The Economic Value Of Stock Recommendations: Evidence From An Online Stock Advice Platform

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Abstract

Stock recommendations are often questioned in terms of their economic value added. This thesis investigates the economic value of stock recommendations using data from a dutch investment platform. Previous research has shown that at least in the short-run there are significant abnormal returns, however, in the long-run there remains disagreement amongst academics. The purpose of this research is to establish whether these stock recommendations add economic value, tested in the Dutch market using recommendations from an online investment platform. The main findings of this paper suggest that there is no economic value added. I find evidence for a positive abnormal return by testing for the cumulative average return and the abnormal return on the event day itself. However, this positive return can not be monetized using a trading strategy. The return of such a strategy is not significantly positive after adjusting for the market risk and would require a great amount of trading, which combined with trading cost would diminish any returns left.

The investor's chief problem - and even his
worst enemy - is likely to be himself.
Benjamin Graham

1 INTRODUCTION

The headline of an article on forbes.com reads "Any Monkey Can Beat The Market". The author of the article refers to Malkiel's book "A Random Walk Down Wallstreet", which highlights Malkiel's claim that *"A blindfolded monkey throwing darts at a newspaper's financial pages could select a portfolio that would do just as well as one carefully selected by experts."* Ferri (2012) Besides these accusations of analysts to have no predicting ability, Barber & Odean (2000) claim that individual investors do not earn a remarkable profit on their investments. These are harsh accusations that fundamentally question the capabilities of analysts.

The value of investment recommendations has been a debated topic in the academic world, owed to its real life implications. One of the first papers on investment recommendations by Pari (1987) claims that there is no significant economic value, in terms of abnormal returns, added by analysts. Furthermore, Keasler & McNeil (2010) claim that there are no significant abnormal long-term returns for stock recommendations and advocate caution for the individual investor following stock recommendations. Possible reasons for individual investors blindly following the stock recommendations are given by Barber & Odean (2008), stating that these investors are facing an immense search problem and are therefore buying attention-grabbing stocks - such as stocks on which recommendations are published.

There seems to be agreement that at least in the short-run analyst recommendations achieve significant positive abnormal returns. Sant & Zaman (1996) note that the positive abnormal returns seem to be the largest for stocks followed by less than 20 analysts. However, in the long-run positive abnormal returns become more ambiguous. Womack (1996) finds a significant post-recommendation drift, thereby suggesting that the analysts indeed add value in the long-run.

This thesis investigates the question of the economic value added by stock recommendations by the following research question:

Do buy stock recommendations of Dutch stocks from analist.nl add economic value in terms of abnormal returns, during the period of 2013-2016?

The research question is especially concerned with the Dutch stock market, owed to the fact that there are, as far as my research has established, no journal articles centered around the Dutch stock recommendation. This thesis contributes to the current literature not only by focusing on the Dutch market, but also by investigating a possible trading strategy based on buy recommendations from an online investment platform.

In this paper, I establish that the abnormal return is the greatest on the event day itself, which is consistent with the literature. Furthermore, the cumulative abnormal return is significantly different from 0, implying that it is possible to obtain significant profits in the short-term, conforming to the literature. On the other hand, an analysis of a trading strategy based on the favorable stock recommendations did not yield any significant alpha, implying that there are no significant abnormal positive returns in following the said investment strategy, after adjusting for the market risk. The remainder of this paper is structured as follows.

Section 2 of this paper digs deeper in existing literature and sketches the current dispute in literature as to whether stock recommendations have economic value defined by significant positive abnormal returns. Additionally the hypotheses used to investigate the research question are developed in Section 3. Section 4 introduces an overview of the data that is utilized in this paper. The descriptives of the data are consistent with findings from current literature: Sell recommendations are far less frequent that any other observation and buy recommendations are the most frequent observation. This is supported by Jegadeesh et al. (2004), claiming that analysts are somewhat biased towards buy recommendations. Section 5 describes the methodology and introduces several ways on how to test the economic value of stock recommendations. Section 6 summarizes the results of the analysis, followed by Section 7 and 8, which relate the findings to the literature and conclude the paper.

2 LITERATURE

A good starting point is one of the first paper published by R. A. Pari in 1987. This short paper introduces the influence of stock recommendation obtained from the Wall $treet Week (W$W) on stock prices. The show frequently invites CEOs of well-known corporates and interviews them about their opinion about the stock market. Naturally they are inclined to speak favorably about their company. He then proceeds by using a two-step procedure to estimate the risk-adjusted abnormal returns of stocks. Firstly, the normal returns are estimated based on a market model using the Scholes-Williams method and the CRSP weighted index. Secondly, he subtracts the normal returns from the realized returns. The methodology used in this paper overlaps with the one that is used in this thesis. The findings suggest evidence for short-lived excess returns, especially on the event day itself. Looking at the cumulative abnormal returns suggests that there is no significant impact of these recommendations on the stock price, implying that it is not possible to effectively monetize these recommendations. However, one short-coming is that the event day used by Pari is a Monday, thus the Monday-effect might be at play.

Engelberg et al.(2009) provide a potential explanation for the initial abnormal and thereafter reverting abnormal returns. They introduce a new tool to measure the attention of investors, namely the search frequency in Google (SVI). An important aspect of this paper, especially in the context of this thesis is that they find a temporary surge in stock prices following an increase in SVI. Hence, there is evidence that more attention leads to short-lived increases in stock prices and more attention could be caused by the recommendation of an analyst.

This is also supportive of the paper by Barber & Odean (2008), claiming that individual investors tend to buy attention-grabbing stocks. A possible reason for this is the sheer amount of stocks out there, resulting in a search problem for the individual investors. Hence, they tend to buy stocks with salient information. In the context of Pari (1987), the spike in stock prices after a well-known TV show can then be explained as a reflection of more attention on a certain stock.

Furthermore, Brav&Lehavy (2003) find a significant market reaction following a target price revision of analysts, from which they conclude that the market views the target price revision as an

indicator that contains information. This yet again shows that market participants have confidence in analysts.

According to Sant & Zaman (1996) this initial surge in stock prices is the greatest for stocks followed by less than 20 analysts, which contradicts the hypothesis that more attention leads to higher returns. In their study they investigate the recommendations in the Business Week and find that the abnormal return increases as the number of analysts decreases. Additionally, they find that these stocks have negative abnormal returns in the long-run, offsetting the initial positive abnormal returns, which is consistent with the self-fulfilling prophecy.

