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Is Top Line Now Top of Mind?

An empirical study on response coefficients on the Stockholm Stock Exchange

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ABSTRACT

This study examines the relationship between abnormal stock returns and surprises in both revenues and earnings on the Stockholm Stock Exchange for the years 2011 – 2015. Previous research has shown a continuously increasing size of the revenue response coefficient, which under certain conditions surpasses the value of the earnings response coefficient. We construct an OLS regression derived from Jegadeesh and Livnat's (2006) paper *"Revenue Surprises and Stock Returns"*, with the hypothesis that the size of revenue response coefficient will exceed the size of the earnings response coefficient for our sample. Our results suggest that the explanatory power, R^2, is remarkably increased by including the revenue response coefficient along with dummy variables in the regression. After including the Fama-French derived factors *size* and *book-to-market*, we ultimately find that the revenue response coefficient is statistically significant different from zero, and indicates a larger size than that of the earnings response coefficient.

Keywords: *Revenue Response Coefficient, Earnings Response Coefficient, Surprise Earnings, Surprise Revenues, Capital Markets*

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1. Introduction

1.1 Background

On the 14th of October 2015, the Swedish retail company Dustin Group released their annual report for the fiscal year of 2014/2015. Compared to analysts' consensus forecast for the fourth fiscal quarter, the earnings declined while the revenues increased. Dustin Group's stock price increased drastically, and at the end of the trading day, it had gained approximately 3,3% (Nasdaq, 2017). Could it be that the effect of the revenue surprise outweighed the effect of the earnings surprise?

A great deal of previous research has been conducted on how the stock market reacts to accounting information. By examining historical accounting information and future outlooks, analysts constantly try to forecast company figures before the actual figures are presented. Previous research within the field has been focusing primarily on how the market reacts to unexpected changes in earnings, i.e. the difference between the actual earnings and the market's expectation on earnings. Ever since Ball & Brown published their groundbreaking article in 1968, numerous studies document positive correlations between unexpected changes in earnings and abnormal stock returns around the earnings announcement. However, less research has been conducted on unexpected changes in revenues and their effect on abnormal stock returns.

In this study, the concept of response coefficients refers to how much the capital market reacts to unexpected changes, i.e. surprises, in earnings and revenues. The terms *unexpected changes* and *surprises* are both defined as the difference between actual figures and the expected figures, and will be used interchangeably in this study. One of the most extensive studies on the revenue response coefficient, conducted by Jegadeesh and Livnat (2006), finds a significant relationship between abnormal stock returns and revenue surprises based on the New York Stock Exchange between 1987 and 2003. They find that the size of the revenue response coefficient has increased drastically over time and that earnings surprises accompanied by revenue surprises signal more persistent earnings growth compared to firms where there is no revenue surprise. By understanding the implications of revenue surprises, we may be able to better predict, and explain, a stock's abnormal returns.

Since Ball and Brown's article in 1968, the revenue response coefficient has evolved from being considered inconsequential, to exceeding the size of the earnings response coefficient in certain settings. By extending the research on the relationship between accounting data and abnormal returns through the implementation of a revenue response coefficient, economists have managed to provide a sounder explanation to what the capital market deems valuable.

1.2 Purpose of the Study & Contribution

This paper aims to contribute to existing research by studying the relationship between abnormal stock returns and unexpected changes in both revenues and earnings. Previous research has been focusing on the U.S market and topics such as the sustainability of earnings and revenue growth (Jegadeesh, Livnat 2006; Ertimur, Livnat & Martikainen 2003; Ghosh, Gu & Jain 2005). We furthermore find no previous research based on the Swedish market after the year 2002. By examining the response coefficients for both revenues and earnings on the Swedish market, this paper aims to answer the following research question:

"How does the capital market react to surprises in revenues and earnings?"

1.3 Scope of Investigation

Our study is based on publicly listed companies on the Stockholm Stock Exchange, and all companies included in our sample are listed on either the small-, mid- or large cap. The accounting data is collected for whole fiscal years over the observed period 2011 – 2015. No limitation based on a specific number of active consecutive years on the Stockholm Stock Exchange has been made, as our study focuses on the effect on a market level rather than on a firm level.

The study is limited to the announcement of accounting data in connection with the annual report, where each observation has at least three analyst forecasts included in the mean estimates for both earnings and revenue. The observations are also limited to where the forecasted, as well as actual, EPS is positive. All observations from other announcements such as interim reports, companies with negative forecasted and/or actual earnings per share, or with a number of analyst forecasts below three, are excluded from our study. For an additional explanation and discussion of the limitations and exclusions, see Section 4.1 and 4.5.

Furthermore, our study focuses on investigating if the Swedish market reacts stronger to revenue surprises than to earnings surprises, and not on giving an explanation to why the Swedish market potentially reacts stronger to revenue surprises than to earnings surprises.

1.4 Disposition

In order to examine and analyze the relationship between abnormal returns and surprises in both revenues and earnings, this study will be separated into different chapters. Chapter 2 provides a theoretical framework based on previous research within the field of response coefficients, stock returns and accounting data. With this framework, we state our hypothesis for our tests in Chapter 3. Chapter 4 thoroughly describes the methodology as well as the sample used in the study. Based on the methodology, we perform regressions and statistical tests for which the generated results will be presented, along with an analysis, in chapter 5. Chapter 6 discusses the statistical assumptions used in, and the accuracy of, the regression model. Chapter 7 then concludes our paper and findings, and provides suggestions for future research.

2 Theoretical Framework and Previous Research

This section aims to provide a solid foundation and theoretical background which this paper is built upon. The chapter is split into sections dealing primarily with theory and research on accounting data, response coefficients and applied models.

2.1 The Relationship Between Stock Return and Accounting Data

Ball and Brown were pioneers in the field of accounting research with their article *"An empirical evaluation of accounting income numbers"* in 1968. In the article, Ball and Brown performed an empirical test on the relationship between accounting data and share prices that functioned as the starting signal for future research within the field of accounting data and its impact on the capital market.

Ball and Brown used both net earnings and earnings per share as different measures of accounting data. The market expectation, which the actual accounting data was compared to, was calculated in two different ways. The first approximation of the market expectation was through using a time series model based on historical trends, whereas the second approximation was based on a naïve model where, for example, the preceding year's actual value functioned as the following year's market expectation.

For their empirical test, Ball and Brown divided their observations into two different portfolios based on either good or bad news. The good news were characterized as reports that outperformed the market expectations, and bad news as reports that failed the market expectations. The cumulative abnormal return, calculated as the stock's performance adjusted for the market's performance over a set event window, was then used to compare the different portfolios with the market. Not surprisingly, the two portfolios differed drastically when it came to performance. The "good news"-portfolio outperformed the "bad news"-portfolio and had a positive abnormal return in comparison with the market (Ball, Brown 1968).

Their study shows a significant relationship between accounting data and changes in share prices, i.e. abnormal return. However, share prices are affected by other factors than announced accounting data as movements in the stocks often occurr before the report is announced. This implies that the market already captures some of the information presented in the reports before they are publicly released. Ball and Brown suggest that up to 90% of the change had already occurred before the announcement of the annual report, which may be due to for example interim reports. For this reason, analyzing abnormal stock returns based on year to year changes in accounting figures becomes less relevant. Instead, by examining the differences between actual figures and expected figures, i.e. surprises, abnormal returns can be studied more accurately.

2.2 The Earnings Response Coefficient

A great deal of research has been conducted following Ball and Brown's conclusion about the relationship between stock returns and accounting data. One of the most prominent concepts is the earnings response coefficient, shortened ERC, which has been thoroughly studied in different settings with differing modifications. Collins and Kothari (1989) operationalizes the ERC as the coefficient in a regression with the cumulative abnormal return as the dependent variable, and the earnings surprise as the independent variable. The ERC thus provides information about the size of the earnings surprise's effect on the abnormal return.

Equation I

The Earnings Response Coefficient

$$\mathrm{CAR}_{it} = \hat{\alpha} + \beta_1 * \mathrm{SE}_{it} + \varepsilon_{it}$$

CAR_{it}	The cumulative abnormal return for company *i* in period *t*
$\hat{\alpha}$	The estimated intercept
$\boldsymbol{\beta_1}$	**The earnings response coefficient (ERC)**
SE_{it}	The earnings surprise for company *i* in period *t*
ε_{it}	The error term for company *i* in period *t*

Equation I shows the regression with the earnings response coefficient presented by Collins and Kothari (1989).

Earnings can, per definition, be described as revenues less expenses. This implies that the earnings surprise is derived from either surprises in revenues or surprises in expenses. Ertimur et al. (2003) used this approach and conducted a test where they compared two different regressions. The first regression included a traditional earnings response coefficient, whereas the second regression included both a revenue response coefficient and an expense response coefficient. This way, they could separate earnings into its accounting fundamentals, and they found that the R^2-value, i.e. the explanatory power, for the second model was greater than for the one with the traditional earnings response coefficient.

Previous studies have shown that different types of companies and industries respond differently to unexpected earnings. For example, companies with higher systematic risk, and therefore higher expected rate of return, tend to have a lower ERC than companies with lower systematic risk. This is probably due to the fact that companies with a higher systematic risk end up with a smaller present value of future dividends caused by unexpected earnings (Collins, Kothari 1989). In addition, Dhaliwal & Reynolds (1994) argue the equity beta does not capture all elements of riskiness of equity, which instead can be explained by the risk of debt. Furthermore, other studies suggest that the ERC is significantly lower for value companies than for growth companies, indicating the greater importance investors attach to earnings for growth companies (Ertimur, Livnat & Martikainen 2003). The definition of value and growth companies is presented in Section 2.6.

The ERC tends to be operationalized in different ways, and the size of the coefficient differs with the operationalization. The main differences between previous studies are the measure of the market expectation for earnings, and the denominator in the calculation of the surprise variable. Commonly, the expected earnings are calculated using either analysts' consensus forecasts, or through a naïve model or a time series model, both explained in Section 2.1. The denominator divides the forecast error, which is the difference between actual and forecasted earnings. Most commonly, the denominator consists of either a standard deviation (Jegadeesh, Livnat 2006), the stock price (Ertimur, Livnat & Martikainen 2003; Ghosh, Gu & Jain 2005) or the expected EPS (Collins, Kothari 1989).

