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Copying Warren Buffett, does it pay off?

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Abstract

Investors look for return and some of these investors try to beat the market. Mimicking a highly regarded investor may seem like an easy strategy to follow to earn excess returns without taking additional risk. Warren Buffett is probably the first investor people would choose to mimic because of his exceptional performance over his career who has built up to a capital of over 80 billion USD. This research looks into the strategy of mimicking Berkshire Hathaway's buy and sell transactions one quarter after the actual transactions made in the period starting medio 2014 up until ultimo 2017. The returns are tested before the transaction and compared with two periods after the transaction, namely the first year after the transaction and from the transaction up until now. This is compared with four relevant benchmarks on the Capital Asset Pricing Model using a cross-sectional approach and a panel data analysis. I found outperformance on the short term, which is one year, using the cross sectional approach. However, I found no evidence of excess returns using this strategy with the panel data analysis, but I found no evidence of underperformance either. On the long term I found no abnormal returns using either of the approaches. Therefore, similar results can be expected when investing in just a broadly diversified index fund with less risk and less transaction costs.

Contents

1 Introduction

Investing is a tool through which people and institutions try to make a positive return to build and/or maintain wealth. Several techniques can be applied to achieve these positive returns. To achieve market returns should be relatively easy by buying a mutual fund that focuses on the overall market worldwide or otherwise. Some investors try to "beat" the market by looking for excess return without taking additional risk.

Almost every investor knows Warren Edward Buffett. He is well known for his investment style, value investing. Buffett is chairman and CEO of Berkshire Hathaway making him the third richest person in the world with 82,5 billion USD (Forbes, 2019). People looking for returns on the stock market sometimes take advice from "experts" and sometimes mimic investment decisions made by institutions like Berkshire Hathaway.

1.1 Imitation

Some research is already done regarding the imitation of portfolios of professional investors. One study suggests that a copycat portfolio does in fact perform better than its target which it is copying fund (Wang & Verbeek, 2009). The relative success of copycat portfolios even improved after the introduction of stricter regulation from the SEC which requires every mutual fund with over 100 million USD in securities to report their holdings quarterly. This research was done over the period 1985 up until 2008 and found an average outperformance of 0,017% per month. After SEC regulation in 2004 this relative outperformance increased to 0,06% per month.

Another study looks at the performance of Berkshire Hathaway over the period 1976 up until 2006 and explores potential explanation for the superior performance (Martin, 2008). Over the test period it found an outperformance in 27 out of the 31 years exceeding the Standard & Poor's 500 index with 11,14% per year. This can happen because of chance, however, the magnitude of the outperformance makes it unlikely. This article also made a hypothetical copycat portfolio of Berkshire Hathaway rebalancing every month. This also earned a significant abnormal return of 10,75% per year compared to the Standard & Poor's 500 index over this period.

1.2 Warren Buffett

Warren Buffett, born on August 30th 1930 in Omaha, Nebraska, is also called the oracle of Omaha. He is the son of Howard Buffett, a stock broker and congressman, and Leila Stahl Buffett (Page, 2017).

1.2.1 First shares

Warren bought his first shares when he was only eleven years old. He visited the New York Stock Exchange, NYSE, and bought a total of three shares of Cities Service Preferred for 35 USD each. Warren enlisted his sister, Doris Buffett, as a partner and together they owned the shares. Cities Service was

an American Oil and Gas concern. Quickly after the purchase, the stock dropped from 38,25 USD to 27 USD. A loss of almost 30 percent from its top. After a while the stock recovered to 40 USD and Warren sold the shares with a profit of 5 USD per share. After he sold, however, the share price rose even further to 202 USD. This taught him not to rush into small profits (The Conservative Income Investor, 2014).

1.2.2 First job

Warren got his first job as a paper delivery boy at thirteen years old. He delivered the paper in the morning as well as in the afternoon. His short term goal as a fourteen-year-old was to have 1.000 USD. He reached this goal when he filed his first tax return at age fourteen.

1.2.3 College

Warren graduated from the University of Nebraska, Lincoln, with a Bachelor of Science degree, after which he applied to get into Harvard Business School. Harvard rejected Warren so he applied to Columbia Business School where he graduated in 1951 with a Master degree in Economics.

In Columbia Warren studied under the supervision of Benjamin Graham, the legendary value investor and writer of the book 'The Intelligent Investor'. With his Master degree he started teaching investing at the University of Nebraska. In 1954 he decided to work for Benjamin Graham in New York.

1.3 Berkshire Hathaway

Berkshire Hathaway started as a textile manufacturer in the 1830s under the name of 'Valley Falls Company'. In 1929 it changed its name to 'Berkshire Fine Spinning Associates' which merged with 'Hathaway Manufacturing Company' in 1955. After the merger, the company went by the name of 'Berkshire Hathaway' and was a company with millions of dollars in revenue, approximately 12.000 employees and counted fifteen factories. Warren first bought some equity in the company in 1962 and acquired the entire company in 1964 as a shareholder. In 1969 Warren decided to dissolve his own company, Buffett Partnership, and focus on Berkshire Hathaway. This was the time when he phased out the core business of Berkshire Hathaway and focused the business on investing.

In 2019 Berkshire Hathaway functions as a holding company buying stocks of various companies. Its headquarters is based in Omaha, Nebraska. The current market capitalization on the New York Stock Exchange is around 500 billion USD. It has holdings in some of the most well-known companies in the world like Coca Cola and Apple Inc. (Hargrave, 2019).

1.4 Research Question

When Berkshire Hathaway buys or sells a stock and in response other (smaller) investor buy or sell the same stock, taking the decision made by Berkshire Hathaway as an advice, it creates an self-fulfilling prophecy, because it forces buying (selling) pressure on the stocks Berkshire Hathaway bought (sold).

Research question: What is the stock price effect of buy/sell decisions made by Berkshire Hathaway over the period 01.07.2014 – 31.12.2017?

This is particularly interesting for people, or institutions, who want to invest with little effort. Just by mimicking someone else. There will, however, always be a delay, because it is impossible to make the decisions/transactions at the same time. This paper investigates whether it does pay off to apply a strategy to mimic the decisions made by Berkshire Hathaway on the short term as well as on the long term.

The paper is structured as follows. Section two will look into previous research regarding this topic alongside my expectations. Section three looks into the acquired data and the methodology. Section four dives into the results of the research and discusses the outcomes and compares this to the before mentioned expectations. Section five takes a look into the conclusions of the research. Section six ends this paper and limitations are discussed with some suggestions to expand the research on this topic.

2 Literature review

2.1 Foresight and Hindsight

Looking back at the Berkshire Hathaway share, it was possible to buy one share for 18 USD on the 10th of May, 1965, around the time Warren Buffett took the leadership of Berkshire Hathaway. Fasting forward in time, this same stock could have been sold for 71.000 USD on the 31st of December, 2000. The annualized return during this timeframe is 26,18%. This is more than twice the return of the Standard & Poor 500 index, which only had an annualized return of 11,69% during this same period. Discounting the Berkshire Hathaway stock against the S&P500 return makes the Berkshire Hathaway share worth 1.383 USD on the 10th of May, 1965, almost 77 times more than its actual price. Based on the Efficient Market Hypothesis the price of 18 USD reflects however all available information and therefore is a risk-adjusted future value discounted to May 10 1965 (Statman, 2019).

Based on this information, it may make sense to copy such a strategy to buy the same stocks. However, if Berkshire Hathaway already bought it, it may be too late and the price may already have gone up.

2.2 Performance of professionals

There have been numerous studies about the performance of mutual funds managed by professionals. All of them tried to determine if financial professionals outperform their relevant benchmark or the overall market. To do this, several risk adjusted performance measures are used. Examples of these risk adjusted performance measures are Sharpe (1966), Treynor (1965) and Jensen (1969). Most of these studies concluded that mutual funds do not outperform their benchmarks on average. Some studies found zero or small average abnormal returns (Malkiel, 1995) and (Daniel, 1997). These studies did correct for survivorship bias, meaning it is accounted for bankrupt companies, which have a

downward pressure on the returns. However, some studies suggest future outperformance can be forecasted using past alphas, implying past alpha predicts future alpha (Carlson, 1970), (Lehmann & Modest, 1987), (Grinblatt & Titman, 1992), (Hendricks et al., 1993) and (Carhart, 1997). This leads to the conclusion that outperformance may be persistent and that some managers are expected to outperform the market in the future.

Most recent research suggests that skilled investors have portfolios that are more concentrated toward an industry according to informational advantage. Research examined the relationship between performance and industry concentration of actively managed mutual funds in the United States from 1984 up until 1999 and found that more concentrated funds perform better than the benchmark (Kacperczyk et al., 2005). Similar research tests whether informational advantages can help explaining why individual investors concentrate the stocks they own in their portfolio to a particular industry (Ivković, Sialm, & Weisbenner, 2008). On the other hand, later research also looked into the performance of these focused funds and found no evidence of outperformance when compared to more diversified funds (Sapp & Yan, 2008).

2.3 Information provision by Institutional Investors

Research suggests that institutional investors are rewarded in returns because they provide information to the markets (Grossman & Stiglitz, 1980). They acquire information and process the information which is often not as easily available or understandable for non-institutional investors. Other research looks into the difference of how investors process the information. Different investors can have different interpretations of the same information. This suggests that more skilled investors process the same information “better” and therefore identify the undervalued or true value of that stock before the rest of the market does (Kurz & Motolese, 2001). Identifying these stocks before the market does may enable the investor to earn excess returns.

It is however not clear how this information is transmitted into the prices of the particular stocks. A possible explanation is discussed below in the Efficient Market Hypothesis which suggests that the information processed by skilled investors will get reflected by the stock price immediately after a transaction is made indicating the validity of the information. These skilled investors profit from copy-cat investors who accelerate the stock price movement even more (Frank et al., 2004). Regulation requires institutional investors to disclose their holdings frequently. This is to improve efficiency of markets, because it can incorporate the produced information faster into the stock prices.

2.4 Efficient Market Hypothesis

According to the Efficient Market Hypothesis, EMH, all information available to the market is incorporated in the current market price of a stock. Because all available information is incorporated

in the current market price, it is impossible to generate a consistent alpha. An underpriced stock will be bought immediately driving its price up and an overpriced stock will be sold driving prices down to its current fair value. The EMH however can be divided into three categories, namely the weak form, the semi-strong form and the strong form (Malkiel B. G., 2003).

The weak form of the EMH states that the stock price of today reflects all the data of past prices. This prevents outperformance when an investor uses technical analysis, which is a technique based on past price movements and trends. Advocates of the weak form, however, believe that it is possible to outperform the market using fundamental analysis by looking into a company's financial statement.

The semi-strong form of the EMH states that all current public information is priced in today's stock price, because it is available for every invertor. This makes it not possible to use technical nor fundamental analysis to earn positive abnormal returns the market persistently. To outperform the market, private information is required according to this theory.

The strong form of the EMH states that all information, even private information, is already priced into the current stock price. Because investors with private information will buy or sell in order to drive the stock price to its fair value. This makes it impossible to have any advantage on the stock market and therefore the only returns possible are normal market returns on the long run. (Maverick, 2019)

2.5 Timing

The possibility exists that Berkshire Hathaway invests at the right time, making use of the value investing strategy. This strategy determines a value per share based on the fundamentals of a company (Graham, 2003). The strategy suggests a margin of safety, for example a percentage under the estimated value. If the price of a stock drops below that price, it is an inducement to buy.

Timing the market is, however, difficult, if not impossible. Previous research shows some contrasting evidence. Prior research shows positive abnormal returns when following analysts' recommendations (Barber, 1993). Other research indicated even market-timing and stock-picking abilities by analysts (Womack, 1996). Contrasting evidence shows, however, that investment newsletters fail to offer marketing timing ability (Graham & Harvey, 1996), (Jaffe & Mahoney, 1999) & (Metrick, 1999).

2.6 Value Investing

Berkshire Hathaway invest according to what investors call 'Value Investing' which is part of the before mentioned fundamental analysis. It was first defined by Benjamin Graham, Warren's former mentor. It is a strategy through which investors believe they can make higher returns than average. This is however in contrast to the semi-strong form of the Efficient Market Hypothesis as discussed earlier. The annual reports are after all publicly available and therefore public information.

Value investors invest according to a few principles. One of those is a high Book to Market ratio, B/M. This means the book value of equity as reported in the annual report as a ratio to the market capitalization. The general thought is that a high B/M ratio implies an undervaluation of the stock. The book value of equity is audited according to accounting principles, where market value is an outcome from supply and demand on the stock market. This outcome is based on the prospects made by investors about the future of a company. A common formula used to determine the price of a stock is the Gordon Growth model:

(1) $Price_{t=0} = \frac{Dividend_{t=1}}{r-g}$

$Dividend_{t=1}$ = Dividend in the next period

r = Discount rate

g = Growth rate

This model implies a constant growth for the dividends and a constant discount rate. The discount rate is usually based on CAPM, see the Data and Methodology section for a more comprehensive explanation, which measures the opportunity cost of equity and the growth rate is an estimation made by the investor based on his/her own market research.

An undervaluation may imply several things:

- The estimation of future dividend is too low
- The discount factor as withdrawn from CAPM is too high
- The growth factor is estimated too low

Spotting these undervalued stocks can have a positive impact on the returns. Research found evidence on excess returns using a value investing strategy (Piotroski, 2000). Also, evidence suggests the rewards from value investing become larger as well as more reliable as the holding period lengthens (Rousseau & van Rensburg, 2003).

2.7 Hypotheses

The before mentioned research question will be split up in four different sub questions regarding the time frame, namely:

What is the short term stock price effect of buy decisions made by Berkshire Hathaway over the period 01.06.2014 – 31.12.2017?

What is the short term stock price effect of sell decisions made by Berkshire Hathaway over the period 01.06.2014 – 31.12.2017?

What is the long term stock price effect of buy decisions made by Berkshire Hathaway over the period 01.06.2014 – 31.12.2017?

What is the long term stock price effect of sell decisions made by Berkshire Hathaway over the period 01.06.2014 – 31.12.2017?

In these questions the timeframe of the short term effect will be set to one year following the transaction. The long term is set to the period after the transaction up until present, which is Q2 2019.

These timeframes are determined using the following approach. A small investor cannot buy all the different stocks Berkshire Hathaway buys or take a stake in Berkshire Hathaway itself because of the limitation of money, for example. If it turns out that the buy decisions made by Berkshire Hathaway creates an effect of abnormal returns on the short term but not on the long term, the conclusion may suggest to sell after the short term period and buy another stock after that period of not hold the stock in the first place. The same applies to the sell decisions, if it turns out that a sell decision made by Berkshire Hathaway only creates negative abnormal returns on the short term, the conclusion may suggest to hold the stock.

The hypotheses above are based on the following expectations. Berkshire Hathaway outperforms their relevant benchmark consistently, therefore it should make sense to follow their investments. This draws more attention to these stocks, increasing buying pressure which inflates prices after a transaction. Buffett is among finance professionals who do generate excess returns and evidence suggests this should be usable to generate future alpha. The alpha should go up after a buy transaction because of information provision. Information is released and Berkshire Hathaway processes this information and buys it in case of an undervaluation, based on value investing, and therefore providing information to the public. Evidence also suggests that abnormal returns based on value investing increase over time, therefore the hypotheses are expanded for the long term.

I expect the following. An improvement in stock returns on the short term period as well as on the long term period after Berkshire Hathaway makes a buying decision. The possibilities are as follows:

Table 1: Expectations buying decisions

Buying decisions	
From	**To**
Negative abnormal returns	No abnormal returns
Negative abnormal returns	Positive abnormal returns
No abnormal returns	Positive abnormal returns
Positive abnormal returns	Positive abnormal returns

The exact opposite is expected after a sell decision, namely the following:

Table 2: Expectations selling decisions

Selling decisions	
From	**To**
Positive abnormal returns	No abnormal returns
Positive abnormal returns	Negative abnormal returns
No abnormal returns	Negative abnormal returns
Negative abnormal returns	Negative abnormal returns

I expect this to apply on the short term period as well as on the long period.

3 Data & Methodology

3.1 Data

Every institution that uses the U.S. mail in the course of its business and exercises investment discretion over 100 million USD in Section 13(F) securities must report its holdings on Form 13F every quarter with the SEC, Securities and Exchange Commission. It contains the following data of every security:

- Name & Class
- CUSIP number
- Number of shares
- Total market value

This Form 13F is required to be filed within 45 days of the end of a calendar quarter (U.S. Securities and Exchange Commission, 2015).

When comparing these forms, it is possible to determine the changes in investments during that particular quarter.

3.2 Database

All the financial data is established from the DataStream database. The stock returns as well as benchmark returns are adjusted to all distributions, like dividends, to make a fair comparison between individual stocks and the related benchmarks. The data is selected starting from 2010 up until the second quarter of 2019.

