Stockholm School of Economics
Bachelor Thesis
Department of Finance
Tutor: Irina Zviadadze
May 2014

Value versus Growth on OMXS and Asymmetric Responses to Earnings Surprises

Carl Elfving and Zacharias Sjöberg*

Abstract

Numerous studies have been conducted worldwide mapping differences in stock returns based on value versus growth characteristics. This paper examines whether there are differences in quarterly returns between value and growth stocks on OMX Stockholm (OMXS) 2004-2014. The obtained results are tested with econometric methods to determine if the differences are explained by asymmetric reactions to earnings surprises between the stock classes. Using quarterly data for companies listed on the OMXS subsequent to the dot-com bubble burst, we form equally weighted portfolios based on the financial ratios Book-to-Price (B/P), Earnings-to-Price (E/P) and Dividend-to-Price (D/P). Growth portfolios consist of the lowest 30% of each measure and value portfolios consist of the highest 30% of each measure. The results show controversial evidence of growth stocks outperforming value stocks in the B/P and E/P portfolios, while no difference in quarterly returns are observed between the D/P portfolios. Furthermore, we find that more pronounced reactions to positive earnings surprises for growth stocks partly explain the differences in quarterly return.

Keywords: Value, Growth, Asymmetric Reactions, Earnings Surprises

*Kindly address all correspondence to Carl Elfving (Stockholm School of Economics) 22649@student.hhs.se or Zacharias Sjöberg (Stockholm School of Economics) 22569@student.hhs.se.

1. Acknowledgements

First and foremost, we are grateful to our tutor Irina Zviadadze (Assistant Professor, Department of Finance, Stockholm School of Economics, Sweden) for the support and guidance throughout the process of writing this thesis. We would also like to thank Adam Myhrman (Associate, Zenit Asset Management, Stockholm, Sweden) and Handelsbanken Equity Research for assistance with the data collection. Finally, we thank Felix Bratell (Analyst, Morgan Stanley, Stockholm, Sweden) for insightful remarks on our draft.

Contents

2. INTRODUCTION **4**

3. PREVIOUS LITERATURE **7**

4. DATA **8**

4.1 SAMPLE DESIGN 8

4.2 DATA COLLECTION 9

4.3 DATA TREATMENT 10

5. METHODOLOGY **11**

5.1 PORTFOLIO FORMATION 11

5.2 ECONOMETRIC METHODS 12

6. EMPIRICAL RESULTS **16**

6.1 THE GROWTH PREMIUM 16

6.2 DESCRIPTIVE STATISTICS 18

6.3 REGRESSION ANALYSIS 19

7. ROBUSTNESS TESTS **23**

7.1 CONTROLLING FOR THE MAGNITUDE OF POSITIVE AND NEGATIVE SURPRISES 23

7.2 RETURN AND SURPRISES AROUND EARNINGS ANNOUNCEMENTS 24

7.2.1. Descriptive Statistics *25*

7.2.2 Regression Analysis *26*

8. CONCLUSION & FUTURE RESEARCH **31**

9. PROBLEMATIZATION **33**

10. REFERENCES **34**

11. APPENDIX **37**

2. Introduction

For many years, value stocks have earned higher average return compared to growth stocks (Fama & French, 1992; 1993; Lakonishok, et al., 1994; Basu, 1977; Jaffe, et al., 1989). The value premium – denoting superior performance of value stocks – has since the discovery baffled economists and resulted in speculations of investor overreactions (Lakonishok, et al., 1994; Daniel, et al., 1998), phenomenon uncaught by regular asset pricing models, and fundamental adjustments of firms' systematic risk (Berk, et al., 1999; Carlsson, et al., 2004; Zhang, 2005). Consistent with the risk-return tradeoff theory, Zhang (2005) argues that a value premium ought to exist, as value firms are less flexible to adjust their asset bases and costs to meet negative shocks during recessions. On the contrary, Lakonishok et al. (1994) find no support for the supposed higher risk and argue that the value premium is explained by a contrarian theory dependent on faulty expectations from investors and agency problems troubling institutional investors.

Following the conclusions of Lakonishok et al. (1994) related to the absence of excess risk in value firms, criticism to the value premium has emerged. The premium is largely dependent on the portfolio formation and is mainly examined on US equity markets (Brailsford, et al., 2012). The value premium is also argued to be sample specific (Scislaw & McMillan, 2012) and exposed to several biases (Andrikopoulos, et al., 2006). When Fama and French (1998) examined international portfolios in order to estimate the pervasiveness of the value premium globally, US and Japanese stocks accounted for a total weight of 73.5%. In these two countries individually, the value premium was statistically verified in 5 out of 6 portfolios. Interestingly, when Fama and French (1998) formed country specific portfolios, they only managed to show significant evidence of the value premium in 11 out of 39 cases. Yan et al. (2004) stress that Fama and French's (1998) study does not examine the smaller stock markets in detail, using Singapore as an example with an average weight of 0.7% in Fama and French's international portfolio. The same discussion can be applied for the Swedish market, with an average weight of 0.8% in the same portfolio. To provide further insight of the premium on smaller stock markets, we focus on the premium in Sweden.

