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The effect of annual earnings announcements in the Netherlands

Name Student: Bas de Jong

Student ID number: 424802

Supervisor: R. Quaedvlieg

Second assessor: Ruben de Bliek

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Abstract

This thesis examines the stock market reaction caused by annual earnings announcements in the Netherlands. In order to do this, we monitored the short- and long-term performance of AEX listed companies which reported their annual report. The earnings announcements are categorized into two categories: earnings announcements which contain good news and earnings announcements which contain bad news. The division is made based on a comparison between the reported earnings per share and the earnings per share as estimated by analysts. We found evidence that good news leads to positive cumulative abnormal returns and bad news leads to negative cumulative abnormal returns in the short-term. In the long-term we see that stock prices drift in the direction of their initial price reaction: upwards for good news and downwards for bad news. Lastly, we found that a portfolio with a long position in stocks who reported good news and a short position in stocks who reported bad news generates a cumulative abnormal return of 2,34% when hold for 60 days. These findings are in violation with the efficient market hypothesis.

Keywords: earnings announcement, (cumulative) abnormal return, efficient market hypothesis, post earnings announcement drift, event study.

Inhoud

I. Introduction

Earnings announcements are an important instrument to distribute information from inside the company to investors. The way capital market participants receipt and react to the new disclosed information has therefore been a topic of research for decades. Therefore, this paper examines the effect of earning announcements on the stock price in the Dutch stock market. The effect will be monitored in both the short- and the long-term. This research will be performed with annual report data published by AEX listed companies within the time span of 1994 till 2019.

Prior research shows that earnings announcements are a significant source of information in the stock price formation process. Among the first finders of the effect of earning announcements on stock prices were Ball and Brown (1968) and Beaver (1968). Ball and Brown (1968) found that a positive earnings announcement led to a positive abnormal return, while a negative earnings announcement led to a negative abnormal return for United States companies. Beaver (1968) found that the effect of the earnings announcement was the biggest on the date the earnings were actual announced. Up until today research shows that above effects still exist in present capital markets. Although the market reaction to earnings announcements has been examined in countries as Australia (Brown, 1970), the UK (Firth, 1981), China (Haw et al., 2000) and France (Louhichi, 2008), most of the research is performed within the US stock market. Therefore, this research with Dutch listed companies will give (additional) insight if the same effects apply to the Dutch market.

This paper will also examine if the reaction to earnings announcements in the Dutch stock market is consistent with the efficient market hypothesis (EMH). According to the efficient market hypothesis, when new information is released to the public, stock prices should immediately adept to the new information. Therefore, they should immediately reflect the 'correct' price. However, Ball and Brown (1968) found a post earnings announcement drift in the days after the earnings announcement as a result of the market reaction to the newly released information. Thus, there is still a market reaction caused by the earnings announcement after the date when the earnings announcement was published; it takes some time to process the released information. If the post earnings announcement drift is present in the Netherlands, the validity of the efficient market hypothesis in the Dutch stock market must be questioned or even stronger, rejected.

Lastly, this paper will monitor the performance of an investment strategy which is based on the presence of the post earnings announcement drift. Rational investors will always try to exploit potential anomalies of the efficient market hypothesis. We will monitor what abnormal returns can be obtained through anticipating on this possible anomaly.

II. Literature review

Efficient market hypothesis and earnings announcements

Malkiel and Fama (1970) state that stock markets are efficient. This implies that all the public available information is yet reflected in the stock price. This theorem is called the efficient market hypothesis and is based on three assumptions: *(i)* Investors act rational, *(ii)* When investors don't act rational, their behavior is arbitrary *(iii)* when investors act irrational, others will make up for it through arbitrage. Hence, this theory implies that abnormal returns can't be achieved systematically, but only by luck.

Stock prices tend to change when new information is distributed from within the inside of the company to the public. The EMH states that when new information is released to the public, the stock price immediately shifts to the 'right' price. In the paper of Beaver (1968) earnings announcements were subject to research. He investigated if earnings announcements indeed distributed new information to the public, on the base of which investors acted, or whether earnings announcements contained information which was already distributed to the public through other media. He found that earnings announcements contained new information for investors and therefore tend to influence the stock price on the date of the earnings announcement.

More recent research of Drake et al. (2012) found that investors indeed value the content of earnings announcements. They found that abnormal google search start to increase two weeks prior to the earnings announcement date, reaches its peak on the announcement date itself and continue at high levels after the earnings announcement. The results of the paper suggest that the information diffusion is not only at the moment the earnings announcement is published, but rather in the whole period around the earnings announcement. The price and the volume response when the news is announced tends to be lower when investors search more information on the day just before the announcement date. The results state that when there is a higher information demand by investors, the content of the earnings announcement is partially preempted.

Ball and Brown (1968) can be considered as the founders of the effect in stock markets caused by earnings announcements. They found that an earnings announcement leads to an effect on the stock price on the date the earnings announcement took place; they found that an earnings announcement which contained a higher earnings per share than expected led to a positive stock return. Vice versa it was found that an earnings announcement which contained lower earnings per share than expected led to a negative abnormal stock return.

Cross sectional differences in stock characteristics are of influence on the way stock prices react to an earnings announcement c.q. earnings surprise. Freeman (1987), Collins et al. (1987) and Collins &

Kothari (1989) found that the size of a company is negatively correlated with the size of an abnormal return caused by earnings announcements. An explanation for this phenomenon is that investors - and therefore financial media and financial analysts - are less interested in smaller companies. Due to the fact that investors are better informed about bigger companies, an earnings announcement of a big company contains less 'new' information than an earnings announcement of a small company. Thus the 'surprise' of the new information might be smaller which leads to a smaller abnormal return.

Chari et al. (1988) found that an earnings announcement leads to an increase in the volatility of a stocks return. He also found that higher volatile stocks tend to have a positive influence on the abnormal return after a company announces their annual earnings. The more volatile a stock has behaved in the past, the more sensitive a stocks abnormal return will be after an earnings announcement.