3.3 Sample selection

Berkshire Hathaway holds approximately 50 investments at any given time between 2014 and 2017. Almost every quarter, this portfolio changes slightly. This is done by buy and sell decisions. It is sensible however that not every decision has a noticeable impact, therefore only transactions with more than 25% change compared to the Berkshire Hathaway holding in the previous quarter are selected for this research. After filtering on this criterion, the sample size is 96 transactions. However, sometimes the stock is bought or sold over two consecutive quarters, therefore the impact is not tested in both quarters. Adjusting for this criterion, the sample size is 74 stocks. The first transaction is the transaction that this research investigates. So, for example, Berkshire Hathaway bought approximately 10 million shares of stock X in Q1 of 2016 and another 5,5 million shares in Q2 of 2016. This research focuses on the effect of the acquirement in Q1 of 2016. The same reasoning applies to a sell decision. When there is a quarter in between, this may indicate a new transaction and therefore a new event study. Last but not least, not every stock is freely exchangeable on a stock exchange. Because these stocks are not freely exchangeable, it is not possible to obtain monthly returns and therefore, these stocks are eliminated from the sample. After eliminating for all these criteria, the total sample size is 62 transactions.

3.4 Event Study

The effect of an economic event on the price of a stock can be measured using an event study. An event study measures the impact of a specific event using financial market data. Referring back to the Efficient Market Hypothesis, the effects of an event will be reflected immediately in the value of a firm on the market place. Central in an event study is the measure of abnormal returns. Abnormal returns are the difference between the realized returns and the expected returns. Several models can be used to determine expected returns. This paper will make use of the CAPM, see for a more comprehensive explanation the paragraph about the CAPM in section 3.7.

The formula to determine abnormal returns is as follows:

$$ARi = RRi - ERi$$

AR_i = Abnormal Returns for stock *I, or Alpha*

RR_I = Realized Returns for stock *i*

ER_i = Expected Returns for stock *i*

This event study will be made on two different time periods, namely on the short term and on the long term. The test is divided into two periods to compare, namely the period before the event and after the event. The period before the event is always starting from 2010 (if available) up until the quarter with the transaction. The period after the event is measured in two ways. One is one year after the transaction starting from the first quarter after the transaction. The other one is from the transaction up until present and measures a more long term effect. Berkshire Hathaway buys for the long term, so this last test is also relevant. Berkshire Hathaway bought Coca Cola for example in 1988 (Investopedia, 2018) and still has this investment as we speak.

The expected returns are measured as if the event did not take place. The difference between the realized returns and the expected returns are the abnormal returns, or alpha. When the abnormal returns are significant, the abnormal returns can be assigned to the event.

The expected returns can be determined using two approaches, namely the constant mean return model and the market model. The constant mean return model assumes that the mean return is constant through time for a given stock. The market model assumes a relationship between the returns of a given stock and the returns of the market portfolio. This paper uses the market approach, since it reflects the best how the economy performs at the same period.

3.4.1 Expected Returns

Several approaches are available to determine the expected returns of a given stock. The two major categories are statistical and economic. The first category follows statistical assumptions concerning the behavior of stock returns and are not dependent of economic reasoning. The economic approach, however, relies on assumptions concerning investor behavior and are not exclusively built upon statistical assumptions.

The statistical model, or constant mean return, assumes a constant return over time and no relationship to the market. The returns should be independently and identically distributed through time. Because this model is independent of global events, it is not applicable to this research (MacKinlay, 1997).

The economic model assumes a relationship with the market portfolio and therefore with global events. This is more applicable to this research because it measures the difference with something that is also sensitive to global events (MacKinlay, 1997).

Assume for example the following scenario. Stock X performs at 5% on average each year for the last 20 years. Over these 20 years there are years with 15% return and years with 5% negative returns. Because of a positive global event the overall stock market has a return of 10% and stock X has a Beta of 1, so the expected returns of stock X are equal to the market returns. The expected returns for stock X are therefore also 10%. The realized returns for stock X are, however, 11%. Based on the statistical model, the abnormal returns are 6%, because 11% - 5% = 6%. Based on the economic model the abnormal returns are 1%, taking the positive global event into account. The economic model is therefore the most appropriate model for this research, because it looks into different time periods. The available data also takes all distributions, like dividends, into account.

A third approach would be to compare the returns of the stock of the subjected firm with the returns of a portfolio with similar characteristics, this is the so called multi factor model. The market model is basically a one factor model. Other factors may be industry, size, book-to-market ratio, etc. The gains from employing such a model compared to the one factor model, the market model, are limited (Bartholdy & Peare, 2005). The market model already adjusts for sensitivity to the overall market. Even though the multi factor model can be more accurate, the market model will be used for this research, because of the limited gains of more factors and simplicity of the market model.

3.5 Benchmarks

Expected returns are determined making use of the Capital Asset Pricing Model, CAPM. CAPM is based on a few assumptions, among which the market returns. Market returns are, however, dependent to the choice of the researcher. Because most firms bought by Berkshire Hathaway are enlisted to an American stock exchange, this is the most obvious choice. To take an even broader view, expected returns are also determined using a world index, in this case the MSCI. American stock exchanges are divided in three major benchmarks for this research, namely the Standard & Poor 500, the Dow Jones Industrial Average and the Nasdaq composite index.

3.5.1 MSCI

The MSCI is the accepted gauge of global stock market activity. Berkshire Hathaway, however, mostly buys stocks from developed countries. Therefore, the best comparison is against the MSCI world which focuses on developed countries. This is composed of over 1.600 securities in large and mid-cap size segments across 23 developed markets. Since it is composed of countries all around the world, this benchmark gives the most reliable gauge for the average world economy. See for the complete composition of the MSCI World Index Figure 1 in Appendix A (MSCI, 2019).

It is relevant to compare the performance of stocks bought and sold by Berkshire Hathaway with the performance of the overall world economy since it may be less risky to invest in the most diversified benchmark, the MSCI.

3.5.2 Standard & Poor 500

The Standard & Poor 500 (S&P 500) is a market capitalization weighted index consisting of the largest 500 U.S. companies which are traded publicly. It is regarded as the best benchmark of large capitalization United States equity. This is because it is a weighted index, which means that a company with a larger market capitalization gets a higher weight. Therefore, a negative event on a larger company will have a larger impact on the index than the event of equal impact on a smaller firm.

It is relevant to compare the performance of stocks bought and sold by Berkshire Hathaway with the performance of the biggest 500 securities in the United States since it may be less risky to invest in the biggest 500 stocks in the United States. It functions as a proxy for the U.S. economy.

3.5.3 Dow Jones Industrial Average

The Dow Jones goes a little further than the S&P500. The Dow Jones Industrial Average consists of the 30 large, publicly traded U.S. companies. It was originally launched as a proxy to track the U.S. economy. It was created by Charles Dow and Edward Jones and consisted of twelve companies which were industrial in nature. This is not the case anymore. The index is now composed by a committee which selects companies based on the representativeness for the United States economy. It is too a weighted index.

It is relevant to compare the performance of stocks bought and sold by Berkshire Hathaway with the performance of the Dow Jones since it may be less risky to invest in stocks selected by a committee of experts in the United States which should represent the U.S. economy best.

3.5.4 Nasdaq Composite Index

The Nasdaq Composite Index include all stocks traded on the Nasdaq. The Nasdaq stands for National Association of Securities Dealers Automated Quotations and was the first electronic stock exchange in the world. This covers more than 3.000 securities in the United States, mostly from the technological industry. This may therefore be a more appropriate benchmark for technological stocks held by Berkshire Hathaway, for example Apple Incorporation.

It is relevant to compare the performance of stocks bought and sold by Berkshire Hathaway with the performance of the technological stocks in the United States since it may be less risky to invest in the more diversified portfolio with a focus on technological stocks in the United States. It functions as a proxy for the U.S. economy.

3.6 Monthly data

The 13F filings publish the portfolio holdings at the end of every quarter. When comparing these, it is possible to determine changes in the portfolio made during that quarter. It is however not possible to determine at what exact date the transactions are made. Therefore, the difference is tested between the period before the transaction, starting from 2010, up until the transaction and after the transaction. The period after the transaction is divided into two periods, namely the first year after the transaction and the period from the transaction up until present, second quarter 2019.

Because Berkshire Hathaway usually invests for the long term, this paper looks not only into the short term but also into the long term effects. This makes an event study feasible when using monthly data. Quarterly data would not give enough data points in order to create reliable regressions, therefore monthly data is being used. Research concludes that the use of monthly data in combination with the market model, see CAPM, is well-specified and powerful under a wide variety of conditions (Brown & Warner, 1980).

3.7 Capital Asset Pricing Model

The Capital Asset Pricing Model, CAPM, describes the relationship between systematic risk and expected returns, see Figure 2 in the Appendix. It implies that only a higher risk taken by an investor is accompanied by a higher return.

CAPM was introduced by Sharpe in 1964 and later used by Jensen to determine Jensen's Alpha. Jensen's Alpha is a performance measure for investments.

CAPM is based on the following formula:

$$ER_i = \alpha_i + R_f + ß(R_M - R_f) + \epsilon_i$$

ER_I = Expected returns for stock *i*

α_i = Abnormal Returns, or Alpha

R_f = Risk Free rate

ß = Beta (the correlation to the market portfolio)

R_M = Expected returns on the market portfolio

u_i = Error term

According to the EMH α_i is expected to be zero, because all available information is incorporated in the share price (Jensen, 1968). Since almost every stock has some sort of relationship, positive or negative, with the average stock market, the beta is almost never zero. Research suggest however that

beta is not constant over time. Historical industry averages have no predictive value and should not be used when own historical stock returns are not available (Levi & Welch, 2017). My paper looks however backwards and therefore the realized betas are known which can be used in the analysis for abnormal returns. Also, the time varying betas are captured in the panel data analysis. The error term is expected to be zero over a longer period of time.

CAPM is one of the simplest models to use for an event study. CAPM is a true theoretical model resulting from reasoning from a set of assumptions. It is a powerful tool in estimating future returns and it is widely used as part of event studies (Armitage, 1995) and (Dimson & Marsh, 1984).

CAPM is however heavily subjected to various assumptions, namely:

- All investors try to maximize economic utilities
- Investors are rational and risk-averse
- Portfolios are broadly diversified
- Investors ae price takers
- Investors can lend and borrow unlimited against the risk free rate
- No transaction costs
- Investors can buy divisible stocks
- All investors have the same information at the same time
- Past standard deviation is a good forecaster for future risk

The first assumption may seem obvious, however, not all investors focus on only returns. For example, there is more and more emphasis on socially responsible investing in the global stock market (Mackenzie, 2002), (Cortez, Silva, & Areal, 2011) and (Scholtens, 2014).

The second assumption states that investors, however, this is not always the case. Many investors are subject to several behavioral finance heuristics, under which representativeness, loss aversion, overconfidence and regret aversion (Singh, 2012) and (La Blanc & Rachlinski, 2005).

The third assumption states a well-diversified portfolio. This assumption is subjected to a lot of debate. The widely accepted notion says an investment portfolio is diversified when it contains at least ten stocks. Research shows a well-diversified portfolio of a borrowing investor contains at least 30 stocks and 40 stocks for a lending investor (Statman M. , 1987). Because this paper only looks into the performance of one stock at a time, this assumption is superfluous.

The fourth assumption means that investors are price takers and cannot change the price of stock by, for example, applying buying pressure.

The risk free rate is represented in Figure 1 Appendix A. The fifth assumption says an investor can lend and borrow unlimitedly against the risk free rate. This is obviously an unrealistic assumption, since the bank is not going to lend an unlimited amount of money to anyone. However, borrowing to buy stocks is usually not relevant. Ultimo 2018, Berkshire Hathaway held 27,5 billion USD in cash and cash equivalents (Berkshire Hathaway, 2018). This includes U.S. treasury bill with a maturity of less than three months.

The seventh assumption means that it is possible to buy parts of a stock, for example $1/5^{th}$ or $3/7^{th}$.

The eighth assumption is in accordance with the strong form of the Efficient Market Hypothesis. No investor has inside information and therefore no one can earn excess returns on the available information. This is why the α is expected to be zero.

The ninth assumption is not taken into account in this research, because attention can be drawn to a stock after Berkshire Hathaway bought or sold it. A stock may be unnoticed for a long time and have therefore a low correlation, beta, with the market. After Berkshire Hathaway made a transaction, the attention can again be drawn to a stock and therefore influence the volume and beta of that stock. Because it is not taken into account, a new regression is made based on the new correlation with the stock market after the transaction.

3.8 White test

To generate Ordinary Least Square (OLS) regressions I will make use of the statistical model STATA. The White test is a test for robustness in statistical economics. It is used to test for heteroscedasticity errors in a regression to assess whether robust standard errors are needed. Heteroscedasticity is the presence of non-constant standard errors which is a criterion of OLS regressions. The use of robust standard errors may have an impact on the significance of the variables, because when using the robust command in STATA the P value of variables differs from a regression without constant standard errors. Robust standard errors should be used when the White test is not significant (White, 1980). As in the rest of this paper a significance level of 5% will be used ($P < 0,05$).

3.9 Methods

The used methods will be divided into two parts, namely a cross section which gives a general statement about the performance of stocks bought/sold by Berkshire Hathaway over the test period. The second method is a time series analysis of panel data.

3.9.1 Cross section

The first method is a cross section. This gives a general view of the transition in the stock performance before and after a transaction made by Berkshire Hathaway. It is a method which compares a particular stock to other stocks or indices as benchmarks. It focuses on more companies at once over a focused

time period. This gives insight into whether a transaction made by Berkshire Hathaway makes a difference in the performance of stocks, but not necessarily in which stock. This method is based on one regression for all stocks and gives one difference between the time periods (Kolari & Pynnönen, 2010).

3.9.2 Panel data

The second approach is much more in depth and looks at every individual stock. This is called panel data. Panel data looks at which stocks do perform better or worse after the transaction that before the transaction. This gives however no insight into a complete effect, but an insight in which individual stocks changed in performance. For every stock, three regressions are required, namely one before the transaction, starting on 01.01.2010 and two after the transaction, depending on the time frame (Allison, 1994).

3.10 Descriptive statistics

Table 3: Descriptive statistics

Company Name	Data availability	Mean monthly return	Standard Deviation	Min return	Max return
American Airlines Group Inc.	01/01/2014 - 31/03/2019	0,69%	10,29%	-19,55%	34,50%
Apple, Inc.	01/01/2010 - 31/03/2019	1,95%	9,79%	-17,36%	19,35%
AT & T, Inc.	01/01/2010 - 31/03/2019	0,67%	4,71%	-13,13%	12,24%
Axalta Coating Systems Ltd.	01/12/2014 - 31/03/2019	0,26%	6,76%	-12,95%	15,16%
Bank of America Corp.	01/01/2010 - 31/03/2019	1,07%	9,87%	-30,09%	32,37%
Bank of New York Mellon Corp. (The)	01/01/2010 - 31/03/2019	0,79%	7,04%	-7,04%	14,77%
Charter Communications, Inc.	01/01/2010 - 31/03/2019	2,30%	7,63%	-14,09%	20,74%
Conoco Phillips	01/01/2010 - 31/03/2019	0,92%	7,26%	-17,33%	18,91%
Deere & Co.	01/01/2010 - 31/03/2019	1,33%	7,44%	-22,27%	21,66%
Delta Air Lines, Inc.	01/01/2010 - 31/03/2019	1,89%	9,66%	-17,00%	34,73%
DTE Energy Company	01/01/2010 - 31/03/2019	1,35%	4,09%	-11,10%	9,80%
Express Scripts Holding Co.	01/01/2010 - 31/12/2018	0,96%	7,16%	-23,11%	23,69%
Exxon Mobil Corp.	01/01/2010 - 31/03/2019	0,46%	5,39%	-16,04%	15,15%
General Electric Co.	01/01/2010 - 31/03/2019	0,18%	7,88%	-20,76%	34,61%
International Business Machines Corp.	01/01/2010 - 31/03/2019	0,39%	5,67%	-23,64%	17,97%
Kinder Morgan, Inc.	01/03/2011 - 31/03/2019	0,18%	7,18%	-33,45%	20,64%
Kraft Heinz Company	01/08/2015 - 31/03/2019	-1,59%	7,89%	-32,16%	10,97%
Lee Enterprises, Inc.	01/01/2010 - 31/03/2019	1,55%	19,92%	-51,69%	90,13%
Liberty Broadband Corporation	01/12/2014 - 31/03/2019	1,44%	7,55%	-14,82%	21,38%