Regressions testing the relationship between abnormal returns and earnings surprises, i.e., the earnings response coefficient, tend to generate rather low R^2-values (Lev 1989). In general, only 2-5% of the abnormal return can be explained by the unexpected change in earnings. However, Runsten (1998) conducted a study on the Swedish market and found that adding extra independent variables can increase the regression's R^2-value drastically. Furthermore, Lipe et al. (1998) find that the relationship between the cumulative abnormal return and the unexpected change in earnings is not linear if extreme values, or negative values, are included in the observed sample. As argued for by Linderholm (2001), this may be because unexpectedly high results are perceived as occasional.

The notion about the earnings' implication on abnormal returns, and thus company value, originates from concepts of company valuation. As described by Berk et al. (2009), a company's present value may be calcuated as the discounted value of all future dividends. Since dividends are derived from earnings, this provides us with an explanation to why earnings, and therefore earnings surprises, matter in company valuation. It is however worth noting that the value of the discounted future dividends implies the fundamental value and not the market value. There is however commonly a relationship between the two.

2.3 The Revenue Response Coefficient

The revenue response coefficient, shortened RRC, is a less explored concept that is derived from the intuition behind the ERC. The revenue response coefficient functions in a similar way as the ERC; it aims to explain the relationship between a stock's abnormal returns and its unexpected changes in revenue.

Hoskin et al. (1986) found that certain earnings components, excluding revenues, convey incremental information content beyond earnings. Later, Swaminathan and Weintrop (1991) finds a positive relation between stock returns and unexpected revenues, and that revenues and expenses together can add information beyond earnings. Trueman (2000) finds no association between net earnings and stock prices for internet companies. He however finds that gross profit, defined as revenues less cost of revenues, is significantly associated with stock prices. Bagnoli et al. (2001) studied internet firms before and after the bubble, and found that firms reporting losses have stock prices that respond to revenue-, but not earnings surprises.

In 2006, Jegadeesh and Livnat find that the revenue response coefficient has grown over time between the years of 1987 and 2003, and Ertimur et al. (2003) discover that the market reacts stronger to a dollar of sales surprise compared to a dollar of cost savings. They argue that the relatively higher persistence of revenues motivates the stronger reaction to a dollar of sales surprise. Kama (2009) further builds upon the research of Jegadeesh and Livnat (2006) and Ertimur et al. (2003) and finds that for R&D intensive companies within oligopolistic industries, the reaction to earnings surprises does not necessarily exceed the reaction to revenue surprises. He argues that this is due to low earnings precision and that revenue functions as an indicator of future outcomes, and the fact that a greater market share "yields the ability to influence future economic parameters in the market".

Since the end of the 1960s, new research has surfaced with incremental information about the market's reaction to revenue surprises. Most recent studies point towards the fact that the revenue response coefficient is a significant factor with a size that has grown over time, and even surpasses the size of the earnings response coefficient in certain settings.

Jegadeesh and Livnat (2006) discuss the intuition behind the effect of revenues on stock prices, and why, theoretically, revenues should impact the stock price. They argue that earnings growth driven by revenue growth exhibits a greater level of persistence, compared to earnings growth driven by expense reduction. Furthermore, revenue as a figure can be considered more homogenous than expenses, and an increase in the measure signals positive outlooks. Ertimur et al. (2003) state that, because company reports announce both revenues and earnings, the market can use the revenue figure to assess the quality of the earnings. Kama (2009) builds further upon previous research and argues that the “relative role of revenues as a value driver and indicator of future cash flows is expected to be more important in contexts in which current earnings are a weak indicator of future earnings”.

2.4 Earnings Management

A major problem when it comes to company valuation is the presence of earnings management. Ertimur et al. (2003) conclude that revenues are harder to manipulate than expenses, because revenue manipulation is easier to detect. Kama (2009) discusses the findings of Cohen et al. (2005) that show a higher magnitude of earnings management in the fourth fiscal quarter, and larger discretionary write-offs have also been found to be occurring more often during the fourth fiscal quarter (Elliott, Shaw 1988; Elliott, Hanna 1996). As argued for by Kama (2009), this implies lower earnings estimate precision for the fourth fiscal quarter, compared to for the other three-quarters. He later shows that the market’s reaction to earnings surprises, i.e. the earnings response coefficient, is lower for the fourth fiscal quarter, indicating that investors attach less importance to earnings surprises for this quarter.

Older accounting standards and regulations on revenue recognition could have contributed to the burst of the IT-bubble and impacted the trustworthiness of the revenue figures (Altamuro, Beatty & Weber 2005). However, in a joint effort by IASB and FASB the regulations on revenue recognition have tightened, and in 2014, both parties issued a converged standard on revenue recognition, resulting in enhanced quality and consistency of how revenue is recognized (IASB, 2004). By using the same reasoning as Kama (2009) about earnings management and its impact on estimate precision, stricter legislation on revenue recognition could imply more accurate revenues estimates.

2.5 The Capital Asset Pricing Model (CAPM)

The capital asset pricing model (CAPM) is a widely used and well-debated asset pricing model. The CAPM allows investors to construct an efficient portfolio based on the market portfolio and the individual company's relation to the market return. The model consists of two components; the risk-free rate, that can be considered as the time value of money, and the risk premium. The risk premium is measured as the relationhip, beta, between the individual return of the asset and the return of the market, multiplied with the market risk premium (Berk et al. 2009).

More in depth, the CAPM is based on a number of assumptions, such as that all investors are rational and risk-averse. The model predicts that no matter what risk an investor might want to face, the optimal return given that particular risk is reached by a combination of risk-free assets and the market portfolio. Based on these predictions, the security market line, shortened SML, is created. The SML is a linear model based on risk and return and starts with zero risk and the risk-free rate. In equilibrium markets, all individual stocks and assets are located on this line, with a perfect relationship between beta and expected return. In cases where equilibrium does not hold, undervalued (overvalued) assets will end up above (below) the SML, as they face excessively high (low) returns based on their beta (Vinell et al., 2007).

2.6 The Fama-French Three Factor Model

In 1996, Eugene F. Fama and Kenneth R. French published their paper *"Multifactor Explanations of Asset Pricing Anomalies.*" The paper examines the, at the time, perceived anomalies when applying the CAPM. By extending the model and including variables based on size and book-to-market, the Fama-French Three Factor Model manages to incorporate what was previously considered to be anomalies into the calculation of stock returns. The size is based on market capitalization, and the book-to-market ratio provides an indication on whether the company in question is a value or growth company. Companies with high book-to-market ratios are called value-companies as they are considered cheaper than companies with low book-to-market ratios. Companies with low book-to-market ratios are called growth-companies as they are expected to grow in order to become "valuable".

Fama & French argue that value- and small companies' return generally exceed the return of the market. By including these factors in the model, they could adjust for the outperformance tendency. Jegadeesh and Livnat (2006) among others incorporate the variables size and book-to-market in their response coefficient regression models to enhance their results.

2.7 Pre- and Post-Announcement Drift

The cumulative abnormal return seems to drift in the same direction as the earnings surprise, and the drift can withhold for a long period. This is one of the thoughts that were presented by Ball and Brown (1968), a theory we today call post earnings announcement drift (PEAD). Numerous research papers have supported this theory, both for tests with longer event windows (Jegadeesh, Livnat 2006; Foster, Olsen & Shevlin 1984) and for tests with shorter event windows (Ertimur, Livnat & Martikainen 2003). The concept of PEAD is a strong counterargument against the market efficiency theory as prices drift despite no additional information being made available to the market.

Jegadeesh and Livnat (2006) test, inter alia, the abnormal return over an event window of six months and find that abnormal returns are related to past revenue surprises, indicating that the market does not fully react to the information conveyed about revenue surprises at the time of the announcement. The same pattern exists when Ertimur et al. (2003) perform similar research with a shorter event window of seven days centered around the announcement date.

In their 1989-article *"Post-Earnings-Announcement Drift: Delayed Price Response or Risk Premium"*, Bernhard and Thomas argue that the delay in price movement might occur for two different reasons. The post-announcement drift may either be because the market fails to assimilate available information, or because the costs, such as transacting costs, associated with the immediate exploitation of the information exceed the gains (Bernard, Thomas 1989).

The other drift, known as the pre-announcement drift, is not that well documented as only a small amount of research has been conducted on the topic. There is, however, a constant risk of information leakage close to the announcement and thereby a potential drift in prices prior to the announcement (Brunnermeier 2005).

3. Hypothesis

This study intends to examine the relationship between revenue- and earnings surprises and the abnormal return of a company over a seven-day event window centered around the announcement date. Previous studies, fundamentally based on the research of Ball and Brown (1968), have shown a significant relationship between stock return and accounting data, and the earnings response coefficient has for a long period played an essential role in the explanation of abnormal returns. More recently, the revenue response coefficient has had an increased importance in the explanation and calculation of abnormal returns. Over the last 30 years, the revenue response coefficient has shown tendencies to significantly increase and approach the values of the earnings response coefficient. One of the most recent pieces of research has shown that the revenue response coefficient in some cases even exceeds the earnings response coefficient, implying that the market reacts stronger to a revenue surprise than to an earnings surprise. These findings, together with evidence of significantly lower earnings response coefficients for the fourth fiscal quarter compared to for the other three fiscal quarters, leads us to believe that the revenue response coefficient will exceed the earnings response coefficient for our sample. Our hypothesis is therefore formulated as following:

HA: *The market reacts stronger to a surprise in revenue than to a surprise in earnings*

4. Method

This chapter explains and discusses the usage of data, models and variables in this paper.

4.1 Data Collection and Sample

In order to measure how the market reacts to revenue surprises and earnings surprises, the market's expectations and the actual accounting data are compared. Forecast data, for both earnings and revenues, is collected through the International Brokers' Estimate System, I/B/E/S, as done in, for example, Jegadeesh and Livnat (2006) and Ertimur et al. (2003).