It is also of importance whether a company classifies as a growth stock or as a value stock. Growth stocks are associated with a growth potential that is higher than the market. This is usually accompanied with a high price-to-earnings ratio and. Value stocks are usually established firms with constant earnings and are accompanied with lower price-to-earnings ratios. Skinner and Sloan (2002) found that the reaction to earnings surprises differs for growth stocks and value stocks. Growth stocks exhibit an asymmetrically large negative price response to a negative earnings announcement. The explanation lies in the fact that investors are overoptimistic about the earnings growth of growth stocks. The earnings announcement confronts them with the reality and ensures a correction from this overoptimistic attitude.

Post earnings announcement drift

When new information about a company is revealed to the public the stock price should shift to the right price immediately, according to the efficient market hypothesis. However, there are some anomalies found that provide evidence against the efficient market hypothesis. Such an anomaly is a predictable pattern of stock returns, which are not explained under the conventional theories such as the efficient market hypothesis and the capital asset pricing model. A widely accepted anomaly is the post earnings announcement drift. It shows that the information released by an earnings announcement is not immediately incorporated in the stock price.

Ball and Brown (1968) found that even when the earnings were already announced, the cumulative abnormal return tended to drift up after good news and down for bad news. This shows that investors 'underreact' to information gotten out of an earnings announcement.

Foster, Olsen and Shevlin (1984) did replicate this phenomenon in their paper by putting together a portfolio with a long position in stocks within the top decile of earnings surprises and with a short position in stocks within the bottom decile of earnings surprises. The results spoke volumes. Such a portfolio, when hold for 60 days, yielded an annualized return of 25%.

In more recent research of Doyle et al. (2006) also found that firms with positive earnings surprises show large positive stock returns in the three years subsequent to the earnings announcement. Vice versa they found that firms with negative earnings surprises show negative stock returns over the three subsequent years after the earnings announcement. This thesis uses the same methodology as Doyle et al. (2006) to see if there is a positive or negative surprise within the earnings announcement: the reported earnings will be compared with the mean estimated earnings by analysts.

Bernard and Thomas (1989) tried to explain the phenomenon of the post earnings announcement drift on the basis of two classes of explanations: *(i)* There is a delay in processing the information by investors, which might be caused by investors failing to assimilate the newly available information or are the result of transaction costs or opportunity costs. *(ii)* The systematic risk (*Beta*) of the company changed after the earnings announcement but is not captured by researchers in the calculation of the expected return; the higher c.q. lower returns are simply a compensation for investors bearing a respectively higher or lower systematic risk. They did not found evidence that supported the second class of explanations, but did found evidence that supported the first class of explanations.

Rational investors are always looking for opportunities that exploit anomalies. Ke and Ramalingegowda (2005) found evidence that transient institutional investors indeed exploit the post earnings announcement drift. Institutional investors were able to generate an annualized return of 22 percent exploiting this anomaly. It is interesting to see what influence those exploiters have on the anomaly itself. Usually, when enough people exploit such an anomaly, the anomaly should disappear. Therefore, we are curious if the post earnings announcement drift is (still) present in the Dutch stock market.

Hypotheses

In this research the way the Dutch stock market responds to annual earnings announcements is to be investigated. Most of the research in the discussed literature was performed in the United States. Yet we expect the same results as found in the United States. This expectation is based on a dual argument;

Firstly, the Dutch financial system is comparable with the American financial system. Both countries can be considered ‘western’, the legal systems are efficient and accessible, and, in both countries the

supervisory financial entities are functional. There can be spoken of, except for the size of the market, similar market characteristics. Secondly, research in other 'western' EU-countries found the same effects as found in the United States applicable in their stock markets.

Hence, the hypotheses in this research are in line with the results found in the United States and sound as follows:

Hypothesis 1: The abnormal return on the announce date is positive for good news events and negative for bad news events.

Hypothesis 2: The cumulative abnormal returns are positive for good news events and negative for bad news event over the first ten trading days after an earnings announcement.

Hypothesis 3: A post earnings announcement drift is present in the Dutch stock market over the period of sixty trading days.

Hypothesis 4: The standardized unexpected earnings, the market value, the price-to-earnings ratio and the volatility are determinants of cumulative abnormal returns.

Hypothesis 5: A portfolio which goes long in stocks who reported good news and goes short in stocks who reported bad news will generate a positive cumulative abnormal return over the holding period of sixty trading days.

III. Methodology

This study is designed as a multiple event study and follows the event study methodology as described in the paper of Mackinlay (1997). First of all, the event dates and corresponding event periods of interest should be determined. So, to answer our main research topic, the earnings announcement dates are to be identified. The date of the earnings announcement will be marked as t=0. The period of investigation is 2 days prior to the earnings announcement till 10 days past the earnings announcement. This implies an event window of [-2, 10].

To check how the event influenced the stock return, the abnormal return as a result of the event should be calculated. In order to calculate the abnormal returns, first the expected return is to be calculated. The expected return is the return we would have expected in case the event – in our case the earnings announcement - would not have happened. The calculation of the expected return will be done through the market model. In line with the paper of Mackinlay (1997), we will not use the risk-free rate due to the fact that we use daily returns. The formula for the market model is given in formula 1, where the independent variable $R_{i,t}$ is the expected return for company i on time t, α_i is the constant for company i, β_i is the systematic risk of company i, Rm_t is the return of the AEX index on time t and finally, the formula contains an error term.

$$R_{i,t} = \alpha_i + \beta_i Rm_t + \epsilon_{i,t} \quad (1)$$

In order to estimate α_i and β_i, respectively $\hat{a}_i$ and $\hat{b}_i$, an Ordinary Least Squares (OLS) regression over the control period will be performed. The control period in this paper is [-105, -5]. Determining the control period [-105, -5], enables us to have to least interference with prior earnings announcements, but still leaves us enough days to speak of reliable estimations of $\hat{a}_i$ and $\hat{b}_i$.

