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School of Business and Management

Strategic Finance and Business Analytics

Petri Gostowski

APPLYING VALUE INVESTING MULTIPLES IN CREATING A DIVIDEND ARISTOCRAT PORTFOLIO

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ABSTRACT

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The purpose of this thesis is to examine how applying value investing multiples in creating a Dividend Aristocrat portfolio affects returns. The examined stock market is the US stock market, the time horizon is from 1991 to 2016 and the benchmark index is the S&P 500. In this paper the author formed portfolios based on P/E-, P/B-, P/CF-, EV/EBITDA-, EV/SALES-, and the DY-multiples and at the start of the research period each portfolio was formed from ten "cheapest" stocks based on these multiples. Stocks were dropped and added to the portfolio after a company lost its Dividend Aristocrat title. The performance of each portfolio was measured by annualized returns, Sharpe ratio and with Jensen's Alpha. The best performing portfolio of this research was the P/B portfolio, which gained a statistically significant and positive alpha on a five percent confidence level. The annualized excess return was slightly above 4 percent. All the examined portfolios produced annualized returns that were above their benchmark between 1991 and 2016.

TIIVISTELMÄ

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Tämän tutkielman tavoitteena on selvittää arvosijoitus-tunnuslukujen soveltamisen toimivuutta Osinkoaristokraatti portfolion muodostamisessa. Tutkittu osakemarkkina on Yhdysvaltojen osakemarkkinat, aikahorisontti on vuodet 1991-2016 ja vertailuindeksi on S&P 500. Tutkimuksessa muodostettiin portfolioita käyttäen P/E-, P/B-, P/CF-, EV/EBITDA-, EV/SALES- ja DY-tunnuslukuja ja alkuvaiheessa portfolio muodostui kymmenestä (kullakin tunnusluvulla) halvimmasta osakkeesta. Osakkeita poistettiin ja lisättiin sitä mukaan, kun yksittäinen osake menetti Osinkoaristokraatti-tittelinsä. Portfolion menestymistä mitattiin annualisoiduilla tuotoilla, Sharpe luvulla ja Jensenin Alfalla. Tutkimuksen parhaiten menestynyt portfolio koko tarkasteluajalta oli P/B-portfolio, jonka tuottama alfa oli myös tilastollisesti merkitsevää 5 % riskitasolla. Portfolion vuotuinen ylituotto oli yli 4 %. Kaiken kaikkiaan jokainen muodostettu portfolio tuotti vertailuindeksiänsä paremmin, kun tarkastellaan annualisoituja tuottoja aikavälillä 1991-2016.

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The process of writing this thesis has been a long journey, not least because of my fast-paced work-life. However, and as often happens, in the end it still feels as if it was a little easier than I thought in the beginning. What helped me in this project is that I was truly interested in the results and that is what kept me going. I believe the results proved to be what I expected them to be.

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Lastly, I want to thank my family and friends that have always been my source of energy to keep going forward.

On 19.3.2017 in Helsinki,

Petri Gostowski

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1 Introduction

" A stocks intrinsic value is equivalent to the amount of money the underlying company can pay to its shareholders during its lifetime. The smaller the amount of risks this is accompanied with, the better the investment is."

(Oksaharju 2012, 14)

Oksaharju (2012) summarizes the main principals of buying stocks from the stock market, and how investors should rank stocks in relation to their potential gains. Any rational investors aim is to maximize their gains through investments while minimizing the risk related to these investments. Thus, his goal is to grow his initial investment to the maximum amount with the smallest risk possible.

One of the biggest influences on the success of any investor comes from the price he pays for stocks he buys and the price he gets when he sells the stock, respectively. Any investor should always aim to buy stocks as cheap as possible and sell them when they are expensive. Puttonen (2009, 143) simplifies the idea behind any sound investing: investors should choose the correct alternatives and buy them when they are cheap. To succeed, an investor should have a strategy that can provide constantly higher returns than its benchmark index.

As the studies of Bennyhoff (2009), Kritzman and Rich (1998) and Chordia, Subrahmanyam and Anshuman (2000) have shown, individual investors often gain higher returns when they minimize their trading and on the contrary maximize the holding period of each stock. This is an interesting finding and has had great influence to this paper and served as a motivator in creation of the investing strategies that are tested in this paper.

When investing in the stock market, it is fundamental to hold on to a strict investment strategy, and thus aim to higher returns than average investors and essentially to beat the benchmark index. Already from the very start of financial theory and research, investors have aimed to find strategies that produce higher returns than their benchmark. Even though the subject highly divides opinions, the author claims that based on today's research, establishing such a strategy is possible, though extremely demanding. Investors are influenced with so many distractions that in order to obey such a strategy requires a lot of character.

Strategies that are based on a stocks valuation multiples have a long history. These strategies have been motivated by the research results that have shown them to beat the market and by the numerous literature that has been written (for examples see Fama and French (1992), Lev and Thiagarajan (1993), Athanassakos (2011) and Loughran and Wellman (2011)) The anomalies behind multiple-based investing have fascinated researches which also helped it gain interest.

A common division for multiples-based investing is to divide it between value and growth investing strategies. Selecting “cheap” stocks based on their valuation multiples has often proven to produce market beating results, which has also lead to its growing interest. Value investing is a common name for buying stocks that have low valuation multiples. Value investors also often believe that due to the cheap value of the stock, its downside is limited and the risk of losing money is smaller. A value investor seeks to find stocks that are valued at below their “fair value”. The idea is that eventually their valuation will raise to match the stocks “fair value” and the investor will gain profits. This idea of finding the cheapest stocks by applying value investing principles is highly linked to this study.

Contrary to value investing is growth investing. In growth investing the attention is not in the stock’s current valuation, but rather its future growth prospects. The main idea behind this approach is that the company’s growth will turn into even greater profits in the future. Growth investors seek for companies with growth expectations that are considerably higher than the prospects that are currently priced into the stock. It should not be forgotten, however, that whether the companies fail to meet their growth expectations the high valuation may lead to significant negative returns.

Miller and Modigliani (1961) have studied the effect of a company’s dividend policy to the returns gained from the underlying company’s stock and stated that it has been of a huge impact. Later, Black and Scholes (1974) reported that in the short term a company’s dividend policy might influence returns gained from its stock. According to Black and Scholes it seems that the company’s dividend policy is seen as something that is highly influenced by the manager’s expectations of future returns. Thus, growing dividends bring up belief towards the company’s future, and on the contrary, any reduce of cash dividends sheds a shade on the future.

As Fama and Frech (2001) show the propensity to pay dividends has fallen in the end of the last decade. DeAngelo H., DeAngelo L., and Skinner (2004) argued that the aggregate real dividends have grown and only the number of dividend paying firms has declined. This was also supported by Denis and Osobov (2008) on their worldwide research. Both DeAngelo et al. (2004) and Denis and Osobov (2008) suggest that this is due to earnings concentrating to the larger (but lower growth) and most profitable companies globally.

In this paper the author creates portfolios that contain stocks, which have a history of growing their cash dividend for at least 25 years. These companies are also known as Dividend Aristocrats. The author has not, until this date, found any equivalent or extensive research conducted on such companies. This is a fact that also makes them so interesting.

Intuitively Dividend Aristocrats may be seen less risky businesses as they are large multinational companies. They are also known for growing dividends, which should grow their intrinsic value as per Oksaharju (2012) since they are growing the amount of money they distribute to their shareholders. Also, if dividends distribution continues to concentrate to the largest and most profitable companies (that are characteristics of Dividend Aristocrats) as suggested by DeAngelo et al. (2004) and Denis and Osobov (2008) this should support them in continuing to pay growing dividends. Then buying “cheap” stocks as Puttonen (2009) suggests should also enhance investors returns. These findings support researching the returns of Dividend Aristocrats and this is why the Dividend Aristocrats portfolios are formed by value investing criteria in this study.

1.1 The purpose of this study and the research problem

The author aims to create a portfolio, or many portfolios, that produce excess returns when compared to their benchmark. The research question is thus, is it possible to create a Dividend Aristocrat portfolio that beats its’ benchmark by applying value multiples in portfolio formation? The author also aims to find whether the portfolios consistently outperform the benchmark on annual returns. In other words, by dividing the data set to two the annualized returns can be examined from two time periods and get a deeper insight into the annual returns.

The author has a common approach to the intrinsic value of a company as the most known investor, Warren Buffet, has. This common approach is the basis of the book by Oksaharju (2012) and is highly influenced by the great Warren Buffet. The author has a long-term interest towards Dividend Aristocrats due to their superior characters. These characteristics are the likes of superior business model, growing profits, and growing cash flows to investors. Unfortunately, they are a poorly studied group of stocks, but in the other hand that may be an educated investor's edge.

The investing world is getting even more complex from day to day and investment managers and equity strategists use more complex models aiming to earn excess returns. Also, many studies have been conducted on how psychology affects investors returns. Investors have a high tendency to react to news, which are often then overinterpreted by the market. The author's experience of the markets as well as especially the over complexity and noise of the markets have worked as a motivation for this study. The author believes that applying simple logic (buying cheap stocks) constantly over time and not reacting to noise will prove out to produce greater returns. It is not easy to restrict one from reacting to all the news around us as they are surrounding us from every direction. Therefore, applying a sound strategy and allowing ourselves no deviations from this should be a goal. The performance of a few such strategy will be presented later in the results section.

The American S&P 500 index is studied in this research, since the Dividend Aristocrats are a part of this index. The stocks used to create the examined portfolios are companies from only this index, because no other companies have grown their dividends to such extent that they would earn to be called Dividend Aristocrats.

This study is divided into 8 sections. The introduction is followed by the theoretical background that is a description of dividends as well as the Efficient Market Hypothesis (EMH). The fourth section gives a detailed explanation of the portfolio formation ratios and introduces previous studies and is then followed by the theoretical framework. The data and methodology section (section 6) gives the reader a detailed introduction to the data and how the study is conducted. Also, in section 6 the model behind the empirical research is presented. Before the conclusions, the results of this thesis are introduced. In the summary and conclusions, the author highlights the major findings and gives suggestions for further research.

2 Dividends

Ross, Westerfield and Jaffe (2005, 388) define dividends as cash flow that investors get directly from a company's account, i.e. a way of distributing of profits. There is no legislation that makes dividends mandatory; rather it is a decision of the company's board. Dividends are often seen as an indication of profits and containing a message to investors.

It is widely common for American companies to distribute dividends quarterly, a difference to what is common for example in Europe. This way companies create a steadier income to their shareholders. The former is also a common character of Dividend Aristocrats.

Ross et al. (2005, 502) note that commonly among investors, dividends are thought to be cash distributions. The financial world also knows dividends that are paid in the form of stocks. When stocks are used as dividends, each shareholder owns a greater percentage of the company. The amount, measured in money terms, they gain from this is dependent of the percentage of stocks they get and the value of the company. In such an event, no actual cash leaves the company's balance sheet. Due to the characteristics of these Dividend Aristocrats and the fact that they distribute dividends in actual cash transfers, the word dividend is used in this study to suggest actual cash dividends.

2.1 Dividend Aristocrats

As mentioned, the name Dividend Aristocrat indicates a listed company that has raised their dividends that are distributed to shareholders for many years in a row. In USA, a company will earn this title when it has been able to raise its dividend for at least 25 years in a row. Standard & Poor maintains a S&P 500 Dividend Aristocrats index, which consist of all the companies that have earned this title. According to Standard & Poor's, to meet the requirements for this title, the company's market cap needs to exceed three billion dollars and its average daily trading volumes have to exceed five million dollars for the last three months. Each company has an equivalent weight in this index, and their weights are rebalanced each quarter to adjust for any changes in market values (which adjust the weights as some stocks go up in market value and vice versa). Standard & Poor's (2013) makes a distinction between European and American Dividend Aristocrats when it notes that in Europe a company is required to raise their dividend (only) ten years in a row to deserve the same title. As stated, this paper concentrates on U.S. based stocks and therefore the author does not see it necessary to pay more attention to their European counterparts.

An equal weighting, like the one used in the Standard & Poor's Dividend Aristocrats -index, is a character that is a more preferred when compared to a market cap weighting. This is because in the long-term a market cap based weighing may result in having a greater weight on the more expensive (higher valuation) stocks. With equal weighting this trap may be avoided.

2.2 Dividend policy and the payout ratio

A company's dividend policy is one of the main influencers on the actual amount of dividends distributed. Just as the dividend policy, the company's payout ratio affects the amount of dividends paid. To put it simple, the payout ratio can be calculated by dividing the amount of dividend per share by earnings per share. This is the amount each shareholder is entitled to for every share they own, thus the dividend per share. The total amount of dividends distributed is calculated by multiplying dividend per share with the total amount of shares outstanding. On the contrary to total amount of distributed dividends (cash), the rest may be seen as the amount the company has left for investments. Equation number 1 is the definition of payout ratio as Ross et al. (2005, 39) describe it:

$$\text{Payout} = \text{DPS}/\text{EPS}. \qquad (1)$$

In equation 1, Payout is the company's payout ratio, DPS is the dividend per share and EPS is the earnings per share. The reader should be able to note hear that whether a company is continuously distributing a 100 percent payout ratio, it has no cash left for investments without adding its debt. Neither does such a payout ratio leave space for growing dividends, unless the company is simultaneously able to grow its earnings per share annually. A key point in Oksaharju (2012) is that a company distributing less than 100 percent of its earnings per share leaves money for investments into the company's balance sheet. This money, when invested wisely, is a key character when the company aims to grow its EPS and later DPS. Also, when such profitable investments are made, the company can grow its DPS without needing to raise the payout ratio.

