Do Stocks With Dividends Outperform the Market: Evidence From the 2011-2020 Business Cycle

Mitchell Miller
Davenport University

Dale Prondzinski
Davenport University

This study compared the returns of stocks with dividends with the returns of the market. It compared the S&P 500 Dividend Aristocrat Index with the Center for Research in Security Prices (CRSP) U.S. Total Stock Market Index. In addition, a comparison was made between the SPDR S&P Dividend ETF (SDY), as a proxy for the S&P 500 Dividend Aristocrat Index and the Vanguard Total Stock Market Index Fund ETF Shares (VTI), as a proxy for the CRSP U.S. Total Market Index.

Keywords: exchange traded funds, dividends, returns, S&P 500 Dividend Aristocrat Index, CRSP U.S. Total Stock Market Index

INTRODUCTION

Dividends

Resulting from the 2020 Covid-19 induced pandemic, economic shock, and uncertainty, investors are more concerned about their investment strategies. How should one's investment portfolio change in the new world order of increased political risk, economic risk, global risk, social unrest and domestic anarchy? A current common recommendation is for investors to purchase dividend-paying stocks, knowing that regular dividend returns will reduce the risk of the portfolio – even portfolios with tax consequences. The combined effect of economic, political, global, domestic and financial environment risks is driving investors to find alternative investment strategies that may provide a decent return without excessive risk.

This paper compares the returns of dividend-paying stocks with the return of the market. The study's primary research question was: During the 2011 to 2020 market cycles, did dividend-type stocks outperform the market and related exchange traded fund proxies?

To answer this research question, the study compares the S&P 500 Dividend Aristocrat Index with the Center for Research in Security Prices (CRSP) U.S. Total Stock Market Index. In addition, a comparison was made between the SPDR S&P Dividend ETF (SDY), as a proxy for the S&P 500 Dividend Aristocrat Index and the Vanguard Total Stock Market Index Fund ETF Shares (VTI), as a proxy for the CRSP U.S Total Market Index.

S&P 500 Dividend Aristocrat Index

According to S&P 500, "Since 1926, dividends have contributed one third of total return, while capital appreciation contributed two thirds. Sustainable dividend income and capital appreciation have both been important to total return expectations," (Parsimony Investment Research, 2013). Managers used stable and increasing dividends as a sign of confidence in the firm's prospects, while investors considered such track records a sign of corporate maturity and strength. The S&P 500 Dividend Aristocrat Index measures the performance of the S&P 500 Index constituents that have followed a policy of consistently increasing dividends every year for at least 25 consecutive years. The S&P 500 Dividend Aristocrat Index for 2020 included 65 securities diversified across eleven sectors. The S&P 500 Dividend Aristocrat Index constituents possess both growth and value characteristics. Dividend income, reinvested in additional shares, compounds through time, creating a geometric growth phenomenon, a critically important aspect of dividends.

Aristocrats have growth and income characteristics, and are selected not only based on their consistent dividend payout level, but also on long-term dividend and earnings growth rates, as well as on profitability measures. The Dividend Aristocrats Index has slightly underperformed the broader market index over the last decade, with a 13.9% total annual return versus a 14.0% total annual return for the S&P 500 Index. But, the Dividend Aristocrats have exhibited slightly lower volatility than the broader market (Ciura, 2020).

In terms of diversification, the Aristocrats span eleven different sectors with both growth and value holdings. This composition contrasts with most other dividend-yield based portfolios, which tend to be heavily weighted toward financials and utilities, and often have a strong value bias.

As of March 2011, there were 65 corporations in the S&P Dividend Aristocrat Index with a market capitalization of 4.3 trillion dollars. The Aristocrat's top holdings account for a large percentage of total market capitalization and include: Walmart; Proctor & Gamble; PepsiCo; Abbott Laboratories; AbbVie; AT&T; Chubb; Coca-Cola; Exxon Mobil; Johnson & Johnson. (Ciura, 2020).

An investor building a stock portfolio to provide passive income depends on these high-performing dividend stocks to continue paying monthly or quarterly payments. Not only can an investor depend on the checks to keep coming, the investor can also expect them to increase each year. The growing dividend feature makes the Dividend Aristocrat stocks a good way to protect investments from inflation. In addition to the dividend payments, the price of these stocks remains stable compared to other options. Over time, dividends can pay for the investor's initial investment, while the investor retains the original stock available for sale if the need arises.

CRSP U.S. Total Stock Market Index

The CRSP is a provider of historical stock market data and is part of the Booth School of Business at the University of Chicago. The CRSP U.S. Total Stock Market Index includes 4,000 constituents, representing nearly 100% of the U.S. investable equity market. The CRSP U.S. Total Stock Market Index was first available on January 8, 2011, with investment daily data available starting April 1, 2011 on the Morningstar Direct database.

Why CRSP?

The CRSP U.S. Total Stock Market Index database is special because it allows us to take the long view. By tapping into the CRSP database, research and analysis dating to year-end 1961 is enhanced. More critically, the CRSP database includes not only funds still operating, but also those that have disappeared because they were liquidated or merged out of existence (Clements, 1999)

CRSP is the stock-pricing database that is perhaps the most widely used both by academics and by numerous researchers on Wall Street: CRSP, maintained by the University of Chicago, dates back to 1926 (Hulbert, 2018).

Exchange Traded Funds

To define what an ETF is, consider its component parts: ET (exchange-traded) and F (fund). ETFs are traded on major stock exchanges, like the New York Stock Exchange and Nasdaq. Buying and selling ETFs is similar to trading an individual stock. An ETF is a collection of hundreds or sometimes thousands of stocks or bonds in a single fund. Owning an ETF is similar to owning a mutual fund, particularly an index fund, and will feel familiar because it has the same built-in diversification and low costs.

Why an ETF Instead of Individual Stocks, Bonds, & Mutual Funds

Ownership of an ETF involves less risk, convenience, and less work because a professional fund manager selects the stocks and bonds comprising the ETF. ETFs, compared to mutual funds, involve lower investment minimums and real-time pricing when they're bought and sold. ETF-related costs are typically less than mutual fund fees.

LITERATURE REVIEW

Dividends

While this paper compares the returns of dividend-paying stocks with the return of the market during the 2011 to 2020 market cycles, a detailed history of the topical academic literature on dividends is provided for perspective, analysis, and contemporary thought.

The idea that changes in dividends have information content is an old one. Lintner's (1956) famous investigation of dividend policy stressed that firms only increased dividends when management believed earnings had permanently increased and that dividend increases are sustainable over the long term.

Modigliani and Miller (1958) demonstrated, under the illogical assumptions of perfect capital markets, rational behavior, and zero taxes, that the value of the firm does not depend on the firm's dividend payout rate. Durand (1959) questioned whether Modigliani and Miller's conclusion was consistent with the then-existing empirical evidence, which consisted of strong positive studies involving correlations of price with dividends and current earnings data collected at a defined time. Post Modigliani and Miller, the information hypothesis has been frequently cited in both financial management articles and texts as a possible explanation of observed relationships between dividends and stock prices.

Miller and Modigliani (1961) explicitly suggested that dividends conveyed information about future cash flows when markets were incomplete. The effect of a firm's dividend policy on its current share price is a matter of considerable importance to corporate governing boards responsible for setting the firm's dividend policy, and to investors planning portfolios and economists seeking to understand and appraise the functioning of capital markets. The authors questioned if companies with generous distribution policies consistently sold at a premium over those with lesser dividend payouts. Miller and Modigliani queried if there was an optimal payout ratio or range of ratios that maximized the current share price. Their paper attempted to fill the existing gap in the theoretical literature on valuation.

The authors began their research by examining the effects of differences in firms' dividend policies on the current price of shares in a theoretical economy characterized by perfect capital markets, rational behavior, and perfect certainty. Where imperfections were found that bias individual preferences--such as the existence of brokerage fees which tended to make young 'accumulators' prefer low-payout shares and retired persons lean toward 'income stocks--such imperfections were not sufficient conditions for chosen dividend policies to command a permanent premium in the market. Of the detailed market imperfections, the one that seemed to be capable of producing such a concentration was the substantial advantage accorded to capital gains compared with dividends under the personal income tax.

It should be remembered that the motivation for capital gains for high-income individuals, however, represents a growing and substantial fraction of the total outstanding shares currently held by investors for whom there was no tax differential; the clientele effect was at work. Modigliani and Miller concluded that since the capital gains tax differential was undoubtedly the major systematic imperfection in the market, one clearly would not invoke 'imperfections' to account for the difference between the irrelevance proposition and the standard view as to the role of dividend policy found in the literature of finance.

With respect to dividend theory, there are two central competing hypotheses: the tax-effect hypothesis and the dividend-neutrality hypothesis. The tax-effect hypothesis proposed by Brenan (1970) postulates that investors receive higher before-tax, risk-adjusted returns on stocks with higher anticipated dividend yields to compensate for the historically high taxation of dividend income relative to capital gains income. Contrasting Brenan's tax-effect hypothesis, the dividend-neutrality hypothesis proposed by Black and Scholes (1974) suggests that if investors required higher returns for holding high-yield stocks, corporations would adjust their dividend policy to restrict the quantity of dividends paid, lower their cost of capital, and increase their share price. Similarly, if investors required a lower return on high-yield stocks, value-maximizing firms would increase their dividend payouts to increase their share price. In a market in equilibrium, value-maximizing behavior would lead to an aggregate supply of dividends that meets the aggregate demand for dividend income from investors valuing dividends as highly as capital gains. As a result, there would be no predictable relation between anticipated dividend yields and risk-adjusted stock returns.