After $\hat{a}_i$ and $\hat{b}_i$ are estimated, we can proceed to the calculation of the expected return. The expected return can be calculated using formula 2.

$$R^*_{i,t} = \hat{a}_i + \hat{\beta}_i Rm_t \quad (2)$$

The difference between the expected return and the actual return is the abnormal return. The abnormal return is mathematically displayed in formula 3.

$$AR_{i,t} = R^*_{i,t} - R_{i,t} \quad (3)$$

Now the abnormal returns for the all different events are collected, the sample of events will be divided into two separate samples: good news events and bad news events. The separation will be based on the fact if the actual reported earnings per share were higher (good news) or lower (bad news) than was expected by analysts.

To test whether the abnormal returns significantly differ from zero, our null hypotheses will be that the tested variables are zero. If we are able to reject this null hypothesis, we may conclude that the abnormal return significantly differs from zero. The tests will be performed with significance levels of ten, five and one percent. The null hypothesis and the alternative hypothesis are as follows.

H_0: mean of tested variable = 0 H_a: mean tested variable ≠ 0

The mean of the abnormal returns and corresponding t-values for both groups are computed with the statistical program STATA. This program calculates the mean and t-values with the following formulas.

$$\overline{AR}_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t} \tag{4}$$

$$T2AR_t = \frac{AR_t}{s_t/\sqrt{N}} \tag{5}$$

$$s_t^2 = \frac{1}{N-1}\sum_{i=1}^{N}(ar_{i,t} - AR_t)^2 \tag{6}$$

For both groups we calculate the cumulative abnormal returns for the period [0,60]. The method of the calculation is given in formula 7. The notation of the cumulative abnormal returns will be CAR 0 for the cumulative abnormal return for day 0, CAR 1 for the cumulative abnormal return over the period of [0,1] and so on till CAR 60 for the cumulative abnormal return over the period [0,60]. The cumulative abnormal returns will for both samples will be statistically tested separate from each other. Beside the separate tests, a portfolio will be formed. It concerns an equal weighted portfolio with a long position in stocks that published 'good' news and a short position in stocks that published 'bad' news. The performance of the portfolio will be monitored to check if the cumulative abnormal returns significantly differ from zero.

$$CAR_{A,B} = \sum_{t=A}^{B} AR_t \tag{7}$$

Hereafter, some regressions are to be performed. With those regressions we check if and which variables might be determinants of the cumulative abnormal returns. This paper uses the general to specific method. This implicates that we start with running a multivariate regression containing al the possible variables with explanatory power. One by one, the most insignificant variable will be removed out of the multivariate regression until only significant variables are left within the regression. Afterwards, univariate regressions are run to see if the variables are significant by them

self. The formulas for the multivariate regression and for the univariate regression are displayed in respectively formula 8 and 9.

$$CAR_{A,B} = \alpha_i + \beta_i X_i + \epsilon_i \tag{8}$$

$$CAR_{A,B} = \alpha + \beta_1 X_1 + ... + \beta_n X_n + \epsilon \tag{9}$$

IV. Data

In order to see what the market reaction in the Dutch market is after an annual earnings announcement, we need to collect some specific data. First of all, we need to demarcate the 'Dutch market'. Due to (dis)availability of data from the rest of the Dutch market, data is collected from AEX-listed companies over the period January 1994 - February 2019.

The AEX constituents over the period January 1994 till February 2019 are found in the Compustat database. Compustat is a database which provides authorative financial and market data covering listed companies over more than 80 different countries, including the Netherlands. This resulted in 73 unique companies who have been (or are) part of the AEX index.

The earnings announcement dates, the expected earnings per share and the actual earnings per share were retrieved from the Institutional Brokers Estimate System (I/B/E/S) database. I/B/E/S is a database which keeps track of different estimates made by stock analysts. Also, the standardized unexpected earnings (SUE) score is gotten from the IBES database. This SUE score measures the 'size' of the surprise of the corresponding earnings announcement and shows how big the surprise of the earnings announcement is and can be calculated as shown below. The Sample we got from I/B/E/S contained 603 earnings announcements published by 63 different companies (see appendix I).

$$SUE = \frac{EPS - Forecast}{\sigma_{Forecast}} \tag{10}$$

The stock returns, index return, market capitalization, price-to-earnings ratio and the volatility - measured as the standard deviation of the returns over the past five years - are collected in the DataStream database. The total return index of the AEX is used to prevent the research being influenced by stocks going ex-dividend. Due to the size and scale of the variable market capitalization, the logaritmus naturalis (ln) of the market capitalization was taken to run the regressions with.

When all the data is collected, the division between earnings announcements containing good news and earnings announcements containing bad news is made. The 'good news' sample consists of 339 earnings announcements, while the 'bad news' sample consists of 263 earnings announcements. The content of one earnings announcement was exactly equal to the earnings per share as expected by the analysts and is therefore not included in one of the two samples.

Descriptive statistics

To get a clear first impression of the collected data we got the descriptive statistics for both the good news events and the bad news events. Based on those statistics, we might be able to specify our hypotheses, which were based on prior literature. In order to specify our hypotheses, the descriptive statistics of both the good- and bad news events are compared. The descriptive statistics are being displayed in table 1 and table 2.