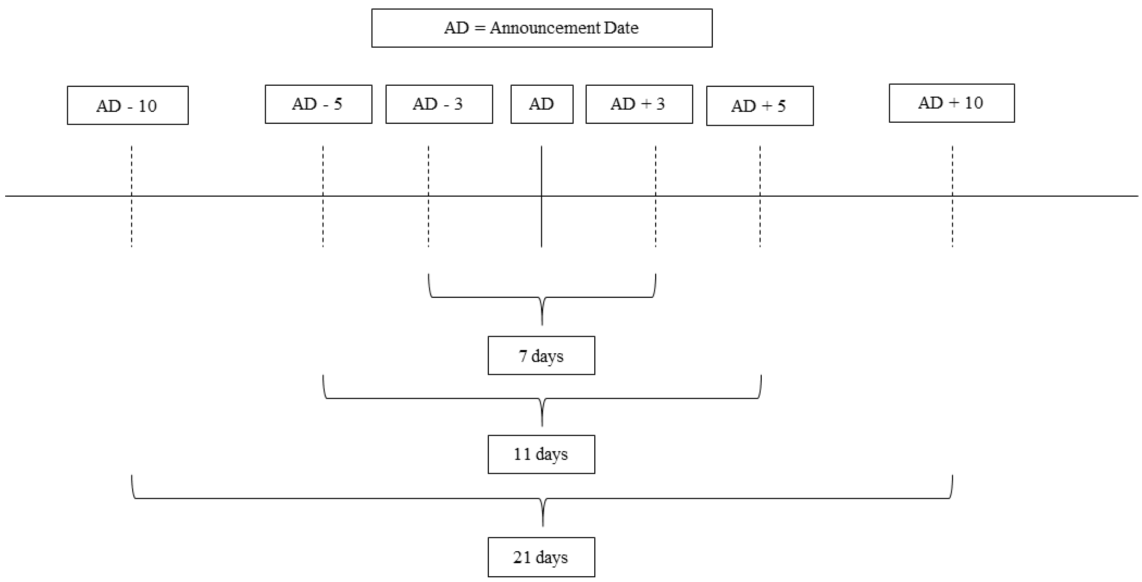
Lee and Park (2000) found in their study that annual reports are perceived to be of higher quality. One of the reasons for this may be that these reports are reviewed by an auditor. With regards to this research, as well as due to limitations in the data, we limit our sample to earnings and revenue observations for companies' reports for the whole fiscal year. We assume that interim reports and other announcements for the first three fiscal quarters have already reached the market when our observations' announcements are made. This implies that only the results for the fourth fiscal quarter are new to the market, even though we study the full year figures. For all observations, the most recent consensus forecasts are selected.

The sample is based on Swedish companies listed on the Stockholm Stock Exchange and their reports for the whole fiscal year. Our initial sample has 964 observations between the years of 2011 and 2015. After adjusting the data, for which limitations and shortfalls are explained and shown in Section 4.5 and Table I, we end up with 430 observations for the period.

4.2 Event Window

The event window is defined as the time period over which the change in stock price is observed. Epps and Oh (1997) showed that a multiple-day event window is preferred over an event window consisting of only a single day, as it can be difficult to determine on what exact day the market reacts to certain news. By using a multiple-day event window, the risk of "missing" the potential effect the announcement has on the stock price decreases, and may to a greater extent account for the potential announcement drift explained in Section 2.7. A longer event window, however, increases the risk of the stock price being affected by other factors than the observed variables (Lee, Park 2000).

As a result of this, and in accordance with previous studies within the field of response coefficients (Linderholm 2001; Jegadeesh, Livnat 2006; Ertimur, Livnat & Martikainen 2003), we intend to use an event window consisting of multiple days. We choose the same event window as Ertimur et al. (2003) of seven trading days centered around the report announcement date. To further test the pre- and post-announcement drift explained in Section 2.7, the sensitivity analysis will test the cumulative abnormal return over an event window of 11 and 21 trading days centered around the report announcement date. The primary event window, as well as the ones used in the sensitivity analysis in Section 6.2, are illustrated in the picture below.



4.3 The Regression Model

To test the effect of surprises in both earnings and revenues on the capital market, we construct an OLS regression where the cumulative abnormal return, CAR, is the dependent variable. The variables SR, surprise revenue, and SE, surprise earnings, are the independent variables. Furthermore, the relevant dummy variables Size and Value/Growth are included. The variables included in the model are operationalized and explained in Section 4.4. We also include year-fixed effects (omitted in the model). The model is derived from the model used by Jegadeesh and Livnat (2006), and in our case tests the years 2011 – 2015. The model can be seen in Equation II.

Equation II

The OLS regression model

$$\text{CAR}_{\text{it}} = \hat{\alpha} + \beta_1 * \text{SR}_{\text{it}} + \beta_2 * \text{SE}_{\text{it}} + \beta_3 * \text{SIZE}_{\text{it}} + \beta_4 * \text{VALUEGROWTH}_{\text{it}} + \varepsilon_{\text{it}}$$

CAR_{it}	The cumulative abnormal return, adjusted for either index or CAPM, for company *i* in period *t*
$\hat{\alpha}$	The estimated intercept
SR_{it}	The surprise revenue variable for company *i* in period *t*
SE_{it}	The surprise earnings variable for company *i* in period *t*
SIZE_{it}	The company size (above or below median OMXSPI market capitalization)
$\text{VALUEGROWTH}_{\text{it}}$	The company growth (above or below median OMXSPI book-to-market ratio)
ε_{it}	The error term for company *i* in period *t*

Equation II shows the OLS regression used in our study. Year-fixed effects are included in the model, but omitted.

4.4 Operationalization of Variables

This section will explain and discuss the variables, and their operationalization, used in the regression model.

4.4.1 Cumulative Abnormal Return (CAR)

The cumulative abnormal return, CAR, is defined as the accumulated abnormal return for company *i* over the observed event window. The daily abnormal return, AR, is defined as the difference between the actual stock return and the expected stock return for each trading day within the observed event window. For this study, we use two variables for cumulative abnormal return: one is adjusted for the index return, and the other one is adjusted for the CAPM return. This is because bthe expected return is calculated in two different ways.

4.4.1.1 Actual Stock Return

The actual stock return is defined as the percental change in stock price for the company in question. As shown in Table XII in the Appendix, the closing stock prices are retrieved through Thomson Reuters Datastream.

Equation III

The Actual Stock Return

$$R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}}$$

R_{it}	Actual stock return for company *i* in period *t*
P_{it}	Closing stock price for company *i* in period *t*
P_{it-1}	Closing stock price for company *i* in period *t - 1*

Equation III shows how the actual stock return, included in the calculation of the cumulative abnormal return, is calculated.

4.4.1.2 Estimated Stock Return (index)

The estimated stock return (index) is defined as the percental return for the index (OMXSPI) over the event window. When using the estimated stock return for the index, one assumes that company *i* has an expected return that equals the market's return.

Equation IV

The Expected Stock Return calculated through index

$$E(r_{it})_{INDEX} = r_{mt}$$

$E(r_{it})_{INDEX}$	The expected stock return (index-based) for company *i* in period *t*
r_{mt}	The OMXSPI return in period *t*

Equation IV shows how the estimated stock return (index), included in the calculation of the cumulative abnormal return, is estimated.

4.4.1.3 Estimated Stock Return (CAPM)

The estimated stock return (CAPM) considers the fact that company *i* may have a systematic risk that differs from the market's. By including the risk-free rate, the company's systematic risk and the market risk premium of equity, the estimated stock return over the event window can be calculated. The systematic risk, which the β-value defines, is calculated as a 60-month rolling beta as done by Linderholm (2001). For the further definition of the included factors, see Table XII in the Appendix.

Equation V

The Expected Stock Return calculated through CAPM

$$E(r_{it})_{CAPM} = r_{ft} + \beta_{it} * (r_{mt} - r_{ft})$$

$E(r_{it})_{CAPM}$	The expected stock return (CAPM-based) for company *i* in period *t*
r_{ft}	The risk-free rate in period *t*
β_{it}	The systematic risk for company *i* in period *t*
r_{mt}	The OMXSPI return in period *t*

Equation V shows how the expected stock return (CAPM), included in calculation of the cumulative abnormal return, is calculated.

4.4.1.4 Summary Cumulative Abnormal Return (CAR)

To Conclude Section 4.4.1, the CAR can be calculated through the following two methods.

Equation VI

The Cumulative Abnormal Return adjusted for index

$$CAR_{it_{INDEX}} = \sum_{t=1}^{T} (R_{it} - E(r_{it})_{INDEX})$$

$CAR_{it_{INDEX}}$	Cumulative abnormal stock return (index-adjusted) for company *i* in period *t*
R_{it}	The actual stock return for company *i* in period *t*
$E(r_{it})_{INDEX}$	The expected stock return (index-based) for company *i* in period *t*

Equation VI shows the cumulative abnormal return adjusted for index. The equation is based on equation III and equation IV.

Equation VII

The Cumulative Abnormal Return adjusted for CAPM

$$CAR_{it_{CAPM}} = \sum_{t=1}^{T} (R_{it} - E(r_{it})_{CAPM})$$

$CAR_{it_{CAPM}}$	Cumulative abnormal stock return (CAPM-adjusted) for company *i* in period *t*
R_{it}	The actual stock return for company *i* in period *t*
$E(r_{it})_{CAPM}$	The expected stock return (CAPM-based) for company *i* in period *t*

Equation VII shows the cumulative abnormal return adjusted for CAPM. The equation is based on equation III and equation V.

4.4.2 Earnings Surprise

The Earnings Surprise variable is the first independent variable in the regression. The forecast error in earnings is measured on the basis of earnings per share and is defined as the difference between actual earnings per share and the market expectations on earnings per share. The reason for the usage of EPS instead of other measures of earnings is because of the availability, consistency and clear connection to equity valuation. Furthermore, Jegadeesh and Livnat (2006) use the same measure for earnings.

There are different ways to measure the market's expectations of EPS. A commonly used measure is the consensus forecast, which is the mean estimate of analysts' forecasts. However, previous studies such as Ball and Brown (1968) operationalized the market expectations using either a naïve model or a time series-model based on historical trends. A naïve model could be based on the usage of last year's EPS as the expectation for this year's expected EPS; a method easily used when no analyst forecasts are available.

In our thesis, the market's expectations of EPS will be operationalized by analysts' consensus forecasts of EPS. According to Schiper (1991) and O'Brien (1986), forecasts are assumed to be based on reasonable predictions and have an advantage over time-series models since they provide a better estimate of the market's assessment. Liljeblom (1989) argues that analysts' consensus forecasts provide a better estimation on actual figures, compared to for example the naïve model. The study also concludes that the announcement of analysts' forecasts had a relatively small impact on the stock price. The market is therefore already aware of the information, implying a close relation between market expectations and analysts' consensus forecasts. As our study examines the Swedish market, as in Liljeblom (1989), the analysts' consensus forecasts are deemed to be a good estimation for the market expectations.