Watts (1973) found that on average the relationship between future earnings changes and current unexpected dividend changes is positive, and thus consistent with the information hypothesis. The statistical tests conducted by Watts suggested that the average size of future earnings changes conveyed by unexpected dividend changes was very small.

Asquith and Mullins, Jr. (1983) investigated the impact of dividends on stockholders' wealth by analyzing 168 firms that either paid its first corporate dividend or initiated dividends after a ten-year hiatus. The empirical results of the authors' investigation exhibited larger positive excess returns than any previous dividend study. Compared with initiating a dividend policy, the results suggest that subsequent dividend increases may produce a larger positive impact on shareholder wealth. The authors' study results also suggest that other studies underestimated the effect of dividend increases. Asquith and Mullins' findings for both the initial and subsequent dividends were consistent with the view that dividends conveyed unique, valuable information to investors.

Miller and Rock (1985), found that the dividend decision revealed information about a firm's current earnings compared to the market. John and Williams' (1985) extended Miller and Rock's findings, concluding that dividend changes were explicit, intentional signals about future earnings conveyed to the investment community and the firm's shareholders at a discrete management opportunity cost.

Healy and Palepu (1988) examined a sample of a 131 firms that paid dividends for the first time or that paid a dividend after a 10-year hiatus compared with a sample of 172 firms that omitted dividends for the first time or after continuously paying dividends for at least 10 years. The authors found significant earnings increases/decreases for at least one year before dividend initiation/omission announcements. Healy and Palepu observed that firms in their sample had earnings increases for the year of, and two years following, a dividend initiation resulting in permanent dividends. Firms that omitted dividends had earnings declines for only one year prior to the dividend date; subsequently, firms that omitted dividends saw their earnings recover.

The abnormal stock price reactions to the dividend initiations or omissions were correlated with the firm's earnings changes in the year of and the year after the dividend announcements. Dividend initiations and omissions seemed to provide incremental information on the firm's future earnings performance. The market reaction to earnings changes was less than usual in the year following dividend initiation announcements, and for five years following announcements of dividend omissions. This was consistent with the hypothesis that dividend initiation or omission announcements anticipated subsequent earnings changes.

Venkatesh (1989) found a decrease in overall return volatility and diminished market reactions to subsequent earnings announcements once firms began paying cash dividends. He attributed this decrease in risk to investors focusing more on the information content of the firm's dividend policy and less on other firm-specific news events such as earnings announcements. The decrease in return volatility and the market's diminished reaction to earnings announcements were also consistent with firms having fewer earnings surprises following the initiation of dividends.

Chang and Rhee's (1990) study found wide research method variations in their observations of corporate financial leverage and dividend policy. They extended Miller's equilibrium model to obtain a theoretical prediction of a positive relation between financial leverage and dividend policy measures. The author's analysis integrated two separate notions: the tax-induced dividend clientele effect and financial leverage clientele effect. Under the financial leverage clientele effect, an inverse relationship also existed between shareholder tax rates and financial leverage. The empirical results of Chang and Rhee's study supported the hypothesized relationship between leverage and dividend ratios.

Impson and Karafiath (1992) uncovered additional evidence on the stock market's reaction to dividend announcements. Based on the results obtained, dividend increases were not associated with significant share price reaction, whether the payout ratio increased or decreased. Similarly, the study's results provided no evidence that, for dividend decreases, payout ratio increases had a greater impact on the share value than payout ratio decreases. A consistent investor interpretation to the negative information related to dividend increases dominated any signaling or tax effect of the payout ratio change. Based on the possible transmission mechanisms dividend announcements can have on stock prices (tax and managerial signaling effects), the authors formulated two hypotheses about the stock market's reaction to dividend announcements.

Impson and Karafiath expected security abnormal returns to be positively correlated with dividend changes and negatively correlated with payout ratio changes. Secondly, when dividends decrease, the authors expected more negative abnormal returns for payout ratio increases than for payout ratio decreases. Given the strong negative investor reaction to dividend decreases, a consistent interpretation was that the negative information released in the dividend announcement dominated any signaling or tax effect of the payout ratio change. Payout ratio changes appeared to be only an artifact of an earnings stream that was more variable than the dividend stream, rather than revealing significant shifts in managerial policy.

Benartzi, Michaely, and Thaler's (1997) study offered limited support for the information content about future returns of dividend changes. They found that firms that increased dividends in year zero had experienced significant earnings increases in year's -1 and 0, but showed no subsequent unexpected earnings. As well, the size of the dividend increase did not predict future earnings.

Naranjo, Nimalendran, and Ryngaert's (1998) study, using an improved measure of a common stock's annualized dividend yield, observed that risk-adjusted NYSE stock returns increased in dividend yield during the period 1963-1994. They wanted to know if stocks, with higher anticipated dividend yields, earned higher risk adjusted returns. The authors documented a consistent positive relationship between returns and current yields that was too large to be explained entirely by taxes. A significant contribution of the paper was to explore possible explanations for the yield effect. The authors found that the size of the yield effect appeared to be unrelated to the level of implied tax rate, and hence to the potential tax liability from receiving dividend income.

Fama and French (2001) found that the proportion of U.S. firms paying dividends dropped sharply during the 1980s and 1990s. The decline after 1978 in the percent of firms paying dividends raised three questions: 1) What were the characteristics of dividend payers? 2) Was the decline in the percentage of payers due to a decline in the prevalence of these characteristics among publicly traded firms, or 3) Had firms with the characteristics typical of dividend payers become less likely to pay? Their research suggested that three characteristics tended to affect the likelihood that a firm would pay dividends: profitability; growth; and size. Larger, more profitable firms were more likely to pay dividends, and high-growth firms were less likely to do so. The decline after 1978 in the percentage of firms paying dividends was due in part to an increasing number of small publicly traded firms with low reported earnings and high growth.

Fama and French noted that from a post-1972 peak of 66.5 percent in 1978, the proportion of dividend payers among NYSE, AMEX, and NASDAQ firms fell to 20.8 percent in 1999. The change in the characteristics of publicly traded firms only partially explained the declining incidence of dividend payers. The more interesting result was that, whatever their characteristics, firms had simply become less likely to pay dividends. The evidence that firms had become less likely to pay dividends, even after controlling for characteristics, suggested that the perceived benefits of dividends had declined through time. The rationale and logic may be due to lower transaction costs for selling stocks, more sophisticated corporate governance techniques (reducing the reliance on dividends as a means of corporate discipline), and larger holdings of stock options by managers who preferred capital gains to dividends.

Grullon and Michaely (2002) showed that share repurchases not only become an important form of payout for U.S. corporations, but that firms financed their share repurchases with funds that otherwise could have been used to increase dividends. The paper provided evidence that corporations had been substituting share repurchases for dividends, suggesting that many firms returning capital to shareholders did so through share repurchases to augment their dividend policies.

DeAngelo, DeAngelo, and Skinner's (2003) study offered evidence that industrial firms' dividends were highly concentrated, and that dividend concentration had increased over the past two decades. The authors observed that aggregate dividends paid by industrial firms increased over the past two decades even though the number of dividend payers had decreased by more than half. The logic for this finding was that the reduction in payers occurred predominantly among firms that paid very small dividends. The findings on dividend concentration cast doubt on the empirical importance of the dividend clientele and signaling hypotheses. Clientele theories attributed heterogeneity in dividend policies to the demand of different investors who, for tax or behavioral reasons, preferred either to hold or to avoid dividend-paying stocks.

The evidence offered by DeAngelo, DeAngelo, and Skinner's study revealed that publicly traded industrial firms exhibited a two-tier structure based on dollar earnings. The first tier contained a few dividend-paying high earners; these firms' dividends collectively dominated the aggregate supply. The second tier contained many firms which, individually and jointly, had modest earnings and which collectively contributed little to the aggregate dividend supply. In sum, the differing behavior of first-and second-tier firms explained why aggregate dividends increased as the number of payers declined over the past two decades. The authors' evidence added to a growing body of empirical research that documents major changes in corporate payout practices over the last 25-50 years.

Contrary to Miller and Modigliani (1961), DeAngelo and DeAngelo (2006), found that payout policy was not irrelevant and investment policy was not the sole determinant of value in frictionless markets, a theoretical environment where all costs and constraints associated with transactions are non-existent. Miller and Modigliani's assumptions forced one hundred percent free cash flow payout, thereby restricting the feasible set of payout policies to those that were optimal and eliminating the value-relevance payout/retention decision from consideration. Payout policy inherently affected stockholder wealth, and not only when it affected project choice or because of market imperfections such as personal taxes.

Lee (2011) discusses the catering theory of dividends, suggesting that corporate dividend policy is driven by prevailing investor demand for dividend payers, and that managers cater to investors by paying dividends when the dividend premium is high. The author hypothesized and found that the preference for dividend-paying stocks by older investors means that the dividend premium should be positively related to changes in the proportion of the older population.

Edgerton (2012) explored the connection between the 2003 tax cut and its effect on aggregate dividend payouts. While the literature suggested that the tax cut caused an increase in aggregate dividend payouts, the author's study called this claim into question by documenting that the post-tax cut increase in dividend payouts coincided with a surge in corporate profits. The facts cited by the author make clear that important non-tax-related changes in payout behavior occurred at the same time as the tax cut; thus estimates of the tax cut's effect should be treated cautiously.

Kuo (2013) study explored the types of information conveyed by dividends on future earnings. The author examined this issue by investigating the effect of dividends on the association between current year stock returns and future earnings; a Future Earnings Response Coefficient (FERC) approach. Kuo sought to specify what types of information content are conveyed by dividends on future earnings.