Table 1*:*

Descriptive statistics for good news events

N=339	**EPS**	**Standardized unexpected earnings**	**Market value (Million €)**	**Price-to-earnings**	**Market-to-book ratio**	**Volatility**
Mean	6,32	1,10	16752,93	30,78	2,95	0,34
Median	1,67	0,70	9939,95	16,80	2,14	0,31
Maximum	406,32	25,25	126903,80	931,30	24,37	1,14
Minimum	-7,45	0,0012	57,28	0	-13,98	0,14
Std. Dev.	35,14	1,95	19566,71	86,77	3,40	0,15
Observations	339	339	339	297	336	339

Table 2:

Descriptive statistics for bad news events

N=263	**EPS**	**Standardized unexpected earnings**	**Market value (Million €)**	**Price-to-earnings**	**Market-to-book ratio**	**Volatility**
Mean	2,62	-1,06	13908,23	24,11	1,67	0,36
Median	1,35	-0,59	7806,19	16,20	2,00	0,28
Maximum	222,59	-0,0031	120581,90	745,50	62,22	1,39
Minimum	-7,65	-17,50	208,52	0	-345,86	0,13
Std. Dev.	13,90	1,74	19446,06	54,27	22,26	0,20
Observations	263	263	263	226	258	263

Both the average earnings per share as the median earnings per share are higher for the good news events. This was not necessarily expected since the division is not made based on the height of the earnings per share but on the fact if the actual earnings per share did beat the analysts' expectations. Furthermore, the standard deviation for the good news events is considerably higher than for the bad news events, which indicates a larger spread in the earnings per share for good news events. Finally, the number of observations is higher for the good news events dataset than for the bad news events dataset. This implies that analysts have underestimated the earnings per share more often than they overestimate them.

For the most prominent variable, the standardized unexpected earnings, the range is the most interesting for both datasets. As we can see, the range for the good news events is from a minimum

of 0,0012 till a maximum of 25,24. The range for bad news events is from the maximum of -0,0031 till the minimum of -17,50. The standard deviation is comparable for both groups and so are - if not for the opposite sign – the median and the mean. This given, we can conclude that the distribution for both groups do not significantly differ from each other.

There are some differences between the groups in the price-to-earnings ratio variable. The mean of the price-to-earnings ratio is higher for the good news event group than for the bad news event group, while the median is approximately the same. This is caused by the higher standard deviation for the good news group. Prior literature showed that a higher price-to-earnings ratio leads to a higher abnormal return. Based on those prior findings we expect that the abnormal returns will be higher for the good news event group than for the bad news event group.

Furthermore, prior literature shows that the size of a company has a negative correlation with the height of the abnormal returns. The average market value is lower for the bad news events than for the good news events. This should lead to a lower abnormal return in the bad news group than in the good news group regarding to this aspect.

The volatility of both groups does not significantly differ from each other. In other words, the volatility of both groups is comparable. Hence, we do not expect a different response in both groups caused by this variable.

V. Results

Hypothesis 1: The abnormal return on the announce date is positive for good news events and negative for bad news events.

Table 3 contains the abnormal returns for every day within event window [-2, 10]. We find different results on the announce dates for both groups. In case the announced earnings per share are worse than analysts had expected, the abnormal return differs from zero within a significance level of 5%. We see that the mean abnormal return on the announce date for bad news is -0,588 percent. This is in line with the prior substantiated hypothesis. If a company publish higher than expected earnings per share, we cannot reject the null hypothesis that the abnormal return differs from zero.

Furthermore, we see some other dates within the event window on which the abnormal return differs from zero with a significance level of 10%. So, we may assume that on the third, fourth and eight day after a company published 'good' earnings, the average abnormal return is higher than zero. On the tenth day after a company publishes 'bad' earnings, the average abnormal return is significantly lower than zero.

Table 3:

Abnormal returns for good news and bad news events.

Good News			Bad News		
Event day	AR (%)	T-value	Event Day	AR (%)	T-value
-2	0,071	0,458	**-2**	-0,058	**-0,387**
-1	0,328	1,633	**-1**	-0,194	-1,611
0	0,050	0,403	**0**	-0,588	-2,058**
1	0,229	1,355	**1**	0,156	0,906
2	0,225	2,19**	**2**	0,174	1,096
3	0,177	1,73*	**3**	-0,146	-1,343
4	-0,148	-1,615	**4**	-0,002	-0,022
5	0,029	0,264	**5**	0,118	1,107
6	0,022	0,249	**6**	0,144	0,892
7	0,158	1,776*	**7**	-0,151	-1,280
8	0,374	0,428	**8**	-0,019	-0,222
9	-0,030	-0,362	**9**	0,029	0,295
10	0,071	0,458	**10**	-0,193	-1,66*

*****, ** and * stand for significant at respectively 1%, 5% and 10% significance levels**

Hypothesis 2: **The cumulative abnormal returns are positive for good news events and negative for bad news events over the first ten trading days after an earnings announcement.**

The cumulative abnormal returns for both groups are displayed in table 4. The cumulative abnormal returns for the bad news group is only significantly different from zero on the announce date itself. The sign of the cumulative abnormal return on the announcement date is - in line with the hypothesis - negative. The cumulative abnormal returns for the good news group significantly differ from zero from day two onwards to day ten. The sign of the cumulative abnormal return is positive,

as was expected in the hypothesis. For the other days, we may not assume that an earnings announcement leads to an abnormal return significantly other than zero.

Table 4:

Cumulative abnormal returns for good news and bad news events

Good News			Bad News		
Event day	AR (%)	T-value	Event Day	AR (%)	T-value
0	0,328	1,633	**0**	-0,588	-2,058**
1	0,379	1,559	**1**	-0,432	-1,242
2	0,608	1,999**	**2**	-0,257	-0,635
3	0,833	2,532**	**3**	-0,403	-0,961
4	1,010	2,969***	**4**	0,405	-0,965
5	0,862	2,422**	**5**	-0,288	-0,659
6	0,891	2,449**	**6**	-0,144	-0,319
7	0,912	2,556**	**7**	-0,295	-0,604
8	1,071	2,956***	**8**	-0,314	-0,650
9	1,108	2,957***	**9**	-0,285	-0,561
10	1,078	2,865***	**10**	-0,478	-0,912

*****, ** and * stand for significant at respectively 1%, 5% and 10% significance levels**

Hypothesis 3: A post earnings announcement drift is present in the Dutch stock market over the period of sixty trading days.