Liberty Global plc LiLAC Class A	01/07/2015 - 31/12/2017	-2,88%	11,40%	-29,08%	16,84%
Liberty Global plc LiLAC Class C	01/07/2015 - 31/12/2017	-3,21%	12,62%	-39,15%	18,42%
Liberty Media, Formula One Group Series A	01/02/2013 - 31/03/2019	1,47%	7,58%	-16,34%	36,18%
Liberty Media, Formula One Group Series C	01/08/2014 - 31/03/2019	1,68%	8,14%	-17,83%	35,21%
Liberty Media, Sirius XM Group Series A	01/05/2016 - 31/03/2019	0,43%	6,51%	-10,94%	12,58%
Liberty Media, Sirius XM Group Series C	01/05/2016 - 31/03/2019	0,46%	6,48%	-10,98%	12,15%
National Oilwell Varco, Inc.	01/01/2010 - 31/03/2019	0,05%	9,91%	-23,84%	36,13%
NOW Inc.	01/06/2014 - 31/03/2019	-0,99%	11,09%	-24,66%	27,20%
Phillips 66	01/05/2012 - 31/03/2019	1,57%	7,10%	-13,97%	18,18%
Precision Castparts Corporation	01/01/2010 - 31/01/2016	1,25%	6,41%	-14,46%	22,15%
Procter & Gamble Co. (The)	01/01/2010 - 31/03/2019	0,82%	3,78%	-9,82%	12,73%
Restaurant Brands International Inc.	01/01/2015 - 31/03/2019	1,37%	7,22%	-14,08%	19,72%
Sirius XM Holdings Inc.	01/01/2010 - 31/03/2019	2,45%	10,25%	-17,86%	46,68%
Southwest Airlines Co.	01/01/2010 - 31/03/2019	1,69%	8,54%	-17,42%	22,91%
STORE Capital Corp.	01/12/2014 - 31/03/2019	1,53%	5,92%	-13,47%	15,84%
Suncor Energy Inc.	01/01/2010 - 31/03/2019	0,41%	8,27%	-24,60%	26,75%
Synchrony Financial	01/08/2014 - 31/03/2019	1,09%	8,39%	-18,98%	27,45%
Teva Pharmaceutical Industries Ltd.	01/01/2010 - 31/03/2019	-0,78%	10,43%	-49,81%	27,76%
Torchmark Corp.	01/01/2010 - 31/03/2019	1,54%	5,16%	-13,89%	17,45%
Twenty-First Century Fox, Inc.	01/01/2010 - 31/03/2019	1,61%	7,52%	-22,63%	27,59%
United Continental Holdings, Inc.	01/01/2010 - 31/03/2019	2,12%	10,28%	-26,79%	41,40%
Verizon Communications, Inc.	01/01/2010 - 31/03/2019	1,06%	4,91%	-11,68%	14,48%
Viacom, Inc.	01/01/2010 - 31/03/2019	0,54%	8,58%	-28,05%	18,66%
Visa, Inc.	01/01/2010 - 31/03/2019	1,97%	5,35%	-19,80%	15,02%
Wabco Holdings, Inc.	01/01/2010 - 31/03/2019	1,90%	9,55%	-26,43%	33,10%
Walmart, Inc.	01/01/2010 - 31/03/2019	0,90%	4,80%	-15,58%	13,03%

The descriptive statistics are relevant in this research because they address some limitations. Not all stocks are traded on the same time period. This is because of the fact that not all companies had a

listing on a stock index on 01.01.2010. Some stocks were even bought right before the listing, meaning there is no period prior to the transaction. A control period is also not necessary because of the Efficient Market Hypothesis which states that abnormal returns do not exist. Therefore the most relevant period is the test period. In the regression results in the panel data analysis, these stocks are added later and therefore the regressions are made on a shorter time period before the transaction was made by Berkshire Hathaway.

4 Results

This section is divided into two parts, namely the cross section analysis and the panel data analysis.

4.1 Cross section

The tables below show the output of the regression using cross sectional analysis. It represents the average beta of the total portfolio, the return difference for each stock, the performance difference for the short term after the transaction, the performance difference for the long term after the transaction, the corresponding R^2 and the results of the White test.

This section is divided into two parts, namely one for buying and one for selling decisions. Each section is divided into four parts, namely one for each benchmark.

4.1.1 Buying decisions

Table 4: Buying decisions

Buying decisions				
	MSCI	**Standard & Poors 500**	**Dow Jones Industrial Average**	**Nasdaq**
Beta	0,976***	0,987***	0,944***	0,822***
Short term performance difference	0,008**	0,008**	0,008**	0,006*
Long term performance difference	-0,004	-0,003	-0,005	-0,004
American Airlines Group Inc.	-0,008	-0,008	-0,008	-0,008
Apple Inc.	0,002	0,002	0,003	0,003
AT&T	-0,010	-0,011	-0,010	-0,010
Axalta Coating Systems Ltd.	-0,011	-0,011	-0,010	-0,011
Bank of America Corp.	-0,007	-0,007	-0,007	-0,007
Bank of New York Mellon Corp. (The)	-0,009	-0,010	-0,009	-0,009
Charter Communications, Inc.	0,006	0,005	0,006	0,006
Deere & Co	-0,003	-0,004	-0,003	-0,003

Delta Air Lines, Inc.	0,002	0,001	0,002	0,002
DTE Energy Company	-0,003	-0,004	-0,002	-0,003
Express Scripts Holding Co.	-0,007	-0,008	-0,006	-0,007
Kinder Morgan , Inc.	-0,014	-0,015	-0,014	-0,014
Kraft Heinz Company	-0,030**	-0,030**	-0,030**	-0,029**
Liberty Broadband Corporation	0,001	0,001	0,002	0,001
Liberty Global plc LiLAC Class A	-0,032***	-0,033***	-0,033***	-0,033***
Liberty Global plc LiLAC Class C	-0,035***	-0,035***	-0,035***	-0,035***
Liberty Media, Formula One Group Series A	-0,001	-0,002	-0,001	-0,002
Liberty Media, Formula One Group Series C	0,003	0,002	0,003	0,002
Liberty Media, Sirius XM Group Series A	-0,012	-0,013	-0,012	-0,013
Liberty Media, Sirius XM Group Series C	-0,012	-0,012	-0,012	-0,013
Phillips 66	-0,001	-0,001	0,001	-0,000
Precision Castparts Corporation	-0,008	-0,009	-0,008	-0,008
Restaurant Brands International Inc.	0,000	0,000	0,001	0,000
Sirius XM Holdings Inc.	0,007	0,007	0,007	0,007
Southwest Airlines Co.	-0,000	-0,001	0,000	-0,000
Suncor Energy Inc.	-0,013	-0,013	-0,012	-0,012
Synchrony Financial	-0,004	-0,005	-0,005	-0,005
Teva Pharmaceutical Industries Ltd.	-0,025**	-0,026**	-0,025**	-0,025**
Torchmark Corp.	-0,001	-0,002	-0,000	-0,001
Twenty-First Century Fox, Inc.	-0,002	-0,003	-0,001	-0,002
United Continental Holdings, Inc.	0,004	0,004	0,004	0,004
Visa, Inc.	0,003	0,003	0,004	0,003
Constant	0,010	0,007	0,007	0,007
Adjusted R^2	0,241	0,254	0,232	0,244
White test	0,000	0,000	0,000	0,000

* *Significant at 10% level*
** *Significant at 5% level*
*** *Significant at 1% level*

All four regressions have a significant outcome in the White Test, meaning there is no correction needed for heteroscedasticity.

4.1.1.1 MSCI

The results above show a beta of 0,976, which is close to the market index, the MSCI in this case. The constant is not significant and therefore there are no abnormal returns before the transaction. Most stocks have no significant abnormal returns on their own after correcting for the transaction. The short term performance difference is positive and significant. This is according to expectations. The long term performance difference is negative, however, this is not significant and has therefore no statistical meaning, this is still in contrast with expectations. I expected a positive performance difference.

4.1.1.2 Standard & Poor's 500

The results above show a beta of 0,987, which is also close to the market index, the Standard & Poor's 500 in this case. The constant is not significant and therefore there are no abnormal returns before the transaction. Most stocks have no significant abnormal returns on their own after correcting for the transaction. There is a positive abnormal return performance difference in the short term after the transaction, which was one year. This is according to expectations. The long term return performance difference is negative, however, this coefficient is not significant, therefore it has no statistical meaning. This is however still in contrast with expectations.

4.1.1.3 Dow Jones Industrial Average

The same results apply when comparing with the Dow Jones Industrial Average. The beta is 0,944, which is close to the market index. The constant is not significant and therefore there are no abnormal returns before the transaction. Most stock have no abnormal returns on their own after correcting for the transaction. There is a positive abnormal return performance difference in the short term after the transaction, which was one year. This is according to expectations. The long term return performance difference is negative, however, this coefficient is not significant, therefore it has no statistical meaning. This is however in contrast with expectations.

4.1.1.4 Nasdaq Composite Index

Quite different results are found when comparing with the Nasdaq Composite Index. The beta is 0,822, which is lower than the other benchmarks. This may be because the Nasdaq mainly focuses on technology stocks. The Adjusted R^2 is however not lower than other benchmarks and therefore the model has the same explanatory value as when compared to the other benchmarks. The constant is not significant and therefore there are no abnormal returns before the transaction. Most stock have

no abnormal returns on their own after correcting for the transaction. There is a positive abnormal return performance difference in the short term. This is however not significant and has therefore no statistical meaning. The same applies to the long term performance difference. This is negative, however, this is not significant either.

4.1.2 Selling decisions

Table 5: Selling decisions

Selling decisions				
	MSCI	**Standard & Poors 500**	**Dow Jones Industrial Average**	**Nasdaq**
Beta	1,056***	1,067***	1,063***	0,825***
Short term performance difference	-0,019***	-0,018***	-0,020***	-0,019***
Long term performance difference	-0,000	0,001	-0,001	-0,000
Conoco Phillips	0,006	0,006	0,007	0,007
Deere & Co.	0,010	0,011	0,011	0,011
DTE Energy Company	0,011	0,011	0,011	0,011
Exxon Mobil Corp.	0,002	0,002	0,002	0,002
General Electric Co.	-0,001	-0,001	-0,001	-0,001
International Business Machines Corp.	0,001	0,001	0,001	0,001
Lee Enterprises, Inc.	0,013	0,013	0,013	0,013
National Oilwell Varco, Inc.	-0,002	-0,002	-0,002	-0,002
NOW Inc.	-0,009	-0,009	-0,009	-0,009
Procter & Gamble Co. (The)	0,005	0,005	0,006	0,006
Suncor Energy Inc.	0,001	0,001	0,002	0,002
Twenty-First Century Fox, Inc.	0,012	0,012	0,012	0,012
Verizon Communications, Inc.	0,008	0,008	0,008	0,008
Viacom, Inc.	0,003	0,003	0,003	0,003
Wabco Holdings, Inc.	0,016	0,016	0,016	0,016
Walmart, Inc.	0,006	0,006	0,006	0,006
Constant	-0,003	-0,007	-0,006	-0,006
Adjusted R^2	0,240	0,246	0,235	0,204
White test	0,000	0,000	0,000	0,000

* *Significant at 10% level*
** *Significant at 5% level*
*** *Significant at 1% level*

All four regressions have a significant outcome in the White Test, meaning there is no correction needed for heteroscedasticity.

4.1.2.1 MSCI

Almost the same results apply to the selling decisions as to the buying decisions. The beta is however slightly higher. The constant is not significant and therefore the stocks have no abnormal returns before the sell decision. Also, all the individual stocks have no significant abnormal returns after correcting for the transaction. The short term return performance difference is negative and significant. This means a worse performance in the year after the transaction than before the transaction, which is according to expectations. The long term performance difference is slightly negative, however, it is not significant and has therefore no statistical meaning.

4.1.2.2 Standard & Poor's 500

Again, similar results are found when comparing with the Standard & Poor's 500 index. The beta is slightly higher than the market index. The constant is not significant and therefore the stocks have no abnormal returns before the sell decision. Also, all the individual stocks have no significant abnormal returns after correcting for the transaction. The short term return performance difference is negative and significant. This means a worse performance in the year after the transaction than before the transaction, which is according to expectations. The long term performance difference is slightly positive, however, it is not significant and has therefore no statistical meaning.

4.1.2.3 Dow Jones Industrial Average

Comparable results are found when comparing with the Dow Jones Industrial Average as to the MSCI. The beta is again slightly higher than 1. The constant is not significant and therefore the stocks have no abnormal returns before the sell decision. Also, all the individual stocks have no significant abnormal returns after correcting for the transaction. The short term return performance difference is negative and significant. This means a worse performance in the year after the transaction than before the transaction, which is according to expectations. The long term performance difference is slightly negative, however, it is not significant and has therefore no statistical meaning.

4.1.2.4 Nasdaq Composite Index

Similar results are also found when comparing with the Nasdaq. However, the beta is 0,825, which is lower than the other benchmarks. This may, again, be because the Nasdaq mainly focuses on technology stocks. The Adjusted R^2 is however not lower than other benchmarks and has therefore the model has the same explanatory value as when compared to the other benchmarks. The constant is not significant and therefore there are no abnormal returns before the transaction. Most stock have no abnormal returns on their own after correcting for the transaction. The short term return performance difference is negative and significant. This means a worse performance in the year after the transaction than before the transaction, which is according to expectations. The long term performance difference is slightly negative, however, it is not significant and has therefore no statistical meaning.

4.2 Panel data

This section looks into which stocks do perform better or worse after the transaction than before the transaction. This section, too, is divided into two parts, namely one for buying decisions and one for selling decisions.

These two sections are again divided into four parts, namely one for each benchmark. The regression results are for clarity reasons included in Table 1 to Table 8 in Appendix B. Below is the interpretation of the regression results discussed. Also is discussed whether the results are according to expectations. The tables in Appendix B represent the selected stocks, the different time frames, the abnormal returns (Alpha), the corresponding beta, the R^2 and the results of the White test.

A summary of the regression results is shown in the following two tables. The first table represents all results of the buy decisions. The second table represents all results of the sell decisions. All possible transitions are included in the tables. The tables can be read as follows: The first 6 rows represent the abnormal returns, positive or negative, before the transaction, one year after the transaction (useful for the hypothesis for the short term) and from the transaction up until second quarter 2019 (useful for the hypothesis for the long term). The rows below that represent the transitions between time periods which happened for the stocks. For example: 'From zero to positive within the first year' (row 13) means that a stock did not have significant abnormal returns before the transaction was made, but did have significant positive abnormal returns in the first year after the transaction.

4.2.1 Buy decisions

Table 6: Regression results buy decisions

Transition	MSCI	Standard & Poor's 500	Dow Jones Industrial Average	Nasdaq
Positive before transaction	5	1	1	2
Negative before transaction	-	1	-	-
Positive after transaction within a year	-	-	-	1
Negative after transaction within a year	1	1	-	1
Positive after transaction up until present	3	2	2	2
Negative after transaction up until present	-	-	-	1
From positive to positive within first year	-	-	-	-
From positive to negative within first year	-	-	-	-
From positive to zero within first year	5	1	1	2
From negative to positive within first year	-	-	-	-
From negative to negative within first year	-	-	-	-
From negative to zero within first year	-	1	-	-

From zero to positive within first year	-	-	-	1
From zero to negative within first year	1	1	-	1
From zero to zero within first year	38	41	43	40
From positive to positive up until present	2	-	-	-
From positive to negative up until present	-	-	-	-
From positive to zero up until present	3	1	1	2
From negative to positive up until present	-	-	-	-
From negative to negative up until present	-	-	-	-
From negative to zero up until present	-	1	-	-
From zero to positive up until present	1	2	2	2
From zero to negative up until present	-	-	-	1
From zero to zero up until present	38	40	41	39

My expectations can be found in section three Data & Methodology.

4.2.1.1 MSCI

Based on the regression results, the performance of the stocks was within the first year after the transaction in contrast to expectations when compared to the MSCI world index as a benchmark. All five stocks went from positive abnormal returns to no abnormal returns. One stock even went from no abnormal returns before the transaction to negative abnormal returns after the acquisition. This stock "recovered" fortunately to no abnormal returns up until present.

On the longer run, three stocks performed significantly better than the MSCI world index. Two of these stocks were however stocks that already outperformed the MSCI world index prior to the transaction. These stocks had no outperformance within the first year after the transaction, indicating the buy and hold strategy Berkshire Hathaway utilizes. Only one stock behaved according to expectations. It did not outperform the MSCI world index before Berkshire Hathaway bought the stock, but did outperform after the purchase.

Most stocks, namely 38 out of 44, did not outperform the MSCI world index prior to the transaction as well as after the transaction. This is as expected by the semi strong form of the Efficient Market Hypothesis.

4.2.1.2 Standard & Poor's 500

Similar observations are made when looking at the performance of stocks compared to the Standard & Poor's 500 index. Most stocks, 42 out of 44, did not outperform the S&P500 index before the acquisition by Berkshire Hathaway.