Jegadeesh et al. (2004) investigate the effect of investment recommendations in relation to other return predicting factors, such as momentum and contrarian signals. Contrarian signals indicate herding behavior amongst investors, and could be measures such as mutual fund flow or the volatility index. They find that for stocks exhibiting low momentum and contrarian signals, a favorable recommendation of analysts is followed by an under-performance of the stock compared to the unfavorably recommended stock with the same signals. For stocks with promising quantitative signals this behaves the other way around - or as one would expect: Favorably recommended stocks outperform unfavorably recommended stocks. In agreement with the self-fulfilling prophecy, they suggest that the favorable recommendation might delay the incorporation of unfavorable signals in the stock price, which leads to an under-performance thereafter. However, on average, they find that favorably recommended stocks outperform unfavorably recommended stocks, which is consistent with the findings of Womack.

The above-mentioned papers are supportive of the self-fulfilling prophecy in one way or another. The common denominator is the fact that most of the authors do not find a significant positive abnormal return in the long-run. On the other hand, there are other authors who claim that there are indeed significant positive abnormal returns in the long-run:

Womack (1996)argues in his paper , that the excess returns after a stock recommendation are in fact not short lived, albeit the returns being the largest during the 3 days following the recommendation. He argues that there is a post-recommendation drift for several months thereafter

in direction of the analyst forecast. This effect seems to be the particularly apparent in the first month after the recommendation. He concludes that the publishing of stock recommendations has a significant impact on stock prices, in the short- and the long-run.

Consistent with the above-mentioned long-run performance Barber et al. (2001) find that an investment strategy selling short the least favorable recommended stocks and going long in the most favorable recommended stocks can indeed be profitable, giving further evidence to analysts recommendations having a fundamental impact on stock prices. They investigate whether one can profit from security analyst recommendations, and find initially that indeed, the most(least) favorably recommended stocks earned an average annual abnormal return of 4.13% (-4.91%). In contrary, they find that obtaining this abnormal return requires a lot of trading, which after the introduction of trading costs, leads to this strategy not being profitable anymore.

Thus, while there is at least some evidence of analysts having predicting power on the stock price, it seems to be the case that it is hard to monetize these abnormal returns.

3 HYPOTHESIS

It becomes evident that the economic value of stock recommendations in terms of returns is not necessarily clear throughout the literature. Furthermore, as far as my research established there is no study in the Dutch stock market, which leads to the introduction of the following research question:

Do buy stock recommendations of Dutch stocks by analysts add economic value in terms of abnormal returns, during the period of 2013-2016?

In this paper I investigate buy recommendations exclusively for two reasons. Firstly, I want to keep the trading strategy implementable and realistic. It would be hard for an individual investor to hold stocks he does not own or to short sell stocks. Secondly, the self-fulfilling prophecy mainly focuses on the buy recommendations, therefore the focus of this thesis is similar. The remaining recommendations serve as supplementary data.

To investigate this research question multiple hypothesis are formulated. Firstly, a simple event study, much like the one performed by Pari would shed light on whether the recommendation actually allows to achieve abnormal returns due to fundamental reasons or if it is simply due to an investor reaction to the recommendation. As discussed earlier one would expect a cumulative abnormal return of 0, calculated over the event day itself and the 4 day period thereafter. Therefore the first hypothesis is the following.

H01: The cumulative abnormal return over the event day and the 4 days following the event day is not significantly different from 0 across all available buy recommendations.

Secondly, if there is indeed an overreaction by the market, one would expect that the abnormal return is the highest on the day following the stock recommendation, which is the event day itself. Therefore, the second hypothesis is formulated as follows:

H02: The abnormal return on the event day is significantly different from the mean of the abnormal return series for buy recommendations over the evaluation period.

Following the attention hypothesis, it might be possible that local firms cause higher attention amongst the Dutch investors. Hence, I will test whether recommendations of local firms are followed by higher returns then non-local firms.

Thirdly, if investment recommendations would add economic value one should be able to profit from the insights given by analysts. The strategy implemented by Barber et al., which goes long in favorably recommended stocks and short in unfavorably recommended stocks seems to have positive returns. While this is a valid way to test whether there is indeed a trading strategy that generates positive returns, it is not necessarily available to individual investors. This is due to severe short-selling constraints that make it difficult for the individual investors to borrow stocks to sell. These constraints have been mentioned throughout financial literature. One of the early papers mentioning short-selling constraints is a paper written by Miller (1977). Furthermore, to hold a stock one needs to own a stock. In the case of an individual investor, it is more than likely that the investor does not own a universe of stocks to hold, since he is already facing a search

problem as claimed byBarber & Odean (2008). Thus, to keep the analysis within the scope of the thesis and to test for a trading strategy implementable for the individual investor this thesis is going to focus on the buy recommendations and investigate the returns of such a strategy with daily clearing:

H03: A daily clearing trading strategy based on buy stock recommendations significantly outperforms the market.

4 DATA

The recommendations used as a base in this paper have been acquired through the website "analist.nl". This website is an online investment advice platform, offering free advice on European and U.S equities. The recommendation is published by either banks or other institutions, such as brokers, credit rating agencies or investment magazines.

Every advisor uses either a three- of five point scale to form their recommendation, which is then translated into either buy, hold or sell by "analist.nl". The buy recommendation comprises the following terms: accumulate, add, buy, out-performer, positive, strong buy and recommended list. Accordingly, hold entails the following terms: hold, in line, equal weight, market performer and neutral. Last but not least, sell consists of the following: negative, reduce, sell, strong sell and under-performer. The recommendations are updated as soon as they are available, which is usually before noon. [1]

More specifically all recommendations of stocks listed on the Euronext Amsterdam in the time period of August 2013 to March 2016, were used. This is owed to the fact that it is not possible to go further into the past on their website. The Euronext Amsterdam was chosen due to "analist.nl" being a Dutch website. Thus, one can expect that its influence is the greatest in Dutch stock markets such as the Euronext Amsterdam. To obtain the raw data a web scraper[2] was utilized.

[1] Analist.nl

[2] This web scraper is based on own code written in the programming language Ruby. It connects to the website and gathers all information from an element based on a certain selector (e.g table). Furthermore, it iterates through the different pages of the table to get all available information on the Euronext and saves it as a csv file.