The cumulative abnormal returns over a period of 60 days after an earnings announcement are displayed in figure 1. We already saw that a better (worse) than expected earnings announcement led to a positive (negative) cumulative abnormal returns in the short-term. In figure 1 we can see an upward drift up for a good news announcement and a downward drift for a bad news announcement. The significance of the calculated cumulative abnormal returns differs over time but is in most of the occasions significant. For the t-values with corresponding significance, see appendix II. The results are in line with the hypothesis, as we found an initial under reaction caused by the earnings announcement.

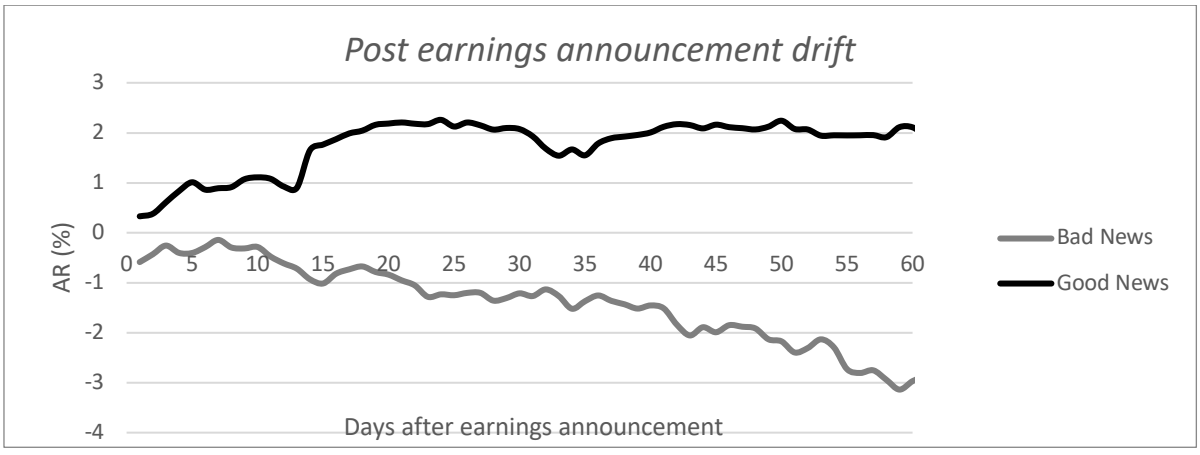

Figure 1:

Cumulative abnormal returns for bad news events and good news events.

Hypothesis 4: The standardized unexpected earnings score, the market value, the price-to-earnings ratio, and the volatility are determinants of cumulative abnormal returns

We tested if the standardized unexpected earnings score, the market value, the price-to-earnings ratio and the volatility are significant determinants of the cumulative abnormal returns in the event window with the general to specific method. We did observe few significant results. The results of the most general regressions are displayed in table 5. None of the variables in the general regressions were found significant. Meanwhile, five (more) specific regressions are found that contained variables with significant influence on certain CAR's. Those regressions are displayed in table 6. We will discuss the results per variable separately.

Table 5:

The general regressions performed on CAR 0 till CAR 10

Variables	Ln (Market Value)	SUE Score	Price to earnings ratio	Volatility	Observations	(Adjusted)-R^2
CAR 0	0,00352	0,00474	$9{,}50*10^{-6}$	-0,0275	516	0,0162
	(0,00151)	(0,000864)	($2{,}39*10^{-5}$)	(0,0144)		
CAR 1	0,00377	0,000113	$4.10*10^{-6}$	-0,0288	516	0,0118
	(0,00175)	(0,000999)	($2{,}76*10^{-5}$)	(0,0167)		
CAR 2	0,00243	0,000525	$-1.94*10^{-5}$	-0,0197	516	0,0000422
	(0,00204)	(0,00117)	($3{,}22*10^{-5}$)	(0,0195)		
CAR 3	0,0256	0,000408	$4{,}46*10^{-5}$	-0,0134	516	0,00174
	(0,00212)	(0,00121)	($3{,}35*10^{-5}$)	(0,0203)		
CAR 4	0,00342	0,00285	$3{,}29*10^{-5}$	-0,00806	516	0,00120
	(0,00212)	(0,00121)	($3{,}34*10^{-5}$)	(0,0203)		
CAR 5	0,00448	$3{,}5*10^{-5}$	$-3{,}27*10^{-5}$	-0,00788	516	0,00461
	(0,00215)	(0,00123)	($3{,}39*10^{-5}$)	(0,0205)		
CAR 6	0,00492	$5{,}29*10^{-5}$	$5{,}29*10^{-5}$	-0,00311	516	0.00386
	(0,00220)	(0,00126)	(0,00126)	(0.0210)		
CAR 7	0,00412	0,000409	$1{,}31*10^{-5}$	-0.0115	516	0.00186
	(0,00227)	(0,00127)	($3{,}51*10^{-5}$)	(0.0216)		
CAR 8	0,00309	0,000780	$2{,}62*10^{-5}$	-0.00837	516	-0.000610
	(0,00225)	(0,00129)	($3{,}55*10^{-5}$)	(0.0215)		
CAR 9	0,00300	0,000767	$5{,}07*10^{-5}$	-0.00661	516	0.00114
	(0,00237)	(0,00135)	($3{,}73*10^{-5}$)	(0.0226)		
CAR 10	0,00216	0,00106	$5{,}77*10^{-5}$	-0.00787	516	0.000958
	(0,00243)	(0,00139)	($3{,}83*10^{-5}$)	(0.0232)		

Note: The standard errors are given in parentheses.