Lintner (1956) studied companies' dividend policies from a sample that consisted of over 600 companies, of which he chose 28 for a more thorough examine. He noted that keeping a constant dividend payout ratio was acting a huge role in them and companies tended to avoid lowering their dividends. He learned that executives of such companies tended to believe the stock market would put a premium on the price of such companies. Therefore, it was a natural cause that kept managers from lowering dividends. Brav, Graham, Campbell and Harvey (2005) have also conducted a thorough study on the same subject. Their survey was sent out to 384 financial executives. Based on the results they concluded that companies think it is important to keep up to the payout ratios they have indicated and to keep a conservative dividend policy. They also concluded that managers believe it is extremely important to keep the same level of DPS at the minimum, and most importantly avoid reducing it.

According to Miller and Modigliani (1961) a company's dividend payout ratio has a prominent effect on its stock price. They state that whenever a company has a steady and conservative payout policy, just a slight change has a huge influence in how its future is estimated. Thus, according to investors, dividends hold information regarding the company's prospects and earnings.

Black and Scholes (1974) noted that the stock price might react in the short term, because the markets believe it will correlate with the future profits. However, if it proves to be that the change was not done due to the upcoming changes in profits, this affect should fade away rather quickly.

A dividend policy may also be seen as a way to note investors about the financial health of a company, according to Bhattacharya (1979). His opinion is that companies that are profitable and able to earn steady profits want to give investors a message about their profitability and help people see them as better investing alternatives. In other words, profitable companies want to be distinguished from their competitors and this is done by their dividend policies.

According to Fama and French (2000) the changing characteristics of publicly traded firms has affected the amount of companies paying dividends and they found that from 1978 to 1999 the proportion of companies paying cash dividends fell from 66,5 percent to 20,8 percent. This is a significant drop and they suggest that this is because the population of publicly traded firms tilts increasingly toward small firms with strong growth opportunities rather than high profitability. According to Fama and French (2000) the aforementioned characteristics are typical for firms that do not pay dividends. However, DeAngelo et al. (2004) showed that although the number of dividend payers have decreased substantially, the aggregate real dividends have increased over the past two decades (from late 1970's to year 2000). According to DeAngelo et al. (2004) it is because the reduction comes from companies paying small dividends whereas the increase in real dividends come from the top payers, which also reflects high and increasing earnings concentration. DeAngelo et. al (2004) also argue that top earners continue to exhibit a tendency to pay dividends. According to them, due to growth (although modest) in earnings, top-end firms produce now more in real earnings and that is why the group shows a large increase in real dividends.

Modest growth, but growing earnings is a characteristic for Dividend Aristocrats studied in this thesis – probably also that is why a substantial number of Dividend Aristocrats are among the best dividend payers in DeAngelo et al. (2004)

Denis and Osobov (2008) studied the determinants of dividend policy internationally between 1994 and 2002 on US, Canadian, German, French and Japanese stock markets and their findings support DeAngelo et al. (2004) finding that paying dividends is concentrated among the largest and the more profitable companies.

More recently, Fatemi and Bildik (2012) studied more than 17 000 companies from 33 different countries and found that the propensity to pay dividends is significantly dropping. They found that the dividend paying is more concentrated towards the larger firms with less growth opportunities whereas the smaller companies with more investing opportunities affect the dropping propensity to pay dividends.

2.3 Valuation models and dividend based theories

According to Niskanen and Niskanen (2007, 127) a common and widespread theory suggests that when buying stocks, investors are actually buying the future dividends. According to this theory the value of a stock is equivalent to the sum investors will gain from their investment in dividends. They explain that investors discount the future dividends in order to have the value of the stock today. The most common model behind this theory is by William (1938), according to which the value of a stock is based on the following equation:

$$V_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+k)^t} \qquad (2)$$

In this equation (2) V0 is the value of a stock at time 0, Dt is equivalent to the dividend at time t and k is the required rate of return.

Gordon and Shapiro (1956) have developed William's model further, in order to enhance its ability to predict further returns. Their idea is based on bringing a variable that takes into account the growth of dividends. Growth is based on knowledge that is on the market already and the growth rate is kept steady over time. Their theory ended in what is one of the most widely used and known dividend based valuation models:

$$P_0 = \frac{D_0}{k-g} \; (k > g) \qquad (3)$$

In Gordon's and Shapiro's equation (3) P_0 is the market value of a stock at time 0, D_0 is the dividend at time 0, k is the required rate of return and g is the component that reflects the future growth rate from here on. In this form, g reflects the percentage growth of dividends and suggests this growth rate continues in perpetuity. An important note to be made, according to Niskanen and Niskanen (2007, 131) is the fact that for the formula to be used as such, the required rate of return k should be greater than the growth rate g.

As such, the dividend growth model by Gordon and Shapiro (1956) is vulnerable for over confidence in regards to the future growth rate of dividends. Also, the same fact applies for underestimation. The outcome, that is the value of the stock, will be highly impacted by rather small deviations in the growth rate as well as the required rate of return.

3 Efficient market hypothesis

The efficient market hypothesis (later EMH) is based on a model according to which stock prices fluctuate randomly. This fluctuation is also known as *random walk*. Eugene Fama (1970) introduced the EMH and stated that the fluctuations of stock prices are random and thus it is impossible to predict these fluctuations. Fama (1970) also introduced the idea that stock markets are efficient when prices of individual stocks reflect the information available to each individual investor and it is one of the main contributors to this theory.

The hypothesis of Fama's (1970) theory is that no investing strategy can produce abnormal (excess) returns in the long run. In other words, the longtime returns of every strategy should revert to the mean and match that of the return of the market. Bodie, Kane and Marcus (2005, 370-371) point out that the efficiency of the market is based on the fact that each investor is aiming to beat the market. In line with their thoughts, Fama (1970) rationalizes his theory by saying that the efficiency of the markets occurs when someone introduces a strategy that produces excess returns. This rationalizing suggests that when the idea behind these excess returns is exposed, every investor aims to adopt the same strategy and this leads to its death.

According to Malkamäki and Martikainen (1989) when discussing market efficiency, we can also talk about information efficiency and separate these two efficiencies. On an efficient market, based on information, all information is included in stock prices and their price is relatively close to their fair value. Neither on information efficient markets is one able to produce excess returns. The difference with these two efficiencies comes from transaction costs. After accounting for the costs stemming from arbitrary and trading on an efficient market no investor can earn excess returns. The markets may be inefficient from information perspective, but still efficient from the market point of view, because the efficiency cannot be used to gain profits.

One of the major prerequisites for efficient markets is that each individual investor acts rationally. Rationality means that investors make correct decisions based on the information that is available and take use of opportunities for arbitrating. Therefore, efficient markets can also be described as rational markets. Taking actions of such when possible, force the markets to be efficient. (Malkiel 2003)

Fama (1970) introduced three degrees of efficiency: *weak-form efficiency*, *semi strong-form efficiency* and *strong-form efficiency*. These three forms of market efficiency are introduced below:

Weak-form efficiency

In such form, the prices of stocks reflect all the news that is out at the market and has been published in the past. According to this form, all this news is already priced in stocks and therefore strategies that are based on historical data, such as technical analysis, are inefficient and they do not lead to market beating returns. This form how ever does not suggest the prices to be at the equilibrium all the time, but rather that no strategy is able to *constantly* provide excess returns.

Semi strong-form efficiency

Semi strong form is the rate of efficiency according to which stock prices reflects all of the above-mentioned characters, but also all publicly available news about individual stocks and the underlying companies. Thus, analyzing stocks based on the underlying company's balance sheet, income statement or future dividends does not contribute to excess returns.

Strong-form efficiency

The strongest form of efficiency consists of not only the afore mentioned forms, but also the knowledge of insiders. It is important to point out that it is a rather theoretical form, because insider information should not be available to the markets. Malkamäki and Martikainen (1989) suggests interpreting the strongest form with the idea that the lower the level of insider information, the stronger the strongest form of efficiency is. In other words, for the markets to be the most efficient, the amount of insider information should be rather minimal.

4 Value strategies

Stocks can be divided into two separate groups based on their economical characters. Value stocks are priced with low multiples with respect to their balance sheet and/or annual earnings. On the contrary, growth stocks have high multiples, which are justified with higher growth rates. Strategies that are based on value stocks are known as value investing and strategies on which growth stocks are dominant as growth investing strategies.

In value investing, low multiples may be the likes of P/E, EV/EBITDA, P/B, P/CF, P/D and EV/S. These fundamental measures are among the ones used to find stocks that are cheap relative to their value. Already as early as 1934 Graham and Dodd realized that investors are often over confident when relying on future growth rates of companies and thus justify high multiples when valuating stocks. In such cases investors tend to buy stocks that prove out to be overpriced. The low multiples used in this paper are introduced as we proceed.

The financial world is yet to be unanimous about what is behind the differences in prices of value and growth stocks. According to Lakonishok, Shleifer and Vishny (1994) the difference is stemming from the markets tendency to undervalue companies that have been less successful lately. Even though the risk related to the pricing of these stocks is lower (since they are cheap) investors are not willing to invest in them. Lakonishok et al. (1994) have also shown that institutional investors have a tendency to prefer growth stocks. They believe that these choices are not only easier to defend to their investors and clients, but also that they must be in these stocks when everyone is speaking about them.

It is easy to relate to this habit, psychologically it is rather easy to believe in a lately successful company that’s price has moved up, if the alternative is a stock that has been on its way down and has deteriorating earnings.

De long, Shleifer, Summers and Waldmann (1990) bring up an interesting note - according to them the majority of investors do not have a long enough investment horizon in order to take use of the returns of value based strategies and therefore they are forced to invest in growth companies that are more likely to earn higher returns in the near term (in their opinion).

Time horizon is an interesting character in investing and this is one of the main influencers in this paper. The author's aim is to endorse long-term strategies and suggest that persistence is a key element in earning excess returns.

4.1 Previous studies of strategies based on multiples

In addition to research on the efficient market hypothesis, the relationship of future returns and stock multiples has been a subject of many studies such as Basu (1977), Blume (1980), Rozeff (1984) and Litzenberger and Ramaswamy (1982). Like often, studies of such strategies are divided and it is yet to be shown that these strategies constantly outperform in every market and environment. However, a significant portion of these studies show that on different time periods and markets it is possible to create excess returns by applying value investing strategies. The research started by applying basic valuation multiples and got more sophisticated once researchers begun to apply composite multiples consisting of two or more multiples as well as momentum as a selection criteria. Momentum is not considered in this study as it is more suitable for shorter holding periods and tends to fade away as time passes while this study aims to maximize the holding periods of individual stocks.

4.1.1 P/B multiple

Lev and Thiagarajan (1993) studied the predictive power of stock multiples on future returns and concluded that they add approximately 70 percent to the explanatory power. One of the most used and studied multiple of value investing is probably the price/book ratio. Stattman (1980) showed that a positive correlation is present between low P/B stocks and future returns. Rosenberg, Reid and Lanstein(1985) conclude the same findings only a few years later. Both studies were concluded on the US stock market. On a study including many more international markets, Capaul et al. (1993) report that between 1981-1992 companies with a low P/B earned excess returns in every market. The excess returns varied from 1 to 3,4 percent (p.a.), with the highest being on the Japanese market. Fama and French (1992) have also reported the relationship between low P/B ratio and excess returns. They emphasize the risk related to these companies, like so many other researchers. On the contrary, Bird and Casavecchia (2007) note that value portfolios are less risky.

Fama and French (1992) emphasize the risk and argue that when stocks have a low P/B ratio they often are distressed companies which are highly leveraged and have an elevated risk of bankruptcy. Since the companies behind the stocks in this study have a long history of growing dividends (profits) it may be expected that these stocks are less risky, meaning they are not over leveraged nor have an elevated risk of bankruptcy. Finance theory determines risk as volatility. The volatility of these portfolios will be presented in the results section which will provide information of the riskiness of these portfolios.

Another study contributing to the power of long investment periods is Trecartin (2001). He found that the P/B ratio has a significant and positive correlation with only just above 40% of monthly returns. However, on his study on the US market between 1936 and 1997, he found a statistically significant and positive correlation with cheap stocks (based on low P/B) and their 10-year returns.

4.1.2 P/E multiple

Probably due to its simplicity, the P/E multiple is also widely studied among researchers. One of the first studies that reported the positive relationship of low P/E stocks and excess returns is Nicholson (1968). He studied the returns of big companies after dividing them into quantiles with the P/E multiple. In this study between years 1937 and 1962 he showed that companies with low multiples earned greater returns than companies with high P/E multiples. Basu (1977) also sorted stocks with their P/E multiples and proved that stocks with lower multiples earn higher returns than stocks with high multiples. He also stated that the returns were higher than what the CAPM would imply and therefore he went on to question the efficiency of the market.