Housel (2014) reports that dividends paid by companies in the S&P 500 currently amount to less than 2% of their share prices, compared with the long-term average of 4.4%. Dividends also are falling steadily as a share of earnings, with about a third of profits getting returned to shareholders in recent years, compared with nearly half in the 1980s and 1990s. The problem is that profits that were paid out as dividends in the past now largely go toward share buybacks, which tend to be sporadic and can lead to bad timing from corporate managers who, on average, tend to buy their own shares when they are expensive.

Mrzyglod and Nowak's (2015) empirically studied a stock market's reaction to dividend announcements and dividend payouts. The outcome of the study confirms that the effect of dividend announcements is in line with the informational content of the dividend hypothesis as well as with dividend signaling models. The authors find that the reaction of the market is consistent with the direction of the dividend change: dividend-increase (-decrease) announcements are interpreted as a positive (negative) signal by the investors. Moreover, the stock market reaction on the news release turns out to be rather quick. Thus, the prices seem to 'digest' the information immediately.

According to Bird (2016), companies are paying out dividends at near-record levels, leaving some investors asking why the companies are unable to find growth opportunities. S&P 500 companies have paid out 37.5% of their earnings in dividends over the past 12 months, just a fraction below the 38.1% recorded in 2009, when earnings were plunging during the depths of the financial crisis.

Bird opines that growing numbers of investors think dividends are too high and investment is too low. "The payout ratio should be a function of growth expectations; when growth is expected to be lower, companies are likely to invest less and return more to shareholders," said a recent research note from Goldman Sachs.

Felimban, Floros and Nguyen (2018) examined the impact of dividend announcements on share price and trading volume. While numerous studies report evidence consistent with the information hypothesis of dividends that announcements of dividend policy changes do convey information about firm's future prospects, the findings of the authors' study shows significant price changes prior to the dividend decrease announcement and immediately after the board meeting, suggesting that there may be considerable information leakage that needs to be plugged.

Wursthorn (2018) says U.S. companies are paying out a record amount of dividends this year, helping prop up what has been a turbulent stock market.

Companies in the S&P 500 have spent nearly $421 billion on dividends through November, eclipsing 2017's mark of about $391 billion and the full-year tally of $420 billion, according to S&P Dow Jones Indices. Many companies have announced dividend increases, which will push this year's total even higher.

Wursthorn (2019) reports that dividends pad stock returns and offer a steady stream of income. According to Wursthorn, the allure of steady, income-generating stocks is expected to be a stabilizing force for major indexes in the months to come. Dividend-paying stocks can help insulate investors from the worst of a pullback.

Ackerman and Timiraos (2020) report that U.S. banks will be allowed to keep paying dividends to shareholders, even as the pandemic threatens to create a mountain of bad loans that could weaken the lenders. Central banks are awaiting the results of bank stress tests used to assess banks' ability to continue lending in a crisis. U.S. central bankers may fear that halting dividends now would send a signal that they are worried about the solvency of the banking system; banks have signaled they have no intention of cutting dividends.

Driver, Grossman, and Scaramozzino (2020) critiques the agency narrative that dividends keep managers honest, mitigating concerns that they over-invest the firm's funds. The authors' study on dividend policy and investor pressure found that traditional agency theory, focused on dividends as a tool for managerial discipline, is not strongly supported by the results which support a narrative of short-term investor pressure on firms irrespective of investment opportunities.

S&P 500 Dividend Aristocrat Index

According to S&P 500, since 1926, dividends have contributed one third of total return, while capital appreciation contributed two thirds. Sustainable dividend income and capital appreciation have both been important to total return expectations (Parsimony Investment Research, 2013. Managers used stable and increasing dividends as a sign of confidence in the firm's prospects, while investors considered such track records a sign of corporate maturity and strength. The S&P 500 Dividend Aristocrat Index measures the performance of the S&P 500 Index constituents that have followed a policy of consistently increasing dividends every year for at least 25 consecutive years. The S&P 500 Dividend Aristocrat Index for 2009 included 52 securities diversified across ten sectors. The S&P 500 Dividend Aristocrat Index constituents possess both growth and value characteristics. Dividend income, reinvested in additional shares, compounds through time, creating a geometric growth phenomenon, a critically important aspect of dividends.

S&P 500 Dividend Aristocrat securities have growth and income characteristics, and are selected based on their consistent dividend payout level, long-term dividend return, earnings growth rates, and profitability measures. Across all measured time horizons, the S&P Dividend Aristocrats Index has exhibited higher returns with lower volatility compared with the S&P 500; the result is higher Sharpe ratios.

In terms of diversification, the Aristocrats span eleven different sectors with both growth and value holdings. The index has a significantly higher percentage of high quality stocks than the S&P 500. The composition of the S&P 500 Dividend Aristocrats contrasts with that of dividend-oriented benchmarks that have a steep value bias and high exposure to the financial and utilities sectors (Chirputkar and Soe, 2019).

An investor building a stock portfolio to provide passive income depends on these high-performing dividend stocks to continue paying monthly or quarterly payments. Not only can an investor depend on the checks to keep coming, the investor can also expect them to increase each year. The growing dividend feature makes the Dividend Aristocrat stocks a good way to protect investments from inflation. In addition to the dividend payments, the price of these stocks remains stable compared to other options. Over time, dividends can pay for the investor's initial investment, while the investor retains the original stock available for sale if the need arises (Top Dividends, 2010).

Spaht and Rubin (2013) discuss how an investor can achieve financial independence even if the investor is the unluckiest person in the world. Using the S&P 500 Dividend Aristocrat Index, an investor can hypothetically make a one-time selection of stocks for a select period of time and then continue investing a fixed dollar amount and reinvesting dividends in each of the stocks. The authors' research proves that even with our unluckiest investor investing at the high points in the market, the strategy of combining dividend growth and the reinvestment of those dividends coupled with dollar cost averaging is efficacious and rewarding.

Vallo's (2015) Barron's article, *Aristocrats Keep Payouts Rising*, reports that some of the most consistent dividend payers are enriching their shareholders, resulting from a flurry of increases from "dividend aristocrats". Coca-Cola and Apple, the second largest dividend payer in the world, announced boosted dividends, returning more of their considerable gains to shareholders.

Strauss (2019) reports that S&P 500 Dividend Aristocrats represent funds that provide reliable, long-term payouts. Consider that the S&P 500 Dividend Aristocrats have boosted their payouts for at least 25 straight years–a bar that usually reflects solid, durable profit growth. Strauss' research suggests that for retail investors, buying all 53 of the S&P 500 Dividend Aristocrats can be cumbersome and expensive; however, there are exchange-traded funds that can help investors with this income bent, offering investors the benefit of consistent and growing income generation.

Strauss (2020) reports that as dozens of companies have cut or suspended dividends to preserve cash amid the uncertain impact of the pandemic on the economy, suggesting that investors turn to the S&P 500 Dividend Aristocrats for ideas. Strauss' point is that for companies, such as those comprising the S&P 500 Dividend Aristocrats, maintaining its dividend in this environment is a victory.

CRSP U.S. Total Stock Market Index

Conway (2012) reports that Vanguard's move to replace MSCI with FTSE and CRSP indexes could mean lower costs and other changes for popular exchange traded funds (ETFs). Vanguard's shift to CRSP helps to push Vanguard's low-cost fees even lower, widening its substantial appeal to individual investors.

According to Conway, there's another underappreciated dynamic of the Vanguard shift: new indexing practices. The University of Chicago's Center for Research in Security Prices, which has provided data to financial researchers for decades, uses a practice known as "packeting" to guide index funds' buying and selling of stocks. As a stock grows in size, the method allows the stock to be shared between two indexes—large-cap and mid-cap, for instance—which relieves index funds of the need to buy or sell an entire stockholding when that stock graduates from one designation to another.

Light (2012) reports that index-licensing fees make up only a small portion of expense ratios, and exchange-traded fund companies are trying to save money by switching the indexes they track. Vanguard officials, according to Light, say FTSE and CRSP will charge less money to license their indexes, meaning reduced expense ratios and cost savings for investors.

Dieterich (2015) reports in his Barron's article, *Beware Those Index Changes*, that Vanguard, the mutual fund giant, caused a stir in the investment world in 2012 by announcing changes to indexes that power many of its stock funds. Vanguard dumped index provider MSCI in 2013 and arranged new licensing arrangements with FTSE and the relatively obscure University of Chicago Center for Research in Security Prices, or CRSP. The new deals, affecting billions of asset dollars under investment, would help cut expenses over time and be good news for average investors.

Exchange Traded Funds

Investing in exchange traded funds (ETFs) combines the diversification of mutual funds with lower investment minimums and real-time pricing. ETFs are traded on major stock exchanges, like the New York Stock Exchange and NASDAQ. Buying and selling an ETF will feel familiar to trading an individual stock. An ETF is a collection of tens, hundreds, or sometimes thousands of stocks or bonds in a single fund. Owning an ETF is similar to owning an index fund because it has the same built-in diversification and low costs (The Vanguard Group, 2020).

Why an ETF Instead of a Mutual Fund

Although ETFs and mutual finds share many similarities, there are a couple of distinguishing characteristics that may make ETFs more attractive to some investors, including lower investment minimums when you first start investing and real-time pricing every time you buy and sell (The Vanguard Group, 2020).

Peters, Vale, and McKay (2013) discuss the use of exchange-traded funds as a framework for investment decision-making in the context of the role of diversification, fees, and returns. The authors' emphasize the primacy of diversification, believing that the core of most portfolio management strategies is to maximize predictability through diversification.

The authors' believe that ETFs offer a more passive approach than mutual funds. The theory is that because investment risk is mitigated by diversification, and diversification is achieved by holding multiple securities in a portfolio, then as long as a portfolio is sufficiently diversified no active management should be required. All that the investor should do is buy a basket of goods that best approximates the entire market.