****, **, * stand for significant at respectively 1%, 5% and 10% significance levels*

Table 6:

Regressions containing significant independent variables on cumulative abnormal returns

Variables	CAR 0	CAR 4	CAR 5	CAR 6	CAR 7
Ln (Market Value)	$1{,}62*10^{-7}$*				
	($8{,}63*10^{-8}$)				
Volatility		0,0269*	0,0387**	0,0527***	0,0552***
		(0,0153)	(0,0158)	(0,0162)	(0,0168)
Observations	603	603	603	603	603
(Adjusted)-R^2	0,00418	0,00348	0,00818	0,0156	0,0161

Note: The standard errors are given in parentheses.

****, **, * stand for significant at respectively 1%, 5% and 10% significance levels*

Market value is, in contrary with prior literature, positively related with the cumulative abnormal returns on day 1. So, the bigger a firm is the higher the cumulative abnormal return on the announce date is (ceteris paribus). We did not find a significant relation between the market value and the cumulative abnormal returns for day two till day 10.

The price-to-earnings ratio proved in no case a significant relation with the cumulative abnormal returns. This part of the hypothesis must therefore be rejected. Surprisingly, also the standardized unexpected earnings score was not found significantly different than zero. The size of the surprise can not be seen as a significant determinant of any cumulative abnormal return.

The volatility of a stock before they announce their annual earnings proved a significant relation with the cumulative abnormal returns on days four, five, six and seven. On all those days, the coefficient of the variable volatility is positive. This means that we may expect higher cumulative abnormal returns on days four, five, six and seven for higher volatile stocks (ceteris paribus).

Hypothesis 5: A portfolio which goes long in stocks who reported good news and goes short in stocks who reported bad news will generate a positive cumulative abnormal return over the holding period of sixty trading days.

Based on the expectation that a post earnings announcement drift is present in the Dutch stock market, we composed a portfolio with a long position in stocks who published good news and with a short position in stock who published bad news. Figure 2 shows the cumulative abnormal returns of such portfolio within the Dutch stock market. The cumulative abnormals return of the portfolio proved to be significant on every day of the holding period (see appendix III). We see that such a portfolio leads to a positive cumulative abnormal return of 2,34 percent, when hold for 60 days.

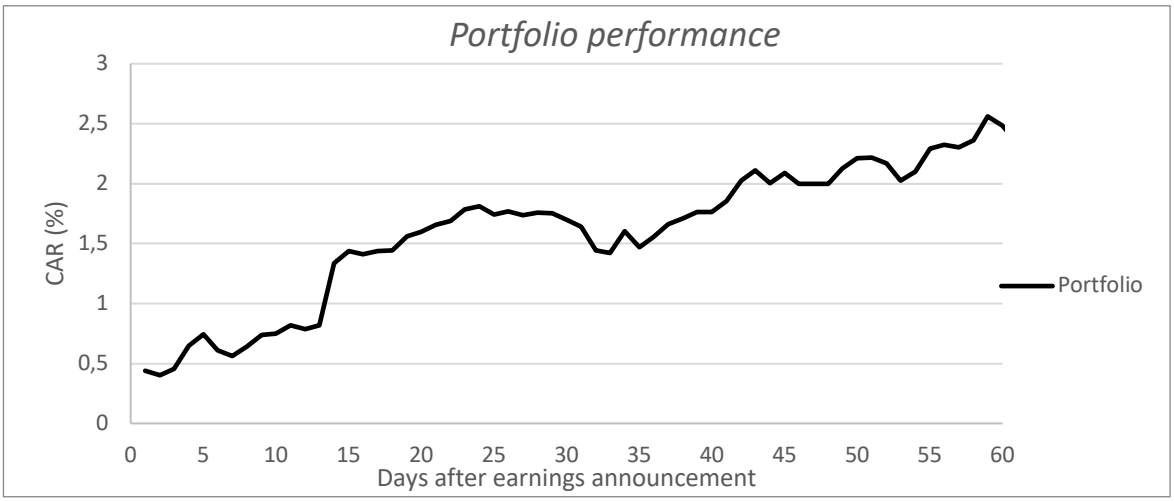

Figure 2:

The cumulative abnormal returns for a portfolio with a long position in stocks who announced good news and a short position for stocks who announced bad news.

VI. Conclusion

This paper tried to answer if and to which extent the Dutch stock market reacted to annual earnings announcements. The market reaction is monitored in both the short-term as in the long-term. Afterwards, we tried to find which variables can be considered as determinants for the market reaction. This is done calculating various (cumulative) abnormal returns with the market model methodology, and further analysis is executed with various methodologies such as univariate regressions, multivariate regressions and portfolio performance tracking. The research was performed with AEX constituent stocks in the period January 1994 till February 2019.

We found 603 annual earnings announcement that met the selection criteria. Those 603 annual earnings announcements were split in to two groups; the good news group and the bad news group. The separation was made based on whether the reported earnings per share were higher or lower than the estimated earnings per share. For both groups we calculated the abnormal returns for the event window [-2, 10]. The abnormal return is the actual return minus the estimated 'normal' return. The estimated return was calculated with the market model, with the AEX index return used as the market return. With the obtained abnormal returns, the cumulative abnormal returns are calculated. The means of those (cumulative) abnormal returns were tested on significance on the levels of ten, five and one percent.

The notable findings for the short-term effects are the following: an abnormal return of -0,588 percent was found on the announcement date when the earnings announcement contained negative news. The abnormal return on the announcement date when the earnings announcement contained good news, did not significantly differs from zero. Meanwhile the cumulative abnormal returns for the good news dataset proved significantly positive for the second day till the tenth day after the earnings announcement was reported. Those findings confirm that the effect as found by Ball and Brown (1968) - a negative cumulative abnormal return for bad news and a positive cumulative abnormal return for good news - is present in the Dutch stock market.