As explained earlier, significant amounts of information is already publicly availabe at the announcement date of the actual full year earnings, as information is released frequently through, for example, interim reports. This is in line with Ball and Brown (1968) who argue that the market's expectation is constantly updated as more information is added. With this information in regards, only the most recent consensus forecasts available for each observation will be used to operationalize the market expectations. The days between the estimation period end date and the announcement date tends to be shorter than 30 days for our observations.

To retrieve as reliable market expectations as possible, this study will only include observations where the mean estimates for revenues and earnings originate from at least three analyst forecasts. By limiting the sample to observations with at least three analyst forecasts, the consensus forecasts include a multifaceted view of the expectations and is therefore expected to become more accurate. Ertimur et al. (2003) limit their observations to, a minimum of, either one or two forecasts in order to minimize the shortfall of observations. Other studies (Imhoff, Lobo 1992) however use a greater number of estimates and limit their observations to have at least five estimates, arguing that it creates a better and more accurate estimate for the market's expectations. In order to maintain forecast accuracy and at the same time minimize the shortfall described and shown in Section 4.5, we choose to require at least three forecasts per observation and measure.

The forecast error in earnings, defined as the difference between actual earnings and forecasted earnings, is divided by the standard deviation of the analysts' forecasts, derived from Jegadeesh and Livnat (2006)[1]. This generates the surprise earnings variable. A higher standard deviation represents a larger earnings estimate uncertainty prior to the announcement, and by dividing the forecast error with the standard deviation of the mean estimate for earnings, we are able to adjust for, and put less weight on, observations where analysts forecasts have greater deviations. Imhoff and Lobo (1992) have shown an inverse relation between the size of the earnings response coefficient and the earnings uncertainty prior to the announcement, which makes the deflation by standard deviation reasonable. There are however examples of previous research where the effect of the earnings uncertainty is excluded, and the earnings surprise is instead divided by either stock price (Ertimur, Livnat & Martikainen 2003; Ghosh, Gu & Jain 2005) or by the expected EPS (Collins, Kothari 1989).

Equation VIII

The Earnings Surprise Variable

$$\mathrm{SE_{it}} = \frac{\mathrm{EPS_{it}} - \mathrm{E(EPS_{it})}}{\sigma_{\mathrm{E(EPS_{it})}}}$$

$\mathrm{SE_{it}}$	The earnings surprise variable for company *i* in period *t*
$\mathrm{EPS_{it}}$	The actual earnings per share for company *i* in period *t*
$\mathrm{E(EPS_{it})}$	The analysts' mean estimate for earnings per share for company *i* in period *t*
$\sigma_{\mathrm{E(EPS_{it})}}$	The standard deviation of analysts' mean estimate for earnings per share for company *i* in period *t*

Equation VIII shows how the surprise earnings variable, used in the OLS regression, is calculated. The numerator, indicating the difference between the actual earnings and the forecasted earnings, is called the forecast error.

[1] Jegadeesh and Livnat (2006) use a complex standard deviation based on quarterly earnings growth. Due to lack of data and in order to make the model a simplified version that adjusts for estimate uncertainty, we use the standard deviation of the mean estimate. They also include a drift in their forecasted earnings, which for the same reasons as stated above, is removed in our forecasted earnings.

4.4.3 Revenue Surprise

The Revenue Surprise variable is the second independent variable in the regression. The operationalization of the revenue surprise variable is in many ways very similar to the operationalization of the earnings surprise variable. Forecast errors in revenues are measured by a company's total revenues and calculated as the difference between the actual revenue and the market's expectations of revenue. Just as for earnings, the market expectations of revenues are operationalized by the most recent consensus analyst revenue forecast retrieved from I/B/E/S. As mentioned earlier, only observations where the mean estimate consists of at least three individual analyst forecasts are included in the sample.

The reasoning behind the division of the forecast error in earnings with the standard deviation of analyst forecasts applies for the revenues surprise variable as well. Dividing the forecast error in revenues with the standard deviation of the mean estimate for revenue causes observations with a larger standard deviation, and therefore greater estimate imprecision, to have their impact on the results reduced. The methodology for this variable is, just as with the earnings surprise variable, derived from, and resembles, Jegadeesh and Livnat's (2006) methodology.

Equation IX

The Revenue Surprise Variable

$$\mathrm{SR_{it}} = \frac{\mathrm{REV_{it}} - \mathrm{E(REV_{it})}}{\sigma_{\mathrm{E(REV_{it})}}}$$

$\mathrm{SR_{it}}$	The revenue surprise variable for company *i* in period *t*
$\mathrm{REV_{it}}$	The actual total revenue for company *i* in period *t*
$\mathrm{E(REV_{it})}$	The analysts' mean estimate for total revenue for company *i* in period *t*
$\sigma_{\mathrm{E(REV_{it})}}$	The standard deviation of analysts' mean estimate for total revenue for company *i* in period *t*

Equation IX shows how the surprise revenue variable, used in the OLS regression, is calculated. The numerator, indicating the difference between the actual revenue and the forecasted revenue, is called the forecast error.

4.4.4 Size

The Size-variable is a dummy variable in the regression. For each observation, the company in question is considered either a large or a small company. In the regression, large companies are given the value 1, whereas small companies are given the value 0. The classification of the companies into the small and large subcategory is based on the Fama French three-factor model, see Section 2.6, and is in our case derived from Jegadeesh and Livnat's (2006) model. Observations are classified based on market capitalization, and observations larger than the OMXSPI index median are categorized as large companies, while observations smaller than the OMXSPI index median are categorized as small. As previous research suggests (Jegadeesh, Livnat 2006), market capitalization figures are retrieved from the beginning of the calendar quarter preceding the report announcement date.

4.4.5 Value/Growth

The Value/Growth-variable is a dummy variable in the regression. The Value/Growth-variable categorizes, for each observation, the company in question as either a growth company or a value company. In the regression, value companies are given the value 1, whereas growth companies are given the value 0. The classification is based on each company's book-to-market ratio. The definition of the classification into growth and value is based on the Fama French three-factor model, see Section 2.6, and is in our case derived from Jegadeesh and Livnat's (2006) model, where companies with a book-to-market ratio above the OMXSPI index median are classified as value companies, and companies with a book-to-market ratio below the OMXSPI index median are classified as growth companies. As previous research suggests (Jegadeesh, Livnat 2006), and as done with the size-variable, book-to-market ratios are retrieved from the beginning of the calendar quarter preceding the report announcement date.

4.5 Observation Limitations and Shortfall

The data has been scrutinized and shortfalls have been removed per Table I.

Table I

Observation shortfall		
Description	**Number**	**Comment**
Initial Sample	964	Number of annual report observations between 2011 and 2015
Number of Estimates (E(REV))	-470	Less than three analyst forecasts per mean estimate for revenue
Number of Estimates (E(EPS))	-13	Less than three analyst forecasts per mean estimate for earnings
Book-To-Market	-13	Missing values in Thomson Reuters Datastream
Standard deviation	-1	Missing standard deviation
E(EPS)	-33	Negative values of E(EPS)
EPS	-4	Negative values of EPS
Remaining observations	430	Final number of annual report observations between 2011 and 2015

Table I shows the initial sample, observation shortfall and the number of observations for the final sample used in the OLS regression.

The major observation shortfall lies in the requirement of having at least three analyst forecasts per mean estimate for revenues. Since estimates for revenues are less common than estimates for earnings, and because it is the first limitation we conduct, it is not surprising that the required number of estimates for revenues would imply the greatest shortfall. Once observations with less than three analyst forecasts for revenues are removed, only 13 remaining observations have less than three forecasts for their earnings estimates.

The book-to-market ratio, which generates the Value/Growth-variable, produces a shortfall of 13 observations due to missing values from Thomson Reuters Datastream. In order to compute the surprise revenue variable and surprise earnings variable for each observation, equation VIII and equation IX require the standard deviations of the mean estimates. One observation lacks the standard deviation of the mean estimate for revenue. Because we are unable to determine whether the value is simply missing from the database, or if all estimates are the same (implying a standard deviation of zero), we choose to exclude this observation. Furthermore, in line with Lipe et al. (1998) as well as Linderholm (2001), negative values of actual earnings and estimated earnings are removed because of their negative impact on the model's explanatory power and accuracy.

4.6 Outliers

Lipe et al. (1998) found that the estimation of the earnings response coefficient may be less accurate for observations with considerably high, or low, values on the surprise earnings. To adjust for this, we winsorize the two independent variables SE and SR at the 5% and 95% levels, as done in Jegadeesh and Livnat (2006). By winsorizing the data, we do not drop the observations but instead adjust their values. We choose to go by this method in order to keep as many observations in the sample as possible, without significantly distorting the results. In the sensitivity analysis in Section 6.2, the regressions have been carried out where the independent variables have been winsorized at different levels.

5. Results & Analysis

This chapter will display the results for the descriptive statistics, correlations and regressions. If nothing else is mentioned, the independent variables SE and SR have been winsorized at the 5% and 95% levels.

5.1 Descriptive Statistics

Table II

Number of observations						
Year	**2011**	**2012**	**2013**	**2014**	**2015**	**Total**
Number of observations	83	84	87	85	91	430

Table II shows the number of observations for each year within the test period.

As we can see in Table II, our sample of observations is rather equally distributed over the five year period. The exact distribution for each individual company over the time period can be seen in Table XIII in the Appendix.

Table III

The mean and the standard deviation for the dependent variables				
Year	**mean(CAR_{INDEX})**	**mean(CAR_{CAPM})**	**std(CAR_{INDEX})**	**std(CAR_{CAPM})**
2011	0,012	0,009	0,097	0,093
2012	0,018	0,017	0,075	0,075
2013	0,015	0,012	0,070	0,070
2014	0,012	0,012	0,080	0,078
2015	0,002	0,003	0,089	0,092

Table III shows the mean and the standard deviation for the dependent variable CAR_{INDEX} and CAR_{CAPM} for each year. CAR_{INDEX} is the dependent variable for cumulative abnormal return adjusted for index. CAR_{CAPM} is the dependent variable for cumulative abnormal return adjusted for CAPM.