The single stock that did outperform the S&P500 index before the acquisition, did not outperform the index anymore within the first after the transaction, which is in contrast with expectations. The single stock that performed significantly worse than the S&P500, however, went to no abnormal returns within the first year after the transaction. No outperformance is according the expectations based on the Efficient Market Hypothesis and the transition is according to expectations of this research, because the stock did perform better after the purchase. One stock, however, went from no abnormal returns, neither positive nor negative, to underperforming the S&P500 after the transaction. This is in contrast to expectations.

On the longer timeframe, from the transaction up until now, the stock that performed better than the S&P500 index before the transaction remained without abnormal returns on the long run. The same applies to the stock that performed worse before the transaction. This stock also had no abnormal returns on the long run anymore. Lastly, two stocks went from no abnormal returns before the transaction to outperformance on the long run, again emphasizing the buy and hold strategy Berkshire Hathaway utilizes.

Again, most stocks, 40 out of 44, did no better nor worse compared to S&P500 index before the transaction as well as after the transaction.

4.2.1.3 Dow Jones Industrial Average

This may be the least representative benchmark since its main focus is on industrial companies. However, it was created as a proxy for the American economy and since all discussed stocks are of American based companies, this comparison may be relevant.

Only one stock performed better compared to the Dow Jones Industrial Average ("Dow Jones") before Berkshire Hathaway bought it. This stock did however not outperform the Dow Jones within the first year after the transaction anymore. Again, most stocks remained without abnormal returns before as well as after the transaction.

On the longer run, the stock that outperformed the Dow Jones before the transaction remained without abnormal returns after the transaction. This was already the case within the first year after the transaction. Two stocks, however, went from no abnormal returns to outperformance on the long run, again indicating the buy and hold strategy.

4.2.1.4 Nasdaq Composite Index

Also when compared with the Nasdaq Composite Index ("Nasdaq") similar observations are made. Only two stocks performed significantly better than the Nasdaq before the transaction. These same two stocks made no abnormal returns within the first year after the transaction, indicating a worse performance after the purchase. One stock went from no abnormal returns to outperformance within

the first year after the transaction. Another stock, however, went from no abnormal returns before the transaction to underperformance within the first year after the purchase.

The same two stocks that performed significantly better before the transaction, had no outperformance after the transaction. This effect already happened within the first year after the transaction. Two stocks went from no abnormal returns to outperformance on the long run and one stock that went from no abnormal returns to underperformance on the long run. The rest of the stocks, 39 out of 44, remained the same before as well as after the transaction, meaning no abnormal returns.

4.2.2 Sell decisions

Table 7: Regression results sell decisions

Transition	MSCI	Standard & Poor's 500	Dow Jones Industrial Average	Nasdaq
Positive before transaction	1	-	1	1
Negative before transaction	-	-	-	-
Positive after transaction within a year	-	-	-	-
Negative after transaction within a year	1	1	1	1
Positive after transaction up until present	-	-	-	-
Negative after transaction up until present	1	-	-	1
From positive to positive within first year	-	-	-	-
From positive to negative within first year	-	-	-	-
From positive to zero within first year	1	-	1	1
From negative to positive within first year	-	-	-	-
From negative to negative within first year	-	-	-	-
From negative to zero within first year	-	-	-	-
From zero to positive within first year	-	-	-	-
From zero to negative within first year	1	1	1	1
From zero to zero within first year	16	17	16	16
From positive to positive up until present	-	-	-	-
From positive to negative up until present	-	-	-	-
From positive to zero up until present	1	-	1	1
From negative to positive up until present	-	-	-	-
From negative to negative up until present	-	-	-	-
From negative to zero up until present	-	-	-	-
From zero to positive up until present	-	-	-	-
From zero to negative up until present	1	-	-	1
From zero to zero up until present	16	18	17	16

My expectations can be found in section three Data & Methodology.

4.2.2.1 MSCI

Again, when comparing the performance of the stocks sold by Berkshire Hathaway with the MSCI world index, most results are in contrast with the expectations. Only one stock out of eighteen outperformed the MSCI before the transaction. According to expectations, this stock went from positive abnormal returns to no abnormal returns within the first year after the transaction, indicating a worse performance after Berkshire Hathaway sold the stock. Another stock went, again according to expectations, from no abnormal returns to underperformance. The other sixteen stocks remained without any abnormal returns.

The same results apply for the longer term results. The same stock that went from outperformance before the transaction to no abnormal returns within the first year after the transaction remained without abnormal returns on the longer term. Also, the same stock that went from no abnormal returns before the transaction to underperformance after the transaction, kept underperforming compared to the MSCI on the long run. The rest of the stocks remained also on the longer term without abnormal returns.

4.2.2.2 Standard & Poor's 500

Only one transition happens when comparing these stocks with the S&P500, namely one stock went from no abnormal returns to underperformance within the first year after the transaction, which is in accordance with expectations. The other seventeen stocks remained without abnormal returns within the first year after the transaction. Even eighteen stocks remained without abnormal returns on the longer run.

4.2.2.3 Dow Jones Industrial Average

Similar things are observed when comparing the stock selection with the Dow Jones. Only one stock outperformed the Dow Jones before the transaction and this stock went to no abnormal returns within one year after the transaction, which is in accordance with expectations. This stock remained without abnormal returns on the long run. Another stock went, also according to expectations, from no abnormal returns to underperformance within the first year after the transaction. This stock however recovered to no underperformance on the long run.

The other sixteen respectively seventeen stocks remained without abnormal returns within one year after the transaction and on the long run.

4.2.2.4 Nasdaq Composite Index

The same observations are made with the comparison with the Nasdaq as with the MSCI. Only one stock outperformed the Nasdaq before the transaction which went to no abnormal returns within the first year after the transaction. Also, one stock went from no abnormal returns before the transaction to underperformance within the first year after the transaction and remained performing significantly worse up until present. The remaining stocks had no significant effect when comparing before and after the transaction.

5 Conclusion

In this section I would like to address all the findings I made throughout this research. This research is however not without its limitations; these are discussed in section 6 along with some suggestions for follow up research.

When compared to four benchmarks on the basis of cross-section analysis I found a significant effect on the short term, but no significant effect on the long term. When compared to several benchmarks on the basis of panel data analysis, almost no transactions made a difference in the performance of the stocks. This is in contrast with the expectation where the purchase of a stock by Berkshire Hathaway would have a positive effect on the performance of the stock and a sale would have a negative effect on the performance of the stock. This did happen in some of the instances, however, not nearly enough to draw the conclusion that someone should base his investment strategy on following Berkshire Hathaway. All the hypotheses including the research question will be discussed below.

> *Research question: What is the stock price effect of buy/sell decisions made by Berkshire Hathaway over the period 01.07.2014 – 31.12.2017?*

In order to provide an answer to the stated research question, the findings and conclusions will be drawn on the following hypothesis.

> *What is the short term stock price effect of buy decisions made by Berkshire Hathaway over the period 01.07.2014 – 31.12.2017?*

The short term effect is addressed as a period of four quarters after the quarter when a transaction is made, so one year. Based on the cross-sectional analysis there exist a short term effect which improves performance after Berkshire Hathaway made an acquisition.

In the panel data, however, of all 44 stocks only one stock performed better the year after the transaction in comparison to the period before the transaction. The cross-sectional analysis assumes a constant beta over the control as well as the test period. This difference in conclusions can be due to

the change in beta after the transaction. This is too little evidence to conclude that buy transactions made by Berkshire Hathaway have an impact on these stocks. At least within one year after the transaction.

What is the short term stock price effect of sell decisions made by Berkshire Hathaway over the period 01.07.2014 – 31.12.2017?

The same conclusion can be drawn on the sell decisions made by Berkshire Hathaway. Using the cross sectional analysis, a decrease in performance is observed. However, in the panel data analysis, in three out of the four benchmarks only one stock showed a significantly worse performance after Berkshire Hathaway sold the stock than before it sold the stock. This again may be due to the change in beta over time. This too is too little evidence to conclude that a made sale has an impact on the performance of the sold stocks on the short term.

What is the long term stock price effect of buy decisions made by Berkshire Hathaway over the period 01.07.2017 – 31.12.2017?

On the long term, there is no clear pattern visible in the cross-sectional analysis as well as in the panel data analysis. The cross section gives no abnormal positive returns on the longer time frame when compared with any of the four benchmarks.

Using the panel data analysis, when comparing with the MSCI World index three stocks performed significantly worse after the purchase by Berkshire Hathaway and only one stock performed better after the purchase. When compared with the S&P500 the one stock that outperformed the index before the purchase, performed significantly worse after the purchase. Three stocks however showed a significant improvement in performance. Comparing with the Dow Jones Industrial Average resulted in one stock that performed significantly worse after the purchase and two stocks that performed better after the purchase. When comparing with the Nasdaq these numbers change to two respectively three stocks. Again, based on a total amount of 44 stocks, this gives too little evidence to conclude that a better performance on the long term can be expected after Berkshire Hathaway bought a stock.

What is the long term stock price effect of sell decisions made by Berkshire Hathaway over the period 01.07.2014 – 31.12.2017?

Similar conclusions can be drawn when looking at the results of sell transactions by Berkshire Hathaway. Again, there is no clear pattern visible in the cross-sectional analysis as well as in the panel data analysis. The cross section gives no abnormal positive returns on the longer time frame when compared with any of the four benchmarks.

Out of all eighteen stocks only two stocks showed a significantly worse performance after Berkshire Hathaway sold the stock when compared to the MSCI World Index using the panel data analysis. The same results were found when comparing with the Nasdaq Composite Index. When the stocks were compared with the S&P500, no stocks outperformed nor underperformed the S&P500 before Berkshire Hathaway sold it as well as after the transaction. Compared to the Dow Jones Industrial Average, one stock performed significantly worse after the sale than before the sale. All in all, this too gives too little evidence to conclude that a worse performance should be expected after Berkshire Hathaway sold a stock.

To draw an overall conclusion on the research question. Over the period 01.07.2014 up until 31.12.2017 Berkshire Hathaway bought and sold several stocks. Based on the cross sectional analysis, there is a clear pattern on the short term, but not on the long term. The short term gives positive abnormal returns after Berkshire Hathaway bought a stock and negative abnormal returns after it sold a stock. These transaction can therefore be interpreted as positive advice (undervalued) in case of a buy decision by Berkshire Hathaway and a negative advice (overvalued) in case of a sell decision. This applies however only on the short term, which is one year in this paper. On the long term however, these effects fade away.

Based on panel data analysis there is however too little evidence to conclude that these transactions had an impact on the performance of these stocks and the generated alpha using the cross sectional analysis may therefore be a result of the change in beta over the different time periods. It is therefore not wise to follow these transactions and mimic them for a personal portfolio. Instead, investing in a less risky broadly diversified index fund is recommended.

6 Limitations

This research is obviously not without its limitations. Below these limitations will be discussed.

The first and foremost limitation is the availability of accurate data on when transactions are made. 13F filings only list the holdings of a certain portfolio on specific times throughout history. By comparing these, it is possible to address the differences and therefore the made transactions in that particular quarter. It remains, however, unknown on what specific date (or dates) a transaction is made. Therefore, it may be possible that an effect occurred in the days around the transaction which are already captured in the quarter when the transaction happened. This should be the case according to the EMH, which states that market prices reflect all available information. If that is the case, it is invisible in this research, which only looks at complete quarters. When the exact trading date(s) are known, a proper event study would start ten days prior to the transaction and end ten days after. This would require daily returns.

A second limitation is the use of available data. Not all traded stocks were traded publicly, therefore not all traded stocks are included in this research. This makes the sample size smaller and also less reliable.

The third limitation is similar to the second. This is the stock exchange listing of several stocks. Not all stocks were listed as publicly traded stocks over the whole research period. Some stocks were not listed at the start of 2010 resulting in less data points making the regression period before the transaction smaller and therefore less reliable. The same applies to stocks that were delisted before the end of the first quarter of 2019. This makes the period after the transaction smaller, resulting in less data points and therefore making the regression less reliable. This risk is somewhat covered in the significance level of the regression and therefore not the biggest risk in this research.

A fourth limitation is the use of models. This research used a simple and highly used Capital Asset Pricing Model. Even though the literature supports this model in event studies there are more extensive models making use of more factors. Examples of these models are Fama & French three factor model and Carhart four factor model. These models include additional factors, making the returns more firm-specific. This limitation is therefore a suggestion for further research. Further research could make use of more models to compare the performance of stocks with relevant benchmarks, even though evidence suggests limited gains from using more extensive models.

A fifth limitation refers to the use of taxes. This research did not take taxes into account because it researches the difference in performance between stocks and their relevant benchmarks. Taxes have to be paid, however, on the capital gains of stocks as well as on the capital gains of their relevant benchmarks. Therefore, the results should be the same. Still, this limitation gives a suggestion for further research, which is incorporating taxes. Some countries treat capital gains and income gains differently.

The sixth, and last, limitation is about the use of transaction costs. The same argument as on the fifth limitation applies to this limitation. Transaction costs should be paid on particular stocks as well as on the acquisition of an index fund, therefore this should not affect the results. This is however with the same number of transactions. Especially with the buy and hold Berkshire Hathaway follows a broadly diversified index fund should be bought once and held into eternity. This is therefore the last suggestion for further research, taking transaction costs into account.

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8 Appendix A

MSCI World Index			
Developed Markets			
Americas	**Europe & Middle East**		**Pacific**
Canada	Austria	Norway	Australia
United States	Belgium	Portugal	Hong Kong
	Denmark	Spain	Japan
	Finland	Sweden	New Zealand
	France	Switzerland	Singapore
	Germany	United Kingdom	
	Ireland		
	Israel		
	Italy		
	Netherlands		

Figure 1: MSCI World Index

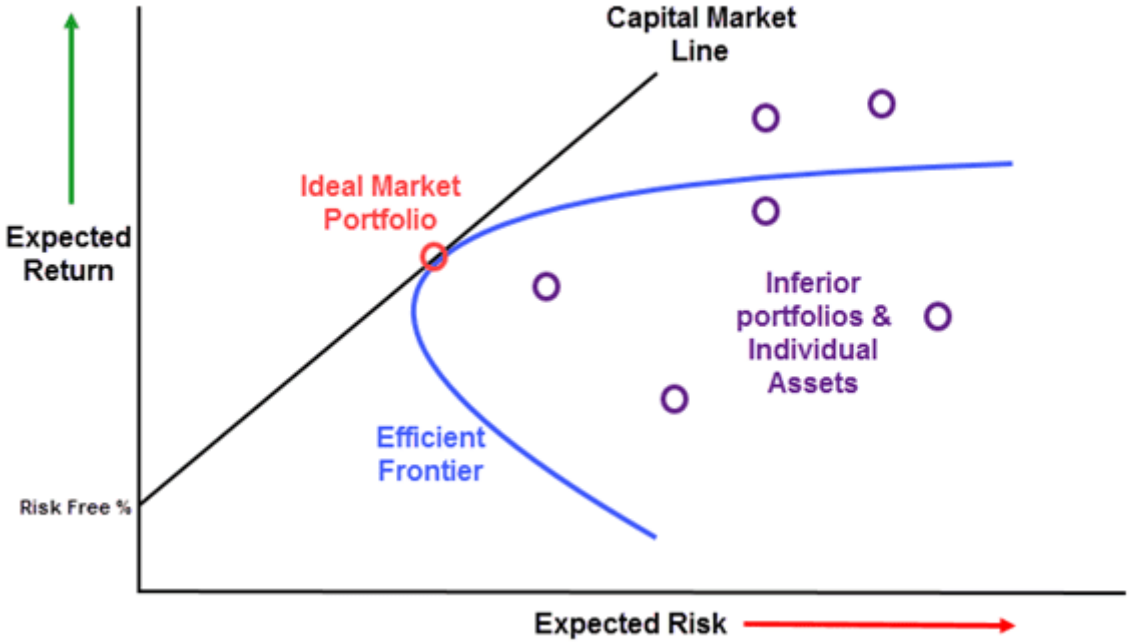

Figure 2: The Capital Asset Pricing Model

9 Appendix B

Table 1: Buy decisions compared to MSCI

Stock	α	β	(Adjusted) R^2	White test
Deere				
2010 - Q3 2014	-0,000	1,288***	0,535	0,432
Q4 2014 - Q3 2015	-0,002	1,440***	0,656	0,508
Q4 2014 - Q2 2019	0,007	1,170***	0,335	0,517
DTE Energy Company				
2010 - Q3 2014	0,011**	0,356***	0,178	0,716
Q4 2014 - Q3 2015	0,008	-0,074	0,002	0,052
Q4 2014 - Q2 2019	0,011**	0,159	0,015	0,334
Express Scripts Holding Co.				
2010 - Q3 2014	0,002	0,970***	0,334	0,067
Q4 2014 - Q3 2015	0,015	1,018***	0,483	0,574
Q4 2014 – Q4 2018	0,002	0,747***	0,160	0,879
Liberty Media, Formula One Group Series C				
2010 - Q3 2014	N/A	N/A	N/A	N/A
Q4 2014 - Q3 2015	0,005	1,029**	0,438	0,009
Q4 2014 - Q2 2019	0,011	1,033***	0,182	0,757
Liberty Broadband Corporation				
2010 - Q3 2014	N/A	N/A	N/A	N/A
Q4 2014 - Q3 2015	0,011	0,886	0,200	0,112
Q4 2014 - Q2 2019	0,008	1,152***	0,278	0,184
Torchmark Corporation				
2010 - Q3 2014	0,010**	1,034***	0,716	0,181
Q4 2014 - Q3 2015	0,011	0,949***	0,559	0,400
Q4 2014 - Q2 2019	0,005	0,970***	0,483	0,625
Twenty-First Century Fox, Inc.				
2010 - Q4 2014	0,008	1,207***	0,554	0,197
Q1 2015 - Q4 2015	-0,024*	2,000***	0,815	0,562
Q1 2015 - Q2 2019	0,004	0,753**	0,110	0,691
Precision Castparts Corporation				
2010 - Q4 2014	0,006	0,911***	0,427	0,273
Q1 2015 - Q4 2015	0,000	-0,619	0,110	0,150
Q1 2015 – Q1 2016	-0,002	-0,566	0,106	0,191

