a ratio for valuing a company that measures its current share price relative to its per-share earnings.

<sup>3</sup>Efficiency Frontier - Set of optimal portfolios that offers the highest expected return for a defined level of risk or the lowest risk for a given level of expected return.

<sup>4</sup>Sharpe Ratio - Average return earned in excess of the risk-free rate per unit of volatility or total risk.

<sup>5</sup>Swap - A derivative contract through which two parties exchange financial instruments.

<sup>6</sup>Future - An agreement traded on an organized exchange to buy or sell assets at a fixed price but to be delivered and paid for later.

<sup>7</sup>Mean Variance Efficiency Frontier - Mathematical framework for assembling a portfolio of assets such that the expected return is maximized for a given level of risk.

## Disclosures

All exhibits and data used in this analysis is from Bloomberg unless otherwise noted. The commodity basket was constructed using a 60%/40% weighted average of returns for Energy/Non-energy commodities, as defined (and data provided) by the World Bank Organization (<http://www.worldbank.org/en/research/commodity-markets>). Further data and methodology for calculating the commodity basket is available upon request.

Indices used (inception date): S&P 500 (1957), Bloomberg Barclays US Agg Bond Index (1986).

SEI Investments Distribution Co. (1 Freedom Valley Drive, Oaks, PA, 19456) is the distributor for the Metaurus Advisors LLC funds.

Index returns are for illustrative purposes only and do not represent actual Fund performance. Index performance returns do not reflect any management fees, transaction costs or expenses. Indexes are unmanaged and one cannot invest directly in an index. Past performance does not guarantee future results.

The Solactive U.S. Cumulative Dividends Index – Series 2027 (the “Dividends Index”, the “Index”) is an Index of Solactive AG and is calculated and distributed by Solactive AG. The Index aims to represent the discounted present value of all listed annual S&P 500 Dividend Index Futures contracts out to and including the December 2027 dividend futures expiry. To accomplish this, each S&P 500 Dividend Index Future market price will be discounted by using the computed yield of a specified U.S. Treasury Security with a similar or prior maturity date as the corresponding S&P 500 Dividend Index Future expiry. After expiry of any S&P 500 Dividend Futures contract, such futures contract and its corresponding U.S. Treasury Security will be removed from the Index. The Index is a price only index. The Index is published in USD.

*This material must be preceded or accompanied by a prospectus. Carefully consider the Fund's investment objectives, risk factors, charges and expenses before investing. This and additional information can be found in the Fund's prospectus, which may be obtained by calling (866) 395-0079, or by visiting [https://www.metaurus.com/Data/Sites/33/media/docs/Metaurus\\_Prospectus.pdf](https://www.metaurus.com/Data/Sites/33/media/docs/Metaurus_Prospectus.pdf). Please read the prospectus carefully before investing.*

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- There is no guarantee that a fund will meet its investment objective.
- The Fund primarily invest in futures, which can be volatile. Even a small movement in market prices could cause large losses.
- Restrictions on redemptions may affect your ability to withdraw your participation in the Fund. Because the Funds have designated maturity dates, new investors may elect not to invest in a Fund as it nears maturity and existing investors may elect to sell their Shares or redeem through an Authorized Participant. As a result, the size of each Fund may decrease as it nears maturity and the impact of fund expenses could increase as a result.
- There is no guarantee that distributions will be made.
- The value of the Fund may decrease due to decreases in actual dividends or share price of the Fund.

The Fund has limited history. Therefore, you have limited performance history to serve as a factor for evaluating an investment in the securities.

Shares are bought and sold at market price (not NAV) and are not individually redeemed from the Funds other than in large Creation Unit aggregations. Instead, investors must buy or sell shares of a Fund in the secondary market with the assistance of a broker. As with all securities, buying and selling shares of Funds will result in brokerage commissions and will generate tax consequences. Brokerage commissions will reduce returns.

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