Cook and Rozeff (1984) studied the monthly returns of stocks listed on the NYSE exchange and found that the P/E-anomaly existed also between 1964 and 1981. An interesting finding was also the fact that a great deal of the excess returns was made on

January.

Bauman, Conover and Miller (1998) included a broad set of markets when studying the P/E-anomaly. On their study from 1986 to 1996 they included companies from 20 developed countries and combined all stocks to four portfolios based on their P/E ratio. Their results suggested that the average return was greater as the average P/E ratio decreased.

Anderson and Brooks (2006) laid criticism on previous studies and stated that not only the earnings of the previous year should be included when calculating the P/E-ratio of a company, but also other previous years should be included. In their study, they included up to eight years of earnings and researched whether it was possible to increase returns by adding years. Their study was concluded on the London stock exchange between years 1975-2003. They again found that the companies with the lowest P/E ratio earned the greatest return, but also that it was not dependent on the amount of years used to calculate the earnings. However, the greatest return was achieved for the portfolio with the lowest P/E ratio and when the E component was based on the average of eight years.

The P/E anomaly has been studied also on the most recent decade. Athanassakos (2011) found on his study with data between years 1985 – 2006 and on the AMEX, NASDAQ and NYSE that companies with low P/E multiples produce greater returns on average on each of the stock exchanges.

4.1.3 P/CF multiple

Lakonishok et al. (1994) showed that stocks with a low P/CF earn even greater returns than stocks with low P/E and P/B multiples. Chan et al. (1993) also reported greater returns on Japanese markets for stocks with low P/CF, even after adjusting for risk. Fama and French (1996) prove the existence of this relationship; they show that stocks with low P/CF outperform stocks with high P/CF.

It is important to note that the E (earnings) in the P/E multiple is rather dependent of accounting measures like depreciations, amortizations and other items that can be affected by management. The actual cash flow (CF) captures the amount that is distributable to shareholders after deducting operational costs and investments. Therefore, it is logical to believe that it does prove out to be an even better value measure than the P/E multiple and has a higher positive relationship with excess returns.

4.1.5 P/D multiple

The excess returns gained from the use of the price/dividend multiple are highly linked to the previous studies introduced. These studies have shown that a sustaining and growing dividend is linked to greater returns. Blume (1980), Rozeff (1984) and Litzenberger and Ramaswamy (1982) suggest the same positive relationship with stocks that have a low P/D multiple and excess returns.

Also, the more recent studies support the findings of previous studies. Filbeck and Visscher (1997) found that on a study conducted on the Canadian stock market between 1987 to 1997 the top 10 stocks ranked on their dividend yield out of the Toronto 35 Index beat the benchmark index and the difference was even greater when adjusted for risk.

Brzeszczynski, Archibald, Gajdka, Brzeszczynska (2008) showed that their results were statistically significant when they tested a dividend yield strategy on the British stock market with data from 1994 to 2007. Their study also highlighted the importance of the holding period – with their dividend yield strategy the portfolios profitability grew as the investment period grew.

4.1.6 EV/EBITDA

The EV (enterprise value) is a common key figure used in M&A transactions to determine the value of a target company. To put it simple, it’s a sum of the company’s equity and net debt (debt after considering available cash and investments) (DePamphilis, 2014).

EBITDA (*Earnings Before Interests Taxes depreciation and Amortization*) is a key figure that can be found on a company’s balance sheet. Loughran and Wellman (2011) found strong evidence that EV/EBITDA multiple has a strong correlation with future returns in their study conducted on US stock markets between 1963 and 2009. According to their study, the cheapest stocks ranked by EV/EBITDA returned more than an annualized five percent premium when stocks from NYSE, NASDAQ and AMEX were studied. Gray and Vogel (2012) add that based on their sample on the same markets throughout the period of 1971-2010 EBITDA/EV (inverse of EV/EBITDA) again returned the best returns and therefore was the best single valuation metric for an investment strategy.

4.1.7 S/EV

S/EV is a multiple which notes the company's sales relative to its enterprise value. On a study that examined the period 1971 to 2013 Pätäri, Karell, Luukka, and Yeomans (2015) studied the performance of US based stocks and especially the returns of the S/EV multiple. The most significant founding of their paper for this study was that the single best selection criterion for the largest 40% of companies was S/EV (the inverse of EV/Sales). This should be kept in mind further on, as the dividend aristocrats tend to have a large market cap relative to the market.

An important note be made is the fact that out of all the multiples, EV/S is the least affected by accounting measures since sales are at the most top on a company's income statement. Whether this implies greater returns than gained with other multiples is to be seen.

4.2 The effect of holding periods on stock returns

All though value strategies are highly studied, the effect of holding period is a rather new character of these studies and is only gaining interest among researchers. An important finding from this papers perspective is the persistence of value. Leivo and Pätäri (2009) found that the holding period could be extended as far as five years without a decrease in returns. Bird and Whitaker (2003) studied holding periods from one to 48 months and found that the use of value multiples added value up to a three-year holding period. Rousseau and van Rensburg (2003) add to this finding with their study that proves the increase in returns when holding periods are extended beyond 12 months.

In this paper the author aims to increase the returns of each portfolio by minimizing the turnover of each portfolio. Minimizing the turnover results in maximal holding periods of each individual stock, which has been linked to greater returns in previous studies. Bennyhoff (2009) found that average returns per annum increased when the length of the holding period increased. This study was made on data for US stocks from 1926 to 2007 and showed that the standard deviation of stock returns declined as the holding period increased. A study by Kritzman and Rich (1998) supports Bennyhoff's (2009) study. Kritzman and Rich (1998) also found that the standard deviation declines as the length of the holding period increases.

Increasing trading activity has been linked to decreasing returns, as well. Chordia et al. (2000) showed strong evidence that average returns are influenced by the level of trading activity. They found that a one standard deviation decrease in the variability of dollar volume traded results to a 1,5 percent to 2 percent greater returns annually.

These studies presented above support the idea of maximizing holding periods and minimizing the trading activity of each portfolio in order to gain higher returns.

5 Theoretical framework

In the theoretical framework part the author gives the reader an insight of the theory behind the following study and presents the performance ratios used in this thesis.

5.1 Capital Asset Pricing Model

Capital Asset Pricing Model (later CAPM) is a model for calculating a portfolio's (or individual stock's) expected returns that was introduced by Sharpe (1964), Lintner (1965) and Moss (1966). The model is based on the modern portfolio theory by Markowitz (1952), according to which the market has risks that can be divided to systematic and unsystematic risks. The unsystematic risks are related to the underlying companies, e.g. the risk of a company going bankrupt. Systematic risks, on the other hand, are based on the characters of the economy that have an influence towards the market. Such risks are inflation and the level on interest rates, to mention a few. Based on the theory, unsystematic risk can be avoided by diversification. Buying stocks with low or negative correlations diversifies a portfolio. However, investors are always left with systematic risks, which cannot be avoided. According to CAPM, a security's expected return constitutes of the risk-free rate, the market return and the beta coefficient, which represents the security's systematic risk (Elton, Gruber, Brown and Goetzmann, 2003). The common model is the following:

$$E(R_i) = R_f + \beta_i[E(R_m)-R_f]. \qquad (4)$$

In equation (4) $E(R_i)$ is the expected rate of return, R_f is the risk-free rate, $E(R_m)$ is the expected return of the market and βi is the security's beta coefficient. The rate of return from a government bond is commonly known as the risk-free rate, because they are widely considered as risk-free. A market portfolio is commonly considered equivalent to the market. The market risk premium comes from deducting the risk-free rate from the market portfolio's return. An important aspect to consider is the fact that the expected return is highly influenced by the beta coefficient. A greater beta induces also a greater expected return.

The risk premium (beta) is calculated with the following equation (Bodie et al, 2009):

$$\beta_i = \frac{COV\ (R_i, R_m\ )}{VAR\ (R_m)} \tag{5}$$

From equation (5) we can see that the beta of a stock stems from the underlying's covariance with the market portfolio and the market portfolios variance. For a single security, the beta is a multiple that reflects its price change in relation to the market. Thus, the beta of a market portfolio is one. A beta of lower than one indicates that the stock (or portfolio of stocks) price changes less than the equivalent of the market. In turn, a greater than one indicates that the stock's price is higher than that of the market. The aforementioned stocks are often called defensive (Vaihekoski 2004, 204).

The Capital Market Line has been introduced to picture a so-called efficient portfolio as suggested by CAPM. From the line, it is possible to see where an efficient market portfolio is when accounting for their risk and return relation. The line is pictured below (Figure 1) by using expected return (E_r) on x-axis and standard deviation on y-axis:

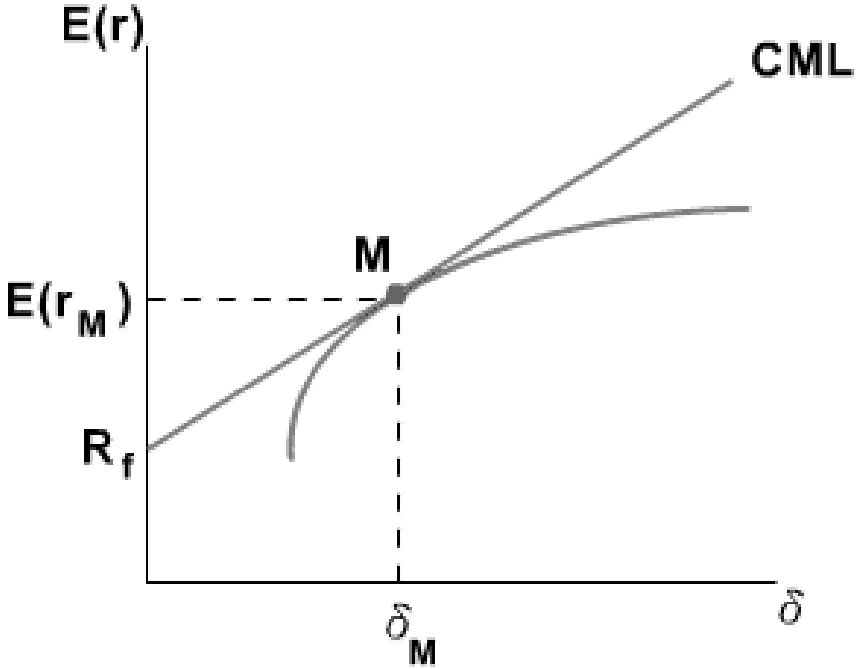


Figure 1. The Capital Market Line (Bodie et al. 2009)

The Security Market Line is in figure 2, which is the result of the link between the expected return of a stock (portfolio) and its beta, as by Bodie et al. (2009, 302):

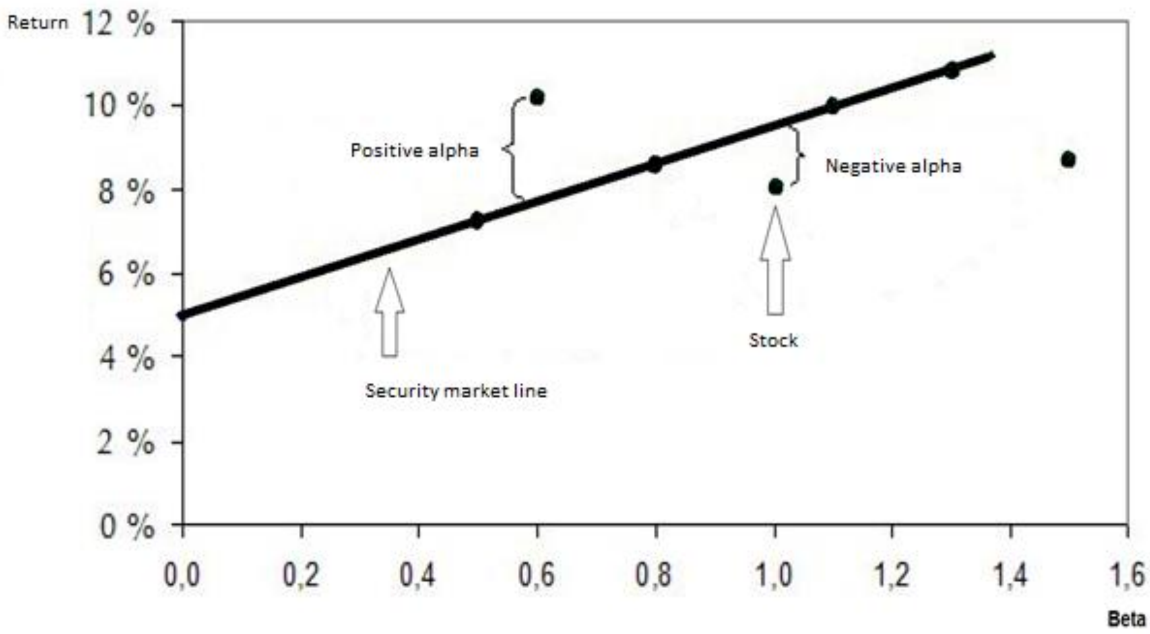


Figure 2. Security Market Line (Vaihekoski 2004)

From figure 2 we can see that securities with higher beta also have a higher expected return. The line shows the securities balance spot suggested by CAPM. (Brealey and Meyers 2003, 195)

5.1 Evidence of CAPM

In their research, Fama and French (1993 and 1996) studied the reasons for value premiums in stock returns and they aimed to explain it with a higher beta, i.e. a higher risk. Their studied focused on US stock markets and they concluded that the correlation with value premium and the beta was not significant. However, in their 2006 study, Fama and French concluded that between 1963-2004 value stocks tended to have a higher beta, and thus value premium was as the theory suggests.