Further processing is done as follows: Firstly, I matched the company names with the tickers, I obtained from the Euronext Amsterdam equities directory[3]. Secondly, I repeated this procedure for the ISIN. The ISIN is a unique company identifier composed out of a country code, a nine digit serial number and a single check digit based on the preceding 11 digits[4]. Furthermore, it is needed as an input for Thomas Reuters Datastream, which is used for further analysis. This procedure results in a data set with the following variables: Date, ISIN, company, advisor, type of advise (i.e buy, hold or sell) and the ticker. The total number of observations for the further analysis amounts to 1055.

This data set forms the baseline for the calculation of abnormal returns of the individual events. The calculations were performed by the event study tool, which is an excel macro that works with Thomas Reuters Datastream. It requires the following inputs: Date of event, ISIN, estimation period, evaluation period and the index chosen to proxy the market. In this paper the AEX was selected, considering that it is compromised of the largest caps in the Netherlands and the focus lies on the Dutch stock market .I chose an estimation period of [t-350, t-50] such that it is sufficiently long enough to make an accurate prediction and far enough from the event itself to overcome any information leakage. Furthermore, I chose and evaluation period of [t-10, t+20], which allows for a more extensive evaluation of the abnormal return, rather than a sole focus on the self-fulfilling prophecy, which typically has an evaluation period of a few days.

Given the inputs the tool obtains raw daily closing price data from Datastream for every stock in the input section over the period of 31/12/2010 to 12/4/2016 and calculates daily returns for recommendation i at time t as $\frac{P_{i,t}-P_{i,t-1}}{P_{i,t-1}}$, which is required to perform the market model regression. This regression is estimated over the period [t-350,t-50], and used to predict normal returns for the evaluation period of [t-10,t+20]. I will go into more detail on the market model regression in the methodology part. The normal returns are then subtracted from the realized returns during the evaluation period to calculate the abnormal returns. This produces a table containing ISIN, Date, slope and intercept of the market model regression and abnormal return.

[3] Equities Directory
[4] Isin.org.

An initial overview of the data is presented in Table 1 and Table 2. The advisors(stocks) are ordered according to the frequency of recommendation given(received) and restricted to a top 10, to ensure clarity. From table 1 and 2 it follows that there are generally less sell recommendations than buy recommendations, which are the most frequent observations. This is not surprising considering the findings of papers such as Jegadeesh & Kim (2006), claiming that there are generally less sell recommendations than buy recommendations. An earlier paper of Jegadeesh et al. (2004) , suggests that analysts are biased towards buy recommendations. Thus, the initial data obtained is in line with the existing literature in terms of descriptives.

5 METHODOLOGY

The Methodology of this paper can be split into 3 parts in accordance with the three hypotheses. The first part is concerned with the cumulative average return and whether it is significant or not - the self-fulfilling prophecy. The second part investigate whether the abnormal return is indeed the highest on the event day compared to the mean over the evaluation period. Finally, the third part is concerned with the question if it is possible to obtain positive abnormal returns by following a daily clearing trading strategy based on stock buy recommendations.

5.1 SELF-FULFILLING PROPHECY

To investigate the existence of the self-fulfilling prophecy related to the recommendations of "analist.nl", I used the Datastream event study tool, which uses the event study methodology introduced in a paper written by MacKinlay (1997). The compulsory inputs for this tool are the ISIN and the event date, which is used to get the available raw stock price data for the period of 2011 - 2016, which then is used to calculate the returns required for the market model regression. The estimation period is defined as [t-350, t-50] and the evaluation period as [t-10, t+20]. The estimation of the normal returns and calculation of abnormal returns follows MacKinlay. Firstly, the market model regression is performed, which is a simple OLS regression that takes returns as well as the

index return at time t as an y and x variable, resulting in the following regression equation:

$$R_{i,t} = \alpha_i + \beta_i \times R_t^m + \epsilon \tag{1}$$

Secondly, once having obtained the $\widehat{\alpha}$ and $\widehat{\beta}$, the normal returns R_i^* of the individual stocks are estimated over the period [t-10, t+20] using the following one-period model:

$$R_{i,t}^* = \widehat{\alpha_i} + \widehat{\beta_i} \times R_t^m \tag{2}$$

Thirdly, after establishing the normal returns R_i^*, the abnormal return $ar_{i,t}$ over the period of [t-10,t+20]. is defined as:

$$ar_{i,t} = R_{i,t} - R_{i,t}^* \tag{3}$$

Finally the car_i is computed as follows:

$$car_i = \sum_{t=0}^{4} ar_{t,i} \tag{4}$$

Once having established the the car_i, the average cumulative abnormal return is the computed in the following way:

$$CAR = \frac{1}{N} \times \sum_{i=1}^{n} car_i \tag{5}$$

The CAR to investigate the self-fulfilling prophecy will be calculated during the period [t, t+4], owed to it being a short-lived phenomena. Thereafter, to investigate whether the CAR is indeed, equal to zero, implying that the self-fulfilling prophecy exists. This can be done by inference testing.

$$t = \frac{CAR - 0}{\frac{s_c}{\sqrt{N}}} \tag{6}$$

where

$$s_c^2 = \frac{1}{N-1} \times \sum_{i=1}^{n} (car_i - CAR)^2 \tag{7}$$

5.2 Abnormal Return on the Event Day

The second hypothesis is based on the fact that one would expect the abnormal return to be the highest on the event day it self, if there is indeed and overreaction. Therefore, the abnormal returns on the event day itself will be tested to investigate the hypothesis. This will be done by comparing the average abnormal return on the event day with the mean of the evaluation period and testing for significance with inference testing.