Stock	α	β	(Adjusted) R^2	White test
Restaurant Brands International Inc.				
2010 - Q4 2014	N/A	N/A	N/A	N/A
Q1 2015 - Q4 2015	0,000	1,772***	0,586	0,450
Q1 2015 - Q2 2019	0,006	1,335***	0,416	0,400
Visa Incorporation				
2010 - Q1 2015	0,013**	0,715***	0,279	0,035
Q2 2015 - Q1 2016	0,018	0,948***	0,553	0,612
Q2 2015 - Q2 2019	0,013***	1,040***	0,585	0,530
Axalta Coating Systems Ltd.				
2010 - Q2 2015	0,042	1,710**	0,390	0,263
Q3 2015 - Q2 2016	-0,014	1,409***	0,688	0,422
Q3 2015 - Q2 2019	-0,012*	1,277***	0,498	0,599
Liberty Broadband Corporation				
2010 - Q2 2015	-0,005	1,979	0,376	0,665
Q3 2015 - Q2 2016	0,014	0,742*	0,372	0,335
Q3 2015 - Q2 2019	0,009	1,092***	0,274	0,302
Phillips 66				
2010 - Q2 2015	0,016	1,193***	0,302	0,580
Q3 2015 - Q2 2016	0,004	0,897	0,349	0,299
Q3 2015 - Q2 2019	-0,001	0,954***	0,266	0,695
Twenty-First Century Fox, Inc.				
2010 - Q3 2015	0,003	1,311***	0,563	0,030
Q4 2015 - Q3 2016	-0,017	1,231*	0,445	0,084
Q4 2015 - Q2 2019	0,013	0,375	0,029	0,643
Liberty Media, Formula One Group Series A				
2010 - Q3 2015	0,000	1,270***	0,510	0,004
Q4 2015 - Q3 2016	0,034	1,319***	0,146	0,741
Q4 2015 - Q2 2019	0,011	0,960***	0,139	0,652
Liberty Media, Formula One Group Series C				
2010 - Q3 2015	0,004	1,096***	0,514	0,009
Q4 2015 - Q3 2016	0,039	1,307***	0,159	0,760
Q4 2015 - Q2 2019	0,013	1,019***	0,152	0,668

Stock	α	β	(Adjusted) R^2	White test
Kraft Heinz Company				
2010 - Q3 2015	N/A	N/A	N/A	N/A
Q4 2015 - Q3 2016	0,021	0,267	0,047	0,159
Q4 2015 - Q2 2019	-0,021*	0,787**	0,115	0,901
Liberty Global plc LiLAC Class A				
2010 - Q3 2015	-0,134	0,887	0,063	0,223
Q4 2015 - Q3 2016	-0,025	1,586***	0,252	0,396
Q4 2015 – Q4 2017	-0,034*	1,554***	0,162	0,558
Liberty Global plc LiLAC Class C				
2010 - Q3 2015	-0,183	0,247	0,003	0,223
Q4 2015 - Q3 2016	-0,025	1,603***	0,242	0,429
Q4 2015 – Q4 2017	-0,035	1,593***	0,156	0,611
Suncor Energy Inc.				
2010 - Q3 2015	-0,010	1,564***	0,583	0,363
Q4 2015 - Q3 2016	-0,006	1,602***	0,470	0,505
Q4 2015 - Q2 2019	-0,004	1,456***	0,478	0,668
AT & T, Inc.				
2010 - Q3 2015	0,004	0,506***	0,266	0,337
Q4 2015 - Q3 2016	0,025	-0,107	0,007	0,758
Q4 2015 - Q2 2019	-0,001	0,639***	0,165	0,444
Deere & Co.				
2010 - Q4 2015	-0,001	1,302***	0,561	0,415
Q1 2016 - Q4 2016	0,030	-0,067	0,001	0,457
Q1 2016 - Q2 2019	0,012	1,059***	0,238	0,486
Kinder Morgan, Inc.				
2010 - Q4 2015	-0,011	0,711***	0,159	0,737
Q1 2016 - Q4 2016	0,032	0,126	0,002	0,707
Q1 2016 - Q2 2019	0,005	0,922***	0,191	0,478
Apple, Inc.				
2010 - Q1 2016	0,015**	0,797***	0,242	0,897
Q2 2016 - Q1 2017	0,012	1,164	0,086	0,587
Q2 2016 - Q2 2019	0,007	1,126***	0,204	0,942

Stock	α	β	(Adjusted) R^2	White test
Liberty Media, Formula One Group Series A				
2010 - Q1 2016	0,000	1,291***	0,600	0,049
Q2 2016 - Q1 2017	0,042	0,886	0,018	0,633
Q2 2016 - Q2 2019	0,014	0,835**	0,085	0,618
Liberty Media, Formula One Group Series C				
2010 - Q1 2016	0,005	1,213***	0,728	0,194
Q2 2016 - Q1 2017	0,047	0,982	0,023	0,610
Q2 2016 - Q2 2019	0,015	0,912**	0,098	0,647
Charter Communications, Inc.				
2010 - Q2 2016	0,019***	0,884***	0,253	0,169
Q3 2016 - Q2 2017	0,011	1,428	0,144	0,886
Q3 2016 - Q2 2019	0,007	1,172***	0,243	0,942
Liberty Global plc LiLAC Class A				
2010 - Q2 2016	-0,036	1,770***	0,301	0,456
Q3 2016 - Q2 2017	-0,057	2,019	0,129	0,529
Q3 2016 – Q4 2017	-0,053*	2,050	0,103	0,712
Liberty Global plc LiLAC Class C				
2010 - Q2 2016	-0,044	1,700***	0,212	0,557
Q3 2016 - Q2 2017	-0,060	2,161	0,134	0,673
Q3 2016 – Q4 2017	-0,057*	2,285*	0,117	0,814
Liberty Media, Sirius XM Group Series A				
2010 - Q2 2016	N/A	N/A	N/A	N/A
Q3 2016 - Q2 2017	-0,011	2,465***	0,402	0,481
Q3 2016 - Q2 2019	-0,005	1,259***	0,390	0,435
Liberty Media, Sirius XM Group Series C				
2010 - Q2 2016	N/A	N/A	N/A	N/A
Q3 2016 - Q2 2017	-0,008	2,279**	0,371	0,534
Q3 2016 - Q2 2019	-0,004	1,233***	0,378	0,402
American Airlines Group Inc.				
2010 - Q3 2016	0,016	0,771	0,053	0,434
Q4 2016 - Q3 2017	0,001	1,569	0,092	0,493
Q4 2016 - Q2 2019	-0,017	1,559***	0,353	0,464

Stock	α	β	(Adjusted) R^2	White test
Delta Air Lines, Inc.				
2010 - Q3 2016	0,013	1,000***	0,162	0,392
Q4 2016 - Q3 2017	0,011	0,548	0,015	0,502
Q4 2016 - Q2 2019	0,004	1,051***	0,256	0,734
United Continental Holdings, Inc.				
2010 - Q3 2016	0,018	0,746***	0,081	0,658
Q4 2016 - Q3 2017	-0,004	1,283	0,048	0,753
Q4 2016 - Q2 2019	0,007	0,900***	0,153	0,770
Apple, Inc.				
2010 - Q4 2016	0,014	0,790***	0,216	0,818
Q1 2017 - Q4 2017	0,011	1,421	0,085	0,580
Q1 2017 - Q2 2019	0,009	1,179***	0,255	0,708
Southwest Airlines Co.				
2010 - Q4 2016	0,014*	0,979***	0,239	0,712
Q1 2017 - Q4 2017	-0,024	2,951*	0,211	0,807
Q1 2017 - Q2 2019	-0,010	1,677***	0,411	0,008
Sirius XM Holdings Inc.				
2010 - Q4 2016	0,020*	1,309***	0,235	0,646
Q1 2017 - Q4 2017	-0,029**	2,749***	0,405	0,097
Q1 2017 - Q2 2019	0,000	1,003***	0,324	0,908
Bank of New York Mellon Corp.				
2010 - Q1 2017	-0,000	1,279***	0,514	0,887
Q2 2017 - Q1 2018	-0,003	1,091**	0,311	0,268
Q2 2017 - Q2 2019	-0,008	1,171***	0,519	0,681
Liberty Media, Sirius XM Group Series A				
2010 - Q2 2017	-0,012	2,495***	0,438	0,357
Q3 2017 - Q2 2018	-0,002	1,458**	0,335	0,651
Q3 2017 - Q2 2019	-0,010	1,096***	0,425	0,580
Liberty Media, Sirius XM Group Series C				
2010 - Q2 2017	-0,010	2,320***	0,404	0,400
Q3 2017 - Q2 2018	0,000	1,421	0,317	0,672
Q3 2017 - Q2 2019	-0,010	1,085***	0,407	0,546

Stock	α	β	(Adjusted) R^2	White test
STORE Capital Corp.				
2010 - Q2 2017	0,009	0,192	0,008	0,988
Q3 2017 - Q2 2018	0,022	-0,614	0,075	0,049
Q3 2017 - Q2 2019	0,020**	0,147	-0,029	0,006
Synchrony Financial				
2010 - Q2 2017	0,006	0,932***	0,139	0,636
Q3 2017 - Q2 2018	-0,000	1,530***	0,486	0,660
Q3 2017 - Q2 2019	0,003	1,412***	0,338	0,050
Bank of America				
2010 - Q3 2017	-0,002	1,552***	0,358	0,402
Q4 2017 - Q3 2018	0,001	1,574**	0,566	0,303
Q4 2017 - Q2 2019	0,001	1,561***	0,766	0,667
Teva Pharmaceutical Industries				
2010 - Q4 2017	-0,010	0,580	0,065	0,665
Q1 2018 - Q4 2018	0,007	1,767*	0,328	0,182
Q1 2018 - Q2 2019	-0,028	2,323**	0,374	0,324

* *Significant at 10% level*
** *Significant at 5% level*
*** *Significant at 1% level*

Table 2: Sell decisions compared to the MSCI

Stock	α	β	(Adjusted) R^2	White test
ConocoPhillips				
2010 - Q3 2014	0,006	1,098***	0,572	0,670
Q4 2014 - Q3 2015	-0,031*	0,231	0,021	0,727
Q4 2014 - Q2 2019	-0,007	1,279***	0,308	0,806
Exxon Mobil Corp.				
2010 - Q4 2014	0,000	0,837***	0,560	0,987
Q1 2015 - Q4 2015	-0,010	1,115***	0,553	0,010
Q1 2015 - Q2 2019	-0,007	1,156***	0,473	0,403
National Oilwell Varco, Inc.				
2010 - Q1 2015	-0,006	1,655***	0,483	0,023
Q2 2015 - Q1 2016	-0,035	0,604	0,130	0,794
Q2 2015 - Q2 2019	-0,019	1,360***	0,263	0,952
Viacom, Inc.				
2010 - Q2 2015	0,004	1,183***	0,553	0,004
Q3 2015 - Q2 2016	-0,021	1,876*	0,335	0,344
Q3 2015 - Q2 2019	-0,016	1,259***	0,185	0,247
DTE Energy Company				
2010 - Q3 2015	0,011**	0,315***	0,106	0,754
Q4 2015 - Q3 2016	0,017	-0,016	0,000	0,888
Q4 2015 - Q2 2019	0,011*	0,212	0,034	0,639
Procter & Gamble Co.				
2010 - Q1 2016	0,005	0,358***	0,172	0,619
Q2 2016 - Q1 2017	0,002	0,570	0,102	0,513
Q2 2016 - Q2 2019	0,007	0,193	0,026	0,172
AT & T, Inc.				
2010 - Q1 2016	0,006	0,464***	0,232	0,144
Q2 2016 - Q1 2017	-0,001	0,986	0,092	0,413
Q2 2016 - Q2 2019	-0,007	0,839***	0,232	0,503
Suncor Energy Inc.				
2010 - Q2 2016	-0,009	1,595***	0,596	0,472
Q3 2016 - Q2 2017	0,025	-1,162	0,154	0,897
Q3 2016 - Q2 2019	-0,004	1,301***	0,399	0,727

Stock	α	β	(Adjusted) R^2	White test
Walmart, Inc.				
2010 - Q2 2016	0,005	0,258***	0,048	0,005
Q3 2016 - Q2 2017	-0,012	1,243**	0,282	0,458
Q3 2016 - Q2 2019	0,007	0,667*	0,167	0,154
Deere & Co.				
2010 - Q4 2016	0,003	1,223	0,471	0,518
Q1 2017 - Q4 2017	-0,012	2,974*	0,354	0,752
Q1 2017 - Q2 2019	0,005	1,320	0,384	0,442
NOW Inc.				
2010 - Q4 2016	-0,016	0,980*	0,095	0,806
Q1 2017 - Q4 2017	-0,109*	3,825	0,169	0,963
Q1 2017 - Q2 2019	-0,022	1,934***	0,327	0,354
Kinder Morgan, Inc.				
2010 - Q4 2016	-0,004	0,666***	0,120	0,630
Q1 2017 - Q4 2017	-0,012	0,163	0,002	0,427
Q1 2017 - Q2 2019	-0,005	1,107***	0,341	0,009
Lee Enterprises, Inc.				
2010 - Q4 2016	0,005	1,967***	0,139	0,220
Q1 2017 - Q4 2017	0,049	-3,710	0,192	0,795
Q1 2017 - Q2 2019	-0,008	1,051	0,092	0,224
Verizon Communications, Inc.				
2010 - Q4 2016	0,008	0,487***	0,167	0,397
Q1 2017 - Q4 2017	-0,018	1,304	0,089	0,253
Q1 2017 - Q2 2019	0,003	0,347	0,066	0,723
Twenty-First Century Fox, Inc.				
2010 - Q1 2017	0,004	1,274***	0,505	0,024
Q2 2017 - Q1 2018	0,007	0,601	0,035	0,695
Q2 2017 - Q2 2019	0,018	0,126	0,003	0,533
General Electric Co.				
2010 - Q2 2017	0,001	1,207***	0,541	0,895
Q3 2017 - Q2 2018	-0,058***	0,432	0,032	0,620
Q3 2017 - Q2 2019	-0,043**	1,392**	0,211	0,000

Stock	α	β	(Adjusted) R^2	White test
Wabco Holdings, Inc.				
2010 - Q2 2017	0,007	1,905***	0,599	0,259
Q3 2017 - Q2 2018	-0,024*	1,771***	0,643	0,457
Q3 2017 - Q2 2019	-0,004	1,318***	0,451	0,739
International Business Machines Corp.				
2010 - Q3 2017	-0,001	0,668***	0,282	0,924
Q4 2017 - Q3 2018	-0,001	0,837***	0,442	0,471
Q4 2017 - Q2 2019	-0,005	1,637***	0,679	0,098

* *Significant at 10% level*
** *Significant at 5% level*
*** *Significant at 1% level*