Dieterich (2014) reports on a fresh ETF milestone: reaching $2 trillion in assets under management. Large institutional investors are poised to ramp up their use of plain-vanilla ETFs in 2015, particularly in the bond market. Dieterich projects that investors will continue to invest into ETFs during the coming years.

Goodman (2014) discusses Eugene Fama's 'market efficiency' perspective on exchange-traded funds. The author observes that Fama's market efficiency hypothesis states that stock prices inherently reflect all available, relevant information. Fama believes that increased use of ETFs and index funds will not make the market less efficient; that active management doesn't make sense. On the topic of behavioral economics, Fama observes that economics is all about behavior, and whether that behavior is rational or irrational.

Constable (2015) reports that there is a lot for investors to like about exchange-traded funds, but that there is also a stock market downside that should be considered. According to Simon, a group of academics says the popularity of ETFs has led to higher trading costs for some stocks, as well as less coverage of stocks by analysts to help investors make decisions. ETFs have also served to reduce the responsiveness of some stock prices to information about the companies behind them and make it harder for investors to diversify their holdings in a way that reduces their risk.

Caginalp and DeSantis' (2017) interesting study examined the key cost benefit of the exchange-traded fund, asking if price efficiency increases with trading volume as theory suggests. The authors' findings support the hypothesis that the relationship between volume and efficiency is nonlinear; efficiency increases as volume increases, but then decreases as volume increases faster. The rise in computerized trading (technology) and high frequency trading have served to fuel efficiency increases and cost decreases.

Hu and Morley (2018) was the first academic work to show the need for a regulatory framework for exchange-traded funds. The authors' perspective is that the economic significance of this innovation could be enormous, given that U.S.-listed ETFs now hold more approximately $4 trillion in assets. Individual ETFs and the underlying innovation process together constitute a modern phenomenon of vital importance to individual investors, institutional investors, and society. This phenomenon, however, poses an array of highly distinctive risks and other concerns that have not been addressed.

Kim (2019) reported on Jack Bogle's legacy and indelible mark on Wall Street when he founded Vanguard Group in 1975 and invented the index fund a year later. Bogle famously had reservations about ETFs, and it wasn't until he left Vanguard that the firm began offering them under its second chief executive, John Brennan. But the house that Jack built still embodied his zeal for innovation. Vanguard ETFs were launched as share classes of existing funds—a patented method no other firm has been able to replicate—which gave them greater tax efficiency and better cost structures.

Weinberg (2019) warns the investor about the hidden trading costs associated with trading ETFs, answering questions about the costs investors don't see. The author says that just because you aren't paying a commission to make a trade doesn't mean that trading is "free"; the investor should think carefully before making a lot of moves with their ETFs. The hidden cost at work is the trading spread, or bid/ask ratio, for the ETF. The higher the spread, the more you pay when you buy and the less you make when you sell. For simplicity, think about the spread as a cost you pay to exit a trade.

DATA AND METHODOLOGY

The following identifies the research process that was used to test the hypotheses that were derived from the research question.

Research Question

The study's primary research question was: During the 2011 to 2020 market cycles, did dividend-type stocks outperform the market and related exchange traded fund proxies?

Research Model and Variables

The study uses the S&P 500 Dividend Aristocrat Index as the benchmark for dividend -type stocks and CRSP U.S. Total Market Index as the benchmark for the total market. The proxy used for the S&P 500 Dividend Aristocrat Index is the SPDR S&P Dividend ETF (SDY) and the Vanguard Total Stock Market ETF (VTI) is the proxy for the CRSP Total Market Index. The study is limited in scope as the CRSP U.S. Total Market Index data became available in April 2011.

Hypotheses

Six hypotheses, derived from the above research question, were tested.

Complete Time Period
***$H1_0$:** For the time period April 1, 2011 to July 2, 2020, the S&P 500 Dividend Aristocrat Index Sharpe ratio is not significantly different than the CRSP U.S. Total Market Index Sharpe ratio.*

***$H1_a$:** For the time period April 1, 2011 to July 2, 2020, the S&P 500 Dividend Aristocrat Index Sharpe ratio is significantly different than the CRSP U.S. Total Market Index Sharpe ratio.*

Complete Time Period
***$H2_0$:** For the time period April 1, 2011 to July 2, 2020, the SPDR S&P Dividend ETF (SDY) Sharpe ratio is not significantly different than the Vanguard Total Stock Market ETF (VTI) Sharpe ratio.*

***$H2_a$:** For the time period April 1, 2011 to July 2, 2020, the SPDR S&P Dividend ETF (SDY) Sharpe ratio is significantly different than the Vanguard Total Stock Market ETF (VTI) Sharpe ratio.*

Bull Market Period
***$H3_0$:** For the time period April 1, 2011 to March 11, 2020, the S&P 500 Dividend Aristocrat Index Sharpe ratio is not significantly different than the CRSP U.S. Total Market Index Sharpe ratio.*

H3$_a$: *For the time period April 1, 2011 to March 11, 2020, the S&P 500 Dividend Aristocrat Index Sharpe ratio is significantly different than the CRSP U.S. Total Market Index Sharpe ratio.*

Bull Market Period
H4$_0$: *For the time period April 1, 2011 to March 11, 2020, the SPDR S&P Dividend ETF (SDY) Sharpe ratio is not significantly different than the Vanguard Total Stock Market ETF (VTI) Sharpe ratio.*

H4$_a$: *For the time period April 1, 2011 to March 11, 2020, the SPDR S&P Dividend ETF (SDY) Sharpe ratio is significantly different than the Vanguard Total Stock Market ETF (VTI) Sharpe ratio.*

Bear Market Recovery
H5$_0$: *For the time period March 12, 2020 to July 2, 2020, the S&P 500 Dividend Aristocrat Index Sharpe ratio is not significantly different than the CRSP U.S. Total Market Index Sharpe ratio.*

H5$_a$: *For the time period March 12, 2020 to July 2, 2020, the S&P 500 Dividend Aristocrat Index Sharpe ratio is significantly different than the CRSP U.S. Total Market Index Sharpe ratio.*

Bear Market Recovery
H6$_0$: *For the time period March 12, 2020 to July 2, 2020, the SPDR S&P Dividend ETF (SDY) Sharpe ratio is not significantly different than the Vanguard Total Stock Market ETF (VTI) Sharpe ratio.*

H6$_a$: *For the time period March 12, 2020 to July 2, 2020, the SPDR S&P Dividend ETF (SDY) Sharpe ratio is significantly different than the Vanguard Total Stock Market ETF VTI) Sharpe ratio.*

Data Collection Methods

Secondary data were collected and analyzed from the Morningstar Direct database for the S&P 500 Dividend Aristocrat Index, the CRSP U.S. Total Market Index, the SPDR S&P Dividend ETF (SDY), and the Vanguard Total Stock Market ETF (VTI). The time period selected started at the inception of the CRSP U.S. Total Market Index and culminated July 2020.

Daily returns were extracted from the Morningstar Direct database for each index and ETF. Standard deviations, the average index and ETF returns, and the average risk-free returns were then calculated with the Microsoft Excel computer program using five daily data points. The Bank of America Merrill Lynch 3-month daily Treasury bill returns were used to calculate the Sharpe Ratio. The computations yielded 466 data points.

Daily data points were extracted and used for each set of paired index comparisons. The daily data points of paired indices were exported into the Microsoft Excel computer program spreadsheet. The means, variances, and related risk-adjusted measures of each of the paired indices were calculated, compared, and analyzed.

Data Analysis Methods

Data analysis was conducted using statistical analyses and hypothesis testing. Each data set was tested for normality using the Kolmogorov-Smirnov test (KS-test) and the Shapiro-Wilk test in the Statistical Package for the Social Sciences (SPSS).

If the KS-test and Shapiro-Wilk test found the data normally distributed, the F-test for two samples for variance was used to test if the variances were equal or unequal then the appropriate t-test was used to check for significant differences between the means of the two indices and ETF's. If the two tests for normality found the data originated from a non-normal distribution, the non-parametric Wilcoxon Signed Rank Test was used to test for significant differences between the means of the two indices and ETF's. The null hypothesis was rejected if the estimated p-value was less than 0.05.

RESULTS

The following details the results and findings of the study's hypotheses tests based on the data extracted from the Morningstar Direct Database and thereby address the study's research question. The findings are presented in the order in which the hypotheses have been stated.

Descriptive Statistics

Table 1 (Hypothesis 1) provides a comparison of the mean daily returns, mean weekly Sharpe Ratios, the standard deviations, and the variances for the S&P 500 Dividend Aristocrat Index against the CRSP U.S. Total Market Index for the April 2011-July 2020 time period. The mean daily return for the period was lower for the CRSP U.S. Total Market Index at 0.050 as compared to the S&P 500 Dividend Aristocrat Index return of 0.051.

The mean weekly Sharpe Ratio for the period for the CRSP U.S. Total Market Index was higher at 0.150 than the S&P 500 Dividend Aristocrat Index at 0.144. The standard deviation and variance were higher for the S&P 500 Dividend Aristocrat Index. The S&P 500 Dividend Aristocrat Index standard deviation was 0.533 and the variance was 0.285 while the CRSP U.S. Total Market Index was 0.525 and 0.276, respectively.