The average abnormal return at the event day is defined as follows:

$$ar_{0,i} = R_{i,0} - R^*_{0,t} \tag{8}$$

$$AR_0 = \frac{1}{N} \times \sum_{i=1}^{n} ar_{0,i} \tag{9}$$

Furthermore, we need the mean of the average abnormal return series:

$$\overline{AR} = \frac{1}{N} \times \sum_{t=0}^{n} AR_t \tag{10}$$

Thereafter, we can test for significance:

$$t = \frac{AR_0 - \overline{AR}}{\frac{s_{AR}}{sqrt(n)}} \tag{11}$$

where s^2_{AR}

$$s^2_{AR} = \frac{1}{N-1} \times \sum_{i=1}^{n} (ar_{0,i} - AR_0)^2 \tag{12}$$

Additionally, it is beneficial to test whether the abnormal return following a buy recommendation is higher for local or for non-local advisors. To test for this, I grouped the buy recommendations based on the location of the companies headquarter, resulting in 193 local recommendations and 323 non-local recommendations. The test statistic is an independent sample t-test, with the

following specifications:

$$t = \frac{\overline{AR_{0,local}} - \overline{AR_{0,non-local}}}{s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \tag{13}$$

where

$$s_p = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}} \tag{14}$$

5.3 Investment Recommendation As Trading Strategy

To investigate whether it is possible to obtain an abnormal return by following the investment advise, a trading strategy with daily clearing will be used. Furthermore, to keep the strategy realistic, only buy recommendations will be followed. This is due to short-selling constraints for individual investors, as well as the fact that one has to own the stock to hold it, thus it is prohibitively hard to implement such a strategy. Moreover, it is not possible to buy the stock at the event day opening price, since the recommendations occur later. Figure 1 suggests that the positive abnormal returns still exist one day after the event, thus trading I suggest would be: Buy at the closing price on the event day and sell at the closing price on the day thereafter. The returns will be calculated as follows:

$$R_{t+1,i} = \frac{P_{t+1,i} - P_{t,i}}{P_{t,i}} \tag{15}$$

In case there are more than one buy recommendation on a day the return will be calculated as the average thereof:

$$R_{t+1} = \frac{1}{N} \times \sum_{i=0}^{n_t} R_{t+1,i} \tag{16}$$

To test whether this return is indeed positive the following t-test is applied

$$t = \frac{\overline{R_{t+1}} - 0}{\frac{s_r}{\sqrt{N}}} \tag{17}$$

where

$$s_r^2 = \frac{1}{N-1} \times \sum_{i=1}^{n} (R_{t+1} - \overline{R_{t+1}})^2 \tag{18}$$

As an alternative to check whether *on average*, it is possible to obtain positive returns, it is advantageous, to investigate the cumulative return over the entire period. The cumulative return is calculated as follows:

$$CAR_1 = (1 + R_1) \times (1 + R_2) \times ... \times (1 + R_t) \tag{19}$$

This exposes the economic implication of the trading strategy, owed to the fact that a significant profit on average, is silent about the magnitude if there is one at all given that we follow every buy recommendation in the dataset.

Furthermore, to establish whether the returns are abnormal after being adjusted for the market risk it should be checked on if the return on the index has predictive power for the return for the stock returns. This can be investigated using the following regression:

$$SR_t = \alpha + \beta \times IR_t + \epsilon \tag{20}$$

[5]

6 RESULTS

The computation of average abnormal returns as well as the average cumulative abnormal return through the market model yielded table 1:

[5] SR_t is the stock return on a given date. The same counts for SI_t, which is the index return on a given date.

Table 1: Descriptives of abnormal returns and cumulative abnormal returns

$\widehat{\beta_i}$ and $\widehat{\alpha_i}$ are the respective slope and intercept series of the individual market model regressions. The variable $ar_{i,0}$ is the abnormal return series on the event date calculated by type of stock recommendation. The variable car_i is the cumulative abnormal return series for the period of [t, t+4], calculated by accruing the abnormal return ($ar_{i,0}$).

Descriptives	n	mean	standard deviation	max	min
$\widehat{\beta_i}$	1055	0.8522	0.3290	1.9136	-0.2640
$\widehat{\alpha_i}$	1055	0.0002	0.0016	0.0125	-0.0052
$ar_{i,0}$ buy advice	516	0.0057	0.0355	0.4031	-0.2172
$ar_{i,0}$ hold advice	425	-0.0046	0.0438	0.4840	-0.2811
$ar_{i,0}$ sell advice	114	-0.0221	0.0772	0.0832	-0.4104
car_i buy advice	516	0.0063	0.0501	0.4350	-0.1904
car_ihold advice	425	-0.0045	0.0617	0.6061	-0.6323
car_i sell advice	114	-0.0479	0.2274	0.2023	-1.9149

Looking at regression coefficient and constant $\widehat{\beta_i}$ and $\widehat{\alpha_i}$, does not necessarily cast doubt on the validity of the market model regression. While a β of 1.9136, might seem high it is not unrealistically high. The minimum and maximum combined with the mean of α suggests that the market model regression did not find a significant abnormal return during the evaluation period - or a stock α.

The extreme minimum of the cumulative abnormal return in the sell category is due to Imtech filing for bankruptcy on the event day. However, a negative cumulative return of -1.9149, would suggest that there was a 191.4% decrease of the stock price over the evaluation period. Thus, it is obvious that a few outliers have to be removed before the hypotheses are tested.

To overcome the outlier problem I applied the Grubbs test Grubbs (1969) for outliers by iterating it through the data and deleting them accordingly. The Grubbs test itself tests whether the maximum value in a vector is indeed an outlier, which is tested as follows:

$$G = \frac{Y_{max} - \overline{Y}}{s} \tag{21}$$

The test statistic is tested against the following critical value:

$$G > \frac{(N-1)}{\sqrt{N}} \times \sqrt{\frac{(t_{\alpha,N-2})^2}{N-2+(t_{\alpha,N-2})^2}} \tag{22}$$

After accounting for the outliers the above-shown descriptives table changes to table 2:

Table 2: Descriptives of abnormal returns and cumulative abnormal returns

$\widehat{\beta_i}$ and $\widehat{\alpha_i}$ are the respective slope and intercept series of the individual market model regressions. The variable $ar_{i,0}$ is the abnormal return series on the event date calculated by type of stock recommendation. The variable car_i is the cumulative abnormal return series for the period of [t, t+4], calculated by accruing the abnormal return ($ar_{i,0}$).

Descriptives	n	mean	standard deviation	max	min
$\widehat{\beta_i}$	1031	0.8523	0.3250	1.9136	-0.2640
$\widehat{\alpha_i}$	1031	2.11e-04	0.0013	0.0125	-0.0052
$ar_{i,0}$ buy advice	510	0.0243	0.0510	0.0895	-0.0818
$ar_{i,0}$ hold advice	413	0.0247	0.0555	0.0902	-0.0976
$ar_{i,0}$ sell advice	108	0.0285	0.0606	0.0832	-0.1030
car_i buy advice	510	0.0051	0.0510	0.4350	-0.1904
car_ihold advice	413	-0.0058	0.0617	0.1755	-0.6323
car_i sell advice	108	-0.0066	0.2274	0.2023	-0.2645

One has to note that the outliers were removed dependent on being an outlying abnormal return on the event day, this explains why some minima and maxima did not change in table 2, specifically the CAR. Overall, the outliers have been removed. The remainder of this section is split into three parts, one part for every hypothesis.