When comparing the two measures of cumulative abnormal return to each other, the values of the mean and the standard deviations are similar. However, larger differences from year to year occur in each of the variables' mean, while the standard deviation remains similar. The distribution of the two dependent variables can be seen in Graph I and Graph II in the Appendix.

Table IV

The mean and standard deviation for the independent variables SR and SE for each year				
Year	**mean(SR)**	**mean(SE)**	**std(SR)**	**std(SE)**
2011	0,167	-0,248	1,390	1,377
2012	-0,024	0,376	1,236	1,609
2013	0,063	-0,268	1,535	1,630
2014	0,450	-0,066	1,388	1,490
2015	0,173	-0,082	1,461	1,522

Table IV shows the mean value and the standard deviation for each of the independent variables, *SR* and *SE*, split per year. *SE* is the independent variable for surprise earnings. *SR* is the independent variable for surprise revenues. The variables *SR* and *SE* have been winsorized at the 5% and 95% levels.

Our independent variables, SR and SE, show large differences in their mean values between different years as seen in Table IV. Furthermore, for each year that the mean surprise revenue variable is positive, the mean surprise earnings variable is negative and vice versa. The yearly shift for each variable is rather stable when it comes to standard deviation.

Table V

Number of observations per year, classified into Value/Growth and Size subcategories.				
Variable	**Value/Growth**		**Size**	
Year	**Value**	**Growth**	**Large**	**Small**
2011	35	48	64	19
2012	35	49	64	20
2013	36	51	73	14
2014	34	51	80	5
2015	38	53	83	8
Total for sub-category	178	252	364	66
Total for variable	430		430	

Table V shows the number of observations per year, classified into the dummy variables *Size* and *Value/Growth*. It is further classified into the subcategories of the dummy variables *Size* and *Value/Growth*. *Size* is a dummy variable, where firms with a market capitalization for the quarter preceding the report announcement date above the median OMXSPI company are regarded as large companies, and those with a market capitalization below the median are regarded as small companies. *Value/Growth* is a dummy variable, where firms with a book-to-market ratio for the quarter preceding the report announcement date above the median OMXSPI company are regarded as value companies, and those with a Book-To-Market ratio below the median are regarded as growth companies. The year-fixed effects are included in the regression, but omitted.

When it comes to the dummy variables Value/Growth and Size, the sample consists of a rather uneven distribution between the observations for the subcategories. The sample has 252 growth firms and 178 value firms, meaning that the sample of growth companies is more than 40% larger than the sample of value companies. Furthermore, the sample has 364 large firms and 66 small firms, implying that the number of large companies is more than five times as large as the number or small companies.

5.2 Correlation

Table VI

Correlation between all independent and dummy variables.				
Variable	**SR**	**SE**	**Value/Growth**	**Size**
SR	1			
SE	0,1372**	1		
Value/Growth	-0,1234*	-0,0224	1	
Size	0,0656	0,0806	-0,1530**	1

Table VI shows the correlation between all the independent and dummy variables. *SE* is the independent variable for surprise earnings. *SR* is the independent variable for surprise revenues. *Size* is a dummy variable, where firms with a market capitalization for the quarter preceding the report announcement date above the median OMXSPI company are regarded as large companies, and those with a market capitalization below the median are regarded as small companies. *Value/Growth* is a dummy variable, where firms with a book-to-market ratio for the quarter preceding the report announcement date above the median OMXSPI company are regarded as value companies, and those with a book-to-market ratio below the median are regarded as growth companies. The year-fixed effects are included in the regression, but omitted. The variables *SR* and *SE* have been winsorized at the 5% and 95% levels. Value companies assume the value 1 in the correlation, Growth companies assume the value 0. Large companies assume the value 1 in the correlation, Small companies assume the value 0.

p < 10%, * p < 5%, ** p < 1%, *** p < 0,1%

As can be seen in Table VI, the variables SR and SE have a correlation of approximately 0,14 that is significant at the 1% level. Furthermore, value firms correlate negatively with revenue surprises, significant at the 5% level. Value firms are also negatively correlated with size, significant at the 1% level. The rest of the correlations are not significant at any acceptable level.

Table VII shows the correlation between the independent variables, SR and SE, for each subcategory within the independent variables Value/Growth and Size. The correlation between the variables is greater for growth companies than for the whole sample, and lower for large companies than for the whole sample. The correlation between the two independent variables is not significant for value firms and small firms.

Table VII

Correlations between SE and SR split per the dummy variables Value/Growth and Size		
Sample		**Correlation**
All		0,1372**
Value/Growth	*Value*	0,0714
	Growth	0,1844**
Size	*Large*	0,1175*
	Small	0,1955

Table VII shows the correlation between the earnings surprise variable and the revenue surprise variable, the independent variables *SR* and *SE*. It is further classified into the subcategories of the dummy variables *Size* and *Value/Growth*. *SE* is the independent variable for surprise earnings. *SR* is the independent variable for surprise revenues. *Size* is a dummy variable, where firms with a market capitalization for the quarter preceding the report announcement date above the median OMXSPI company are regarded as large companies, and those with a market capitalization below the median are regarded as small companies. *Value/Growth* is a dummy variable, where firms with a book-to-market ratio for the quarter preceding the report announcement date above the median OMXSPI company are regarded as value companies, and those with a book-to-market ratio below the median are regarded as growth companies. The year-fixed effects are included in the regression, but omitted. The variables *SR* and *SE* have been winsorized at the 5% and 95% levels. Value companies assume the value 1 in the correlation, Growth companies assume the value 0. Large companies assume the value 1 in the correlation, Small companies assume the value 0.

p < 10%, * p < 5%, ** p < 1%, *** p < 0,1%

5.3 Regression

Table VIII

Regression results								
MODEL	**INDEX**				**CAPM**			
Variable	**SR**	**SE**	**Size**	**Value/ Growth**	**SR**	**SE**	**Size**	**Value/ Growth**
Coefficient	0,0156***	0,0103***	-0,0203	0,0101	0,0155***	0,0106***	-0,0211	0,007
Robust Std. Error	0,0029	0,0024	0,0137	0,0074	0,0029	0,0024	0,0136	0,0074
R^2	*0,1286*				*0,1293*			

Table VIII shows the regression coefficients and the robust standard errors for each variable in the two regressions. The explanatory power, R^2, can also be seen in the table. *SE* is the independent variable for surprise earnings. *SR* is the independent variable for surprise revenues. *Size* is a dummy variable, where firms with a market capitalization for the quarter preceding the report announcement date above the median OMXSPI company are regarded as large companies, and those with a market capitalization below the median are regarded as small companies. *Value/Growth* is a dummy variable, where firms with a book-to-market ratio for the quarter preceding the report announcement date above the median OMXSPI company are regarded as value companies, and those with a book-to-market ratio below the median are regarded as growth companies. The year-fixed effects are included in the regression, but omitted. The variables *SR* and *SE* have been winsorized at the 5% and 95% levels. Value companies assume the value 1 in the regression, Growth companies assume the value 0. Large companies assume the value 1 in the regression, Small companies assume the value 0.

p < 10%, * p < 5%, ** p < 1%, *** p < 0,1%

As can be seen in Table VIII, the regression has been carried out two times with the dependent variable being either $CAR_{it_{INDEX}}$ or $CAR_{it_{CAPM}}$. The coefficients for the independent variables and dummy variables, as well as the respective robust standard errors, are shown in Table VIII.

Similar results can be observed from both of the models. We see a positive coefficient for both of our independent variables in both scenarios. The SR-coefficient, 0,0156 in index and 0,0155 in CAPM, is larger than the SE-coefficient, 0,0103 in index and 0,0106 in CAPM, for both scenarios. The coefficients are furthermore significantly different from zero at the 0,1% level. Even though the difference is small, the CAPM-model generates a higher R^2, 0,1293, in comparison to the index model, 0,1286.

For both regressions, the Size-coefficient is negative, and the Value/Growth-coefficient is positive, with rather similar standard deviations between the models. These coefficients are however not significant at any acceptable level.

5.4 Hypothesis

To test our hypothesis that "*The market reacts stronger to a surprise in revenue than to a surprise in earnings"*, we perform two tests. First, we test if the two coefficients, the revenue response coefficient and the earnings response coefficient, are statistically significantly different from zero.

H_0 and its decision rule

$H_0 : \beta_{SR} = 0, \beta_{SE} = 0$
Reject H_0 if $\beta_{SR} \neq 0,\ \beta_{SE} \neq 0$

β_{SR} signifies the coefficient (β_1) associated with the surprise revenue variable, *SR*, in the regression stated in Section 4.3 Equation II. β_{SE} signifies the coefficient (β_2) associated with the surprise earnings variable, *SE*, in the regression stated in Section 4.3 Equation II.

As can be seen in Table VIII, both coefficients are statistically significantly different from zero, suggesting that we can reject the null hypothesis. This means that both revenue surprises and earnings surprises have a significant effect on the cumulative abnormal return.

To further test our hypothesis, we perform a test to see if the two coefficients, the revenue response coefficient and the earnings response coefficient, are statistically significantly different from each other.

H_0 and its decision rule

$H_0 : \beta_{SR} = \beta_{SE}$
Reject H_0 if $\beta_{SR} \neq \beta_{SE}$

β_{SR} signifies the coefficient (β_1) associated with the surprise revenue variable, *SR,* in the regression stated in Section 4.3 Equation II. β_{SE} signifies the coefficient (β_2) associated with the surprise earnings variable, *SE,* in the regression stated in Section 4.3 Equation II.

This test yields the results F = 1,6 and p = 0,2070 (using the coefficients generated in the CAPM-model). This suggests that we can not reject the null hypothesis, stating that the two coefficients are not significantly different from each other. However, even though the null hypothesis is rejected, the difference in the coefficients generated in the regression in Table VIII is interesting for further investigation.