TABLE 1
NUMBER OF DATA POINTS, DAILY RETURNS, SHARPE RATIOS, STANDARD DEVIATIONS, VARIANCES, AND P-VALUES: S&P 500 DIVIDEND ARISTOCRAT INDEX VERSUS CRSP U.S. TOTAL MARKET INDEX (2011-2020)

Number/ Returns/ Ratios/Standard Deviation/ Variance/ P-Value	Hypothesis Number	Time Period	Index	Index	P-Value
	$H1_0$	2011-2020	S&P 500 Dividend Aristocrat	CRSP U.S. Total Market	
Number of Data Points			466	466	
Mean Daily Return			0.051	0.050	
Mean Weekly Sharpe Ratio			0.144	0.150	
Standard Deviation			0.533	0.525	
Variance			0.285	0.276	
P-Value					0.639

Table 2 (Hypothesis 2) provides a comparison of the mean daily returns, mean weekly Sharpe Ratios, the standard deviations, and the variances for the SPDR S&P Dividend ETF (SDY) against the Vanguard Total Stock Market ETF (VTI) for the April 2011-July 2020 time period. The mean daily return for the period was lower for the SPDR S&P Dividend ETF (SDY) than the Vanguard Total Stock Market ETF (VTI). The difference between mean monthly returns was 0.006.

The mean weekly Sharpe Ratio for the period for the Vanguard Total Stock Market ETF (VTI) was higher than the SPDR S&P Dividend ETF (SDY) where the VTI Sharpe Ratio was 0.151 as compared to the SDY of 0.129. SPDR S&P Dividend ETF (SDY) standard deviation was 0.556 and the variance was 0.310 while the Vanguard Total Stock Market ETF (VTI) was 0.526 and 0.277, respectively.

TABLE 2
NUMBER OF DATA POINTS, DAILY RETURNS, SHARPE RATIOS, STANDARD DEVIATIONS, VARIANCES, AND P-VALUES: SPDR S&P DIVIDEND ETF (SDY) VERSUS VANGUARD TOTAL STOCK MARKET ETF (VTI) (2011-2020)

Number/Returns/Ratios/Standard Deviation/Variance/P-Value	Hypothesis Number	Time Period	ETF	ETF	P-Value
	$H2_0$	2011-2020	(SDY)	(VTI)	
Number of Data Points			466	466	
Mean Daily Return			0.043	0.050	
Mean Weekly Sharpe Ratio			0.129	0.151	
Standard Deviation			0.556	0.526	
Variance			0.310	0.277	
P-Value					0.018

Table 3 (Hypothesis 3) provides a comparison of the mean daily returns, mean weekly Sharpe Ratios, the standard deviations, and the variances for the S&P 500 Dividend Aristocrat Index against the CRSP U.S. Total Market Index for the April 2011-March 2020 time period. The mean daily return of 0.048 for the period was greater for the S&P 500 Dividend Aristocrat Index as compared to the CRSP U.S. Total Market Index return of 0.043.

The mean weekly Sharpe Ratio for the period for the CRSP U.S. Total Market Index was higher at 0.145 as compared to the S&P 500 Dividend Aristocrat Index at 0.143. The standard deviations and the variances tended to be close arithmetically. The S&P 500 Dividend Aristocrat Index standard deviation was 0.535 and the variance was 0.287 while the CRSP U.S. Total Market Index was 0.524 and 0.276, respectively.

TABLE 3
NUMBER OF DATA POINTS, DAILY RETURNS, SHARPE RATIOS, STANDARD DEVIATIONS, VARIANCES, AND P-VALUES: S&P 500 DIVIDEND ARISTOCRAT INDEX VERSUS CRSP U.S. TOTAL MARKET INDEX (2011-2020)

Number/ Returns/ Ratios/ Standard Deviation/ Variance/ P-Value	Hypothesis Number	Time Period	Index	Index	P-Value
	$H3_0$	2011-2020	S&P 500 Dividend Aristocrat	CRSP U.S. Total Market	
Number of Data Points			450	450	
Mean Daily Return			0.048	0.043	
Mean Weekly Sharpe Ratio			0.143	0.145	
Standard Deviation			0.535	0.524	
Variance			0.287	0.276	
P-Value					0.924

Table 4 (Hypothesis 4) provides a comparison of the mean daily returns, mean weekly Sharpe Ratios, the standard deviations, and the variances for the SPDR S&P Dividend ETF (SDY) against the Vanguard Total Stock Market ETF (VTI) for the April 2011-March 2020 time period of the study. The mean daily return for the period was larger for the Vanguard Total Stock Market ETF (VTI) at 0.043 as compared to the SPDR S&P Dividend ETF (SDY) return of 0.040.

The mean weekly Sharpe Ratio for the period for the SPDR S&P Dividend ETF (SDY) was lower than the Vanguard Total Stock Market ETF (VTI) where the (SDY) Sharpe Ratio was 0.129 as compared to 0.146 for the (VTI). The standard deviation and the variance for the (SDY) were 0.559 and 0.313, respectively, whereas for the (VTI) they were 0.526 and 0.276, respectively.

TABLE 4
NUMBER OF DATA POINTS, DAILY RETURNS, SHARPE RATIOS, STANDARD DEVIATIONS, VARIANCES, AND P-VALUES: SPDR S&P DIVIDEND ETF (SDY) VERSUS VANGUARD TOTAL STOCK MARKET ETF (VTI) (2011-2020)

Number/Returns/Ratios/Standard Deviation/Variance/P-Value	Hypothesis Number	Time Period	ETF	ETF	P-Value
	$H4_0$	2011-2020	(SDY)	(VTI)	
Number of Data Points			450	450	
Mean Daily Return			0.040	0.043	
Mean Weekly Sharpe Ratio			0.129	0.146	
Standard Deviation			0.559	0.526	
Variance			0.313	0.276	
P-Value					0.05

Table 5 (Hypothesis 5) provides a comparison of the mean daily returns, mean weekly Sharpe Ratios, the standard deviations, and the variances for the S&P 500 Dividend Aristocrat Index against the CRSP U.S. Total Market Index for the March 2020-July 2020 time period. The mean daily return of 0.239 for the period was greater for the CRSP U.S. Total Market Index as compared to the S&P 500 Dividend Aristocrat Index return of 0.154.

The mean weekly Sharpe Ratio for the period for the CRSP U.S. Total Market Index was higher at 0.292 as compared to the S&P 500 Dividend Aristocrat Index at 0.185. The standard deviations and the variances tended to be close arithmetically. The S&P 500 Dividend Aristocrat Index standard deviation was 0.492 and the variance was 0.242 while the CRSP U.S. Total Market Index was 0.532 and 0.283, respectively.

TABLE 5
NUMBER OF DATA POINTS, DAILY RETURNS, SHARPE RATIOS, STANDARD DEVIATIONS, VARIANCES, AND P-VALUES: S&P 500 DIVIDEND ARISTOCRAT INDEX VERSUS CRSP U.S. TOTAL MARKET INDEX (2020-2020)

Number/ Returns/ Ratios/Standard Deviation/ Variance/ P-Value	Hypothesis Number	Time Period	Index	Index	P-Value
	$H3_0$	2020-2020	S&P Dividend Aristocrat	CRSP U.S. Total Market	
Number of Data Points			16	16	
Mean Daily Return			0.154	0.239	
Mean Weekly Sharpe Ratio			0.185	0.292	
Standard Deviation			0.492	0.532	
Variance			0.242	0.283	
P-Value					0.561

Table 6 (Hypothesis 6) provides a comparison of the mean daily returns, mean weekly Sharpe Ratios, the standard deviations, and the variances for the SPDR S&P Dividend ETF (SDY) against the Vanguard Total Stock Market ETF (VTI) for the March 2020-July 2020 time period of the study. The mean daily return for the period was larger for the Vanguard Total Stock Market ETF (VTI) at 0.238 as compared to the SPDR S&P Dividend ETF (SDY) return of 0.129.

The mean weekly Sharpe Ratio for the period for the SPDR S&P Dividend ETF (SDY) was lower at 0.139 than the Vanguard Total Stock Market ETF (VTI) at .292. The standard deviation and the variance for the SPDR S&P Dividend ETF (SDY) were 0.477 and 0.227, respectively, whereas for the Vanguard Total Stock Market ETF (VTI) they were 0.531 and 0.282, respectively.

TABLE 6
NUMBER OF DATA POINTS, DAILY RETURNS, SHARPE RATIOS, STANDARD DEVIATIONS, VARIANCES, AND P-VALUES: SPDR S&P DIVIDEND ETF (SDY) VERSUS VANGUARD TOTAL STOCK MARKET ETF (VTI) (2020-2020)

Number/Returns/Ratios/Standard Deviation/Variance/P-Value	Hypothesis Number	Time Period	ETF	ETF	P-Value
	$H4_0$	2020-2020	(SDY)	(VTI)	
Number of Data Points			16	16	
Mean Daily Return			0.129	0.238	
Mean Weekly Sharpe Ratio			0.139	0.292	
Standard Deviation			0.477	0.531	
Variance			0.227	0.282	
P-Value					0.400

Results of the Study

Hypothesis 1

Weekly Sharpe ratios were calculated from daily returns for the S&P 500 Dividend Aristocrat Index and the CRSP U.S. Total Market Index for the period April 2011 to July 2020 representing 466 periods.

Appendix A shows the Kolmogorov Smirnov-test (KS-test) for normality, the Shapiro-Wilk test, and the Wilcoxon Signed Rank test for variance results for the time period addressed in the study. The KS-test and Shapiro-Walk test indicated a non normal distribution for the period; therefore, the Wilcoxon Signed Rank test for variance was conducted as identified in the study's methodology section. The p-value for the period was 0.639. Given these results, the null hypothesis of the time period was retained. That is, the S&P 500 Dividend Aristocrat Index Sharpe ratio is not significantly different than the CRSP U.S. Total Market Index Sharpe ratio for the period.

Hypothesis 2

Weekly Sharpe ratios were calculated from daily returns for the SPDR S&P Dividend ETF (SDY) and the Vanguard Total Stock Market ETF (VTI) for the period April 2011 to July 2020, representing 466 periods.