6.1 Self-fulfilling Prophecy

The purpose of this part in the investigation is to find out whether there are any significant cumulative average returns over [t, t+4]. To check for this it one can investigate the graphs to get a first impression. As mentioned earlier for the analysis and inference testing of the CAR, only buy recommendations are regarded, however, it is still useful to briefly discuss the other recommendations.

Figure 4 shows the CAR for buy recommendations over the entire evaluation period [t-10,t+20], the event date itself is at $t = 11$. One can see that the CAR spikes at the event date and is relatively flat before and after the event, albeit the period after the event shows a small upward drift. Compared to figure 1, which shows the AR over the event period, it is easily seen that this spike is reflected in the AR as well.

Figure 5 shows the CAR for the hold recommendation and does not show a distinctive pattern, however, it seems to be the case that following a hold advice there is a negative return, which is reflected by the sharp drop of the AR on the event day as seen in figure 2.

Figure 6 shows the CAR for the sell recommendations and shows less patterns than the hold recommendations, besides the downwards trend. However, if one compares it to figure 3, the abnormal return of sell recommendations, it is not possible to make any conclusions about the pattern or the effect of the event day.

To test for the significance itself a t-test was conducted as mentioned in the methodology part, with the following hypotheses:

$$\textit{H0: } CAR = 0$$
$$\textit{H1: } CAR > 0$$

The t-statistic for this test is $t = 2.2782$. At a significance level of 0.05, the critical value for this t-test would be 1.645, thus the null is rejected.

6.2 Abnormal Return on Event Day

The the section above discussed the figures for the abnormal return and it seems that the magnitude of the abnormal return on the event day is the highest for the buy and the hold recommendations. However, since I am only concerned with buy recommendation I will test for the significance of the buy recommendations only. Table 2 suggests that the mean abnormal return for the event day $AR_{0,}$ is 0.0057. Furthermore the mean of the average abnormal return series $\overline{AR}$ is $2.7413e-04$ and the standard deviation s_{AR} is 0.0012. Thus the t-statistic for the the test

$$\textit{H0: } AR_0 = \overline{AR}$$
$$\textit{H1 : } AR_0 > \overline{AR}$$

is equal to 3.9482, which is larger than the critical value of 1.645, meaning that the null is rejected and the AR_0 is significantly larger than $\overline{AR}$.

Furthermore, the investigation of the groups local vs. non-local, resulted in significant findings. The t-test performed had the following hypotheses:

$$\textit{H0: } AR_{0,local} = AR_{0,non-local}$$

$$\textit{H1: } AR_{0,local} > AR_{0,non-local}$$

The following table shows the descriptives of local versus non-local, in terms of the above-mentioned t-test.

Table 3: Descriptives of buy recommendations grouped in local and non-local

Descriptive	Local	Non-local
Mean	0.0079	0.0045
n	193	323
Standard deviation	0.0320	0.0373

The buy recommendations have been grouped based on the headquarter of the institution giving the advice. Any institution in the Netherlands is regarded as local.

Together with a pooled standard deviation of 0.0354 the t-statistic of this t-test is 11.8168, which is significant on the 1%, 5% and 10% significance level. Therefore, it seems that stock buy recommendations given by local institutions are followed by larger abnormal returns. This could either be due to more attention or the fact that local institutions are recommending smaller stocks, which generally expose higher returns.

6.3 Investment Recommendation As Trading Strategy

This is section is concerned with the third hypothesis and tests whether it is possible to obtain positive returns utilizing a daily clearing strategy for buy recommendations. This investigation is split into 2 parts. Firstly, I am going to test whether on average there is a positive return on the day following the event day. The t-test investigates the following hypothesis:

$$\textit{H0: } \overline{R_{t+1}} = 0$$

$$\textit{H1: } \overline{R_{t+1}} > 0$$

The test statistic is 1.2890, which is well below the critical value of 1.645. Thus, the null of the abnormal return being 0 on the event day is not rejected.

Secondly, after having established that there is, on average, no significant positive return on the day following the event day the questions remains: If one were to follow this trading strategy how much money can be made? To answer this the cumulative return of a buy recommendation strategy with daily clearing was calculated.

Figure 7 clearly shows the upwards slope of the cumulative return one obtains by buying every buy recommendation at the closing price of the event day and selling it on the next day. Thus, if one utilizes this approach there will be a profit. The cumulative sum of all buy recommendations amounts to 1.4696, which is measured in percentages. Thus, investing €1 in every buy recommendation and selling it on the same day, would leave you now with €0.4696 of return. However, one has to note that when compared to the index, which is represented as the orange line in figure 7, the cumulative return of the stocks is mostly below the index and only outperforms it from 2016 onwards. Furthermore, there is a big drop in cumulative return around the third quarter of 2015, which could be caused by the 2015-2016 stock market sell off, which caused irregularities in all markets. However, following all buy recommendations results in a profit if pursued over the whole sample.

To further investigate the impact of the index return on the stock return, a OLS regression was performed. The purpose of this investigation was to establish, whether the constant, the stocks alpha, is positive, which would imply abnormal returns. However, as can be seen in table 6 the constant is not significant. Hence, there is no abnormal returns for following the buy recommendations, which is backed by figure 7.

7 Discussion

The purpose of the discussion part is to put the findings of this thesis into perspective with the reviewed literature and to answer the developed hypothesis. For sake of clarity this section will be

split into 3 parts, one for each hypothesis.

7.1 Self-fulfilling Prophecy

The existence of the self-fulfilling prophecy was found by Pari, claiming that the return of stock buy recommendations are only short-lived. One would expect to find a cumulative abnormal return that is not significantly different from 0, over [t , t+4]. Pari (1987) However, my findings contradict this to some extent. Firstly, the graph of the cumulative return, shows that there is a spike at the event day, however, thereafter it does not revert back to 0 but rather shows an upward drift. This is confirmed by a t-test, that gives evidence that the CAR is significantly different from 0. Therefore *H01: The cumulative abnormal return over the event day and the 4 days following the event day is not significantly different from 0 across all available buy recommendations* is rejected. This is in accordance with the findings of Womack (1996), claiming that albeit the returns are the highest the 3 days following the event, they are not short-lived and there is a post-recommendation drift.