5.5 Analysis

As can be seen in Table IV, the mean value of the revenue surprise variable is positive in four out of five years. At the same time, the mean value of the earnings surprise variable is negative in four out of five years. This leads us to believe that analysts tend to underestimate companies' performance when it comes to revenue and overestimates companies' performance when it comes to earnings. As described earlier, earnings are derived from both revenues and expenses. A negative correlation between revenues and earnings may be considered logically odd as it would imply that an increase in revenues with one unit would incur more than one unit of an increase in expenses. In the article *"Why Some Digital Companies Should Delay Profitability for as Long as They Can"* published by the Harvard Business Review on May 4th 2017, the authors discuss company strategies and the fact that companies focusing on growth in revenue may signal a more long-term focused strategy and future profitability. Even though the article focuses primarily on digitally based companies, the notion itself applies to our results. It could be possible that the companies on the Stockholm Stock Exchange focus on pleasing investors in the long-term, rather than focusing on short-termism and current profitability. This, combined with analysts' inability to incorporate this strategy in the forecasting, could be an explanation to our results.

The R^2-value, i.e. the model's explanatory power, equals 0,1286 for the index-model and 0,1293 for the CAPM-model. Linderholm (2001) also generates a larger R^2 for her regression based on the CAR adjusted for CAPM. Our tests indicate that the CAPM-model slightly better operationalizes the studied relationship, which is why the results from that regression will be used in further analysis if nothing else is mentioned. Since the estimates generated in the two regressions are very similar, analyzing only the results from one of the models will make this paper more concise and easy to follow.

The explanatory power of the regression, R^2, is strongly dependent on the numbers of variables used in the regression. This is in accordance with previous research, where tests monitoring solely the earnings response coefficient over similar event window end up with R^2-values between 2-5%. The higher R^2-value can therefore partly be derived from the increased number of independent variables, just as Runsten (1998) argues. A regression with only the SE variable and year-fixed effects returns an R^2-value of 5,43%, which is very similar to what previous studies show. Table IX below shows the incremental explanatory power that is added for each included variable.

Table IX

Explanatory Power, R^2				
Variable	**SR**	**SE**	**Size**	**Value/Growth**
Additional R^2	8,31%	3,51%	0,93%	0,18%
Accumulated R^2	8,31%	11,82%	12,75%	12,93%

Table IX shows the explanatory power, R^2, added for each additional variable that is included in the regression. *SE* is the independent variable for surprise earnings. *SR* is the independent variable for surprise revenues. *Size* is a dummy variable, where firms with a market capitalization for the quarter preceding the report announcement date above the median OMXSPI company are regarded as large companies, and those with a market capitalization below the median are regarded as small companies. *Value/Growth* is a dummy variable, where firms with a book-to-market ratio for the quarter preceding the report announcement date above the median OMXSPI company are regarded as value companies, and those with a book-to-market ratio below the median are regarded as growth companies. The year-fixed effects are included in the regression, but omitted. The variables *SR* and *SE* have been winsorized at the 5% and 95% levels.

As the revenue response coefficient is not as widely monitored as the earnings response coefficient, comparable data for solely the revenue response coefficient is hard to find. Nevertheless, our results display an R^2 of 8,31% in a model including only SR and year-fixed effects. The results of our regressions indicate that the revenue response coefficient explains more of the abnormal return over a 7-day period in comparison to the earnings response coefficient over the same period.

The revenue response coefficient, i.e. the beta-value for the SR variable, is larger than the earnings response coefficient, i.e. the beta-value for the SE variable. This points towards the fact that abnormal returns are affected to a greater extent by the unexpected changes in revenue compared to by the unexpected changes in earnings. As discussed in Section 2.4, Kama (2009) finds that the ERC is significantly lower during the fourth fiscal quarter, probably due to the higher presence of earnings management and lower estimate accuracy. There is to our knowledge no research that shows differences in the revenue response coefficient over the fiscal quarters, and Ertimur et al. (2003) conclude, as discussed in Section 2.4, that revenues are harder to manipulate than expenses. Regressions and tests based on new information for the other fiscal quarters might have yielded different results and relationships between the two response coefficients. However, for this paper, we are unable to carry out those tests. It is therefore not possible to deem if the revenue response coefficient is larger than the earnings response coefficient due to the potential earnings management's effect on the latter.

The Size-variable yields a negative coefficient, whereas the Value/Growth-variable yields a positive coefficient. This implies that small value firms experience greater abnormal returns, and these results are in line with findings by Fama and French (1996). The Fama-French three-factor model is explained and discussed in Section 2.6. However, these variables merely provide us with an indication, since no significance is yielded.

If there were a perfect correlation between revenues and earnings, there would be no need to separate the variables. However, revenues and earnings can be expected to deviate since expenses and revenues are not perfectly correlated. Table VI in Section 5.2 shows the correlation between surprise earnings and surprise revenues. For the sample as a whole, the correlation is 0,1372 and significant at a level of 1%. Jegadeesh and Livnat (2006) yield a correlation of approximately 0,25 for their variables of surprise earnings and surprise revenues. Our value, 0,1372, is significantly lower and implies that, for our sample, surprise revenues and surprise earnings are less correlated. Since earnings can be defined as revenue less expenses, an increase in revenue will result in increased earnings, as long as expenses remain the same or increase less than revenues. The low correlation between the earnings and revenues may imply that surprise revenues are more often accompanied by increased expenses, or that earnings surprises are more often triggered by cost savings rather than increases in revenues.

The question that arises from our study is why the revenue response coefficient has grown to such an extent that it surpasses the earnings response coefficient, or, put more simply: why does the market value revenue surprises more than earnings surprises? Ultimately, the bottom line is what produces monetary value to the shareholders. However, as described in Section 2.3, revenue may function as a measure that helps to assert the quality of the earnings, as well as an indication of future cash flows. Our explanation to the results is that the market investors see greater potential profitability and earnings in the future when a company presents a current revenue figure that exceeds the expectations. We believe that investors see a surprise in revenues as a greater chance of gaining, and maintaining, future earnings, than what an increase in current earnings would convey. This may very well be because increased earnings could be generated through unsustainable activities, such as earnings management or unjustified cost savings. Furthermore, stricter accounting legislation as described in Section 2.4 could imply that revenue, as a measure, has become even more reliable to investors.

6. Discussion

6.1 Test of Model Assumptions

The OLS regression used in the model assumes certain characteristics regarding the data. In this section, these assumptions will be tested through different robustness tests.

6.1.1 Heteroscedasticity

One assumption in the regression analysis is that the error terms are of homoscedastic nature. If this assumption does not hold, the error terms are of heteroscedastic nature, implying that the variance of the error terms differs across observations. If the assumption of homoscedasticity does not hold, the regression analysis can be considered less accurate. A common way to adjust for this inaccuracy is to use robust standard errors.

In order to test for heteroscedasticity, we perform the Breusch-Pagan/Cook-Weisberg test. This test generates a χ^2-value of 2,94, with a p-value of 0,0863. With this test, we can reject the null hypothesis, i.e. that the error terms would be homoscedastic, at a 10% significance level. We further test the heteroscedasticity through the White test. The test generates a χ^2-value of 57,32 and a p-value of 0,0039. Both tests provide us with an indication that the error terms are of heteroscedastic nature.

The characteristics of the error terms reveal that the model may be inaccurate. To adjust for this, we use robust standard errors. This does not change the point estimates of the coefficients, but considers, and adjusts for, the issues with the heteroscedastic error terms.

6.1.2 Multicollinearity

Another assumption in the linear regression model is that the model does not suffer from multicollinearity. Multicollinearity occurs when the variation of one independent variable can be explained by the variation in another, in other words, if they are correlated. In order to test for potential multicollinearity, we calculate the “Variance Inflation Factor” (VIF). All of our independent and dummy variables have a VIF-value of less than 1,1 and a mean VIF of 1,06 as shown in Table X.

Table X

Multicollinearity		
Variable	**VIF**	**1/VIF**
SE	1,05	0,95
SR	1,05	0,95
Size	1,08	0,93
Value/Growth	1,04	0,96
Mean VIF	1,06	

Table X shows the VIF (Variance Inflation Factor) for each independent variable and dummy variable. *SE* is the independent variable for surprise earnings. SR is the independent variable for surprise revenues. *Size* is a dummy variable, where firms with a market capitalization for the quarter preceding the report announcement date above the median OMXSPI company are regarded as large companies, and those with a market capitalization below the median are regarded as small companies. *Value/Growth* is a dummy variable, where firms with a book-to-market ratio for the quarter preceding the report announcement date above the median OMXSPI company are regarded as value companies, and those with a book-to-market ratio below the median are regarded as growth companies. The variables *SR* and *SE* have been winsorized at the 5% and 95% levels.

These low values provide us with an indication that the data does not suffer from problems of multicollinearity. To get a clearer view of potential multicollinearity and to see the exact correlations between the variables, please refer to Table VI.

6.1.3 Autocorrelation

When autocorrelation (serial correlation) is present, the dependent variable's values affect each other over time. The beta coefficients in a regression will not be affected by autocorrelation, however, standard errors and accuracy of the model may be impacted negatively. Since our observations originate from panel data, a Wooldridge test with the null hypothesis stating no presence of autocorrelation is fitting to test for potential autocorrelation. The test yields a result of F = 0,002 and p = 0,9642 indicating that the null hypothesis cannot be rejected and that the data is not autocorrelated. Since no autocorrelation is deemed to be present, firm-fixed effects have not been adjusted for. The fact that the test shows no sign of autocorrelation could be because many companies are not present in the sample for consecutive years. Since a company may appear one year and disappear the next, the dependent variable depending on itself over time becomes less likely. What company is present what year can be seen in Table XIII in the Appendix.

6.2 Sensitivity analysis

To further test the accuracy of the model and the results, we perform a sensitivity analysis where certain characteristics and assumptions are adjusted. The ERC, RRC, and R^2-values are presented in Table XI below the different tests.

1. We remove all observations where the days between the estimation period and the report announcement date exceed 30 to minimize the use of non-recent estimates, as tested by Ertimur et al (2003). A shortfall of 31 observations is noted, and the results are very similar to the previous results.
2. We winsorize at the 10% and 90% levels instead of 5% and 95%. The results are similar to before, with somewhat higher coefficients both for SE and SR. The R^2 decreases slightly.
3. We winsorize at the 2,5% and 97,5% levels instead of 5% and 95%. The results are similar to before, with somewhat lower coefficients both for SE and SR. The R^2 increases slightly.
4. We increase the required number of forecasts per mean estimate to at least five for both earnings and revenues, as done by Imhoff and Lobo (1992). We end up with 302 observations and the ERC and RRC are of similar sizes. This is the only case in which we can not see that the RRC is larger than the ERC. The R^2 decreases substantially.
5. We extend the event window to incorporate 11 trading days centered around the announcement date. The ERC is similar to the ERC in the CAPM regression. The RRC and the R^2 decrease slightly.
6. We extend the event window to incorporate 21 trading days centered around the announcement date. The ERC is similar to the ERC in the CAPM regression. The RRC and the R^2 decrease slightly.