Appendix B shows the KS-test for normality, the Shapiro-Wilk test, and the Wilcoxon Signed Rank test for variance results for the time period addressed in the study. The KS-test and Shapiro-Wilk test indicated a non normal distribution for the period; therefore, the Wilcoxon Signed Rank test for variance was conducted as identified in the study's methodology section. The p-value for the period was 0.018. Given these results, the null hypothesis for the time period was rejected. Therefore, the SPDR S&P Dividend ETF (SDY) Sharpe ratio is significantly different than the Vanguard Total Stock Market ETF (VTI) Sharpe ratio for the time period.

Hypothesis 3

Weekly Sharpe ratios were calculated from daily returns for the S&P 500 Dividend Aristocrat Index and the CRSP U.S. Total Market Index for the period April 2011 to March 2020 representing 450 periods.

Appendix C shows the KS-test for normality, the Shapiro-Wilk test, and the Wilcoxon Signed Rank test for variance results for the time period addressed in the study. The KS-test and the Shapiro-Wilk test indicated a non normal distribution for the period; therefore, the Wilcoxon Signed Rank test for variance was conducted as identified in the study's methodology section. The p-value for the period was 0.924. Given these results, the null hypothesis for the time period was retained. Therefore, the S&P 500 Dividend Aristocrat Index Sharpe ratio is not significantly different than the CRSP U.S. Total Market Index Sharpe ratio the time period.

Hypothesis 4

Weekly Sharpe ratios were calculated from daily returns for the SPDR S&P Dividend ETF (SDY) and the Vanguard Total Stock Market ETF (VTI) for the period April 2011 to March 2020, representing 450 periods.

Appendix D shows the KS-test for normality, the Shapiro-Wilk test, and the Wilcoxon Signed Rank test for variance results for the time period addressed in the study. The KS-test and the Shapiro-Wilk test indicated a non normal distribution for the period; therefore, the Wilcoxon Signed Rank test for variance was conducted as identified in the study's methodology section. The p-value for the period was 0.050. Given these results, the null hypothesis for the time period was rejected. Therefore, the SPDR S&P Dividend ETF (SDY) Sharpe ratio is significantly different than the Vanguard Total Stock Market ETF (VTI) Sharpe ratio for the time period.

Hypothesis 5

Weekly Sharpe ratios were calculated from daily returns for the S&P 500 Dividend Aristocrat Index and the CRSP U.S. Total Market Index for the period March 2020 to July 2020 representing 16 periods.

Appendix E shows the KS-test for normality, the Shapiro-Wilk test, and the Wilcoxon Signed Rank test for variance results for the time period addressed in the study. The KS-test and the Shapiro-Wilk test indicated a normal distribution for the period; therefore, the F-test for variance was used to test if the variances were equal or unequal then the appropriate t-test was used to check for significant differences between the means as identified in the study's methodology section. The p-value for the period was 0.561. Given these results, the null hypothesis for the time period was retained. Therefore, the S&P 500 Dividend Aristocrat Index Sharpe ratio is not significantly different than the CRSP U.S. Total Market Index Sharpe ratio for the time period.

Hypothesis 6

Weekly Sharpe ratios were calculated from daily returns for the SPDR S&P Dividend ETF (SDY) and the Vanguard Total Stock Market ETF (VTI) for the period March 2020 to July 2020 representing 16 periods.

Appendix F shows the KS-test for normality, the Shapiro-Wilk test, and the Wilcoxon Signed Rank test for variance results for the time period addressed in the study. The KS-test and the Shapiro-Wilk test indicated a normal distribution for the period; therefore, the F-test for variance was used to test if the variances were equal or unequal then the appropriate t-test was used to check for significant differences between the means as identified in the study's methodology section. The p-value for the period was 0.400. Given these results, the null hypothesis for the time period was retained. Therefore, the SPDR S&P Dividend ETF (SDY) Sharpe ratio is not significantly different than the Vanguard Total Stock Market ETF (VTI) Sharpe ratio for the time period.

CONCLUSION

This study found that on a risk-adjusted basis the mean weekly Sharpe Ratios were not significantly different for the S&P 500 Dividend Aristocrat Index as compared to the CRSP U.S. Total Market Index for the three periods tested. The CRSP U.S. Total Market Index outperforms the S&P 500 Dividend Aristocrat Index during these periods but when considering risk-adjusted returns the findings are not statistically significant.

A previous study conducted by Williams and Miller (2013) found that for the recovery and recessionary periods of 2001 and 2008, the S&P 500 Dividend Aristocrat Index outperformed the S&P 500 Index. Given the short duration of the third time period during the bear market and recovery, the results of this study did not duplicate their findings.

When testing the exchange fund proxies for the two indices, the study found on a risk-adjusted basis the mean weekly Sharpe Ratios for the SPDR S&P Dividend ETF (SDY) were significantly different from the Vanguard Total Stock Market ETF (VTI) for the bull market period and for the entire period of the study. The statistical results indicated the Vanguard Total Stock Market ETF (VTI) out performed the SPDR S&P Dividend ETF (SDY) for these time frames.

For the bear market period, the study found on a risk-adjusted basis the mean weekly Sharpe Ratios for the SPDR S&P Dividend ETF (SDY) were not significantly different from the Vanguard Total Stock Market ETF (VTI). The Vanguard Total Stock Market ETF (VTI), however, does outperform the SPDR S&P Dividend ETF (SDY) during the period but when considering risk-adjusted returns the findings are not statistically significant.

The findings of this study provide valuable insight to portfolio assets as investors seek returns during the pandemic. Given the Federal Reserve accommodative monetary policy, investors are finding it difficult to achieve sufficient returns in the credit markets to meet their portfolio objectives. This leads individuals and institutions to seek higher returns and take greater risks in the stock market until the Federal Reserve changes their policy regarding interest rates and/or inflation targets.

REFERENCES

Ackerman, A., & Timiraos, N. (2020, April 4). Exchange --- Fed is unlikely to halt bank dividends. *Wall Street Journal*. ProQuest Central. Retrieved from http://search.proquest.com.proxy.davenport.edu/docview/2385886799?accountid=40195

Asquith, P., & Mullins, D., Jr. (1983). The impact of initiating dividend payments on shareholders' wealth. *The Journal of Business*, *56*(2), 77-96.

Benartzi, S., Michaely, R., & Thaler, R. (1997). Do dividends signal the future or the past? *Journal of Finance*, *52*(3), 1007-1034.

Bird, M. (2016, May 19). Are dividends too high and investment too low? *Wall Street Journal*. ProQuest Central. Retrieved from http://search.proquest.com.proxy.davenport.edu/docview/1789697111?accountid=40195

Black, F., & Scholes, M. (1974). The effect of dividend yield and dividend policy on common stock prices and returns. *Journal of Financial Economics*, *1*, 1-22.

Brennan, M.J. (1970). Taxes, market valuation and corporate financial policy. *National Tax Journal*, *26*, 1115-1121.

Caginalp, G., & DeSantis, M. (2017). Does price efficiency increase with trading volume? Evidence of nonlinearity and power laws in ETFs. *Physica A: Statistical Mechanics and Its Applications*, *467*, 436–452. https://doi.org/10.1016/j.physa.2016.10.039

Chang. R., & Rhee, S. (1990). The impact of personal taxes on corporate dividend policy and capital structure decisions. *Financial Management*, *19*(2), 21-31.

Chirputkar, S., & Soe, A. (2019, January 7). *A Fundamental Look at S&P 500 Dividend Aristocrats*. Retrieved from https://www.spglobal.com/spdji/en/research/article/a-fundamental-look-at-sp-500-dividend-aristocrats/

Ciura, B. (2020). *Sure Dividend*. Retrieved July 7, 2020, from https://www.suredividend.com/dividend-aristocrats-list/

Clements, J. (1999, October 5). *Wall Street Journal*.

Constable, S. (2015, August 10). Investing in funds & ETFs: A monthly analysis—The downside of ETFs—Study says they drive up cost of trading. *Wall Street Journal*. ProQuest Central. Retrieved from http://search.proquest.com.proxy.davenport.edu/docview/1702336996?accountid=40195

Conway, B. (2012). In indexing, new techniques to lower costs. *Barron's*, *92*(42), 36. ProQuest Central.

DeAngelo, H., & DeAngelo, L. (2006). The irrelevance of the MM dividend irrelevance theorem. *Journal of Financial Economics*, *79*, 293-315.

DeAngelo, H., DeAngelo, L., & Skinner, D. (2003). Are dividends disappearing? Dividend concentration and the consolidation of earnings. *Journal of Financial Economics*, *72*, 425-456.

Dieterich, C. (2014). Everyone into the ETF pool. *Barron's*, *94*(52), 27. ProQuest Central.

Dieterich, C. (2015). Beware those index changes. *Barron's*, *95*(15), 36. ProQuest Central.

Driver, C., Grosman, A., & Scaramozzino, P. (2020). Dividend policy and investor pressure. *Economic Modelling*, *89*, 559–576. https://doi.org/10.1016/j.econmod.2019.11.016

Durand, D. (1959). The cost of capital, corporation finance, and the theory of investment: Comment. *American Economic Review*, *49*(4), 639-654.

Edgerton, J. (2012). Four facts about dividend payouts and the 2003 tax cut. *International Tax and Public Finance; New York*, *20*(5), 769–784. http://dx.doi.org.proxy.davenport.edu/10.1007/s10797-012-9242-z

Fama, E., & French, K. (2001). Disappearing dividends: Changing firm characteristics or lower propensity to pay? *Journal of Applied Corporate Finance*, *14*, 67-79.