7.2 Abnormal Return on the Event Day

This section is concerned with the above-mentioned spike in abnormal returns on the event day itself. The majority of the papers discussed in this thesis agree that there is indeed a spike of abnormal returns on the event day itself. Possible reasons for this are given by Barber & Odean (2008) and Engelberg et al. (2009), who see attention as a possible driver of a surge of abnormal returns on the event day. The findings of this thesis are in line with this: The spike can be clearly seen in figure 1 and a t-test revealed that the abnormal return on the event day itself, is significantly different from the average over the entire evaluation period. Therefore, *H02: The abnormal return on the event day is significantly different from the mean of the abnormal return series for buy recommendations over the evaluation period* is not rejected. Furthermore, it is interesting to note that recommendations of local firms seem to have a higher impact on stock returns than non-local firms. There are two possible reasons for this as mentioned above. Firstly, the local firm might have superior knowledge of the Dutch market and be subject to higher attention by local investors.

Secondly, local firms might be more inclined to recommend smaller local stocks. It is a well-known fact that smaller companies tend to perform better in terms of stock returns. This means that there might be possible opportunities for profits which leads to the next section.

7.3 Investment Recommendation as Trading Strategy

The approach used to investigate this hypothesis deviated slightly from the approaches given in the literature. Firstly, I used a daily clearing strategy rather than holding a portfolio for a prolonged period of time as done by Barber et al. (2001) . Secondly, I focused on buy recommendations rather than all recommendations for the sake of being implementable by the individual investor, who might face severe short-selling constraints. Thirdly, the trading strategy uses the return of the day after the event day, rather than the day itself, to keep it implementable.

My findings are not entirely in correspondence with the literature (considering that I am choosing for different dates): Firstly, the t-test established that the return on the day following the event day is not different from 0. Secondly, figure 7 revealed that following buy recommendations with daily clearing results in a cumulative return of 1.4696, measured in percentages. Hence, it is possible to say that following buy recommendations will yield a positive return, that is if one disregards transaction costs, which will be quite high for a day-trading strategy. Albeit, there being positive returns for the strategy, after adjusting for the market risk there are no returns left. This can be seen in figure 7 and by the lack of a significant constant in table 6. The findings suggest, that *H03: A daily clearing trading strategy based on buy stock recommendations achieves significant abnormal positive returns* is rejected.

The fact that this paper finds significant abnormal returns on the event day, however, no significant returns on the day following the event day might seem inconsistent. However, testing for abnormal returns on the day following the event reveals that they are not significant($t = -0.17$. Hence, it is consistent, which leaves the question as to why there are no significant abnormal returns on the day after the event. One explanation could be that there was insider trading on the event day leading to abnormal returns. However, thereafter all the information was incorporated

and hence there are no abnormal returns left. Kadan et al. (2015) found that news-driven institutions are significant net buyers of stocks before the upgrade of the stock. This could explain how it is possible that the returns on the day after the event day are not significant anymore, since the abnormal return was captured by the better informed institution.

8 Conclusion

The discussion above revealed that $H01$ and $H03$ are rejected and $H02$ is not rejected. There is a positive abnormal return on the event day itself greater than the average return over the event period. Furthermore, the cumulative abnormal return of 0 over a short post-event window could not be established, meaning that buy recommendations are associated with positive abnormal returns in the short-run. Additionally, it would be possible to obtain a positive return following a daily trading strategy that takes buy recommendations as a signal. However, the positive return is not greater than the positive return of the index, therefore, there are no abnormal returns to be achieved. Furthermore, the transaction costs are disregarded in this thesis, which potentially diminishes the positive returns. The findings of this paper are in line with most papers mentioned in the literature. The findings of the paper written by Pari, have not been found back, since the to positive abnormal return is not only short-lived.

The economic value of buy recommendations could not be established from the findings in this thesis, thus the research question *Do buy stock recommendations of Dutch stocks by Dutch analysts add economic value in terms of abnormal returns, during the period of 2013-2016?* can be answered with a cautious no. Albeit there being positive abnormal returns and on the event day itself, this could be due to simultaneous equation bias, meaning that the increase in stock price might have caused the recommendation. The CAR for the evaluation period was significantly different from 0, which could suggest that analysts add economic value, however, if put into context with the other findings it could simply be due to the data obtained. The economic significance is rather small, since a trading strategy based on these buy recommendations would not result in

significant abnormal returns. In terms of significance and implication for the real world the trading strategy is the paramount aspect to consider. After all, even if there is a significant abnormal return established with certain tests, if it is not possible to monetize this return and claim abnormal returns, the recommendations of analysts add little to no value.

Furthermore, this thesis has some limitations: Firstly, I solely focused on stock recommendations published by analysts of the website "analist.nl". Secondly, I only investigated a sample of the Euronext Amsterdam over the period of 2013-2016. Finally, I disregarded transaction cost, which could potentially diminish any positive abnormal returns obtained by a daily trading strategy. Thus, for the future I suggest to gather more data over a longer time period as well as including transaction costs to account for the real positive return. Additionally, it would be interesting to include the search volume index for the respective tickers into the analysis to establish whether attention has an effect on the results found in this paper. Overall, it seems that analysts do not have the ability to generate positive abnormal returns at least compared to the market. This supports questions findings of studies such as the one conducted by Malkiel, suggesting that apes have better investment skills than analysts.

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APPENDIX

Table 4: Descriptives of Stocks

This table depicts the buy hold and sell recommendations per advising institution in the sample. For the sake of clarity, this table contains a top 10. The % of total observations is defined as the $\frac{Total_{top10,r}}{Total_{allinstitution,r}}$, where r stands for the respective recommendations (i.e buy, hold or sell). The top 10 was ranked according to total observations across all recommendation categories.