Table 3: Buy decisions compared to Standard & Poor's 500

Stock	α	β	(Adjusted) R^2	White test
Deere				
2010 - Q3 2014	-0,004	1,325***	0,521	0,126
Q4 2014 - Q3 2015	-0,007	1,343***	0,608	0,547
Q4 2014 - Q2 2019	0,005	1,101***	0,340	0,495
DTE Energy Company				
2010 - Q3 2014	0,009*	0,397***	0,204	0,879
Q4 2014 - Q3 2015	0,008	0,143	0,007	0,026
Q4 2014 - Q2 2019	0,010*	0,212	0,031	0,503
Express Scripts Holding Co.				
2010 - Q3 2014	-0,002	1,082***	0,382	0,004
Q4 2014 - Q3 2015	0,012	1,097***	0,597	0,415
Q4 2014 – Q4 2018	-0,000	0,832***	0,226	0,904
Liberty Media, Formula One Group Series C				
2010 - Q3 2014	N/A	N/A	N/A	N/A
Q4 2014 - Q3 2015	0,001	1,004**	0,496	0,062
Q4 2014 - Q2 2019	0,009	0,996***	0,194	0,709
Liberty Broadband Corporation				
2010 - Q3 2014	N/A	N/A	N/A	N/A
Q4 2014 - Q3 2015	0,009	0,907	0,204	0,152
Q4 2014 - Q2 2019	0,006	1,058***	0,266	0,238
Torchmark Corporation				
2010 - Q3 2014	0,006	1,115***	0,766	0,183
Q4 2014 - Q3 2015	0,007	0,931***	0,573	0,133
Q4 2014 - Q2 2019	0,003	0,921***	0,499	0,178
Twenty-First Century Fox, Inc.				
2010 - Q4 2014	0,005	1,291***	0,596	0,257
Q1 2015 - Q4 2015	-0,027**	1,951***	0,856	0,802
Q1 2015 - Q2 2019	0,003	0,770***	0,130	0,791
Precision Castparts Corporation				
2010 - Q4 2014	0,002	0,998***	0,464	0,027
Q1 2015 - Q4 2015	0,001	-0,456	0,066	0,059
Q1 2015 – Q1 2016	-0,000	-0,434	0,066	0,094

Stock	α	β	(Adjusted) R^2	White test
Restaurant Brands International Inc.				
2010 - Q4 2014	N/A	N/A	N/A	N/A
Q1 2015 - Q4 2015	-0,002	1,635***	0,551	0,289
Q1 2015 - Q2 2019	0,004	1,206***	0,386	0,392
Visa Incorporation				
2010 - Q1 2015	0,010	0,790***	0,320	0,014
Q2 2015 - Q1 2016	0,014	0,903***	0,539	0,684
Q2 2015 - Q2 2019	0,012***	0,935***	0,535	0,531
Axalta Coating Systems Ltd.				
2010 - Q2 2015	0,041	2,028**	0,558	0,544
Q3 2015 - Q2 2016	-0,021	1,356***	0,681	0,412
Q3 2015 - Q2 2019	-0,014*	1,122***	0,439	0,579
Liberty Broadband Corporation				
2010 - Q2 2015	-0,004	1,976	0,381	0,226
Q3 2015 - Q2 2016	0,011	0,725**	0,380	0,260
Q3 2015 - Q2 2019	0,008	0,997	0,261	0,346
Phillips 66				
2010 - Q2 2015	0,013	1,269***	0,333	0,442
Q3 2015 - Q2 2016	-0,001	0,991**	0,456	0,122
Q3 2015 - Q2 2019	-0,003	0,919***	0,281	0,833
Twenty-First Century Fox, Inc.				
2010 - Q3 2015	0,001	1,410***	0,619	0,050
Q4 2015 - Q3 2016	-0,019	1,164**	0,437	0,250
Q4 2015 - Q2 2019	0,012	0,427**	0,044	0,628
Liberty Media, Formula One Group Series A				
2010 - Q3 2015	-0,004	1,202***	0,503	0,031
Q4 2015 - Q3 2016	0,033	1,096*	0,111	0,800
Q4 2015 - Q2 2019	0,009	0,917***	0,149	0,629
Liberty Media, Formula One Group Series C				
2010 - Q3 2015	-0,001	1,049**	0,547	0,121
Q4 2015 - Q3 2016	0,038	1,082**	0,119	0,811
Q4 2015 - Q2 2019	0,011	0,981***	0,165	0,641

Stock	α	β	(Adjusted) R^2	White test
Kraft Heinz Company				
2010 - Q3 2015	N/A	N/A	N/A	N/A
Q4 2015 - Q3 2016	0,018	0,384	0,108	0,341
Q4 2015 - Q2 2019	-0,022*	0,775**	0,131	0,923
Liberty Global plc LiLAC Class A				
2010 - Q3 2015	-0,133	1,192	0,122	0,223
Q4 2015 - Q3 2016	-0,026	1,367**	0,205	0,433
Q4 2015 – Q4 2017	-0,029	1,017*	0,082	0,781
Liberty Global plc LiLAC Class C				
2010 - Q3 2015	-0,175	0,674	0,025	0,223
Q4 2015 - Q3 2016	-0,026	1,367**	0,193	0,496
Q4 2015 – Q4 2017	-0,030	1,043*	0,080	0,743
Suncor Energy Inc.				
2010 - Q3 2015	-0,014*	1,485***	0,492	0,229
Q4 2015 - Q3 2016	-0,010	1,592***	0,509	0,347
Q4 2015 - Q2 2019	-0,006	1,343***	0,477	0,841
AT & T, Inc.				
2010 - Q3 2015	0,002	0,529***	0,271	0,897
Q4 2015 - Q3 2016	0,024	0,039	0,001	0,733
Q4 2015 - Q2 2019	-0,002	0,636***	0,191	0,508
Deere & Co.				
2010 - Q4 2015	-0,005	1,314***	0,544	0,187
Q1 2016 - Q4 2016	0,029*	0,042	0,000	0,077
Q1 2016 - Q2 2019	0,010	1,021***	0,255	0,430
Kinder Morgan, Inc.				
2010 - Q4 2015	-0,014	0,758***	0,177	0,810
Q1 2016 - Q4 2016	0,028	0,444	0,025	0,982
Q1 2016 - Q2 2019	0,004	0,924***	0,222	0,295
Apple, Inc.				
2010 - Q1 2016	0,012	0,848***	0,260	0,988
Q2 2016 - Q1 2017	0,011	1,229*	0,144	0,604
Q2 2016 - Q2 2019	0,005	1,173***	0,261	0,875

Stock	α	β	(Adjusted) R^2	White test
Liberty Media, Formula One Group Series A				
2010 - Q1 2016	-0,004	1,215***	0,602	0,327
Q2 2016 - Q1 2017	0,042	0,820	0,023	0,671
Q2 2016 - Q2 2019	0,013	0,824**	0,098	0,563
Liberty Media, Formula One Group Series C				
2010 - Q1 2016	-0,002	1,146***	0,721	0,582
Q2 2016 - Q1 2017	0,047	0,975	0,035	0,647
Q2 2016 - Q2 2019	0,014	0,904**	0,114	0,593
Charter Communications, Inc.				
2010 - Q2 2016	0,016**	0,938***	0,270	0,107
Q3 2016 - Q2 2017	0,018	0,952	0,103	0,979
Q3 2016 - Q2 2019	0,007	1,028***	0,224	0,793
Liberty Global plc LiLAC Class A				
2010 - Q2 2016	-0,044	1,635***	0,275	0,438
Q3 2016 - Q2 2017	-0,038	0,679	0,024	0,513
Q3 2016 – Q4 2017	-0,032	0,573	0,013	0,488
Liberty Global plc LiLAC Class C				
2010 - Q2 2016	-0,052	1,580***	0,196	0,546
Q3 2016 - Q2 2017	-0,041	0,830	0,032	0,309
Q3 2016 – Q4 2017	-0,034	0,730	0,019	0,284
Liberty Media, Sirius XM Group Series A				
2010 - Q2 2016	-0,028***	1,039***	1,000	0,000
Q3 2016 - Q2 2017	-0,005	2,103***	0,475	0,202
Q3 2016 - Q2 2019	-0,006	1,212***	0,432	0,559
Liberty Media, Sirius XM Group Series C				
2010 - Q2 2016	N/A	N/A	N/A	N/A
Q3 2016 - Q2 2017	-0,002	1,940***	0,436	0,205
Q3 2016 - Q2 2019	-0,006	1,192***	0,422	0,519
American Airlines Group Inc.				
2010 - Q3 2016	0,013	0,867	0,073	0,248
Q4 2016 - Q3 2017	-0,006	1,986	0,234	0,636
Q4 2016 - Q2 2019	-0,020	1,521***	0,403	0,482

Stock	α	β	(Adjusted) R^2	White test
Delta Air Lines, Inc.				
2010 - Q3 2016	0,010	1,086***	0,181	0,606
Q4 2016 - Q3 2017	-0,004	1,552	0,188	0,612
Q4 2016 - Q2 2019	0,002	1,119***	0,348	0,559
United Continental Holdings, Inc.				
2010 - Q3 2016	0,014	0,929	0,119	0,716
Q4 2016 - Q3 2017	-0,016	2,056	0,196	0,819
Q4 2016 - Q2 2019	0,005	1,000***	0,226	0,614
Apple, Inc.				
2010 - Q4 2016	0,010	0,853***	0,241	0,983
Q1 2017 - Q4 2017	0,018	1,031	0,084	0,631
Q1 2017 - Q2 2019	0,008	1,192***	0,303	0,893
Southwest Airlines Co.				
2010 - Q4 2016	0,009	1,125***	0,301	0,598
Q1 2017 - Q4 2017	-0,018	2,732***	0,341	0,534
Q1 2017 - Q2 2019	-0,011	1,584***	0,437	0,007
Sirius XM Holdings Inc.				
2010 - Q4 2016	0,015	1,345***	0,236	0,756
Q1 2017 - Q4 2017	-0,010	1,701***	0,292	0,199
Q1 2017 - Q2 2019	-0,001	0,982	0,368	0,784
Bank of New York Mellon Corp.				
2010 - Q1 2017	-0,005	1,346***	0,549	0,561
Q2 2017 - Q1 2018	-0,004	1,219**	0,415	0,476
Q2 2017 - Q2 2019	-0,009	1,110***	0,536	0,891
Liberty Media, Sirius XM Group Series A				
2010 - Q2 2017	-0,010	2,159***	0,477	0,237
Q3 2017 - Q2 2018	-0,006	1,540***	0,423	0,705
Q3 2017 - Q2 2019	-0,012	1,056***	0,459	0,658
Liberty Media, Sirius XM Group Series C				
2010 - Q2 2017	-0,007	1,985***	0,430	0,222
Q3 2017 - Q2 2018	-0,005	1,522***	0,412	0,687
Q3 2017 - Q2 2019	-0,012	1,055***	0,449	0,650

Stock	α	β	(Adjusted) R^2	White test
STORE Capital Corp.				
2010 - Q2 2017	0,008	0,275	0,017	0,962
Q3 2017 - Q2 2018	0,023	-0,533	0,049	0,047
Q3 2017 - Q2 2019	0,020**	0,172	-0,018	0,011
Synchrony Financial				
2010 - Q2 2017	0,002	1,049***	0,182	0,547
Q3 2017 - Q2 2018	-0,005	1,580***	0,587	0,356
Q3 2017 - Q2 2019	0,000	1,347***	0,390	0,058
Bank of America				
2010 - Q3 2017	-0,007	1,630***	0,379	0,542
Q4 2017 - Q3 2018	-0,003	1,289***	0,454	0,691
Q4 2017 - Q2 2019	-0,003	1,396***	0,725	0,385
Teva Pharmaceutical Industries				
2010 - Q4 2017	-0,011	0,598***	0,067	0,607
Q1 2018 - Q4 2018	0,000	1,775**	0,413	0,452
Q1 2018 - Q2 2019	-0,034	2,294***	0,432	0,480

* *Significant at 10% level*
** *Significant at 5% level*
*** *Significant at 1% level*

Table 4: Sell decisions compared to the Standard & Poor's 500

Stock	α	β	(Adjusted) R^2	White test
ConocoPhillips				
2010 - Q3 2014	0,002	1,184***	0,613	0,380
Q4 2014 - Q3 2015	-0,031*	0,205	0,017	0,706
Q4 2014 - Q2 2019	-0,008	1,109	0,265	0,737
Exxon Mobil Corp.				
2010 - Q4 2014	-0,003	0,919***	0,623	0,920
Q1 2015 - Q4 2015	-0,012	1,116***	0,620	0,024
Q1 2015 - Q2 2019	-0,009	1,139***	0,523	0,738
National Oilwell Varco, Inc.				
2010 - Q1 2015	-0,013	1,799***	0,534	0,012
Q2 2015 - Q1 2016	-0,038	0,517	0,103	0,966
Q2 2015 - Q2 2019	-0,022*	1,280***	0,263	0,856
Viacom, Inc.				
2010 - Q2 2015	0,001	1,198***	0,527	0,022
Q3 2015 - Q2 2016	-0,030	1,835**	0,343	0,512
Q3 2015 - Q2 2019	0,019	1,206***	0,193	0,399
DTE Energy Company				
2010 - Q3 2015	0,009*	0,370***	0,137	0,590
Q4 2015 - Q3 2016	0,015	0,114	0,008	0,847
Q4 2015 - Q2 2019	0,011*	0,224	0,044	0,825
Procter & Gamble Co.				
2010 - Q1 2016	0,003	0,408***	0,213	0,518
Q2 2016 - Q1 2017	0,004	0,389	0,071	0,335
Q2 2016 - Q2 2019	0,006	0,205	0,035	0,394
AT & T, Inc.				
2010 - Q1 2016	0,005	0,483***	0,239	0,532
Q2 2016 - Q1 2017	-0,003	1,047	0,156	0,919
Q2 2016 - Q2 2019	-0,008	0,799***	0,249	0,573
Suncor Energy Inc.				
2010 - Q2 2016	-0,014*	1,525***	0,517	0,319
Q3 2016 - Q2 2017	0,012	-0,279	0,014	0,751
Q3 2016 - Q2 2019	-0,005	1,179***	0,392	0,921

Stock	α	β	(Adjusted) R^2	White test
Walmart, Inc.				
2010 - Q2 2016	0,004	0,294**	0,062	0,005
Q3 2016 - Q2 2017	-0,007	0,897**	0,238	0,339
Q3 2016 - Q2 2019	0,007	0,629**	0,178	0,349
Deere & Co.				
2010 - Q4 2016	-0,001	1,235***	0,459	0,274
Q1 2017 - Q4 2017	0,008	1,879	0,266	0,846
Q1 2017 - Q2 2019	0,004	1,213***	0,384	0,564
NOW Inc.				
2010 - Q4 2016	-0,019	0,964*	0,101	0,819
Q1 2017 - Q4 2017	-0,068	1,468	0,047	0,877
Q1 2017 - Q2 2019	-0,023	1,793***	0,333	0,630
Kinder Morgan, Inc.				
2010 - Q4 2016	-0,007	0,730***	0,141	0,775
Q1 2017 - Q4 2017	-0,005	-0,257	0,008	0,283
Q1 2017 - Q2 2019	-0,005	1,012***	0,337	0,012
Lee Enterprises, Inc.				
2010 - Q4 2016	-0,002	2,044***	0,144	0,495
Q1 2017 - Q4 2017	0,016	-1,769	0,082	0,760
Q1 2017 - Q2 2019	-0,009	1,061*	0,111	0,161
Verizon Communications, Inc.				
2010 - Q4 2016	0,006	0,499***	0,168	0,672
Q1 2017 - Q4 2017	-0,014	1,113**	0,122	0,369
Q1 2017 - Q2 2019	0,003	0,372	0,090	0,700
Twenty-First Century Fox, Inc.				
2010 - Q1 2017	0,000	1,319***	0,527	0,091
Q2 2017 - Q1 2018	0,005	0,905	0,086	0,654
Q2 2017 - Q2 2019	0,017	0,281	0,018	0,563
General Electric Co.				
2010 - Q2 2017	-0,003	1,314***	0,617	0,902
Q3 2017 - Q2 2018	-0,059***	0,445	0,038	0,578
Q3 2017 - Q2 2019	-0,045	1,194**	0,174	0,001

Stock	α	β	(Adjusted) R^2	White test
Wabco Holdings, Inc.				
2010 - Q2 2017	0,001	1,917***	0,584	0,114
Q3 2017 - Q2 2018	-0,025*	1,437***	0,479	0,878
Q3 2017 - Q2 2019	-0,006	1,150***	0,401	0,696
International Business Machines Corp.				
2010 - Q3 2017	-0,004	0,727***	0,321	0,554
Q4 2017 - Q3 2018	-0,003	0,740***	0,414	0,446
Q4 2017 - Q2 2019	-0,009	1,453***	0,632	0,196

* *Significant at 10% level*
** *Significant at 5% level*
*** *Significant at 1% level*