Chen and Zhang (1998) concluded that the value premium is only a reflection of higher risks. According to them, value premium is due to the fact that the companies behind these stocks are often in financial problems, or at least possess a greater risk for them to occur. Thus, they propose that their lower prices are justifiable with these risks.

However, many international studies from different markets have proved value strategies to outperformance on different time frames and data sets (Fama and French 1998).

5.2 Jensen’s alpha

Jensen’s alpha was presented by Michael Jensen (1967) in his study on mutual funds between 1945 – 1964. In his study about fund manager’s ability to forecast future returns he found that fund managers were not able to beat a buy and hold -strategy.

Jensen’s alpha measures the excess return of a stock in relation to its theoretical return. Jensen’s alpha is based on CAPM, which is basis for the theoretical return. In short and according to CAPM, Jensen’s alpha should equal to zero and thus no excess returns should exist. Jensen’s alpha can be derived from CAPM and is as follows:

$$\alpha_J = R_i - [R_f + \beta_i * (R_m - R_f)] \qquad (6)$$

In the equation α_J is the excess return, R_i is the portfolio return, R_f is the risk-free rate, β_i is the portfolios beta and R_m is the market return (benchmark). A positive and statistically significant Jensen’s alpha implies that the portfolio has generated excess returns.

5.3 Sharpe Ratio

Sharpe ratio is a measure of risk adjusted performance and was developed by Sharpe (1966). It is commonly used to measure portfolio performance and is thus also a good fit in this thesis. Sharpe ratio measures the excess returns of a portfolio in relation to the risk (standard deviation) the portfolio has carried. Sharpe ratio may be used to rank portfolios and the higher the ratio of a portfolio the better it is.

The Sharpe ratio as Sharpe (1966) presented is presented in equation 7:

$$Sharpe\ ratio = \frac{\mathrm{Ri-Rf}}{\sigma \mathrm{i}} \qquad (7)$$

In the formula, R_i is the portfolio's return, R_f is the risk-free rate and σi is the standard deviation of portfolio $_i$.

6 Data and Methodology

This section describes the data used to construct the examined portfolios as well as gives the reader an insight how the common biases of finance research are avoided.

6.1 Description of data and the data period

The data consists of stocks listed on the US stock market and included on the S&P 500 index. The stock universe is limited to Dividend Aristocrats. The amount of Dividend Aristocrats varies as on some years more stocks qualify as Dividend Aristocrats and at times less companies qualify. However, the benchmark consists of all the stocks on S&P 500 index and it represents the market return. As the stocks in all the portfolios are part of the S&P 500 index it is the best fit for the benchmark. The database used to gather the required data in order to construct this paper is downloaded from Thomson Reuters Datastream. Total return series are used to capture the effect of possible corporate actions such as dividends, spin offs and stock issuances. This also means that all dividends are reinvested as they are received. The risk-free rate in this study is the US 30-year treasury and it is from Bloomberg. Often fiscal companies are excluded from the data on financial studies, but this is not the case in this paper. The fiscal companies are not excluded due to the small amount of Dividend Aristocrats, which would thus limit the possible stock universe to an even smaller amount of companies. Also, the author does not see the fiscal companies as an issue since the key interest is to examine the equity returns of companies that have grown their cash dividend for at least 25 years.

The dataset starts from first of May 1991 and ends to 27th of April 2016. Due to the lack of data on some key financial metrics each portfolio does not have the same stock universe each year. If a ratio for a specific company cannot be calculated due to missing data, this stock has been excluded from the portfolio formation.

Prior to the portfolio formation, the possible universe for each criterion was formed and all stocks that held a Dividend Aristocrat -title and for which the data was available were included. The ratio used in the formation of the portfolio was calculated for each individual stock, after which ten of the “cheapest” (lowest multiple or highest dividend yield for the DY portfolio) companies were included in the starting portfolio of year 1991. Although it may be argued that ten stocks are not a meaningful diversification, the author does not see the case to be valid for Dividend Aristocrats. It is important for the reader to understand that the companies included in the universe are huge global brands and companies with sales all around the worlds. Often these companies also have not just one product, but many products which they sell globally. Their brand and widespread sales and wide product categories provide a wide diversification within the companies. In addition, these Dividend Aristocrats are commonly the biggest players in their sector and only the best companies from each sector may earn the Dividend Aristocrats title. Thus, the companies represent a wide scope of industries which brings industry diversification to the portfolios and reduces risks. This also reduces the weight of any specific industry in the portfolios.

A stock has been dropped from the portfolio after a year that it did not manage to increase its dividend. A full year is the key here, since Dividend Aristocrats commonly distribute dividends quarterly and the dividend raise may come on any quarter during the year. A new stock, when needed, is always added on the 1st of May of each year. If zero stocks were dropped from the portfolio the formation stays the same event past one year. To clarify, it should be said that if all the stocks in the portfolio can hold their Dividend Aristocrat title for several years, no trading in the portfolio is done during this time. Also, if a company that is selected in the portfolio at t_0 (1st of May 1991) maintains its Dividend Aristocrats title throughout the 25-year period it will then stay in the portfolio throughout the whole examined period. This then lowers the turnover of the portfolio.

After the portfolios for the whole examined period are formed, the returns of each portfolio is calculated and then compared to the benchmark index returns. The data consists of weekly observations of which annual returns are calculated to make a comparison of each portfolio for the whole period.

A fictional portfolio is formed by assuming that 100 000 is invested in each stock in the start and thus the whole portfolio is valued at 1 000 000 as of 1st of May 1991. The end values of the amount invested (total value of each portfolio 1 million at t_0) are calculated from the returns of each portfolio to mirror the returns. The annual returns have been calculated from each portfolio's end value using the compounded annual growth rate formula. Therefore, the annual returns presented are comparable to returns of other investing strategies and gained results from long-term investment portfolios.

The dataset is also divided into two halves of the whole studied period. This is done in order to get a deeper look into the returns and the standard deviations. Braking down the data into two makes it possible to analyze the returns for the second half and to see whether the annualized returns drop significantly. It also allows more testing for the null hypothesis regarding CAPM and whether the alpha equals zero, as it is according to the theory.

6.2 Robustness and validity

The validity of a study is evaluated based on how well do the methods of the research measure the phenomena under examination. As stated, the data of this study is from Thomson Reuters Datastream, thus it natural to believe in its validity. Indeed, the nature of the data brings up some risks that need to be considered. The fact the large amount of numeric data are handled manually might lead to mistakes. Therefore, the author has conducted the study with extreme carefulness and continuously aimed to ensure nothing is left out or no mistakes are made. Also, the data can be found from the same database and therefore the author believes it is possible to conduct the same research again and end up with the same results.

Taxes and transaction costs are not accounted for in this paper. However, due to nature of the research, the author believes that their influence on the results is rather minimal. The only transaction costs stemming from constructing an equivalent portfolio are the initial costs of purchasing the stocks in each portfolio and the possible transactions (sell one and buy another) when a company loses its Dividend Aristocrat title. Another time they would affect returns is if the portfolio is liquidated at the end of the studied period or if a stock is delisted. The tax-affect would be a consequence of such delisting and would affect the reallocation of such funds. Later, table 1 presents the amount of stocks in each portfolio during the research period, which helps to picture the amount of transaction costs. As the table shows, the turnover in each portfolio is fairly low when considering the length of the period.

6.3 Common biases

When conducting research on historical data, one of the most important things to consider is avoiding any biases. Using knowledge that no investor would have had at the time of portfolio formation, but used when constructing the research might result in totally different results.

Removing data of companies that are acquired, delisted or have gone bankrupt is known as survival bias. Companies that go bankrupt often produce weaker than average returns and thus excluding them from the sample may prove to produce higher returns than what would have been earned. Therefore, in this paper and in case of such events, it is assumed that the funds from events of delisting or acquiring are reinvested or in case of a bankruptcy any funds involved are lost.

Look-ahead bias refers to using information that would have not been available during the time decisions were made. Commonly, such a bias would be a situation where a stock is taken into a portfolio at the very beginning of the year, but based on accounting data of the prior year. Because accounting data is usually published around February and March the selection period should be moved closer to the summer months. To mitigate this aforementioned risk, the author has used 1st of May as the selection date.

6.4 Linear regression

The linear regressions of this paper are based on CAPM. The essentiality of the results lies in examining the relative performance of the created portfolios in relation to their benchmark, the S&P 500 index. In order to examine the over or under performance of the portfolios the intercept of the regression slopes is of high importance. Based on the CAPM model the intercept (α) should not statistically significantly differ from zero.

Derived from Jensen’s alpha (equation 6) we have the regression model in equation 8:

$$R_i - R_f = \alpha_j + \beta_i * (R_m - R_f) + \varepsilon_i \quad (8)$$

where the only addition (compared to equation 6) is the error term ε_i, which is expected to equal zero.

Based on this model (equation 8) we can formulate the main hypotheses of this study:

$H_0: \alpha = 0$

$H_1: \alpha \neq 0$

If the null hypothesis fails to be rejected, we can state that the markets are efficient and thus no abnormal returns have been produced. On the other hand, if the null hypothesis is rejected it shows that abnormal returns have been produced with the portfolio(s) under examination.

Some limitations are characteristic for regression analysis and they should be noted. In order to examine the causality of variables they should have a linear connection. If this precondition does not exist, the result will be that the independent variables do not have a statistically significant connection to the dependent variable. Also, significant preconditions related to the error term are that the error terms must be homoscedastic, normally distributed and its expected value should be zero. Homoscedasticity refers to the error terms variance being constant, in other words that the variables do not affect it. (KvantiMOT, 2003)

7 Results

Section 7 presents the descriptives of the data and the returns for each portfolio during the whole period examined. Also, the returns for each portfolio are linked to previous research on their success. The descriptives of data for the subperiods can be found as appendices.

7.1 Descriptives

Table 1 shows the number of shares held in each portfolio throughout the whole 25-year investment period.

Table 1. Number of shares in portoflio during the investment period per formation criteria

Portfolio	Number of shares
P/E	23
P/B	26
DY	33
EV/Sales	21
EV/EBITDA	24
P/CF	22

The number of stocks in a portfolio varies between 21 and 33 stocks. The biggest rotation is in the dividend yield portfolio whereas the smallest rotation is in the EV/sales portfolio. The greatest amount of rotation in the DY portfolio occurs on the spring of 2010 which is after year 2009. 2009 is the year that is considered to be the time when the global financial crisis escalated. Four companies failed to increase their dividend on year 2009 and thus they were dropped out of the portfolio. P/E and EV/EBITDA portfolios include five stocks that stayed in the portfolio throughout the whole studied 25 years.