We observed the presence of the post earnings announcement drift in the Dutch stock market. The direction of the drift was in the same direction as the initial abnormal return. Thus, we may conclude that the Dutch stock market initially under reacts to an earnings announcement. Such a drift is in violation with the efficient market hypothesis, as that theorema states that the stock price should immediately adjust to the right price after new information is disclosed. Based on the presence of the drift, we may conclude that the efficient market hypothesis does not hold within the Dutch stock market.

Ke and Ramalingegowda (2005) found that institutional investors exploit the presence of the post-earnings-announcement drift. We simulated such an attempt to exploit the post-earnings-announcement drift by constructing a portfolio with a long position in stocks who presented good news and with a short position in stocks who presented bad news. We found that such a portfolio did generate an abnormal return of 2,34 percent over a 60-day period.

We tried to find out which factors influenced the height of the cumulative abnormal returns. Prior literature showed that the market capitalization, the price-to-earnings ratio and the volatility of a stock influence the height of the abnormal returns in the United States. Because of the similarities between the American and the Dutch financial markets, we expected that these factors would be of influence in the Dutch stock market as well. Besides, we expected the standardized unexpected earnings score to be a determinant with a positive influence on the size of the cumulative abnormal returns. However, the results proved this only partially true. On the announce date, only the market capitalization of a firm showed to be of significant influence. Remarkable is that the market capitalization is positively related with the size of the abnormal return, while in the United States the market capitalization shows a negative relation with the size. The price-to-earnings ratio and the standardized unexpected earnings showed no significant relationship with the cumulative abnormal returns in the Dutch market. This is also in contradiction with the hypothesis, as we expected the price-to-earnings ratio and the standardized unexpected earnings to have a positive impact on the height of the cumulative abnormal returns. Finally, we checked the influence of volatility on the cumulative abnormal returns. This relationship turned out to be insignificant, except for the fourth, fifth, sixth and seventh day. On those days the volatility had a positive effect on the size of the abnormal returns. This is consistent with what was hypothesized based on earlier findings.

Based on this paper, the answer to the question whether and till what extent the Dutch stock market reacts to annual earnings announcements must sound: *''Yes, annual earnings announcements do influence the Dutch stock market; the short-term reaction is a positive cumulative abnormal return for earnings announcement which exceed analysts' expectations and a negative cumulative abnormal return for earnings announcements which fail to meet analyst's expectation. The long-term reaction shows that a post-earnings-announcement drift is present in the direction of the initial reaction, which implicate an initial underreaction to earnings announcement.''*

VII. References

Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of accounting research*, 159-178.

Beaver, W. H. (1968). The information content of annual earnings announcements. *Journal of Accounting Research*, *6*, 67–92.

Bernard, V. L., & Thomas, J. K. (1989). Post-earnings-announcement drift: delayed price response or risk premium?. *Journal of Accounting research*, *27*, 1-36.

Brown, P., 1970. The impact of the annual net profit report on the stock market. *The Australian Accountant*, 277–283.

Collins, D. W., & Kothari, S. P. (1989). An analysis of intertemporal and cross-sectional determinants of earnings response coefficients. *Journal of accounting and economics*, *11*(2-3), 143-181.

Collins, D. W., Kothari, S.P. & Raybum, J. (1987), Firm size and the information content of prices with respect to earnings. *Journal of Accounting and Economics,* 9, 111-138.

Doyle, J. T., Lundholm, R. J., & Soliman, M. T. (2006). The extreme future stock returns following I/B/E/S earnings surprises. *Journal of Accounting Research*, 44(5), 849-887.

Drake, M. S., Roulstone, D. T., & Thornock, J. R. (2012). Investor information demand: Evidence from Google searches around earnings announcements. *Journal of Accounting Research*, 50(4), 1001-1040

Firth, M., 1981. The relative information content of the release of financial results data by firms. *Journal of Accounting Research* 19, 521–529.

Foster, G., Olsen, C., & Shevlin, T. (1984). Earnings releases, anomalies, and the behavior of security returns. *Accounting Review*, 574-603.

Freeman, R. N. (1987). The association between accounting earnings and security returns for large and small firms. *Journal of Accounting and Economics*, *9*(2), 195-228.

Haw, I., Qaqing, D., Wu, W., 2000. Timeliness of annual report releases and market reaction to earnings announcements in an emerging capital market: the case of China. *Journal of International Financial Management and Accounting 11*, 108–131.

Ke, B., & Ramalingegowda, S. (2005). Do institutional investors exploit the post-earnings announcement drift?. *Journal of Accounting and Economics*, *39*(1), 25-53.

Louhichi, W. (2008). Adjustment of stock prices to earnings announcements: Evidence from Euronext Paris. *Review of Accounting and Finance*, *7*(1), 102–115.

MacKinlay, A. C. (1997). Event studies in economics and finance. *Journal of economic literature*, *35*(1), 13-39.

Malkiel, B. G., & Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The journal of Finance*, 25(2), 383-417.

Skinner, D. J., & Sloan, R. G. (2002). Earnings surprises, growth expectations, and stock returns or don't let an earnings torpedo sink your portfolio. *Review of accounting studies*, *7*(2-3), 289-312.