Table XI

The Sensitivity Analysis

Test no.	**CAPM Regression**	**1**	**2**	**3**	**4**	**5**	**6**
ERC	0,0106***	0,0099***	0,0123***	0,0088***	0,0092***	0,0109***	0,0108***
RRC	0,0155***	0,0160***	0,0185***	0,0140***	0,0092**	0,0141***	0,0141***
R^2	0,1293	0,1315	0,1232	0,1314	0,0841	0,1104	0,0959

Table XI shows the size of the earnings response coefficient and the revenue response coefficient, as well as the R^2 value, for each regression in the sensitivity analysis. *ERC* is the earnings response coefficient, i.e. the β associated with the earnings surprise variable. *RRC* is the revenue response coefficient, i.e. the β associated with the revenue surprise variable. The CAPM regression column shows the original regression with the assumed characteristics and limitations. The other columns show the results from each sensitivity test. For each test, year-fixed effects are included in the regression, but omitted. For all regressions except for test 2 and 3, the *SR* and *SE* variables have been winsorized at the 5% and 95% levels.

[#] p < 10%, * p < 5%, ** p < 1%, *** p < 0,1%

6.3 Sample bias

Due to certain limitations and requirements in the model, bias in the results may occur. One of the main requirements is that the number of analysts' forecasts equals at least three, which implies a shortfall of approximately half of the observations. As can be seen in Table V, the number of small companies is significantly lower than the number of big companies. This may be since a greater number of analysts are more likely to cover larger companies. When it comes to the Value/Growth-variable, we can see a greater number of growth companies compared to value companies. Ertimur et al. (2003) had the same characteristic with their dataset and argued that this may be because analysts' forecasts for revenues are more common for growth companies than for value companies.

Furthermore, observations where the estimated EPS and actual EPS are negative are removed from the sample. This limits the sample to profit-making companies, and companies where profits are expected, which further increases the bias.

6.4 Evaluation of test design and variables

6.4.1 The Linear Regression Model

As done by Jegadeesh and Livnat (2006) and Ertimur et al. (2003), we use a linear regression to test our hypothesis. As discussed earlier, Lipe et al. (1998) found that there is necessarily not a linear relationship between unexpected earnings and cumulative abnormal return. Extreme results tend to generate lower response coefficients, which is why we winsorize the data. Furthermore, we remove observations with negative earnings and negative estimated earnings (see Section 4.5 for details) due to their negative impact on the explanatory power and accuracy of the model.

6.4.2 Market Expectations and Revenue- and Earnings Surprises

The accuracy in the calculation of the revenue and earnings surprises is fundamental in order to generate as reliable results as possible from the applied regression model. Earlier studies within the field of response coefficients relied upon time series forecasts instead of analysts' consensus forecasts as proxies for market expectations. In line with recent studies (Jegadeesh, Livnat 2006; Ertimur, Livnat & Martikainen 2003), we use analysts' forecasts and assume that these estimates reflect the market expectations most accurately. It is, of course, difficult to deem whether the market, before the report announcement date, has fully incorporated the forecasts into the stock price. However, because of the information availability provided via for example the internet, along with the requirement of having at least three analyst forecasts per mean estimate, we assume that the market has incorporated reasonable and accurate forecasts to a great extent. Furthermore, by using similar methodology and forecast sources for both the earnings and revenue estimates, any inaccuracies would apply to both variables. This implies that the relationship between the two, which this paper mainly focuses on, should remain accurate.

The calculation of revenue- and earnings surprise variables is done through scaling the forecast error ($[REV_{it} - E(REV_{it})]$ or $[EPS_{it} - E(EPS_{it})]$) by the standard deviation of the mean estimates ($\sigma_{E(REV_{it})}$ or $\sigma_{E(EPS_{it})}$). This is derived from the calculation done by Jegadeesh and Livnat (2006). However, Ertimur et al. (2003) primarily divides the forecast error by the company's stock price and divides the forecast error by the absolute values of actual revenues and earnings in their sensitivity analysis. We choose to follow a method derived from Jegadeesh and Livnat (2006), thus scaling with a standard deviation, as this puts less weight on observations where the analysts' forecasts are incoherent.

6.4.3 The Operationalization of CAR

The cumulative abnormal return, CAR, has been operationalized in two ways throughout this paper. The first way, which adjusts for solely the average index return, and the second way, which uses CAPM to adjust for the return based on the risk-free rate and the company's systematic risk. As stated before, we evaluate the CAR adjusted for the CAPM in our analysis.

This decision is based on the fact that the CAPM adjustment generated the greatest explanatory power, R^2, in our regressions, and therefore slightly better operationalizes the relationship. However, some of the CAPM fundamental assumptions have been criticized in a number of articles, as it does not perfectly predict reality.

One of the issues is the beta, which creates problems with the model. Almost all attempts to identify one of the key concepts, the security market line, have failed. Results show that the relationship between the measure for systematic risk, beta, and rate of returns are weak. Because of this, the slope of the SML is close to zero (Vinell et al., 2007). The CAPM is however used despite this criticism due to the slightly higher R^2 and the lack of better applicable pricing models.

6.5 Reliability, Validity, and Generalizability

6.5.1 Reliability

The reliability of this study, i.e. the possibility of recreating this study with the same results, is considered high. The high reliability is derived from the simplicity of the linear regression model and the availability of data. All steps of the study, such as operationalization of variables, are enclosed in Section 4.4, and the observations limitations and shortfall in Section 4.5. The possibility of potential errors in the data and constructed calculations are drastically limited by extensive double-checking. However, despite thorough double-checking and random sample tests, potential miscalculations and database errors cannot be entirely dismissed.

6.5.2 Validity

The validity is, in other words, if our study measures what it intends to measure and if it affects our ability to draw reliable conclusions. We follow earlier studies when it comes to the operationalization of variables as well as the usage of the linear regression model. The sensitivity analysis in Section 6.2 discloses the sensitivity of our results by changing certain factors.

In order to minimize the effect of outlier observations, we choose to winsorize at 5% and 95% level. Is this the correct level though? The sensitivity analysis generates new values for the coefficients as well as for the explanatory power, R^2.

The size of the event window also seems to affect our results, even though the outcome of our hypothesis remains the same. However, whether the applied event window of seven days is the optimal event window can be discussed. By extending the event window to either 11 or 21 days, the values of both our coefficients and R^2-values decrease. In Section 2.7 the effect of both post- and pre-announcement drifts are monitored, and this gives us insight that the event window both can be too long as well as too short. Too long in the sense that “noise” may affect the CAR, and too short as the post-announcement drift might outrun the event window.

6.5.3 Generalizability

The generalizability of the study, i.e. if the results can be applied to other time-periods or samples, is limited. We cannot draw any conclusion about any other periods of time or different sample of companies based on the results of this study. Furthermore, the generalizability of the results is also limited to our targeted sample due to the sample bias discussed in Section 6.3.

7. Conclusion and Future Research

This study aimed to study the relationship between revenue- and earnings surprises and a stock's abnormal return. The conclusion for this study is that, for the sample consisting of companies listed on the Stockholm Stock Exchange between 2011 – 2015, we find indications that the market reacts stronger to an unexpected change in revenue compared to for an unexpected change in earnings.

7.1 Future Research

The linear regression model has shown limitations in explaining the relationship between abnormal returns and response coefficients. Further testing for potential non-linearity in the relationship would be a suggestion for interesting future research. There is to our knowledge no research on the revenue response coefficient based on observations from a period after 2003. This fact, in combination with that only a small portion of studies on the revenue response coefficient on the Swedish market has been conducted, makes it hard to draw any kind of conclusions on how the impact of the measure has changed over time. Future research could investigate whether the revenue response coefficient's relevance has grown over time on the Stockholm Stock Exchange, as studies suggest it has for the US market. Other requirements and classifications, such as the incorporation of a dummy variable based on the company's industry, could further increase the accuracy for the model.

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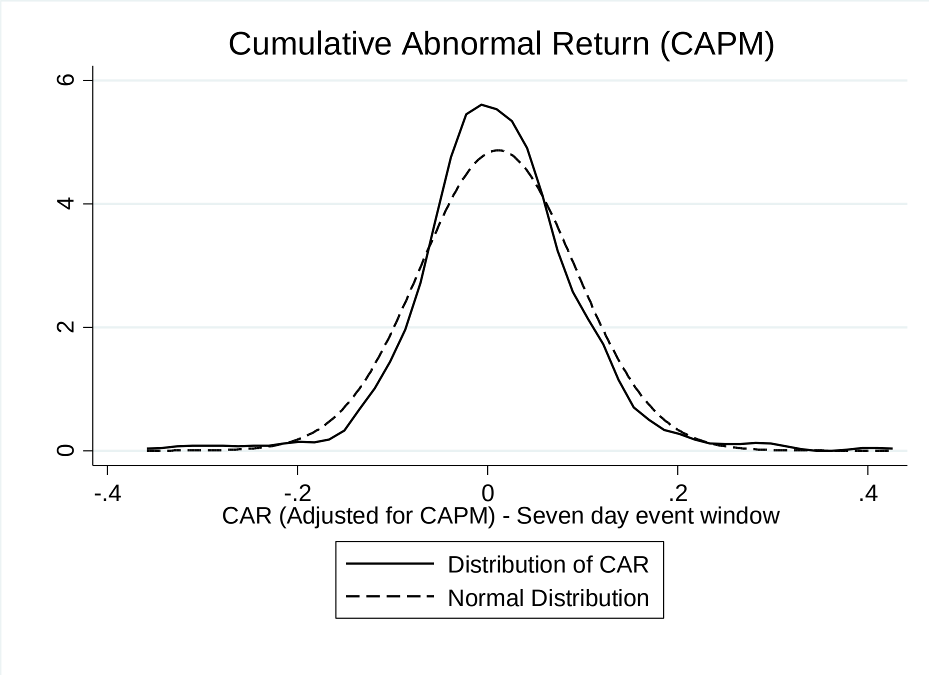
Appendix