Table 2. Descriptives of portfolio returns per formation criteria (1991 to 2016)

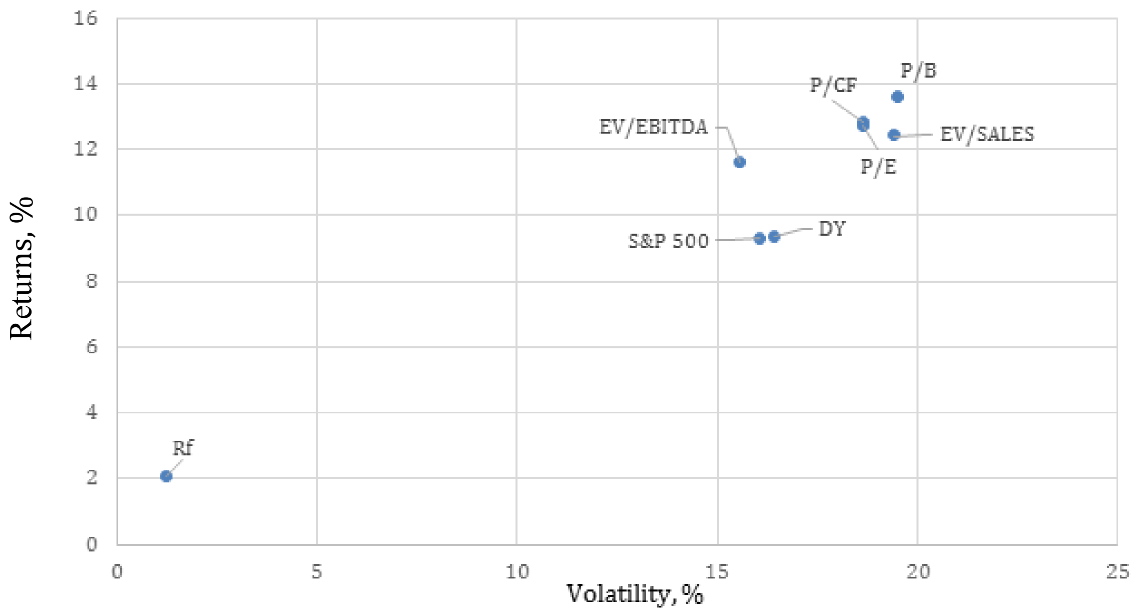
Portfolio	Annualized returns, (%)	Annualized std. dev., (%)	Sharpe ratio	Skew	Kurtosis	N
P/E	12,74	18,63	0,57	-0,1757	2,5895	1304
P/B	13,60	19,51	0,63	-0,1218	2,6990	1304
P/CF	12,85	18,63	0,58	-0,0937	2,0719	1304
EV/SALES	12,46	19,44	0,54	-0,1139	2,2498	1304
EV/EBITDA	11,62	15,58	0,61	-0,4264	3,0268	1304
DY	9,34	16,41	0,44	-0,1115	3,0692	1304
S&P 500	9,29	16,05	0,45	-0,4380	4,1499	1304

Table 2 shows that the highest returns for the whole period were gained from the P/B portfolio with a 13,60 percent annual return. All the formed portfolios provided greater returns than their benchmark portfolio which had an annual return of 9,29 percent. The worst performing portfolio was the DY portfolio with only a slightly above the benchmark portfolio return at 9,34 percent. Also, the P/B portfolio had the highest Sharpe ratio (0,63), which means that the higher risk it carried (highest standard deviation) was rewarded with higher returns.

The volatility of each portfolio measured with their standard deviation was above the benchmark, except for the EV/EBITDA portfolio. The highest volatility occurred in the P/B portfolio at 19,51 percent, which also produced the greatest returns.

The skewness, which shows the distribution of the returns on the normal distribution implies that the greater mass of the returns is on the right side of the normal distribution for every portfolio. The kurtosis is highest on the DY portfolio, which implies that a greater deal of the returns has been within a small variation on the normal distribution. This is in line with the portfolios performance, which was just slightly above the benchmark. Each portfolio has 1304 weekly observations.

Graph 1. shows the annual returns and volatility on a scatter plot



Graph 1. Return and volatility scatter plot for the whole examined period

7.1.1 Descriptives for the subperiods

During the first half, the P/B portfolio earned the highest return with a 16,50 percent annualized return. The worst performer, although above the index, was the EV/EBITDA portfolio with an annualized return of 11,56 percent. The EV/EBITDA portfolios return is though above that of the index, which earned only a 10,55 percent annualized return. Also, the standard deviation of the EV/EBITDA portfolio was below the equivalent of the S&P 500 at 15,05 percent. The standard deviation of the S&P 500 was 16,03 percent and all the other formed portfolios had standard deviations above this level.

The Sharpe ratios of the first half show that although the P/B portfolio produced the highest annualized returns, just above the P/E portfolio, the return of the P/E portfolio came with significantly lower risk and thus had a higher Sharpe ratio.

During the second half, the single best performance was the 11,46 percent annual return of the EV/EBITDA portfolio. The P/B portfolio returned 10,53 percent annually which helped to keep it on track to be the best performing single portfolio. All portfolios except the DY portfolio returned a greater return than the S&P 500 index during the this subperiod. The detailed descriptives may be seen in tables 3 and 4 below.

On the second half the P/B portfolio had the highest Sharpe ratio, as the returns did not drop as significantly (compared to the first half) and the risk was not too high when compared to the other portfolios. In other words, the higher risk (standard deviation) was worth it as it was rewarded with higher returns.

Table 3. Descriptives for the first half

Portfolio	Annualized returns, (%)	Annualized std. dev., (%)	Sharpe ratio	Skew	Kurtosis	N
P/E	16,47	18,41	0,81	0,0467	1,3950	652
P/B	16,50	20,42	0,73	0,1115	1,4011	652
P/CF	16,09	19,10	0,76	0,0404	1,4570	652
EV/SALES	15,45	19,90	0,70	0,0226	1,5755	652
EV/EBITDA	11,56	15,05	0,67	-0,1045	1,2893	652
DY	12,22	16,30	0,66	-0,1188	1,4794	652
S&P 500	10,55	16,03	0,56	0,0199	1,9689	652

Table 4. Descriptives for the second half

Portfolio	Annualized returns, (%)	Annualized std. dev., (%)	Sharpe ratio	Skew	Kurtosis	N
P/E	8,96	18,84	0,37	-0,3802	3,6640	652
P/B	10,53	18,56	0,46	-0,4439	4,4621	652
P/CF	9,48	18,15	0,41	-0,2603	2,7986	652
EV/SALES	9,34	18,96	0,39	-0,2776	3,0470	652
EV/EBITDA	11,46	16,09	0,59	-0,6888	4,3345	652
DY	6,46	16,52	0,27	-0,3297	4,5762	652
S&P 500	7,90	16,06	0,37	-0,8929	6,3131	652

7.2 The returns and previous studies

As all the formed portfolios beat the benchmark index on annualized returns, it may be said that they support the previous findings presented. Stocks that are cheap, based on low valuation multiples, can be linked to market beating returns also in this study. This holds also for Dividend Aristocrats that are commonly large multinational companies.

The performance of the P/B portfolio is in line with the studies introduced earlier (Lev and Thiagaran (1993), as well as Stattman (1980) and Fama and French (1992), to name a few). For the whole period, the P/B portfolio returned annually a 4,31 percent excess return in comparison to the S&P 500 index. This is even greater than the excess return of 1 to 3,4 percent that Capaul et al. (1993) showed in their research. Also, Trecartin (2001) found a positive correlation with low P/B stocks and their 10-year returns. The results of this research support also his findings.

Fama and French emphasized the elevated risk of low P/B, which is a result of high leverage and risk of bankruptcy. Thus, they argued that these stocks have a low P/B for a reason. It should be noted, once again, that the Dividend Aristocrats are global brands and have strong balance sheets. Thus, their riskiness and low P/B is probably due to other reasons than the ones suggested by Fama and French.

Athanassakos (2011) found that between 1985 and 2006 and on the US markets (AMEX, NASDAQ ad NYSE) low P/E companies produce greater returns on average on each of the exchanges. The results of this study support his findings. Also the findings of Bauman et. al (1998) and Anderson and Brooks (2006) get support from the excess returns provided by the P/E portfolio in this research.

The overperformance for the P/CF turned out as expected. However, the overperformance for the P/CF versus P/E portfolio was rather low. The expectations were higher for the P/CF portfolio when compared to the P/E portfolio since the actual cash flow (CF) captures the amount distributable to shareholders and can be less (than E component) affected by earnings management.

Previously introduced studies showed a positive correlation with sustaining and growing dividends and excess returns. Studies by Blume (1980), Rozeff (1984) and Litzenberger and Ramaswamy (1982) reported a positive relationship with low P/D multiple stocks and excess returns where as Brzeszczynski et al. (2008) highlighted the importance of the holding period. In their dividend yield strategy, the portfolios profitability grew as the investment period grew. This is opposite to the findings in this study, where the DY portfolios annualized returns encounter a significant drop on the second half of the examined period.

The returns for EV/EBITDA portfolio are in line with Loughran and Wellman's (2011) findings. According to their study on the US market (NYSE, NASDAQ and AMEX) between 1963 and 2009 the EV/EBITDA multiples has strong correlation with future returns and yet again cheap stocks outperform the more expensive ones (measured by EV/EBITDA). On the same markets between 1971-2010 Gray and Vogel (2012) found that EBITDA/EV was the best single metric in stock selection. Their finding is not line in with the results for the whole 25-year period examined. However, for the latter period and when the data is divided in two, the EV/EBITDA produced greater returns than any other portfolio. This is in line with Gray's and Vogel's findings.

Pätäri et al. (2015) found in their study on US stocks between 1971 and 2013 that the best selection criteria for the largest 40 % of stocks was the inverse of EV/Sales. Although the Dividend Aristocrats commonly are large companies and thus would fit the findings of Pätäri et al., in this study the EV/Sales portfolio did not live up to the expectations based on the previous study. Despite the market beating returns for the EV/Sales portfolio, the annualized returns were not specifically high on any of the periods examined. Also, for the second half the annualized returns dropped significantly and were below the S&P 500.

7.3 Cumulative returns

During the whole period examined (1991 to 2016) the formed portfolios beat their benchmark as can also be seen from figure 3. The best performing single portfolio was the P/B portfolio. The P/B portfolio gained a 2 324 percent return during the 25-year time period and the invested 1 000 000 € turned into 24 240 711 €. All the end values for each portfolio are presented in appendix 3.

The P/B portfolio was also the best performing single portfolio on both subperiods. During the first half P/CF and P/E portfolios managed to return quite in line with the P/B portfolio, but on the second half the significantly greater returns for the P/B portfolio widen the gap. Also on both subperiods all the formed portfolios beat the benchmark index, as can be seen from figures 4 and 5.