Stock	Buy	Hold	Sell	Total
Unilever	15	18	6	39
ASML Netherlands N.V	26	10	3	39
Koninklijke DSM N.V	18	14	2	34
Deutsche Telekom AG	19	12	3	34
Royal Dutch Shell	19	13	1	33
AkzoNObel	16	13	3	32
Ahold	21	11	0	32
ING Groep	23	6	2	31
Heineken	12	14	4	30
Aegon	18	11	0	29
Total	188	122	24	334
as % of total obs.	36.4%	28.7%	21.1%	31.7%

Table 5: Descriptives of Advisors

This table depicts the buy hold and sell recommendations per advising institution in the sample. For the sake of clarity, this table contains a top 10. The % of total observations is defined as the $\frac{Total_{top10,r}}{Total_{allinstitution,r}}$, where r stands for the respective recommendations (i.e buy, hold or sell). The top 10 was ranked according to total observations across all recommendation categories.

Advisor	Buy	Hold	Sell	Total
Beursexpress	49	17	0	66
ING	31	28	0	59
Rabo Securities	33	16	5	54
SNS Securities	34	16	3	53
ABN AMRO	28	24	1	53
TGB	21	2	22	45
Kepler Capital Markets	19	19	7	45
KBC Securities	22	16	3	41
JP Morgan	16	16	3	35
Goldman Sachs	13	16	6	35
Total	266	168	50	484
as % of total observations	51.6%	39.5%	43.9%	45.9%

Table 6: Regression Table: The impact of the index return on the stock return

This regression table depicts the regression output for a regression of the stock return SR and the index return IR. The individual observations correspond to a individual stock recommendation on a certain date. Furthermore, in case there was more than one recommendation on a certain day, the observation is the average of these recommendations. The constant is not significant, therefore there is no significant abnormal return for the stocks, when adjusted for market risk. DW stands for the Durbin-Watson test-statistic and shows, that there is no concern about serial correlation, at least for the first lag of SR

	Model
	SR
Constant	0.0008
	(0.0007)
IR	0.3403***
	(0.0304)
N	261
Adjusted R-Squared	0.3234
DW	2.063

Standard errors in parenthesis. Significance levels: * p<0.1, ** p<0.05, *** p<0.01. Two-tailed test.

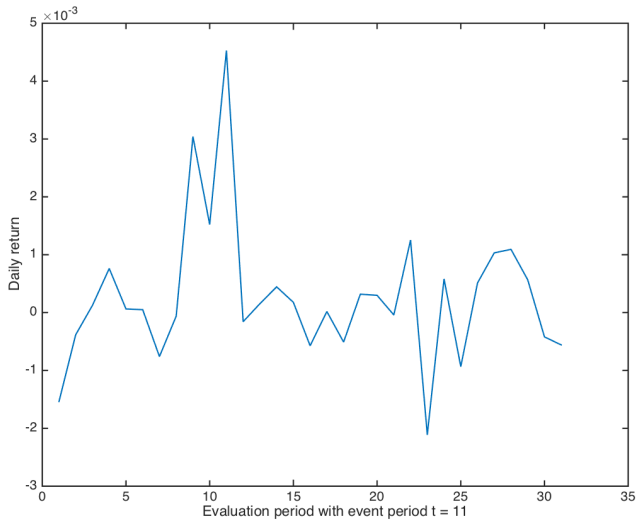

Figure 1: Average abnormal return for buy recommendation.

This figure depicts the average abnormal return over the entire evaluation period of [t-10, t+20]. The value 0 on the x-axis represents the beginning of the evaluation periods, thus $t - 10$. The event day itself is found at $t = 11$). The average abnormal return is computed as the difference of the normal return and the realized return on a certain date, using the market model for normal return predictions.

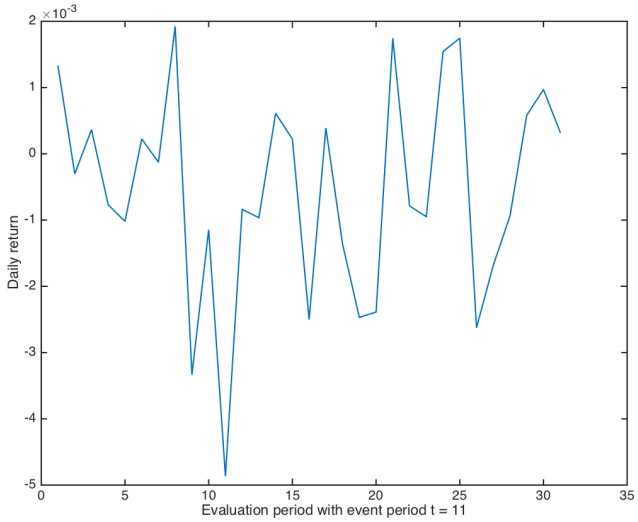

Figure 2: Average abnormal return for hold recommendation

This figure depicts the average abnormal return over the entire evaluation period of [t-10, t+20]. The value 0 on the x-axis represents the beginning of the evaluation periods, thus $t - 10$. The event day itself is found at $t = 11$). The average abnormal return is computed as the difference of the normal return and the realized return on a certain date, using the market model for normal return predictions.

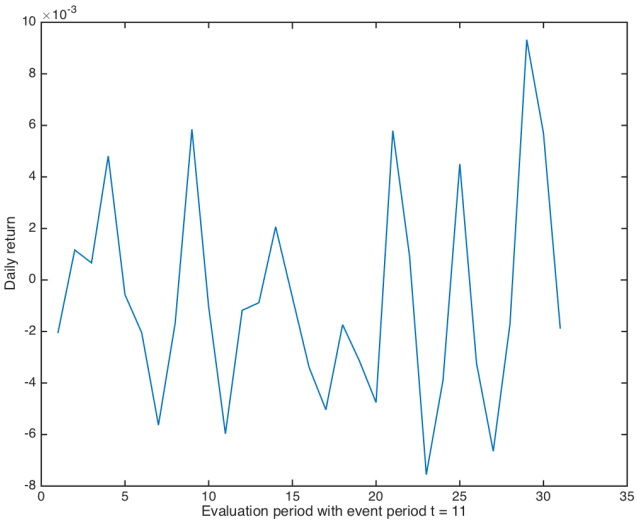

Figure 3: Average abnormal return for sell recommendation

This figure depicts the average abnormal return over the entire evaluation period of [t-10, t+20]. The value 0 on the x-axis represents the beginning of the evaluation periods, thus $t - 10$. The event day itself is found at $t = 11$). The average abnormal return is computed as the difference of the normal return and the realized return on a certain date, using the market model for normal return predictions.