Table XII

Component	Definition	Source
Stock Prices	Stock prices are retrieved from Thomson Reuters Datastream, and is defined as the closing price for company *i* period *t*	Datastream
EPS and E(EPS)	EPS and E(EPS) are defined as earnings per share and estimated earnings per share for company *i* period *t*. Estimated earnings per share are defined as the mean estimate, i.e. the mean of all analysts' forecasts (within the statistical period closest to the report announcement date).	I/B/E/S
REV and E(REV)	REV and E(REV) are defined as the total revenue and estimated total revenue for company *i* period *t*. Estimated total revenue is defined as the mean estimate, i.e. the mean of all analysts' forecasts (within the statistical period closest to the report announcement date).	I/B/E/S
Std. Deviation and No. Of Estimates for E(EPS) & E(REV)	The standard deviation for the mean estimates of earnings per share and total revenue, as well as the number of analysts' forecasts included in the mean estimate for estimated EPS and REV.	I/B/E/S
Year	The year, which functions as a fixed-effect (omitted) in the regression, is defined as the year in which the company's fiscal year ends. 384 out of 430 observations have fiscal years that follow the calendar year.	I/B/E/S
Book − To − Market	The book-to-market ratio, which in this case functions as a proxy for the Value/Growth-variable for company *i* period *t*. The book-to-market ratio is retrieved for the beginning of the quarter preceding the report announcement date.	Datastream
Market Capitalization	The market capitalization, which in this case functions as a proxy for the Size-variable for company *i* period *t*. The market capitalization is retrieved for the beginning of the quarter preceding the report announcement date.	Datastream
r_f	The risk-free rate, which is used in the CAPM, is based on the 10-year Swedish government bond-rate.	The Swedish Riksbank
Beta	The beta value for company *i* period *t*, which functions as the systematic risk in the CAPM, is defined as a rolling beta over 60 months for company i period t.	Datastream
OMXSPI	The OMXSPI is the price index for the Stockholm Stock Exchange and functions as the base for the market return.	Datastream

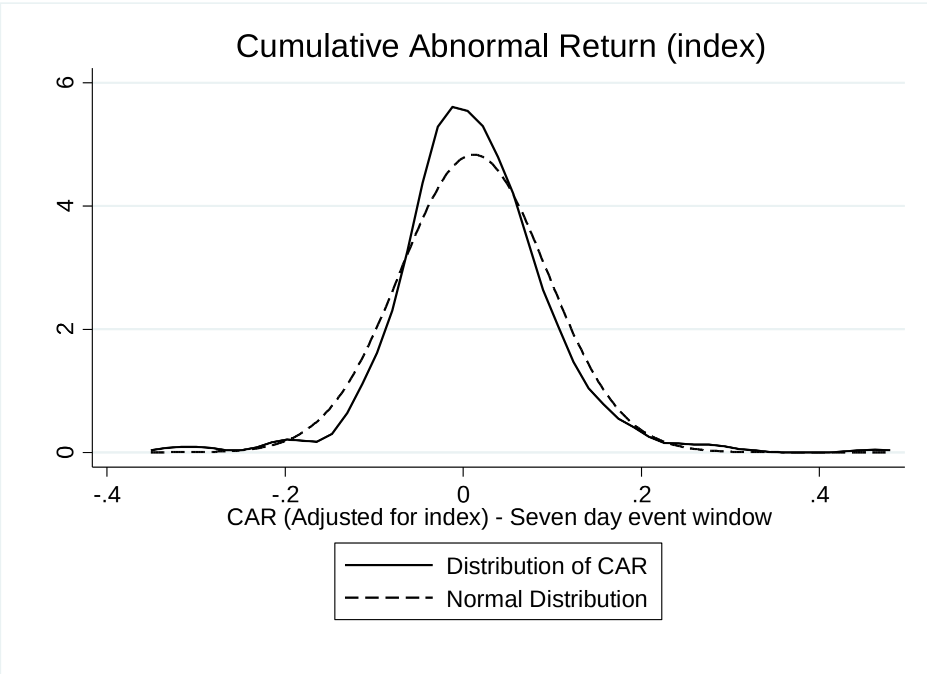
Table XII shows the different components used in the various equations in the paper. I/B/E/S is the abbreviation for the Institutional Brokers' Estimate System. Datastream refers to Thomson Reuters Datastream. The information gathered from the Swedish Riksbank is done through their website, www.riksbank.se.

Graph I



The graph above shows the distribution of the cumulative abnormal return adjusted for CAPM for the seven day event window (+/- 3 days around the announcement date).

Graph II



The graph above shows the distribution of the cumulative abnormal return adjusted for index for the seven day event window (+/- 3 days around the announcement date).

Table XIII

Company name	2011	2012	2013	2014	2015	Total for company
AAK AB	X	X	X	X	X	5
ACANDO			X		X	2
ADDTECH	X	X	X	X	X	5
AF	X	X	X	X	X	5
ALFA LAVAL	X	X	X	X	X	5
ARCAM AB			X	X	X	3
ARISE AB	X	X	X			3
ASSA ABLOY	X	X	X	X	X	5
ATLAS COPCO AB	X	X	X	X	X	5
ATRIUM LJUNGBERG	X	X	X	X	X	5
ATTENDO INTL					X	1
AVANZA BANK HOLD				X	X	2
AXFOOD AB	X	X	X	X	X	5
B&B TOOLS	X	X	X	X		4
BE GROUP	X	X	X			3
BEIJER ALMA AB		X	X	X	X	4
BETSSON	X	X	X	X	X	5
BILIA	X	X	X	X	X	5
BILLERUDKORSNAS	X	X	X	X	X	5
BIOGAIA			X			1
BJORN BORG	X	X	X			3
BOLIDEN AB	X	X	X	X	X	5
BONG LJUNGDAHL		X				1
BRAVIDA HOLDING					X	1
BULTEN		X	X	X	X	4
BYGGMAX GROUP AB	X	X	X	X		4
CASTELLUM	X	X	X	X	X	5
CDON GROUP	X	X				2
CLAS OHLSON AB	X	X	X	X	X	5
CLOETTA AB		X	X	X	X	4
COLLECTOR					X	1
COM HEM HOLDING					X	1
CONCENTRIC AB		X	X	X	X	4
DIOS FASTIGHETER			X	X	X	3
DOMETIC GRP					X	1
DORO AB		X				1
DUNI AB	X	X				2
DUSTIN GROUP					X	1
ELECTROLUX AB	X	X	X	X	X	5
ELEKTA	X	X	X	X	X	5
ENEA	X	X				2
ENIRO AB	X	X	X	X		4
ERICSSON, L.M.	X	X	X	X	X	5
FABEGE AB	X	X	X	X	X	5
FAGERHULT	X					1
FAST PARTNER		X	X			2
FASTIGHETS AB	X	X	X	X	X	5
G & L BEIJER AB	X					1
GETINGE AB	X	X	X	X	X	5
GUNNEBO					X	1
HALDEX	X	X	X	X	X	5
HANDELSBANKEN	X	X	X	X	X	5
HEMFOSA FASTIGH				X	X	2
HENNES & MAURITZ	X	X	X	X	X	5
HEXPOL AB	X	X	X	X	X	5
HIQ	X	X	X	X	X	5
HMS NETWORKS A			X			1
HOLMEN	X	X	X	X	X	5
HUFVUDSTADEN	X	X	X	X	X	5
HUSQVARNA	X	X	X	X	X	5

ICA GRUPPEN AB	X	X	X	X	X	5
INDUTRADE AB	X	X	X	X	X	5
INTRUM JUSTITIA	X	X	X	X	X	5
INWIDO				X	X	2
JM AB	X	X	X	X	X	5
KAPPAHL AB	X		X	X	X	4
KLOVERN AB	X	X	X	X	X	5
KUNGSLEDEN	X	X	X	X	X	5
LAGERCRANTZ	X	X	X	X		4
LINDAB INTERNATI	X	X	X	X	X	5
LOOMIS AB	X	X	X	X	X	5
MEDIVIR	X			X	X	3
MEKONOMEN	X	X	X	X	X	5
MQ HOLDING AB	X	X	X	X	X	5
MTG	X	X	X	X	X	5
MYCRONIC		X	X	X	X	4
NCC	X	X	X	X	X	5
NET ENTERTAINMEN	X	X	X	X	X	5
NEW WAVE	X		X	X	X	4
NIBE INDUSTRIER	X	X	X	X	X	5
NOBIA	X	X	X	X	X	5
NOLATO	X	X				2
NORDAX GROUP					X	1
OPUS GROUP			X	X	X	3
PANDOX					X	1
PEAB AB	X	X	X	X	X	5
POOLIA	X					1
RAYSEARCH LABORA	X	X				2
RECIPHARM				X	X	2
REJLERS PUBL AB	X		X			2
S ENSKILDA BANKE	X	X	X	X	X	5
SAAB AB	X	X	X	X	X	5
SANDVIK AB	X	X	X	X	X	5
SAS	X		X		X	3
SCANDI STANDARD					X	1
SCANDIC HOTELS					X	1
SECTRA		X	X	X		3
SECURITAS	X	X	X	X	X	5
SKANSKA	X	X	X	X	X	5
SKF AB	X	X	X	X	X	5
SKISTAR				X		1
SSAB AB	X			X		2
SWECO AB	X	X	X	X	X	5
SWEDBANK AB	X	X	X	X	X	5
SWEDISH MATCH AB	X	X	X	X	X	5
SWEDISH ORPHAN B				X	X	2
SVENSKA CELLULOS	X	X	X	X	X	5
SYSTEMAIR AB	X	X	X	X	X	5
TELE2	X	X	X	X	X	5
TELIASONERA	X	X	X	X	X	5
TETHYS OIL AB			X			1
THULE GROUP				X	X	2
TRADEDOUBLER	X	X	X			3
TRELLEBORG	X	X	X	X	X	5
WALLENSTAM	X	X	X	X	X	5
WIHLBORGS FASTIG	X	X	X	X	X	5
VITROLIFE		X				1
VOLVO	X	X	X	X	X	5
Total for year	83	84	87	85	91	430

Table XIII shows how the sample is distributed between individual companies and years.