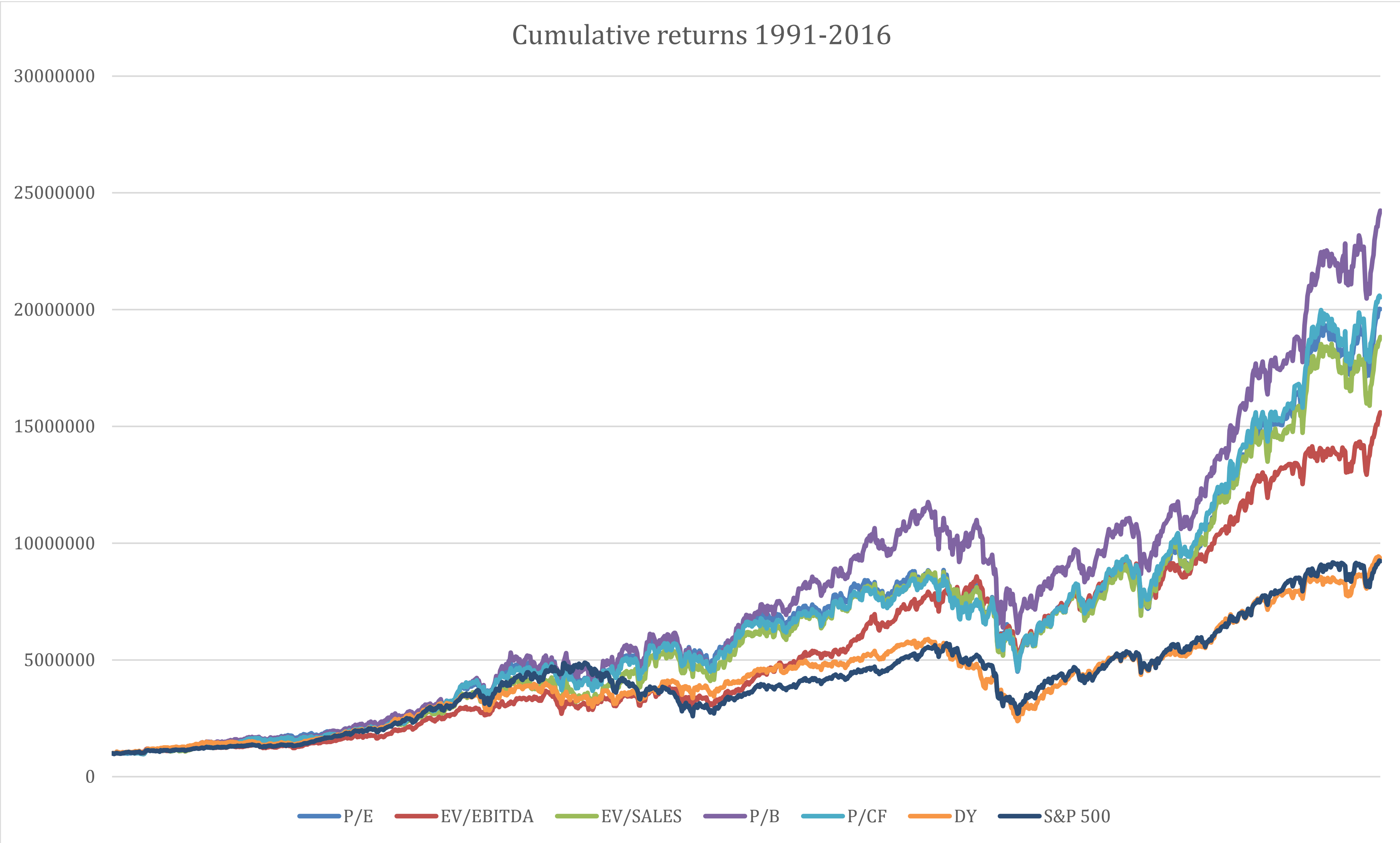


Figure 3. Returns for the whole period

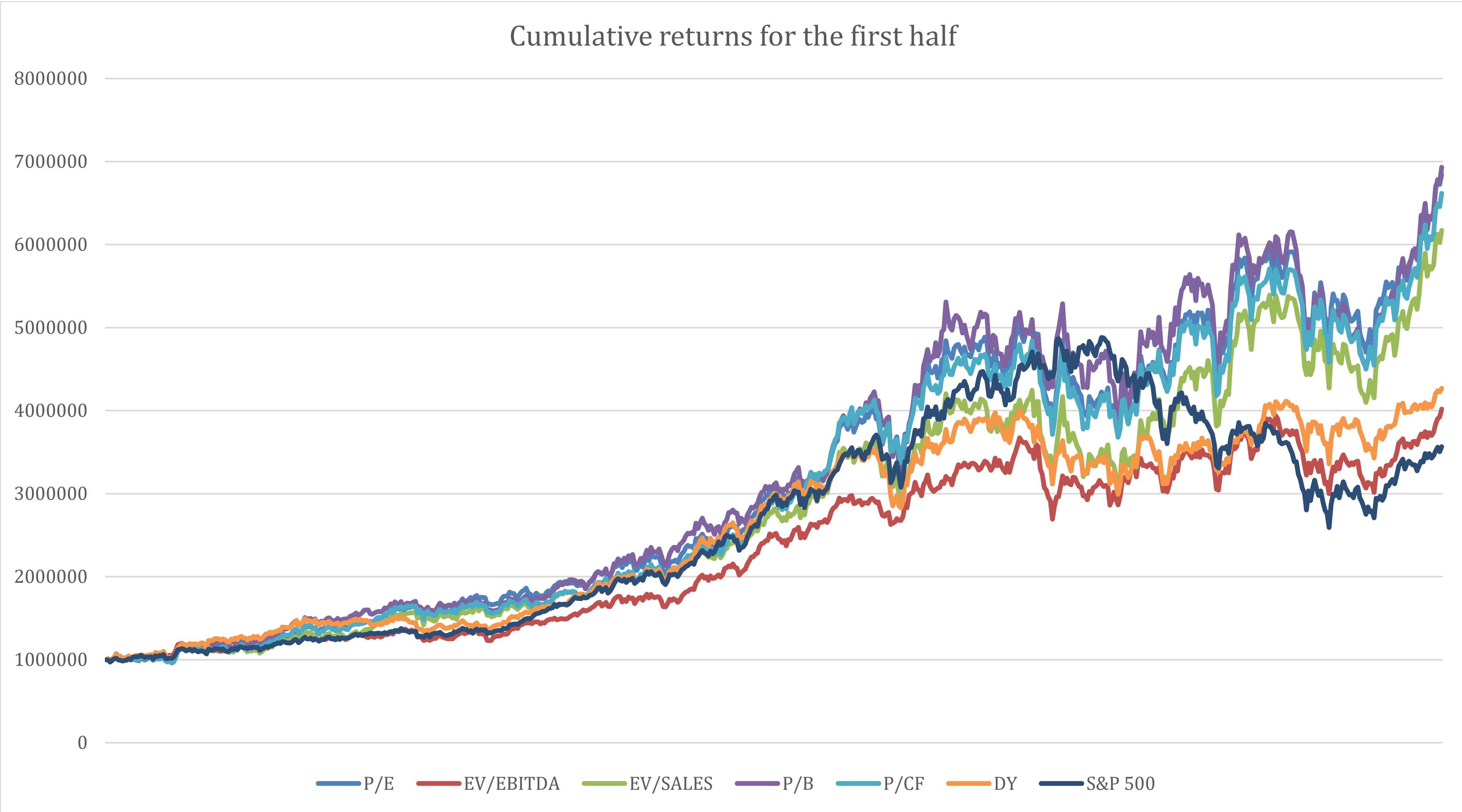


Figure 4. Returns for the first half

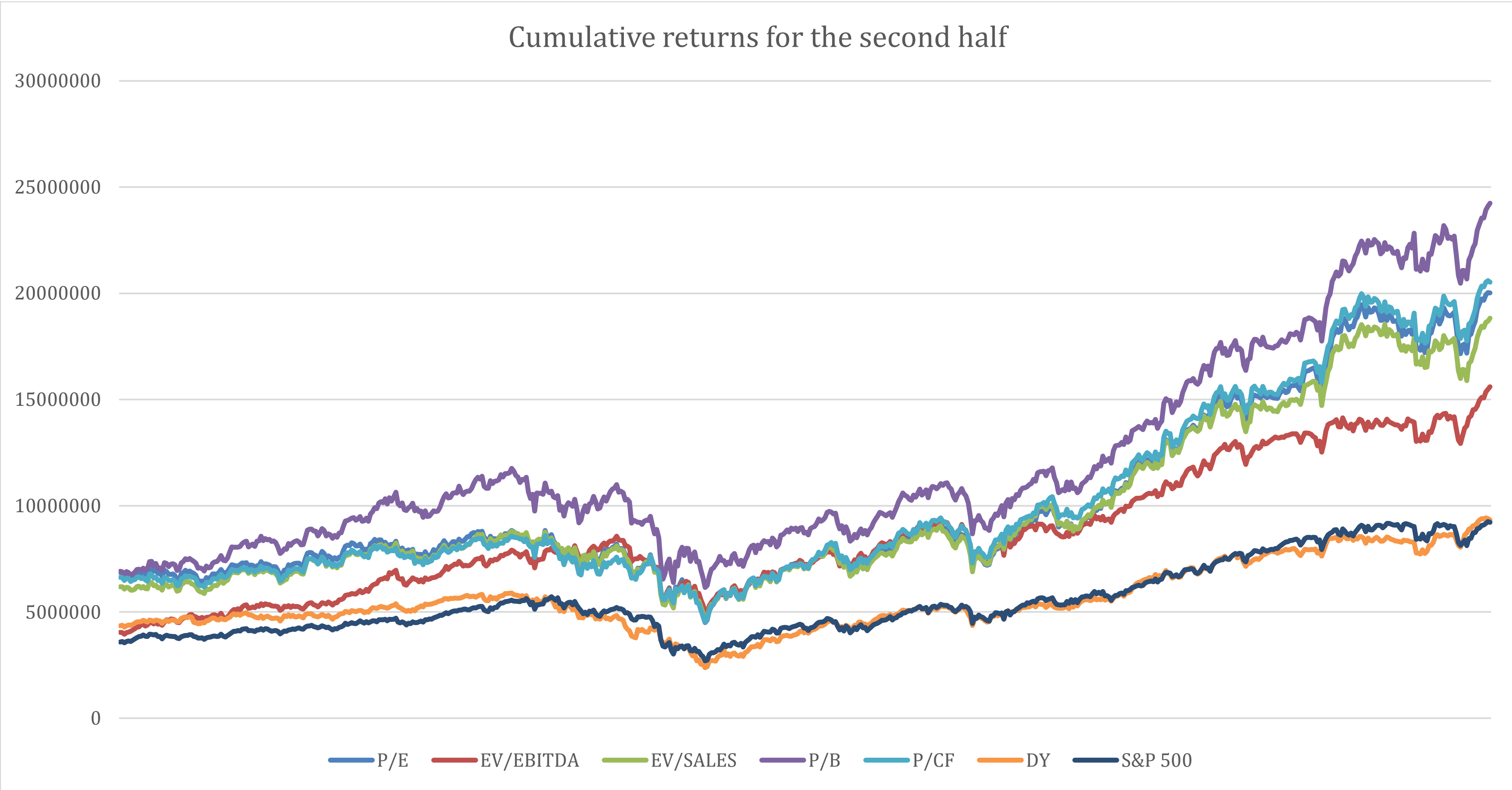


Figure 5. Returns for the second half

7.4 Regressions

The following subsections provides detailed results of the regressions. The results are presented separately for each portfolio formation criteria.

7.4.1 The whole sample period

The lowest F-value was in the EV/Sales portfolio (table 14) at 2189,97, which is high and shows the model has been a good fit for the data. The betas of each portfolio have been below one and thus the movements have been milder than the overall benchmark's movements and the portfolios can be described as defensive. The lowest beta 0,82 for the EV/EBITDA portfolio (table 17) shows that the portfolio has moved with a 0,82 multiple in relation to the market's movements. The presented adjusted R-square describes the percentage of the portfolios movement that is a result of the market's movement (S&P 500). The adjusted R-square takes the sample size into account.

Apart from the DY portfolio on the second half all the portfolios have positive alpha values (as can be seen from tables 5-21). The alpha varies between 0,0002 (DY portfolio, table 20) and 0,0008 (P/B portfolio and P/CF portfolio, tables 8 and 11). However only the P/B portfolios alpha is statistically significant at a five percent confidence level and for the other portfolios we can state that the markets has been efficient. The efficiency also proves the null hypothesis to not be rejected.

The results of the linear regressions for each portfolio are presented below. High F-values for each regression show that the model fit the data well. It also proves that the results are not a result of coincidence.

7.4.2 The subperiods

For the first half, the F-values for the models are significantly lower than on the whole sample period as well as for the second half. Despite the rather low values the data can be considered to fit the data well and the results should not be thought to be a result of coincidence.

On the first half, the alpha values vary from the highest at 0,0012 (P/E, P/B and P/CF portfolios on tables 6, 9 and 12) to the low of 0,0004 for the EV/EBITDA portfolio (table 18). The 0,0012 alpha is equivalent to a 6,4 percent annualized excess return, which can be considered significantly high. Despite the high alpha loadings, none of the values are statistically significant on a five percent confidence level. However, on a ten percent confidence level the P/B, P/E and P/CF portfolios generated statistically significant alpha (tables 6,9 and 12).

On the second half, the F-values are again rather high and the model seems as a good fit for the data. Also, the adjusted R-square values are clearly higher than on the first half as the returns drop - thus on the second half the shifts in the index account for a greater deal of the shifts in the formed portfolios.

The alpha values drop for the second half, which is in line with the drop in returns that is greater than the change in the beta values. The lowest alpha loading is on the DY portfolio which has a negative alpha on the second half. The overall weak performance (low annualized return) on the second half is reflected well in the negative alpha. On the contrary and on the second half the EV/EBITDA portfolio has a 0,0007 alpha (table 19) that is statistically significant on a 5 percent confidence level. The alpha value is equivalent to a 3,7 percent annualized excess return.

7.4.3 P/E portfolio results

Tables 5 to 7 present the results of the regressions for the P/E portfolio.

Table 5. Regression results for the P/E portfolio

P/E portfolio	Value	t-stat	Pr < ItI
F-value	2550,296		< 0,001
Adjusted R-square	0,662		
α	0,0007	1,778	0,076*
β	0,945	50,500	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

The P/E portfolio beta at 0,945 (table 5) shows that the portfolio has moved fairly in line with the market. When the market has gone up (down) 1 percent the P/E portfolio has gone up (down) at the same time 0,945 percent. The created alpha at 0,0007 represents a clear excess return compared to the market return. However, the alpha is not statistically significant on a five percent confidence level, but on a 10 percent level it can be considered statistically significant. The adjusted R-square is fairly high for the P/E portfolio and the results show that the market portfolio accounts for almost 70 percent of the movements in the P/E portfolio.

Table 6. Regression results for the P/E portfolio (first half)

P/E portfolio	Value	t-stat	Pr < ItI
F-value	888,992		< 0,001
Adjusted R-square	0,577		
α	0,00122	1,871	0,0617*
β	0,873	29,816	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

For the first half, the beta of the P/E portfolio (table 6) was clearly lower than for the whole examined period and the second half. Also, the alpha was low at only 0,0012, but it was statistically significant on a 10 percent confidence level.

Table 7. Regression results for the P/E portfolio (second half)

P/E portfolio	Value	t-stat	Pr < ItI
F-value	1951,138		< 0,001
Adjusted R-square	0,749		
α	0,0003	0,513	0,601
β	0,945	44,172	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

For the second half, the beta is significantly higher at 0,95 (table 7). The alpha is at 0,0003, but in this period, it is not statistically significant either and thus the null hypothesis is not rejected. The P/E portfolio did not manage to return statistically significant alpha on any of the tested periods.

7.4.4 P/B portfolio results

Tables 8-10 presents the results for the P/B portfolio which was the best performing single portfolio when compared by total return.

Table 8. Regression results for the P/B portfolio

P/B portfolio	Value	t-stat	Pr < ItI
F-value	2671,939		<0,001
Adjusted R-square	0,672		
α	0,0008	2,007	0,045**
β	0,997	51,690	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

Table 8 shows that the P/B portfolio has a high beta (0,997) and it is also the highest among the created portfolios. Also, the alpha is among the highest (in line with P/CF portfolio), but it is also statistically significant at a 5 percent confidence level, which is how it differs from the other portfolios. The statistical significance proves that the P/B portfolio has been able to create approximately a 4,5 percent excess return (annualized) and shows that the market is not always efficient and the null hypothesis can be rejected. According to the adjusted R-square, the market movements have accounted for 67 percent of the movements in the P/B portfolio.