Felimban, R., Floros, C., & Nguyen, A.-N. (2018). The impact of dividend announcements on share price and trading volume. *Journal of Economic Studies*, *45*(2), 210–230. ProQuest Central. https://doi.org/10.1108/JES-03-2017-0069

Goodman, B. (2014). Fama weighs in on ETFs. *Barron's*, *94*(38), 34. ProQuest Central.

Grullon G., & Michaely, R. (2002). Dividends, share repurchases, and the substitution hypothesis. *The Journal of Finance*, *57*(4), 1649-1684.
Healy, P., & Palepu, K. (1998). Earnings information conveyed by dividend initiations and omissions. *Journal of Financial Economics*, *21*, 149-175.
Housel, M. (2014, October 4). Weekend investor --- Upside: How to boost income in an era of low stock dividends. *Wall Street Journal*. ProQuest Central. Retrieved from http://search.proquest.com.proxy.davenport.edu/docview/1577833668?accountid=40195
Hu, H.T.C., & Morley, J.D. (2018). A regulatory framework for exchange-traded funds. *Southern California Law Review*, *91*(5), 839–942.
Hulbert, M. (2018, December 10). *Wall Street Journal*.
Impson C., & Karafiath, I. (1992). A note on the stock market reaction to dividend announcements. *The Financial Review*, *27*(2), 259-271.
John, K., & Williams, J. (1985). Dividends, dilution, and taxes: A signaling equilibrium. *Journal of Finance*, *40*, 1053-1070.
Kim, C. (2019). Bogle's indexing legacy. *Barron's*, *99*(3), 33. ProQuest Central.
Kuo, N. (2013). Dividend tax signaling and the pricing of future earnings: A case of taxable stock dividends. *Review of Quantitative Finance and Accounting; New York*, *40*(3), 539–570. http://dx.doi.org.proxy.davenport.edu/10.1007/s11156-012-0287-y
Lee, K.F. (2011). Demographics, dividend clienteles and the dividend premium. *The Quarterly Review of Economics and Finance*, *51*(4), 368–375. https://doi.org/10.1016/j.qref.2011.08.004
Light, J. (2011). Demographics, dividend clienteles and the dividend premium. *The Quarterly Review of Economics and Finance*, *51*(4), 368-375. https://doi.org/10.1016?j.qref.2011.08.004
Lintner, J. (1956). Distribution of incomes of corporations among dividends, retained earnings and taxes. *American Economic Review*, *46*, 97–113.
Miller, M., & Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. *The Journal of Business*, *34*(4), 411-433.
Miller, M., & Rock, K. (1985). Dividend policy under asymmetric information. *Journal of Finance*, *40*(4), 1031-1051.
Modigliani, F., & Miller, M.H. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review*, *48*(3), 261-297.
Mrzygłód, U., & Nowak, S. (2017). Market reactions to dividends announcements and payouts. Empirical evidence from the Warsaw Stock Exchange. *Contemporary Economics; Warsaw*, *11*(2), 187–204. http://dx.doi.org.proxy.davenport.edu/10.5709/ce.1897-9254.236
Naranjo, A., Nimalendran, M., & Ryngaert, M.(1998). Stock returns, dividend yields, and taxes. *The Journal of Finance*, *53*(6), 2029–2057.
Parsimony Investment Research. (2013, January 23). *Core Retirement Portfolio: 12 Dividend Aristocrats Yielding Over 3%* (Part 3). Seeking Alpha. Retrieved from https://seekingalpha.com/article/1127201-core-retirement-portfolio-12-dividend-aristocrats-yielding-over-3-percent-part-3
Peters, D.A., Vale, A.Z., & McKay, D.A. (2013). Where do I put my money? Mutual funds versus exchange-traded funds. *The Canadian Journal of Plastic Surgery*, *21*(3), 197–198.
Spaht, C., & Rubin, H. (2013). An investment strategy for financial independence for the unluckiest person in the world. *The Journal of Applied Business and Economics*, *15*(1), 64–70. Entrepreneurship Database; ProQuest Central.
Strauss, L.C. (2019). 3 ETF aristocrats. *Barron's*, *99*(5), 32. ProQuest Central.
Strauss, L.C. (2020). These 8 aristocrats have safe dividends. (Safe being relative.). *Barron's*, *100*(14), 31. ProQuest Central.
The Vanguard Group. (2020). *Add an ETF without breaking the bank*. Vanguard. Retrieved September 1, 2020, from https://investor.vanguard.com/etf/
Top Dividends. (2010, July 14). *Dividend aristocrats—Income investing*. Dividends. Retrieved from https://www.dividendstocksonline.com/2010/07/what-are-dividend-aristocrats/

Vallo, M. (2015). Aristocrats keep payouts rising. *Barron's*, *95*(8), 40. ProQuest Central.
Venkatesh, P.C. (1989). The impact of dividend initiation on the information content of earnings announcements and returns volatility. *Journal of Business*, *62*, 175-197.
Watts, R. (1973). The information content of dividends. *The Journal of Business*, *46*(2), 191-211.
Weinberg, A.I. (2019, November 4). Investing in funds & ETFs: A monthly analysis—Why no-cost ETFs aren't no-cost—ETF sticker prices are sinking. But don't let cheap trading dictate your decisions, or forget the other costs that are harder to see. *Wall Street Journal*. ProQuest Central. Retrieved from http://search.proquest.com.proxy.davenport.edu/docview/2311475972?accountid=40195
Williams, A., & Miller, M. (2013). Do stocks with dividends outperform the market during recessions? *Journal of Accounting and Finance*, *13*(1), 58-69.
Wursthorn, M. (2018, December 17). Record dividends buoy investors. *Wall Street Journal*. ProQuest Central. Retrieved from http://search.proquest.com.proxy.davenport.edu/docview/2157295300?accountid=40195
Wursthorn, M. (2019, August 14). Dividends in spotlight as bond yields drop. *Wall Street Journal*. ProQuest Central. Retrieved from http://search.proquest.com.proxy.davenport.edu/docview/2272621827?accountid=40195

APPENDIX A

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SP500DivAristocrat	466	20.00%	1860	80.00%	2326	100.00%
CRSPUSTotalMarket	466	20.00%	1860	80.00%	2326	100.00%

Descriptives

			Statistic	Std. Error
SP500DivAristocrat	Mean		0.1443	0.0247
	95% Confidence Interval for Mean	Lower Bound	0.0957	
		Upper Bound	0.1929	
	5% Trimmed Mean		0.1385	
	Median		0.0848	
	Variance		0.285	
	Std. Deviation		0.53348	
	Minimum		-1.98	
	Maximum		2.77	
	Range		4.75	
	Interquartile Range		0.61	
	Skewness		0.237	0.113
	Kurtosis		2.04	0.226
CRSPUSTotalMarket	Mean		0.1504	0.0243

95% Confidence Interval for Mean	Lower Bound	0.1026	
	Upper Bound	0.1982	
5% Trimmed Mean		0.1539	
Median		0.1305	
Variance		0.276	
Std. Deviation		0.52533	
Minimum		-1.7	
Maximum		1.89	
Range		3.59	
Interquartile Range		0.64	
Skewness		-0.086	0.113
Kurtosis		0.885	0.226

Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SP500DivAristocrat	0.059	466	0.000	0.978	466	0.000
CRSPUSTotalMarket	0.044	466	0.031	0.99	466	0.002

a Lilliefors Significance Correction

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
SP500DivAristocrat	466	0.1443	0.53348	-1.98	2.77
CRSPUSTotalMarket	466	0.1504	0.52533	-1.7	1.89

Wilcoxon Signed Ranks Test - Ranks

		N	Mean Rank	Sum of Ranks
CRSPUSTotalMarket - SP500DivAristocrat	Negative Ranks	232a	228.62	53040
	Positive Ranks	234b	238.34	55771
	Ties	0c		
	Total	466		

a CRSPUSTotalMarket < SP500DivAristocrat

b CRSPUSTotalMarket > SP500DivAristocrat

c CRSPUSTotalMarket = SP500DivAristocrat

Test Statistics

	CRSPUSTotalMarket - SP500DivAristocrat
Z	-.469b
Asymp. Sig. (2-tailed)	0.639

a Wilcoxon Signed Ranks Test

b Based on negative ranks.

APPENDIX B

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SDY	466	20.00%	1860	80.00%	2326	100.00%
Vanguard	466	20.00%	1860	80.00%	2326	100.00%

Descriptives

			Statistic	Std. Error
SDY	Mean		0.1292	0.02577
	95% Confidence Interval for Mean	Lower Bound	0.0786	
		Upper Bound	0.1798	
	5% Trimmed Mean		0.1187	
	Median		0.0823	
	Variance		0.31	
	Std. Deviation		0.55634	
	Minimum		-1.92	
	Maximum		2.84	
	Range		4.76	
	Interquartile Range		0.61	
	Skewness		0.446	0.113
	Kurtosis		2.356	0.226
Vanguard	Mean		0.1506	0.02436
	95% Confidence Interval for Mean	Lower Bound	0.1027	
		Upper Bound	0.1984	
	5% Trimmed Mean		0.154	
	Median		0.1308	
	Variance		0.277	

	Std. Deviation	0.52586	
	Minimum	-1.7	
	Maximum	1.88	
	Range	3.58	
	Interquartile Range	0.63	
	Skewness	-0.086	0.113
	Kurtosis	0.886	0.226

Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SDY	0.062	466	0	0.97	466	0
Vanguard	0.044	466	0.031	0.989	466	0.002

a Lilliefors Significance Correction

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
SDY	466	0.1292	0.55634	-1.92	2.84
Vanguard	466	0.1506	0.52586	-1.7	1.88

Wilcoxon Signed Ranks Test - Ranks

Vanguard - SDY

		N	Mean Rank	Sum of Ranks
a Vanguard < SDY				
b Vanguard > SDY	Negative Ranks	209a	227.45	47537
c Vanguard = SDY	Positive Ranks	257b	238.42	61274
	Ties	0c		
	Total	466		

Test Statistics

	Vanguard - SDY
Z	-2.361b
Asymp. Sig. (2-tailed)	0.018

a Wilcoxon Signed Ranks Test
b Based on negative ranks.