Appendix I: Included Companies

NN GROUP N.V.
ABN AMRO GROUP NV
AIR FRANCE - KLM
DELTA LLOYD NV
AALBERTS NV
ABN-AMRO HOLDINGS NV
AGEAS SA/NV
AEGON NV
AKZO NOBEL NV
ALTICE EUROPE NV
KONINKLIJKE BAM GROEP NV
BAAN CO NV
BOSKALIS WESTMINSTER NV
ROYAL P&O NEDLLOYD NV
CORBION NV
KONINKLIJKE DSM NV
RELX NV
FOKKER NV
FUGRO NV
GIST-BROCADES (KONINKLIJKE) NV
USG PEOPLE NV
GUCCI GROUP NV
GETRONICS NV
HAGEMEYER NV
HEINEKEN NV
HOOGOVENS (KONINKLIJKE) NV
KONINKLIJKE AHOLD DELHAIZE
ARCELORMITTAL
ING GROEP NV
GALAPAGOS NV
CORPORATE EXPRESS NV
KPNQWEST NV
SIGNIFY NV
VOPAK (KONINKLIJKE) NV
VAN DER MOOLEN NV
NUMICO (KONINKLIJKE) NV
SBM OFFSHORE NV
TELE2 NETHERLANDS HOLDING NV
KONINKLIJKE PHILIPS NV
POLYGRAM NV
KONINKLIJKE KPN NV
APERAM SA
ROYAL DUTCH SHELL PLC
RODAMCO EUROPE NV
RANDSTAD NV
POSTNL NV
OCE NV
GEMALTO
UNIBAIL RODAMCO WE
UNILEVER NV
VEDIOR NV
OCI NV
KLEPIERRE SA
CORIO NV
STORK NV
NIELSEN HOLDINGS PLC
TNT EXPRESS NV
WESSANEN NV
WOLTERS KLUWER NV
WERELDHAVE NV
ASML HOLDING NV
KONINKLIJKE VENDEX KBB
UNITED PAN-EUROPE COMMNS NV

Appendix II: T-values CAR for good and bad news

Good news				Bad news			
Event day	T-Value	Event day	T-Value	Event Day	T-Value	Event Day	T-Value
0	1,6325	**31**	1,9359*	**0**	-2,058**	**31**	-1,4074
1	1,5590	**32**	1,7486*	**1**	-1,2421	**32**	-1,5837
2	1,9994**	**33**	1,8736*	**2**	-0,6346	**33**	-1,9144*
3	2,5321**	**34**	1,7277*	**3**	-0,9612	**34**	-1,7494*
4	2,9686***	**35**	1,8883*	**4**	-0,9654	**35**	-1,5509
5	2,4223**	**36**	1,9472*	**5**	-0,6585	**36**	-1,6410
6	2,4486**	**37**	1,9284*	**6**	-0,3193	**37**	-1,6796*
7	2,5562**	**38**	1,8563*	**7**	-0,6042	**38**	-1,7946*
8	2,9560***	**39**	1,8223*	**8**	-0,65	**39**	-1,6886*
9	2,9571***	**40**	1,8945*	**9**	-0,5606	**40**	-1,7243*
10	2,8651***	**41**	1,9310*	**10**	-0,9124	**41**	-1,8564*
11	2,4299**	**42**	1,9043*	**11**	-1,1903	**42**	-1,9588*
12	2,3405**	**43**	1,8092*	**12**	-1,3725	**43**	-1,8959*
13	2,1626**	**44**	1,8455*	**13**	-1,7938*	**44**	-2,0008**
14	2,3752**	**45**	1,7846*	**14**	-1,9467*	**45**	-1,9529*
15	2,5322**	**46**	1,7517*	**15**	-1,5457	**46**	-2,0075**
16	2,6151***	**47**	1,6795*	**16**	-1,3291	**47**	-1,9974**
17	2,5663**	**48**	1,6891*	**17**	-1,1842	**48**	-2,0558**
18	2,5875**	**49**	1,7708*	**18**	-1,3599	**49**	-2,0907**
19	2,6252***	**50**	1,6175	**19**	-1,4183	**50**	-2,2098**
20	2,6301***	**51**	1,5917	**20**	-1,5878	**51**	-2,0270**
21	2,6391***	**52**	1,4903	**21**	-1,7553*	**52**	-1,9871**
22	2,7058***	**53**	1,4923	**22**	-2,0270**	**53**	-2,1410**
23	2,8149***	**54**	1,4856	**23**	-1,9273*	**54**	-2,2668**
24	2,6184***	**55**	1,4905	**24**	-1,9665*	**55**	-2,2129**
25	2,6695***	**56**	1,4819	**25**	-1,8644*	**56**	-2,1593**
26	2,5661**	**57**	1,4290	**26**	-1,7920*	**57**	-2,2039**
27	2,4313**	**58**	1,5637	**27**	-1,8473*	**58**	-2,2817**
28	2,4478**	**59**	1,4787	**28**	-1,7111*	**59**	-2,2668**
29	2,3953**	**60**	1,3513	**29**	-1,5711	**60**	-2,2856**
30	2,2236**			**30**	-1,5786		

*****, ** and * stand for significant at respectively 1%, 5% and 10% significance levels**

Appendix III: T-values CAR Portfolio

CAR Portfolio			
Event day	T-value	Event Day	T-value
0	2,6221***	**31**	2,3949**
1	1,9681**	**32**	2,3435**
2	1,8471*	**33**	2,6324***
3	2,4766**	**34**	2,4134**
4	2,8112***	**35**	2,4326**
5	2,2081**	**36**	2,5314**
6	1,9853**	**37**	2,5370**
7	2,1924**	**38**	2,5260**
8	2,52**	**39**	2,4356**
9	2,4412**	**40**	2,5162**
10	2,6159***	**41**	2,6434***
11	2,5389**	**42**	2,6919***
12	2,6069***	**43**	2,5605**
13	2,7508***	**44**	2,6439***
14	3,0177***	**45**	2,5481**
15	2,9635***	**46**	2,5419**
16	2,9291***	**47**	2,4724**
17	2,8165***	**48**	2,5331**
18	2,9212***	**49**	2,6190***
19	2,9821***	**50**	2,5660**
20	3,0691***	**51**	2,4582**
21	3,1604***	**52**	2,3276**
22	3,3664***	**53**	2,4102**
23	3,4078***	**54**	2,5271**
24	3,2597***	**55**	2,5228**
25	3,2495***	**56**	2,4829**
26	3,1259***	**57**	2,4804**
27	3,0498***	**58**	2,6429***
28	2,9878***	**59**	2,5214**
29	2,8648***	**60**	2,4014**
30	2,7284***		

*****, ** and * stand for significant at respectively 1%, 5% and 10% significance levels**