Table 9. Regression results for the P/B portfolio (first half)

P/B portfolio	Value	t-stat	Pr < ItI
F-value	1050,666		<0,001
Adjusted R-square	0,617		
α	0,0012	1,706	0,088*
β	1,002	32,414	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

As table 9 shows, the beta of the P/B portfolio is slightly above that of the benchmark on the first half, but the generated alpha is fairly high at 0,0011. The alpha as an annualized percent accounts for almost a six percent excess return and is also statistically significant at a 10 percent confidence level.

Table 10. Regression results for the P/B portfolio (second half)

P/B portfolio	Value	t-stat	Pr < ItI
F-value	1836,471		<0,001
Adjusted R-square	0,738		
α	0,0006	1,070	0,285
β	0,992	42,854	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

7.4.5 P/CF portfolio results

Tables 11-13 presents the results for the P/CF portfolio.

Table 11. Regression results for the P/CF portfolio

P/CF portfolio	Value	t-stat	Pr < ItI
F-value	2355,733		<0,001
Adjusted R-square	0,644		
α	0,0008	1,808	0,071*
β	0,932	48,536	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

Table 11 shows that the adjusted R-square for the P/CF portfolio shows that approximately 65 percent of the portfolios movement can be explained with the benchmarks movement. The alpha is also high at an annual level just above 4 percent and can be considered statistically significant on a 10 percent confidence level. The beta of this portfolio is also just below one, which is line with the rather defensive character of the Dividend Aristocrat stocks.

Table 12. Regression results for the P/CF portfolio (first half)

P/CF portfolio	Value	t-stat	Pr < ItI
F-value	866,670		<0,001
Adjusted R-square	0,571		
α	0,0012	1,706	0,089*
β	0,901	29,439	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

For the first half, the P/CF portfolios beta is in line with the whole period. With a beta of 0,9 the portfolio has swung clearly less than the benchmark index (table 12). Also for the first period the generated alpha is clearly higher than for the two other periods. The 0,0012 alpha is an annualized excess return of 6,4 percent, which may be considered as significant. The alpha can be considered statistically significant at a 10 percent confidence level as the p-value stands at 0,089.

Table 13. Regression results for the P/CF portfolio (second half)

P/CF portfolio	Value	t-stat	Pr < ItI
F-value	1722,843		<0,001
Adjusted R-square	0,726		
α	0,0004	0,746	0,456
β	0,963	41,507	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

On the second half, the adjusted R-square is significantly higher for the P/CF portfolio and the movements in the benchmark account for almost 73 percent to that of the P/CF portfolio. The beta is only slightly below one and the portfolio has moved fairly in line with the market. Also, the alpha drops significantly to 0,0004, but is not statistically significant either on this period. (Table 13)

7.4.6 EV/Sales portfolio results

Tables 14-16 presents the regression results for the EV/Sales portfolio.

Table 14. Regression results for the EV/Sales portfolio

EV/Sales portfolio	Value	t-stat	Pr < ItI
F-value	2189,973		<0,001
Adjusted R-square	0,627		
α	0,0007	1,548	0,122
β	0,959	46,797	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

Table 14 shows that the EV/Sales portfolio had the lowest F-value (2189,973), but it may be considered rather high and thus does not lay a doubt on the validity of the results. The generated alpha is 0,0007, but it is far from statistically significant at a 5 percent confidence level and proves the market efficient once again. Also, the portfolios beta is in line with the other portfolios at approximately 0,96 which means the portfolio has moved fairly in line with the benchmark portfolio. The adjusted R-square shows that approximately 63 percent of the movement in this portfolio can be explained with the movements in the market portfolio.

Table 15. Regression results for the EV/Sales portfolio (first half)

EV/Sales portfolio	Value	t-stat	Pr < ItI
F-value	724,858		<0,001
Adjusted R-square	0,526		
α	0,001	1,454	0,146
β	0,902	26,923	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

In line with previous portfolios, for the EV/Sales portfolio the alpha generated on the first half is clearly higher than on the second half or the whole examined period. This is in line with the overall returns as they are higher on the first half. However, the alpha is not statistically significant either in this case. The adjusted R-square at 0,53 shows that the S&P 500 index explains only approximately half of the variation in the EV/Sales portfolio during the latter period. (Table 15)

Table 16. Regression results for the EV/Sales portfolio (second half)

EV/Sales portfolio	Value	t-stat	Pr < ItI
F-value	1868,662		<0,001
Adjusted R-square	0,742		
α	0,0003	0,631	0,122
β	1,012	43,228	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

From table 16 we can see that the F-value at 1868,7 shows that the model was a good fit also on the latter period for the EV/Sales portfolio as was the case for the whole period. Only for the first half the values are significantly lower, but not low enough to raise concerns about the fit of the model. Also for the EV/Sales portfolio the beta raises clearly for the latter period and the alpha drops to only 0,0003. In line with the previous results, the null hypothesis is yet again rejected and no statistically significant excess returns have been made.

7.4.7 EV/EBITDA portfolio results

Tables 17-19 presents the results for the EV/EBITDA portfolio which produced the lowest returns.

Table 17. Regression results for the EV/EBITDA portfolio

EV/EBITDA portfolio	Value	t-stat	Pr < ItI
F-value	3291,992		<0,001
Adjusted R-square	0,716		
α	0,0006	1,826	0,068*
β	0,822	57,376	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

The EV/EBITDA portfolio's adjusted R-square is approximately 72 percent and is among one of the highest. This tells that over two thirds of the movements in the portfolio can be explained by the move in the benchmark portfolio. The generated alpha is significantly high at 0,0006 and is statistically significant (on a 10 percent confidence level). The low beta of 0,822 shows that the portfolio has been significantly defensive in relation to the movements in the market. It is also the lowest beta of any formed portfolio. (Table 17)

Table 18. Regression results for the EV/EBITDA portfolio (first half)

EV/EBITDA portfolio	Value	t-stat	Pr < ItI
F-value	1019,897		<0,001
Adjusted R-square	0,610		
α	0,0004	0,869	0,385
β	0,734	31,936	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

Table 18 shows that the EV/EBITDA portfolio has the lowest single beta on the first half. The beta at 0,73 shows that the portfolio has been very defensive. As the returns on the first half were for all portfolios as well as the index higher on the first half the defensiveness results in a low alpha of 0,0004. Also, the R-square of 0,61 indicates that a great deal of the shifts in the portfolio's value can be explained something else than the shifts in the S&P 500.

Table 19. Regression results for the EV/EBITDA portfolio (second half)

EV/EBITDA portfolio	Value	t-stat	Pr < ItI
F-value	3053,65		<0,001
Adjusted R-square	0,824		
α	0,0007	1,967	0,049**
β	0,909	55,260	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

The high F-value for the EV/EBITDA at 3053,65 shows that the model was a good fit for the data and the 0,82 adjusted R-square indicates that a great deal of the shifts in the EV/EBITDA portfolio during the second half can be explained by the shifts in the benchmark index. The alpha of 0,0007 is statistically significant at a 5 percent confidence level. The only statistically significant excess return for the latter period represents a 3,7 percent annualized excess return. With a 0,91 beta, the EV/EBITDA is the most defensive portfolio on the second half. This is in line with its standard deviation (16,09) which was the lowest among the constructed portfolios and just slightly above the benchmark. The annualized return for the EV/EBITDA portfolio at 11,46 percent is significantly higher than that of the index (7,90 percent), but the standard deviations (16,09 vs. 16,06) are on a fairly similar level, which also proved to be statistically significant alpha. (Table 19)

7.4.8 DY portfolio results

Tables 20-22 presents the results for the dividend yield portfolios, which produced the lowest returns, but which still exceeded the benchmark's returns.

Table 20. Regression results for the DY portfolio

DY portfolio	Value	t-stat	Pr < ItI
F-value	3314,313		<0,001
Adjusted R-square	0,718		
α	0,0002	0,489	0,625
β	0,866	57,570	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

Table 20 shows that the DY portfolio has the lowest alpha at 0,0002 and is also not statistically significant. The portfolio also gained the lowest total returns and is thus the worst performer. Its beta is in line with the defensive character of the portfolios with the value of 0,866. Given the results, this regression proves the market efficient yet again.

Table 21. Regression results for the DY portfolio (first half)

DY portfolio	Value	t-stat	Pr < ItI
F-value	1472,148		<0,001
Adjusted R-square	0,693		
α	0,0005	0,919	0,358
β	0,846	38,369	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

The beta of the DY portfolio is constantly low on all three examined periods and shows that it has been rather defensive throughout the period. This is characteristic for stocks with high dividend yields and is no surprise. However, the high alpha for the former period of 0,0005 is not statistically significant and the null hypothesis is not rejected.

Table 22. Regression results for the DY portfolio (second half)

DY portfolio	Value	t-stat	Pr < ItI
F-value	1873,366		<0,001
Adjusted R-square	0,742		
α	- 0,0001	- 0,268	0,788
β	0,866	43,282	<0,001***

*** significant at 1 % level, ** significant at 5 % level, * significant at 10 % level

The negative alpha for the DY portfolio on the latter period defines well the poor results gained with this portfolio. The overall returns for the DY portfolio where a disappointed and also the alpha values were at the lowest end. It is clear that no statistically significant excess returns were made by forming a portfolio based on a high dividend yield. The only interesting aspect is the defensive character of the DY portfolios, which could turn out valuable on bear markets. (Table 22)

8 Summary and conclusions

For decades, the investing world has researched to find winning strategies that beat their benchmark in returns. This field of study has gained speed in recent years due to even more complex strategies and the capabilities of computers to calculate even more sophisticated formulas. However, for an individual investor, the complexity is often a barrier for greater returns as well as the lack of patience. In this study, the author wanted to show that following a simple strategy with patience will pay off.

Dividends are among the most common ways for companies to distribute their earnings to investors, which then are the pay investors get for investing in these companies. In this study, the author researched whether following a consistent investing strategy that is built on companies known for their impressive dividend track-record would prove to yield excess returns. These companies are also known as the Dividend Aristocrats. Dividend Aristocrats are companies listed on the S&P 500 index and are known for raising their cash dividend for at least 25 years in a row. Typically, these companies have a long history and a strong presence in the market they are on.

Dividends and their linkage to returns have been studied a lot. Miller and Modigliani (1961) as well as Black and Scholes (1974) among many others have studied the signal that dividend announces carry and it is believed to shed light on the expectations that companies' management has for the future.

As dividends have been researched for a long time, also valuations methods that are based on dividends have been invented. The most simple and common is the dividend discount model by Gordon and Shapiro (1956).

The usual division between stocks is between growth and value stocks. In this study the author focuses on so called value stocks. Stocks that are cheap in relation to other stocks when measured with financial ratios such as P/E, EV/EBITDA, P/B, P/CF, P/D and EV/S are called value stocks. On the contrary growth stocks seem usually expensive with the same financial ratios, but the idea is that their future growth will offset this current relative high valuation.

The financial ratios used in this study have been widely used and previous research suggests that applying them in portfolio formation yields excess returns. However, also opposite results and conclusions exist.

Among many other examples, Fama and French (1992) reported the positive relationship between a low P/B multiple and excess returns as well as Stattman (1980). For the P/E multiple, Basu (1977) shows that stocks with low P/E multiples earn higher returns. Basu (1977) also stated that the returns where higher than CAPM would imply and thus he questioned the theory.

The time period in this study is 25 years, from spring 1991 to spring 2016. The stocks in this study's universe are all Dividend Aristocrats, which means they have all raised their cash dividend for at least 25 years in a row. The author created six portfolios, of which each one is formed based on one valuation multiple. The stocks were then ranked from cheapest to most expensive based on the current multiple in question. Each portfolio was formed from the ten cheapest stocks and every stock was kept in the portfolio until it did not fulfil the criteria of a Dividend Aristocrat anymore (i.e. it failed to raise its dividend).

The main theory behind this research is CAPM. According to CAPM, a security's expected return constitutes of the risk-free rate, the market return and the beta coefficient, which represents the security's systematic risk. From CAPM we can formulate Jensen's alpha, which measures the excess return of a stock in relation to its theoretical return. The main null hypothesis is based on this theory - according to the null hypothesis Jensen's alpha equals zero for each regression and thus no excess returns existed.

The earned annual returns for each portfolio were in line with previous studies. All the portfolios earned market beating returns, as can be seen from table 23. For the first half, each of the formed portfolios also beat the S&P 500. The only time a portfolio did not beat the S&P 500 was on the second half and it was the DY portfolio.

Table 23. Annualized returns, %

Portfolio	Whole period	First half	Second half
P/E	12,74	16,47	8,96
P/B	13,60	16,50	10,53
P/CF	12,85	19,10	9,48
EV/SALES	12,46	15,45	9,34
EV/EBITDA	11,62	11,56	11,46
DY	9,34	12,22	6,46
S&P 500	9,29	10,55	7,90

The best performing portfolio was the P/B portfolio, which was in line with the previous studies of Lev and Thiagaran (1993) as well as Fama and French (1992). The P/B portfolio was a good fit for this study since the long holding period was accompanied with a low P/B valuation. Trecartin (2001) found a positive correlation with low P/B stocks and their 10-year returns. Based on this study we can make the same conclusion.