APPENDIX C

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SP500DivAristocrat	450	19.30%	1876	80.70%	2326	100.00%
CRSPUSTotalMarket	450	19.30%	1876	80.70%	2326	100.00%

Descriptives

			Statistic
SP500DivAristocrat	Mean		0.1428
	95% Confidence Interval for Mean	Lower Bound	0.0932
		Upper Bound	0.1924
	5% Trimmed Mean		0.1371
	Median		0.0889
	Variance		0.287
	Std. Deviation		0.53533
	Minimum		-1.98
	Maximum		2.77
	Range		4.75
	Interquartile Range		0.61
	Skewness		0.235
	Kurtosis		2.101
CRSPUSTotalMarket	Mean		0.1453
	95% Confidence Interval for Mean	Lower Bound	0.0967
		Upper Bound	0.194
	5% Trimmed Mean		0.15
	Median		0.129
	Variance		0.276
	Std. Deviation		0.52499
	Minimum		-1.7
	Maximum		1.89
	Range		3.59
	Interquartile Range		0.63

Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SP500DivAristocrat	0.064	450	0	0.977	450	0
CRSPUSTotalMarket	0.042	450	0.051	0.99	450	0.003

a Lilliefors Significance Correction

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
SP500DivAristocrat	450	0.1428	0.53533	-1.98	2.77
CRSPUSTotalMarket	450	0.1453	0.52499	-1.7	1.89

Wilcoxon Signed Ranks Test - Ranks

		N	Mean Rank	Sum of Ranks
CRSPUSTotalMarket - SP500DivAristocrat	Negative Ranks	228a	221.38	50475
	Positive Ranks	222b	229.73	51000
	Ties	0c		
	Total	450		

a CRSPUSTotalMarket < SP500DivAristocrat
b CRSPUSTotalMarket > SP500DivAristocrat
c CRSPUSTotalMarket = SP500DivAristocrat

Test Statistics

	CRSPUSTotalMarket - SP500DivAristocrat
Z	-.095b
Asymp. Sig. (2-tailed)	0.924

a Wilcoxon Signed Ranks Test
b Based on negative ranks.

APPENDIX D

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SDY	450	19.30%	1876	80.70%	2326	100.00%
Vanguard	450	19.30%	1876	80.70%	2326	100.00%

Descriptives

			Statistic	Std. Error
SDY	Mean		0.1288	0.02637
	95% Confidence Interval for Mean	Lower Bound	0.077	
		Upper Bound	0.1807	
	5% Trimmed Mean		0.1186	
	Median		0.0837	
	Variance		0.313	
	Std. Deviation		0.55941	
	Minimum		-1.92	
	Maximum		2.84	
	Range		4.76	
	Interquartile Range		0.61	
	Skewness		0.443	0.115
	Kurtosis		2.382	0.23
Vanguard	Mean		0.1456	0.02478
	95% Confidence Interval for Mean	Lower Bound	0.0969	
		Upper Bound	0.1943	
	5% Trimmed Mean		0.1501	
	Median		0.1293	
	Variance		0.276	
	Std. Deviation		0.52556	
	Minimum		-1.7	
	Maximum		1.88	
	Range		3.58	
	Interquartile Range		0.63	
	Skewness		-0.119	0.115
	Kurtosis		0.874	0.23

Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SDY	0.062	450	0	0.97	450	0
Vanguard	0.042	450	0.051	0.99	450	0.003

a Lilliefors Significance Correction

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
SDY	450	0.1288	0.55941	-1.92	2.84
Vanguard	450	0.1456	0.52556	-1.7	1.88

Wilcoxon Signed Ranks Test - Ranks

		N	Mean Rank	Sum of Ranks
Vanguard4 - SDY	Negative Ranks	205a	221.16	45337
	Positive Ranks	245b	229.13	56138
	Ties	0c		
	Total	450		

a Vanguard < SDY
b Vanguard > SDY
c Vanguard = SDY

Test Statistics

	Vanguard - SDY
Z	-1.957b
Asymp. Sig. (2-tailed)	0.05

a Wilcoxon Signed Ranks Test
b Based on negative ranks.

APPENDIX E

Case Processing Summary

	Cases Valid N	Percent	Missing N	Percent	Total N	Percent
SP500DivAristocrat	16	0.70%	2310	99.30%	2326	100.00%
CRSPUSTotalMarket	16	0.70%	2310	99.30%	2326	100.00%

Descriptives

			Statistic	Std. Error
SP500DivAristocrat	Mean		0.1855	0.12308
	95% Confidence Interval for Mean	Lower Bound	-0.0769	
		Upper Bound	0.4478	
	5% Trimmed Mean		0.1713	
	Median		0.0224	
	Variance		0.242	
	Std. Deviation		0.4923	
	Minimum		-0.5	
	Maximum		1.12	
	Range		1.62	
	Interquartile Range		0.84	
	Skewness		0.457	0.564
	Kurtosis		-0.805	1.091
CRSPUSTotalMarket	Mean		0.292	0.13299
	95% Confidence Interval for Mean	Lower Bound	0.0085	
		Upper Bound	0.5755	
	5% Trimmed Mean		0.2531	
	Median		0.1783	
	Variance		0.283	
	Std. Deviation		0.53198	
	Minimum		-0.32	
	Maximum		1.61	
	Range		1.93	
	Interquartile Range		0.74	
	Skewness		0.995	0.564
	Kurtosis		0.921	1.091

Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SP500DivAristocrat	0.173	16	.200*	0.951	16	0.505
CRSPUSTotalMarket	0.136	16	.200*	0.922	16	0.181

* This is a lower bound of the true significance.
a Lilliefors Significance Correction

F-Test Two-Sample for Variances

	SP500DivAristocrat	*CRSPUSTotalMarket*
Mean	0.185476469	0.291995591
Variance	0.242359602	0.282999796
Observations	16	16
df	15	15
F	0.856394973	
P(F<=f) one-tail	0.383959303	
F Critical one-tail	0.416069075	

F-Test Two-Sample for Variances

	CRSPUSTotalMarket	*SP500DivAristocrat*
Mean	0.291995591	0.185476469
Variance	0.282999796	0.242359602
Observations	16	16
df	15	15
F	1.167685509	
P(F<=f) one-tail	0.383959303	
F Critical one-tail	2.403447071	

t-Test: Two-Sample Assuming Equal Variances

	SP500DivAristocrat	*CRSPUSTotalMarket*
Mean	0.185476469	0.291995591
Variance	0.242359602	0.282999796
Observations	16	16
Pooled Variance	0.262679699	
Hypothesized Mean Difference	0	
df	30	
t Stat	-0.587840242	
P(T<=t) one-tail	0.280519411	
t Critical one-tail	1.697260887	
P(T<=t) two-tail	0.561038821	
t Critical two-tail	2.042272456	

APPENDIX F

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SDY	16	0.70%	2310	99.30%	2326	100.00%
Vanguard	16	0.70%	2310	99.30%	2326	100.00%

Descriptives

			Statistic	Std. Error
SDY	Mean		0.1391	0.11924
	95% Confidence Interval for Mean	Lower Bound	-0.115	
		Upper Bound	0.3933	
	5% Trimmed Mean		0.1153	
	Median		0.0282	
	Variance		0.227	
	Std. Deviation		0.47696	
	Minimum		-0.52	
	Maximum		1.23	
	Range		1.75	
	Interquartile Range		0.65	
	Skewness		0.655	0.564
	Kurtosis		0.189	1.091
Vanguard	Mean		0.2916	0.13284
	95% Confidence Interval for Mean	Lower Bound	0.0085	
		Upper Bound	0.5747	
	5% Trimmed Mean		0.2528	
	Median		0.1787	
	Variance		0.282	
	Std. Deviation		0.53135	
	Minimum		-0.32	
	Maximum		1.6	
	Range		1.93	
	Interquartile Range		0.74	
	Skewness		0.992	0.564
	Kurtosis		0.907	1.091

Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SDY	0.154	16	.200*	0.954	16	0.552
Vanguard	0.136	16	.200*	0.922	16	0.182

* This is a lower bound of the true significance.
a Lilliefors Significance Correction

F-Test Two-Sample for Variances

	SDY	Vanguard
Mean	0.13913999	0.29159623
Variance	0.2274924	0.28233196
Observations	16	16
df	15	15
F	0.80576211	
P(F<=f) one-tail	0.34056614	
F Critical one-tail	0.41606908	

F-Test Two-Sample for Variances

	Vanguard	SDY
Mean	0.29159623	0.13913999
Variance	0.28233196	0.2274924
Observations	16	16
df	15	15
F	1.24106108	
P(F<=f) one-tail	0.34056614	
F Critical one-tail	2.40344707	

t-Test: Two-Sample Assuming Equal Variances

	SDY	Vanguard
Mean	0.13913999	0.29159623
Variance	0.2274924	0.28233196
Observations	16	16
Pooled Variance	0.25491218	
Hypothesized Mean Difference	0	
df	30	
t Stat	-0.8540728	
P(T<=t) one-tail	0.19991668	
t Critical one-tail	1.69726089	
P(T<=t) two-tail	0.39983336	
t Critical two-tail	2.04227246	