Table 5: Buy decisions compared to the Dow Jones Industrial Average

Stock	α	β	(Adjusted) R^2	White test
Deere				
2010 - Q3 2014	-0,004	1,458***	0,550	0,091
Q4 2014 - Q3 2015	-0,005	1,271***	0,584	0,861
Q4 2014 - Q2 2019	0,003	1,119***	0,382	0,565
DTE Energy Company				
2010 - Q3 2014	0,009*	0,447***	0,226	0,973
Q4 2014 - Q3 2015	0,008	-0,034	-0,100	0,020
Q4 2014 - Q2 2019	0,011*	0,159	0,019	0,359
Express Scripts Holding Co.				
2010 - Q3 2014	-0,001	1,064***	0,310	0,005
Q4 2014 - Q3 2015	0,013	1,074***	0,613	0,181
Q4 2014 – Q4 2018	-0,001	0,837***	0,250	0,793
Liberty Media, Formula One Group Series C				
2010 - Q3 2014	N/A	N/A	N/A	N/A
Q4 2014 - Q3 2015	0,003	0,918**	0,445	0,086
Q4 2014 - Q2 2019	0,009	0,864***	0,159	0,624
Liberty Broadband Corporation				
2010 - Q3 2014	N/A	N/A	N/A	N/A
Q4 2014 - Q3 2015	0,011	0,909	0,217	0,166
Q4 2014 - Q2 2019	0,006	0,944***	0,231	0,416
Torchmark Corporation				
2010 - Q3 2014	0,006*	1,171***	0,738	0,262
Q4 2014 - Q3 2015	0,009	0,826***	0,484	0,122
Q4 2014 - Q2 2019	0,002	0,903***	0,521	0,107
Twenty-First Century Fox, Inc.				
2010 - Q4 2014	0,006	1,392***	0,605	0,359
Q1 2015 - Q4 2015	-0,025*	1,825***	0,793	0,712
Q1 2015 - Q2 2019	0,002	0,708**	0,120	0,739
Precision Castparts Corporation				
2010 - Q4 2014	0,002	1,073***	0,469	0,041
Q1 2015 - Q4 2015	0,000	-0,303	-0,066	0,026
Q1 2015 – Q1 2016	-0,000	-0,295	0,033	0,059

Stock	α	β	(Adjusted) R^2	White test
Restaurant Brands International Inc.				
2010 - Q4 2014	N/A	N/A	N/A	N/A
Q1 2015 - Q4 2015	-0,000	1,502***	0,492	0,195
Q1 2015 - Q2 2019	0,004	1,132***	0,371	0,453
Visa Incorporation				
2010 - Q1 2015	0,010	0,873***	0,350	0,034
Q2 2015 - Q1 2016	0,014	0,794***	0,442	0,704
Q2 2015 - Q2 2019	0,012**	0,781***	0,401	0,447
Axalta Coating Systems Ltd.				
2010 - Q2 2015	0,045*	1,757**	0,533	0,681
Q3 2015 - Q2 2016	-0,021	1,312***	0,685	0,415
Q3 2015 - Q2 2019	-0,014*	1,017***	0,388	0,554
Liberty Broadband Corporation				
2010 - Q2 2015	-0,001	1,876	0,438	0,233
Q3 2015 - Q2 2016	0,011	0,687*	0,366	0,282
Q3 2015 - Q2 2019	0,007	0,871***	0,214	0,558
Phillips 66				
2010 - Q2 2015	0,015	1,288***	0,356	0,354
Q3 2015 - Q2 2016	-0,001	0,988**	0,487	0,155
Q3 2015 - Q2 2019	-0,004	0,934***	0,312	0,970
Twenty-First Century Fox, Inc.				
2010 - Q3 2015	0,001	1,497***	0,626	0,071
Q4 2015 - Q3 2016	-0,018	1,077**	0,411	0,291
Q4 2015 - Q2 2019	0,012	0,384*	0,039	0,749
Liberty Media, Formula One Group Series A				
2010 - Q3 2015	0,000	1,078***	0,431	0,155
Q4 2015 - Q3 2016	0,037	0,797	0,064	0,747
Q4 2015 - Q2 2019	0,010	0,767***	0,113	0,535
Liberty Media, Formula One Group Series C				
2010 - Q3 2015	-0,000	0,969**	0,475	0,243
Q4 2015 - Q3 2016	0,041	0,818	0,075	0,751
Q4 2015 - Q2 2019	0,011	0,837***	0,130	0,542

Stock	α	β	(Adjusted) R^2	White test
Kraft Heinz Company				
2010 - Q3 2015	N/A	N/A	N/A	N/A
Q4 2015 - Q3 2016	0,019	0,330	0,087	0,322
Q4 2015 - Q2 2019	-0,022*	0,633*	0,095	0,829
Liberty Global plc LiLAC Class A				
2010 - Q3 2015	-0,106	2,095	0,333	0,223
Q4 2015 - Q3 2016	-0,023	1,085**	0,142	0,469
Q4 2015 – Q4 2017	-0,022	0,432	0,019	0,463
Liberty Global plc LiLAC Class C				
2010 - Q3 2015	-0,142	1,833	0,164	0,223
Q4 2015 - Q3 2016	-0,023	1,121**	0,143	0,506
Q4 2015 – Q4 2017	-0,023	0,476	0,021	0,432
Suncor Energy Inc.				
2010 - Q3 2015	-0,012	1,455***	0,423	0,227
Q4 2015 - Q3 2016	-0,011	1,642***	0,596	0,396
Q4 2015 - Q2 2019	-0,008	1,291***	0,477	0,733
AT & T, Inc.				
2010 - Q3 2015	0,002	0,596***	0,309	0,932
Q4 2015 - Q3 2016	0,023	0,106	0,009	0,736
Q4 2015 - Q2 2019	-0,003	0,614***	0,193	0,905
Deere & Co.				
2010 - Q4 2015	-0,005	1,406***	0,564	0,229
Q1 2016 - Q4 2016	0,024	0,411	0,046	0,013
Q1 2016 - Q2 2019	0,008	1,070***	0,307	0,532
Kinder Morgan, Inc.				
2010 - Q4 2015	-0,013	0,746***	0,160	0,794
Q1 2016 - Q4 2016	0,029	0,264	0,012	0,772
Q1 2016 - Q2 2019	0,003	0,784***	0,175	0,266
Apple, Inc.				
2010 - Q1 2016	0,013*	0,824***	0,226	0,943
Q2 2016 - Q1 2017	0,021	0,383	0,023	0,604
Q2 2016 - Q2 2019	0,006	0,923***	0,174	0,770

Stock	α	β	(Adjusted) R^2	White test
Liberty Media, Formula One Group Series A				
2010 - Q1 2016	-0,001	1,101***	0,523	0,748
Q2 2016 - Q1 2017	0,047	0,342	0,007	0,570
Q2 2016 - Q2 2019	0,013	0,647*	0,065	0,482
Liberty Media, Formula One Group Series C				
2010 - Q1 2016	-0,002	1,073***	0,675	0,953
Q2 2016 - Q1 2017	0,051	0,545	0,018	0,538
Q2 2016 - Q2 2019	0,014	0,733**	0,081	0,509
Charter Communications, Inc.				
2010 - Q2 2016	0,016**	0,991***	0,278	0,062
Q3 2016 - Q2 2017	0,023	0,458	0,037	0,710
Q3 2016 - Q2 2019	0,006	0,903***	0,185	0,821
Liberty Global plc LiLAC Class A				
2010 - Q2 2016	-0,045	1,686***	0,314	0,265
Q3 2016 - Q2 2017	-0,025	-0,204	0,003	0,129
Q3 2016 – Q4 2017	-0,015	-0,394	0,010	0,230
Liberty Global plc LiLAC Class C				
2010 - Q2 2016	-0,054	1,746***	0,257	0,405
Q3 2016 - Q2 2017	-0,027	-0,137	-0,099	0,038
Q3 2016 – Q4 2017	-0,017	-0,308	0,005	0,087
Liberty Media, Sirius XM Group Series A				
2010 - Q2 2016	N/A	N/A	N/A	N/A
Q3 2016 - Q2 2017	0,002	1,272*	0,194	0,041
Q3 2016 - Q2 2019	-0,007	1,056	0,352	0,228
Liberty Media, Sirius XM Group Series C				
2010 - Q2 2016	N/A	N/A	N/A	N/A
Q3 2016 - Q2 2017	0,005	1,143	0,156	0,037
Q3 2016 - Q2 2019	-0,006	1,027***	0,336	0,215
American Airlines Group Inc.				
2010 - Q3 2016	0,015	0,582	0,035	0,066
Q4 2016 - Q3 2017	-0,015	1,967**	0,362	0,643
Q4 2016 - Q2 2019	-0,024*	1,570***	0,464	0,375

Stock	α	β	(Adjusted) R^2	White test
Delta Air Lines, Inc.				
2010 - Q3 2016	0,011	1,038***	0,152	0,973
Q4 2016 - Q3 2017	-0,016	1,805***	0,401	0,536
Q4 2016 - Q2 2019	-0,002	1,168***	0,408	0,783
United Continental Holdings, Inc.				
2010 - Q3 2016	0,015	0,922***	0,108	0,663
Q4 2016 - Q3 2017	-0,025	1,977*	0,285	0,818
Q4 2016 - Q2 2019	0,002	1,034***	0,261	0,433
Apple, Inc.				
2010 - Q4 2016	0,011	0,795***	0,196	0,930
Q1 2017 - Q4 2017	0,028	0,304	0,012	0,607
Q1 2017 - Q2 2019	0,008	1,020***	0,233	0,674
Southwest Airlines Co.				
2010 - Q4 2016	0,010	1,125***	0,282	0,259
Q1 2017 - Q4 2017	-0,013	1,876**	0,267	0,485
Q1 2017 - Q2 2019	-0,012	1,512***	0,408	0,014
Sirius XM Holdings Inc.				
2010 - Q4 2016	0,017	1,248***	0,191	0,717
Q1 2017 - Q4 2017	0,002	0,703	0,083	0,412
Q1 2017 - Q2 2019	-0,001	0,851***	0,285	0,762
Bank of New York Mellon Corp.				
2010 - Q1 2017	-0,004	1,318***	0,500	0,640
Q2 2017 - Q1 2018	-0,007	1,079**	0,438	0,968
Q2 2017 - Q2 2019	-0,011	1,116***	0,541	0,812
Liberty Media, Sirius XM Group Series A				
2010 - Q2 2017	-0,003	1,327***	0,284	0,051
Q3 2017 - Q2 2018	-0,003	1,120**	0,298	0,321
Q3 2017 - Q2 2019	-0,013	0,972***	0,390	0,375
Liberty Media, Sirius XM Group Series C				
2010 - Q2 2017	-0,009	1,226*	0,196	0,050
Q3 2017 - Q2 2018	-0,001	1,093**	0,282	0,335
Q3 2017 - Q2 2019	-0,013	0,964***	0,375	0,385

Stock	α	β	(Adjusted) R^2	White test
STORE Capital Corp.				
2010 - Q2 2017	0,008	0,233	0,015	0,807
Q3 2017 - Q2 2018	0,023*	-0,475	0,143	0,064
Q3 2017 - Q2 2019	0,020**	0,108	-0,036	0,004
Synchrony Financial				
2010 - Q2 2017	0,000	1,059***	0,213	0,354
Q3 2017 - Q2 2018	-0,005	1,470***	0,676	0,120
Q3 2017 - Q2 2019	-0,001	1,294***	0,330	0,035
Bank of America				
2010 - Q3 2017	-0,006	1,568***	0,333	0,547
Q4 2017 - Q3 2018	-0,005	1,214***	0,539	0,809
Q4 2017 - Q2 2019	-0,004	1,422***	0,750	0,763
Teva Pharmaceutical Industries				
2010 - Q4 2017	-0,010	0,487**	0,042	0,850
Q1 2018 - Q4 2018	-0,001	1,680**	0,365	0,529
Q1 2018 - Q2 2019	-0,032	2,279***	0,405	0,693

* Significant at 10% level
** Significant at 5% level
*** Significant at 1% level

Table 6: Sell decisions compared to the Dow Jones Industrial Average

Stock	α	β	(Adjusted) R^2	White test
ConocoPhillips				
2010 - Q3 2014	0,003	1,218***	0,566	0,372
Q4 2014 - Q3 2015	-0,031*	0,354	0,055	0,618
Q4 2014 - Q2 2019	-0,010	1,156***	0,313	0,656
Exxon Mobil Corp.				
2010 - Q4 2014	-0,004	1,020***	0,670	0,708
Q1 2015 - Q4 2015	-0,011	1,101***	0,642	0,015
Q1 2015 - Q2 2019	-0,010*	1,123***	0,554	0,600
National Oilwell Varco, Inc.				
2010 - Q1 2015	-0,011	1,801***	0,475	0,016
Q2 2015 - Q1 2016	-0,038	0,516	0,109	0,996
Q2 2015 - Q2 2019	-0,023*	1,263	0,275	0,789
Viacom, Inc.				
2010 - Q2 2015	0,002	1,276***	0,532	0,018
Q3 2015 - Q2 2016	-0,030	1,720*	0,323	0,445
Q3 2015 - Q2 2019	-0,020	1,111***	0,177	0,363
DTE Energy Company				
2010 - Q3 2015	0,009**	0,383***	0,132	0,505
Q4 2015 - Q3 2016	0,015	0,136	0,012	0,890
Q4 2015 - Q2 2019	0,011*	0,198	0,037	0,769
Procter & Gamble Co.				
2010 - Q1 2016	0,003	0,453***	0,241	0,509
Q2 2016 - Q1 2017	0,008	0,049	-0,098	0,024
Q2 2016 - Q2 2019	0,007	0,154	0,021	0,169
AT & T, Inc.				
2010 - Q1 2016	0,005	0,534***	0,268	0,521
Q2 2016 - Q1 2017	-0,003	0,886*	0,182	0,691
Q2 2016 - Q2 2019	-0,009	0,778***	0,254	0,747
Suncor Energy Inc.				
2010 - Q2 2016	-0,012	1,504***	0,463	0,346
Q3 2016 - Q2 2017	0,004	0,274	0,021	0,977
Q3 2016 - Q2 2019	-0,006	1,112***	0,375	0,968

Stock	α	β	(Adjusted) R^2	White test
Walmart, Inc.				
2010 - Q2 2016	0,004	0,323**	0,070	0,000
Q3 2016 - Q2 2017	-0,004	0,536	0,131	0,504
Q3 2016 - Q2 2019	0,005	0,681**	0,224	0,407
Deere & Co.				
2010 - Q4 2016	-0,002	1,320***	0,491	0,185
Q1 2017 - Q4 2017	0,012	1,259	0,199	0,969
Q1 2017 - Q2 2019	0,003	1,242***	0,415	0,467
NOW Inc.				
2010 - Q4 2016	-0,020	0,919*	0,103	0,702
Q1 2017 - Q4 2017	-0,051	0,296	0,003	0,866
Q1 2017 - Q2 2019	-0,023	1,527***	0,249	0,571
Kinder Morgan, Inc.				
2010 - Q4 2016	-0,006	0,703***	0,128	0,764
Q1 2017 - Q4 2017	-0,002	-0,339	0,023	0,249
Q1 2017 - Q2 2019	-0,006	0,907***	0,273	0,019
Lee Enterprises, Inc.				
2010 - Q4 2016	0,001	1,891***	0,115	0,558
Q1 2017 - Q4 2017	0,005	-0,893	0,035	0,875
Q1 2017 - Q2 2019	-0,009	0,967*	0,095	0,306
Verizon Communications, Inc.				
2010 - Q4 2016	0,006	0,539***	0,183	0,879
Q1 2017 - Q4 2017	-0,017	1,009*	0,167	0,593
Q1 2017 - Q2 2019	0,002	0,427*	0,122	0,517
Twenty-First Century Fox, Inc.				
2010 - Q1 2017	0,001	1,329***	0,508	0,139
Q2 2017 - Q1 2018	0,001	0,944	0,126	0,698
Q2 2017 - Q2 2019	0,017	0,264	0,016	0,693
General Electric Co.				
2010 - Q2 2017	-0,004	1,377***	0,642	0,828
Q3 2017 - Q2 2018	-0,055**	0,035	0,000	0,734
Q3 2017 - Q2 2019	-0,045*	0,948*	0,092	0,004

Stock	α	β	(Adjusted) R^2	White test
Wabco Holdings, Inc.				
2010 - Q2 2017	0,003	1,846***	0,513	0,069
Q3 2017 - Q2 2018	-0,025*	1,312***	0,531	0,601
Q3 2017 - Q2 2019	-0,008	1,214***	0,447	0,674
International Business Machines Corp.				
2010 - Q3 2017	-0,004	0,800***	0,369	0,481
Q4 2017 - Q3 2018	-0,005	0,775***	0,608	0,340
Q4 2017 - Q2 2019	-0,010	1,410***	0,593	0,482

* *Significant at 10% level*
** *Significant at 5% level*
*** *Significant at 1% level*