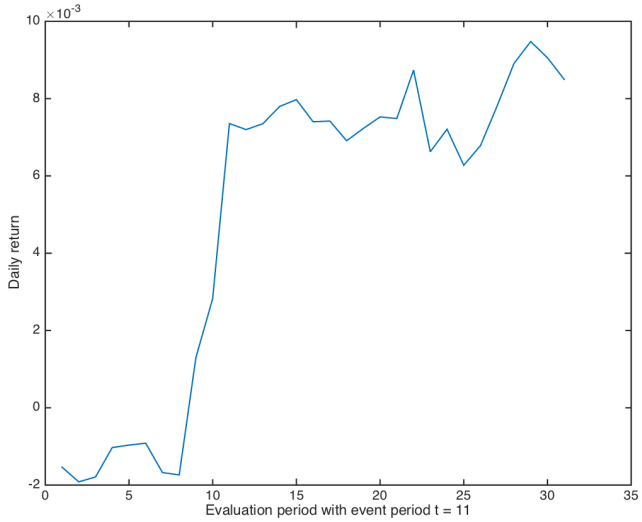

Figure 4: Cumulative abnormal return for buy recommendations over whole period

This figure depicts the cumulative average abnormal return over the entire evaluation period of [t-10, t+20]. The value 0 on the x-axis represents the beginning of the evaluation periods, thus $t - 10$. The event day itself is found at $t = 11$). The average abnormal return is computed as the difference of the normal return and the realized return on a certain date, using the market model for normal return predictions. Thereafter it is the cumulative average abnormal return is calculated as the sum of all observations.

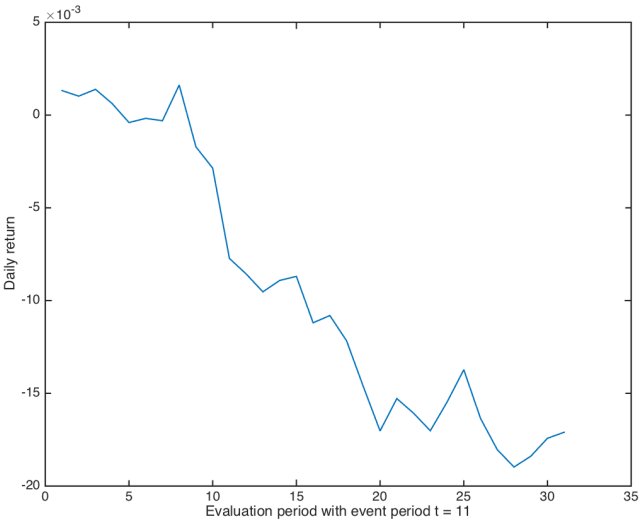

Figure 5: Cumulative abnormal return for hold recommendations over whole period

This figure depicts the cumulative average abnormal return over the entire evaluation period of [t-10, t+20]. The value 0 on the x-axis represents the beginning of the evaluation periods, thus $t - 10$. The event day itself is found at $t = 11$). The average abnormal return is computed as the difference of the normal return and the realized return on a certain date, using the market model for normal return predictions. Thereafter it is the cumulative average abnormal return is calculated as the sum of all observations.

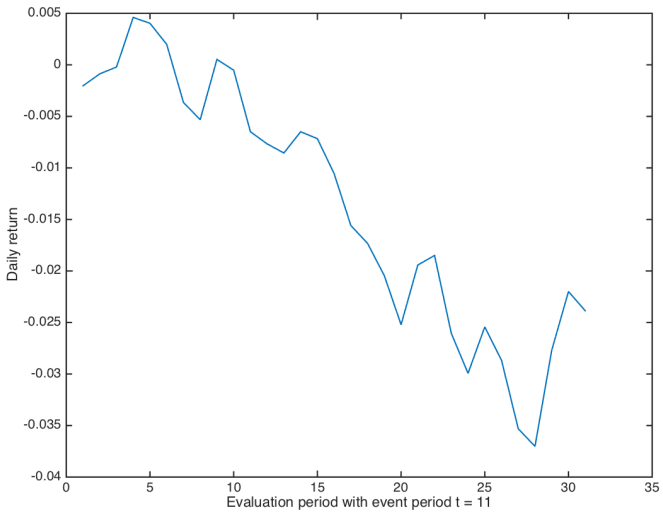

Figure 6: Cumulative abnormal return for sell recommendations over whole period

This figure depicts the cumulative average abnormal return over the entire evaluation period of [t-10, t+20]. The value 0 on the x-axis represents the beginning of the evaluation periods, thus $t - 10$. The event day itself is found at $t = 11$). The average abnormal return is computed as the difference of the normal return and the realized return on a certain date, using the market model for normal return predictions. Thereafter it is the cumulative average abnormal return is calculated as the sum of all observations.

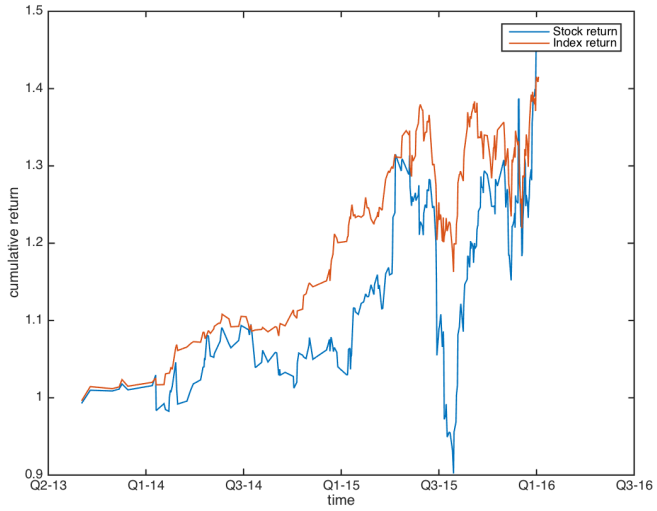

Figure 7: Cumulative abnormal return for following every buy recommendation with daily clearing

This figure depicts the cumulative abnormal return for buy recommendations (blue) and the cumulative average abnormal return of the index (orange). The abnormal return was calculated per day as the average abnormal return of all buy recommendations on a certain date. Thereafter it was cumulated as follows: $1 + r_1) \times (1 + r_2) ... \times (1 + r_t)$. The figure shows that the stocks did not significantly outperform the index. The measurement of the x-axis is quarters and ranges from the second quarter of 2013 to the first quarter of 2016.