Gray and Vogel (2012) found that the inverse of EV/EBITDA was the single best metric in stock selection on US markets between 1971-2010. This may have been the case for the entire universe of stocks in these markets, but the results of this study do not support their findings. For the Dividend Aristocrats, the P/B turned out to be the best selection criteria when combined with a long holding period.

Based on the annual returns presented above the answer to the research question is the following: by applying value multiples in portfolio formation it is possible to create a Dividend Aristocrat portfolio that beats its' benchmark.

The author also aimed to find whether the portfolios consistently outperform the benchmark on annual returns. The results show that the portfolios consistently beat their benchmark index, although on the second half the annual excess returns decreased.

For the theory presented in this study the results are mixed. Despite that the returns turned out to be greater than those of the benchmark index, the theory regarding efficient markets cannot fully be proved false based on the results. The main hypothesis of this study was based on CAPM and suggested that no statistically significant excess returned would be earned on any of the portfolios. However, based on the results, on eight out of 18 tests the generated alpha was statistically significant and the null hypothesis can be rejected. For the entire examined period, the alpha of the P/B portfolio was statistically significant on a five percent confidence level and suggest that the second null hypothesis ($\alpha \neq 0$) holds. The generated alpha was 0,0008, which equals an above 4 percent annual excess return. This is a level that may be considered significant and as figure 3 shows it leads to significantly greater absolute returns than the market.

The EV/EBITDA portfolio generated an alpha of 0,0007 which equals a 3,7 percent excess return annually. The generated alpha was also statistically significant and does not support the CAPM theory and is against the first null hypothesis.

Based on the results of the regressions it may be concluded that CAPM does not always hold. Also, and as previous financial research suggests, the markets are not always efficient and it is possible to earn excess returns with a lower standard deviation than that of the market.

DeAngelo et al. (2004), Denis & Osobov (2008) and Fatemi & Bildik (2012) showed that growing real dividends seem to concentrate to large companies with slow growth. Whether this is the case is not a subject of this research, but as Oksaharju (2012) and Puttonen (2009) put it - finding stocks that are cheap and that maximize the amount of money they distribute to their shareholders grows the value of these companies and maximizes investors profits. Dividend Aristocrats fit the characteristics of DeAngelo et al. (2004), Denis and Osobov (2008) anf Fatemi and Bildik (2012), but also Oksaharju (2012) and Puttonen (2009). Also, the results of this research show that by combining all these characteristics investors can earn above the benchmark index returns even after adjusting for risk.

The financial literature and researchers have disagreed whether the markets are efficient for decades. Researchers have tried to prove either way and still no final conclusions can be made. The results presented add to these mixed results as they prove the market to be efficient in some cases, but also show the contrary. However, we can state, lastly, that it is possible to create a Dividend Aristocrat portfolio that beats its' benchmark by applying value multiples in portfolio formation, which answers the main research question of this research.

8.1. Suggestions for future research

The Dividend Aristocrats are not a widely-known concept nor have they been widely researched. This leaves a lot of space for further research. This research shows that by applying a simple strategy, any investor could have beaten the benchmark index during the examined period (May 1991 to May 2016) on the US stock market. Since the Dividend Aristocrats are limited to companies that are listed on the S&P 500 index there is a lot of space to widen the scope to other markets as well as different time frames. It is not common to have companies with such dividend histories as the Dividend Aristocrats, but it is possible to find companies with long histories of raising dividends. That is also where there is a lot of room for further research.

As the P/B -portfolio proved out to outperform the index, as well as the other formed portfolios, the author believes the link between return on equity (ROE) and the returns should be studied further. Due to continuous compounding the higher the ROE the more the company will able to earn in the future. Thus, a high ROE will grow the earnings of a company on an accelerating pace which will then make greater dividends possible.

The risk measure we use these days does not capture the company's fundamentals. The fundamentals are the key for determining the ability of the company to keep raising its dividend to the foreseeable future. This is also where the risk lies for the investor. The author believes that by creating a way to estimate the risk of not being able to raise dividend the coming years and applying this for stock selection criteria would be very interesting. It would also possibly help to avoid the companies that are cheap, but due to reasons like worsening business outlook. Being able to avoid these companies in the strategy presented in this study would highly likely improve the results and result in greater excess returns.

The finance theory that we are taught these days suggests standard deviation to be used as the measure of risk. Standard deviation is a measure of the stock's historical performance. This measure of risk does not capture the company's fundamentals and neither does it tell anything about the company's future. In this study, the author sees the biggest risk for future returns to be highly linked to the company's ability to raise their dividend in the coming year.

The author highly believes that standard deviation fails to capture the true risk of a stock. That is why the biggest interest is the actual returns the created portfolios have produced rather than the risk adjusted returns or the statistical significance of them that is linked to the CAPM. To put it simple, the returns of the created portfolios have all exceeded that of the benchmark index. So why would an investor be interested in the volatility the portfolio has faced? A long-term investor does not need to pay attention to the volatility, all that matters in the end is the returns. The risk in the presented strategy does not lie in the volatility, but as one intelligent man once said: “*the risk comes from not knowing what you are doing*”.

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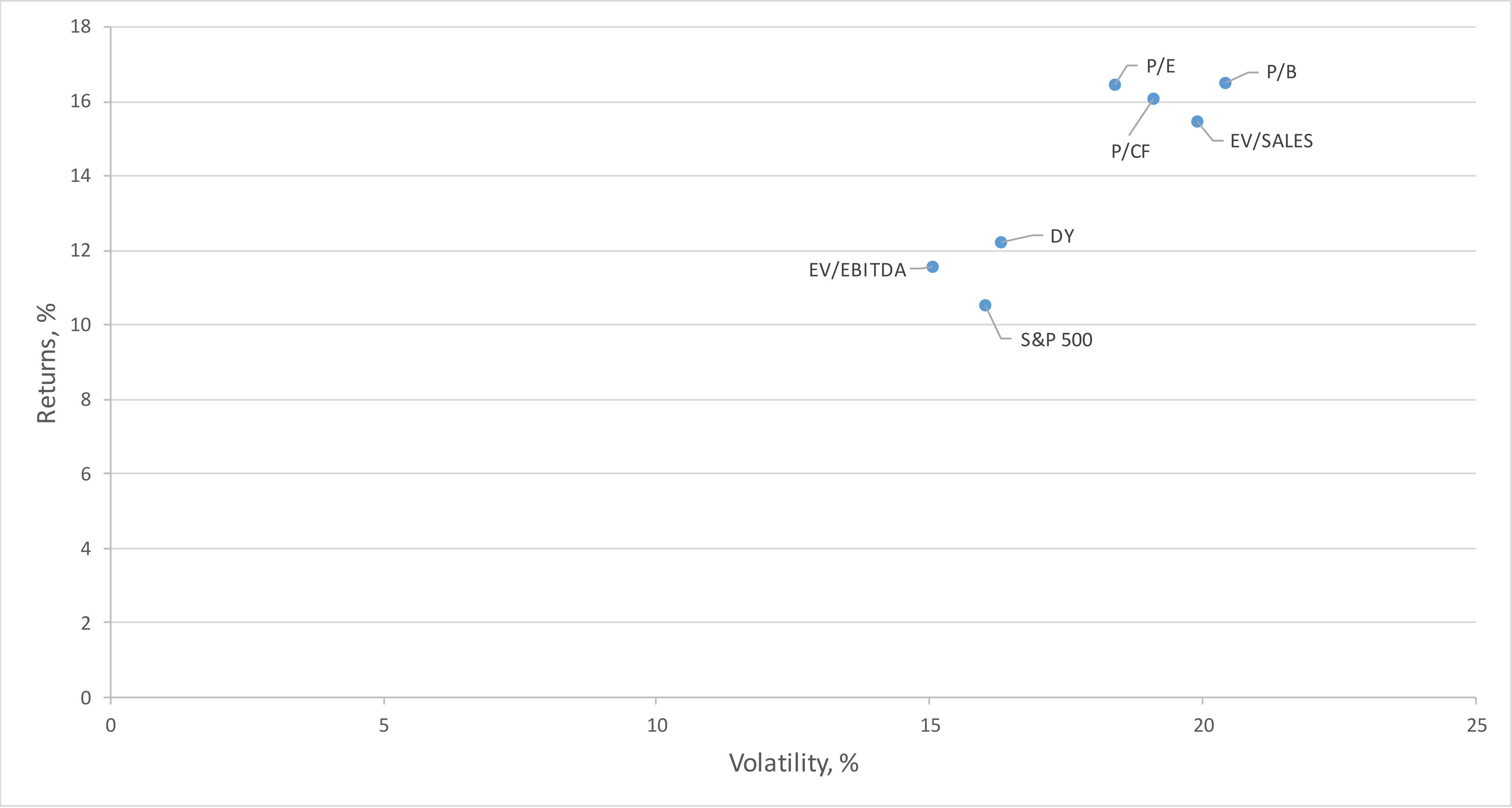
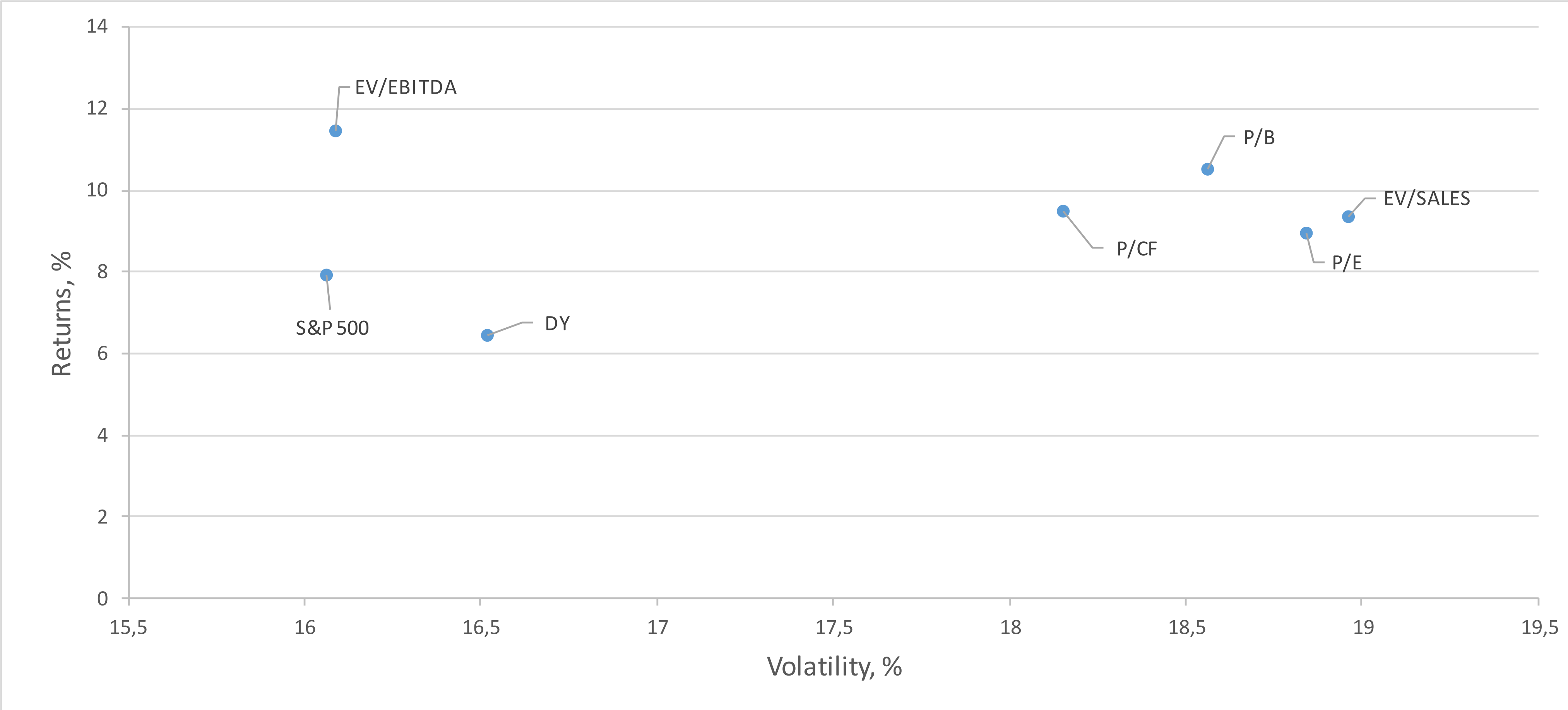
Appendices

Portfolio	End value
P/E	20 024 534 €
P/B	24 240 711 €
P/CF	20 528 553 €
EV/SALES	18 830 170 €
EV/EBITDA	15 601 784 €
DY	9 329 964 €
S&P 500	9 223 836 €

Appendice 1. End values of portfolios (1991 to 2016)



Appendice 2. Return and volatility scatter plot for the first half (annualized)



Appendice 3. Return and volatility scatter plot for the second half (annualized)