Table 7: Buy decisions compared to the Nasdaq composite index

Stock	α	β	(Adjusted) R^2	White test
Deere				
2010 - Q3 2014	-0,003	1,070***	0,436	0,221
Q4 2014 - Q3 2015	-0,012	1,169***	0,628	0,547
Q4 2014 - Q2 2019	0,006	0,771***	0,243	0,577
DTE Energy Company				
2010 - Q3 2014	0,011**	0,243**	0,098	0,710
Q4 2014 - Q3 2015	0,008	0,031	-0,100	0,011
Q4 2014 - Q2 2019	0,011*	0,095	0,009	0,239
Express Scripts Holding Co.				
2010 - Q3 2014	-0,003	1,018***	0,424	0,010
Q4 2014 - Q3 2015	0,008	0,902***	0,550	0,380
Q4 2014 – Q4 2018	0,000	0,582***	0,161	0,940
Liberty Media, Formula One Group Series C				
2010 - Q3 2014	N/A	N/A	N/A	N/A
Q4 2014 - Q3 2015	-0,003	0,952**	0,608	0,030
Q4 2014 - Q2 2019	0,008	0,908***	0,234	0,714
Liberty Broadband Corporation				
2010 - Q3 2014	N/A	N/A	N/A	N/A
Q4 2014 - Q3 2015	0,006	0,888	0,270	0,231
Q4 2014 - Q2 2019	0,005	0,912***	0,288	0,070
Torchmark Corporation				
2010 - Q3 2014	0,007	0,924***	0,676	0,379
Q4 2014 - Q3 2015	0,004	0,801***	0,578	0,280
Q4 2014 - Q2 2019	0,004	0,640***	0,350	0,400
Twenty-First Century Fox, Inc.				
2010 - Q4 2014	0,007	1,098***	0,555	0,154
Q1 2015 - Q4 2015	-0,035**	1,658***	0,810	0,709
Q1 2015 - Q2 2019	0,003	0,557**	0,099	0,689
Precision Castparts Corporation				
2010 - Q4 2014	0,003	0,857***	0,449	0,071
Q1 2015 - Q4 2015	0,002	-0,386	0,062	0,064
Q1 2015 – Q1 2016	0,001	-0,343	0,060	0,192

Stock	α	β	(Adjusted) R^2	White test
Restaurant Brands International Inc.				
2010 - Q4 2014	N/A	N/A	N/A	N/A
Q1 2015 - Q4 2015	-0,008	1,459	0,575	0,309
Q1 2015 - Q2 2019	0,004	0,879***	0,297	0,227
Visa Incorporation				
2010 - Q1 2015	0,010	0,670***	0,297	0,021
Q2 2015 - Q1 2016	0,014	0,833***	0,611	0,721
Q2 2015 - Q2 2019	0,011***	0,838***	0,622	0,792
Axalta Coating Systems Ltd.				
2010 - Q2 2015	0,033	1,563**	0,507	0,663
Q3 2015 - Q2 2016	-0,015	1,111***	0,639	0,197
Q3 2015 - Q2 2019	-0,014**	0,9763***	0,481	0,352
Liberty Broadband Corporation				
2010 - Q2 2015	-0,014	1,762	0,463	0,227
Q3 2015 - Q2 2016	0,013	0,603*	0,368	0,270
Q3 2015 - Q2 2019	0,007	0,857***	0,279	0,111
Phillips 66				
2010 - Q2 2015	0,016	0,841***	0,190	0,492
Q3 2015 - Q2 2016	0,003	0,833**	0,450	0,472
Q3 2015 - Q2 2019	-0,002	0,662***	0,211	0,629
Twenty-First Century Fox, Inc.				
2010 - Q3 2015	0,001	1,193***	0,563	0,035
Q4 2015 - Q3 2016	-0,014	0,679	0,255	0,377
Q4 2015 - Q2 2019	0,013	0,295*	0,031	0,506
Liberty Media, Formula One Group Series A				
2010 - Q3 2015	-0,007	1,108***	0,557	0,009
Q4 2015 - Q3 2016	0,030	1,255***	0,250	0,724
Q4 2015 - Q2 2019	0,008	0,866***	0,197	0,673
Liberty Media, Formula One Group Series C				
2010 - Q3 2015	-0,005	0,973***	0,625	0,029
Q4 2015 - Q3 2016	0,035	1,194***	0,250	0,730
Q4 2015 - Q2 2019	0,011	0,890***	0,202	0,643

Stock	α	β	(Adjusted) R^2	White test
Kraft Heinz Company				
2010 - Q3 2015	N/A	N/A	N/A	N/A
Q4 2015 - Q3 2016	0,021	0,168	0,036	0,073
Q4 2015 - Q2 2019	-0,022*	0,623**	0,126	0,929
Liberty Global plc LiLAC Class A				
2010 - Q3 2015	-0,144	0,647	0,043	0,223
Q4 2015 - Q3 2016	-0,026	1,182**	0,264	0,336
Q4 2015 – Q4 2017	-0,034*	1,179***	0,181	0,535
Liberty Global plc LiLAC Class C				
2010 - Q3 2015	-0,189	0,046	0,000	0,223
Q4 2015 - Q3 2016	-0,025	1,195**	0,255	0,326
Q4 2015 – Q4 2017	-0,034	1,217***	0,178	0,572
Suncor Energy Inc.				
2010 - Q3 2015	-0,014	1,216***	0,424	0,112
Q4 2015 - Q3 2016	-0,003	0,916*	0,290	0,486
Q4 2015 - Q2 2019	-0,004	0,964***	0,365	0,685
AT & T, Inc.				
2010 - Q3 2015	0,003	0,364***	0,165	0,746
Q4 2015 - Q3 2016	0,026*	-0,180	0,039	0,855
Q4 2015 - Q2 2019	0,000	0,319*	0,072	0,323
Deere & Co.				
2010 - Q4 2015	-0,005	1,079***	0,471	0,264
Q1 2016 - Q4 2016	0,032	-0,346	0,045	0,932
Q1 2016 - Q2 2019	0,012	0,639***	0,152	0,579
Kinder Morgan, Inc.				
2010 - Q4 2015	-0,013	0,596***	0,139	0,816
Q1 2016 - Q4 2016	0,030	0,288	0,020	0,669
Q1 2016 - Q2 2019	0,005	0,663**	0,174	0,661
Apple, Inc.				
2010 - Q1 2016	0,010	0,851***	0,342	0,772
Q2 2016 - Q1 2017	-0,006	1,982***	0,658	0,160
Q2 2016 - Q2 2019	0,001	1,322***	0,496	0,935

Stock	α	β	(Adjusted) R^2	White test
Liberty Media, Formula One Group Series A				
2010 - Q1 2016	-0,006	1,084***	0,643	0,175
Q2 2016 - Q1 2017	0,032	1,251	0,095	0,587
Q2 2016 - Q2 2019	0,011	0,816***	0,144	0,686
Liberty Media, Formula One Group Series C				
2010 - Q1 2016	-0,003	1,008***	0,781	0,377
Q2 2016 - Q1 2017	0,040	1,138	0,083	0,579
Q2 2016 - Q2 2019	0,012	0,846***	0,150	0,664
Charter Communications, Inc.				
2010 - Q2 2016	0,017**	0,735***	0,219	0,223
Q3 2016 - Q2 2017	0,009	1,084	0,211	0,903
Q3 2016 - Q2 2019	0,005	0,861***	0,227	0,411
Liberty Global plc LiLAC Class A				
2010 - Q2 2016	-0,038	1,352***	0,263	0,545
Q3 2016 - Q2 2017	-0,052	1,187	0,113	0,446
Q3 2016 – Q4 2017	-0,053*	1,467*	0,131	0,756
Liberty Global plc LiLAC Class C				
2010 - Q2 2016	-0,046	1,260**	0,174	0,602
Q3 2016 - Q2 2017	-0,056	1,339	0,132	0,597
Q3 2016 – Q4 2017	-0,057*	1,662*	0,154	0,848
Liberty Media, Sirius XM Group Series A				
2010 - Q2 2016	N/A	N/A	N/A	N/A
Q3 2016 - Q2 2017	-0,009	1,663***	0,467	0,119
Q3 2016 - Q2 2019	-0,010	1,134***	0,548	0,808
Liberty Media, Sirius XM Group Series C				
2010 - Q2 2016	N/A	N/A	N/A	N/A
Q3 2016 - Q2 2017	-0,007	1,563**	0,390	0,159
Q3 2016 - Q2 2019	-0,009	1,129***	0,548	0,794
American Airlines Group Inc.				
2010 - Q3 2016	0,010	0,979**	0,138	0,748
Q4 2016 - Q3 2017	0,020	0,172	0,003	0,213
Q4 2016 - Q2 2019	-0,019	1,104***	0,299	0,423

Stock	α	β	(Adjusted) R^2	White test
Delta Air Lines, Inc.				
2010 - Q3 2016	0,009	0,986***	0,199	0,237
Q4 2016 - Q3 2017	0,027	-0,408	0,018	0,475
Q4 2016 - Q2 2019	0,004	0,704**	0,194	0,945
United Continental Holdings, Inc.				
2010 - Q3 2016	0,012	0,929***	0,158	0,881
Q4 2016 - Q3 2017	0,006	0,472	0,014	0,486
Q4 2016 - Q2 2019	0,007	0,641**	0,130	0,675
Apple, Inc.				
2010 - Q4 2016	0,009	0,893***	0,350	0,824
Q1 2017 - Q4 2017	-0,008	1,971***	0,497	0,266
Q1 2017 - Q2 2019	0,003	1,251***	0,489	0,971
Southwest Airlines Co.				
2010 - Q4 2016	0,010	0,919***	0,266	0,986
Q1 2017 - Q4 2017	0,016	0,450	0,015	0,787
Q1 2017 - Q2 2019	-0,011	1,120***	0,303	0,005
Sirius XM Holdings Inc.				
2010 - Q4 2016	0,015	1,238***	0,266	0,828
Q1 2017 - Q4 2017	-0,017	1,587***	0,409	0,738
Q1 2017 - Q2 2019	-0,004	0,949***	0,493	0,630
Bank of New York Mellon Corp.				
2010 - Q1 2017	-0,004	1,069***	0,458	0,297
Q2 2017 - Q1 2018	-0,004	0,810	0,233	0,293
Q2 2017 - Q2 2019	-0,009	0,852***	0,461	0,792
Liberty Media, Sirius XM Group Series A				
2010 - Q2 2017	-0,010	1,547***	0,443	0,086
Q3 2017 - Q2 2018	-0,023	1,792***	0,717	0,654
Q3 2017 - Q2 2019	-0,014	1,024***	0,614	0,634
Liberty Media, Sirius XM Group Series C				
2010 - Q2 2017	-0,008	1,409**	0,340	0,098
Q3 2017 - Q2 2018	-0,021	1,790***	0,712	0,538
Q3 2017 - Q2 2019	-0,014	1,033***	0,612	0,760

Stock	α	β	(Adjusted) R^2	White test
STORE Capital Corp.				
2010 - Q2 2017	0,009	0,061	0,001	0,783
Q3 2017 - Q2 2018	0,026**	-0,483	0,139	0,010
Q3 2017 - Q2 2019	0,020**	0,144	-0,017	0,015
Synchrony Financial				
2010 - Q2 2017	0,003	0,699**	0,121	0,777
Q3 2017 - Q2 2018	-0,010	1,198***	0,422	0,714
Q3 2017 - Q2 2019	-0,001	1,184***	0,429	0,250
Bank of America				
2010 - Q3 2017	-0,007	1,383***	0,365	0,874
Q4 2017 - Q3 2018	-0,003	0,933**	0,313	0,435
Q4 2017 - Q2 2019	-0,003	1,129***	0,668	0,192
Teva Pharmaceutical Industries				
2010 - Q4 2017	-0,011	0,449***	0,050	0,535
Q1 2018 - Q4 2018	-0,003	1,644**	0,465	0,283
Q1 2018 - Q2 2019	-0,037	2,071***	0,499	0,368

* *Significant at 10% level*
** *Significant at 5% level*
*** *Significant at 1% level*

Table 8: Sell decisions compared to the Nasdaq composite index

Stock	α	β	(Adjusted) R^2	White test
ConocoPhillips				
2010 - Q3 2014	0,004	0,957***	0,514	0,1633
Q4 2014 - Q3 2015	-0,031*	0,067	0,003	0,655
Q4 2014 - Q2 2019	-0,007	0,719	0,162	0,885
Exxon Mobil Corp.				
2010 - Q4 2014	-0,002	0,705***	0,472	0,981
Q1 2015 - Q4 2015	-0,016	0,900***	0,515	0,009
Q1 2015 - Q2 2019	-0,008	0,745***	0,325	0,380
National Oilwell Varco, Inc.				
2010 - Q1 2015	-0,013	1,562***	0,520	0,018
Q2 2015 - Q1 2016	-0,038	0,417	0,089	0,903
Q2 2015 - Q2 2019	-0,020	0,844***	0,165	0,684
Viacom, Inc.				
2010 - Q2 2015	0,001	1,012***	0,493	0,196
Q3 2015 - Q2 2016	-0,023	1,355	0,261	0,178
Q3 2015 - Q2 2019	-0,018	0,887**	0,152	0,318
DTE Energy Company				
2010 - Q3 2015	0,010**	0,220*	0,062	0,247
Q4 2015 - Q3 2016	0,018	-0,080	0,006	0,793
Q4 2015 - Q2 2019	0,012*	0,105	0,015	0,472
Procter & Gamble Co.				
2010 - Q1 2016	0,004	0,283***	0,133	0,628
Q2 2016 - Q1 2017	0,000	0,512*	0,217	0,679
Q2 2016 - Q2 2019	0,007	0,141	0,025	0,831
AT & T, Inc.				
2010 - Q1 2016	0,006	0,320***	0,137	0,283
Q2 2016 - Q1 2017	0,008	0125	0,004	0,125
Q2 2016 - Q2 2019	-0,006	0,419**	0,102	0,436
Suncor Energy Inc.				
2010 - Q2 2016	-0,012	1,220***	0,436	0,262
Q3 2016 - Q2 2017	0,024	-0,750	0,163	0,316
Q3 2016 - Q2 2019	-0,005	0,864***	0,305	0,288

Stock	α	β	(Adjusted) R^2	White test
Walmart, Inc.				
2010 - Q2 2016	0,005	0,175	0,022	0,000
Q3 2016 - Q2 2017	-0,008	0,686	0,219	0,454
Q3 2016 - Q2 2019	0,007	0,432*	0,122	0,757
Deere & Co.				
2010 - Q4 2016	0,001	0,946***	0,357	0,337
Q1 2017 - Q4 2017	0,023	0,724	0,064	0,207
Q1 2017 - Q2 2019	0,004	0,913***	0,313	0,310
NOW Inc.				
2010 - Q4 2016	-0,019	0,654	0,070	0,783
Q1 2017 - Q4 2017	-0,052	0,351	0,004	0,257
Q1 2017 - Q2 2019	-0,024	1,360***	0,275	0,511
Kinder Morgan, Inc.				
2010 - Q4 2016	-0,006	0,545***	0,104	0,734
Q1 2017 - Q4 2017	-0,010	0,074	0,001	0,242
Q1 2017 - Q2 2019	-0,006	0,782***	0,283	0,027
Lee Enterprises, Inc.				
2010 - Q4 2016	-0,003	1,889***	0,163	0,089
Q1 2017 - Q4 2017	0,004	-0,774	0,025	0,681
Q1 2017 - Q2 2019	-0,013	1,081**	0,166	0,366
Verizon Communications, Inc.				
2010 - Q4 2016	0,008	0,297**	0,079	0,209
Q1 2017 - Q4 2017	0,000	0,175	0,005	0,114
Q1 2017 - Q2 2019	0,004	0,175	0,029	0,882
Twenty-First Century Fox, Inc.				
2010 - Q1 2017	-0,001	1,057***	0,445	0,099
Q2 2017 - Q1 2018	0,009	0,292	0,011	0,512
Q2 2017 - Q2 2019	0,018	0,159	0,009	0,396
General Electric Co.				
2010 - Q2 2017	-0,001	0,976***	0,454	0,911
Q3 2017 - Q2 2018	-0,060***	0,310	0,023	0,479
Q3 2017 - Q2 2019	-0,046**	1,023**	0,184	0,004

Stock	α	β	(Adjusted) R^2	White test
Wabco Holdings, Inc.				
2010 - Q2 2017	0,001	1,666***	0,587	0,058
Q3 2017 - Q2 2018	-0,029	1,056*	0,323	0,438
Q3 2017 - Q2 2019	-0,005	0,814***	0,285	0,730
International Business Machines Corp.				
2010 - Q3 2017	-0,004	0,590***	0,283	0,519
Q4 2017 - Q3 2018	-0,002	0,476*	0,225	0,806
Q4 2017 - Q2 2019	-0,009	1,154***	0,562	0,421

* Significant at 10% level
** Significant at 5% level
*** Significant at 1% level