This paper studies the time period subsequent to the one examined by Fama and French (1998). The chosen timeframe is of interest as limited research on the value premium has been made after the new millennium, a time when Swedish companies have experienced revolutions in information

technology and increased productivity - coined as "the new economy" (Andersson & Ådahl, 2005). The years 1998-2003 contain substantial shocks related to the dot-com bubble and the counter reactions that followed. To retrieve data representing normal market conditions, these years have been excluded. Furthermore, the years 1995 to 1997 have been excluded in order to obtain a coherent and continuous sample (for further clarification, see section 4.1). Thus, quarterly data from OMX Stockholm (OMXS)[1] Large- Mid- and Small Cap lists has been collected for the period 2004 - 2014.

The "value investment" strategy is widely used by investors despite the fact that the research outside the US is inconclusive (Brailsford, et al., 2012). With this in mind, the aim of this study is to answer the question:

(i) Is there a difference in return between value and growth stocks on OMXS 2004-2014?

Following our conclusions from question (i), we aim to determine the reason for the potential difference in returns. Fama and French (1993) find a significant value premium in their US market portfolio between 1975-1995. However, Lakonishok et al. (1994) provide evidence that the differential return is not due to higher fundamental risk for value stocks. Skinner and Sloan (2002) suggest that the stock return differentials can be explained by investor overreactions. This concept is unexamined on the vast majority of markets, including the OMXS. We therefore aim to answer the second question:

(ii) Could any potential difference in return be explained by asymmetric stock price reactions to earnings surprises between value and growth stocks?

Our results for research question (i) contradict the previous, primarily American, research by showing a growth premium in two out of three portfolio measures during the examined time period. Evaluating the findings from question (ii), we provide evidence that the growth premium partially can be explained by a more pronounced reaction to positive earnings surprises for growth stocks. No difference in reaction to negative earnings surprises has been found between the stock classes.

[1] Swedish stock exchange, part of NASDAQ OMX Group (NASDAQ OMX Group, 2014)

Henceforth, the paper is organized as follows. The next section presents previous literature. Section 4 introduces the sample design, data collection and data treatment. Section 5 describes the methodology by presenting the portfolio formation and econometric methods. Section 6 provides the empirical findings through descriptive statistics and regression analysis. Section 7 presents various robustness tests. Thereafter, Section 8 presents conclusions and future research. The paper ends with Section 9: Problematization.

3. Previous Literature

Previous studies of the value premium are abundant, but the methodology varies. Fama and French (2006), among others, examine the US equity market using value-weighted portfolios with size breakpoints based on the New York Stock Exchange. Other researchers determine the same breakpoints based on all companies in the sample (Brailsford, et al., 2012). Depending on the methodology, the results differ. Fama and French (Fama & French, 1993; 2006) argue that the value premium is pervasive across all sizes of US stocks, with a somewhat stronger result for smaller stocks. However, Kothari et al. (1995) and Loughran (1997) imply that their results are non-conclusive as the premium in fact *only* can be seen in the portfolios containing smaller US stocks.

The research on non-American markets is more limited. Evidence of the value premium has been seen on the Japanese stock market (Daniel, et al., 2001) and the Australian stock market (Halliwell, et al., 1999; Gaunt, 2004; Kassimatis, 2008) but the results are only conclusive within the three out of five largest market capitalization portfolios. Chui and Wei (1998) find the opposite, namely that the value premium exists in the smallest market capitalization portfolios, on several Pacific-Basin stock markets. Due to the differences in portfolio formation methodology a comparison is difficult to do. In order to fully examine the effect of the growth and value characteristics, this paper forms portfolios solely on the respective key figure (Book-to-Price, Earnings-to-Price and Dividend-to-Price) not taking the size of the company into consideration.

Studies examining the difference in stock price reactions to earnings surprises are rare. La Porta et al. (1997) find that abnormal expectations on growth stocks result in inferior return around quarterly report releases. Skinner and Sloan (2002) show that the return around the quarterly reports differs as growth stocks react more pronounced to negative deviations from consensus earnings estimates than value stocks, while growth stocks outperform value stocks during normal market conditions. Moreover, they do not find a difference in reaction to positive surprises between the stock classes. The results of Skinner and Sloan (2002) are consistent with Poorebrahimi et al. (2012), showing that negative earnings surprises increase volatility more than positive earnings surprises. In contrast to Poorebrahimi et al. (2012) among others, this paper does not aim to explain the difference in returns by connecting it to the efficient market hypothesis, but rather through regressing it on asymmetric stock price reactions to surprises.

4. Data

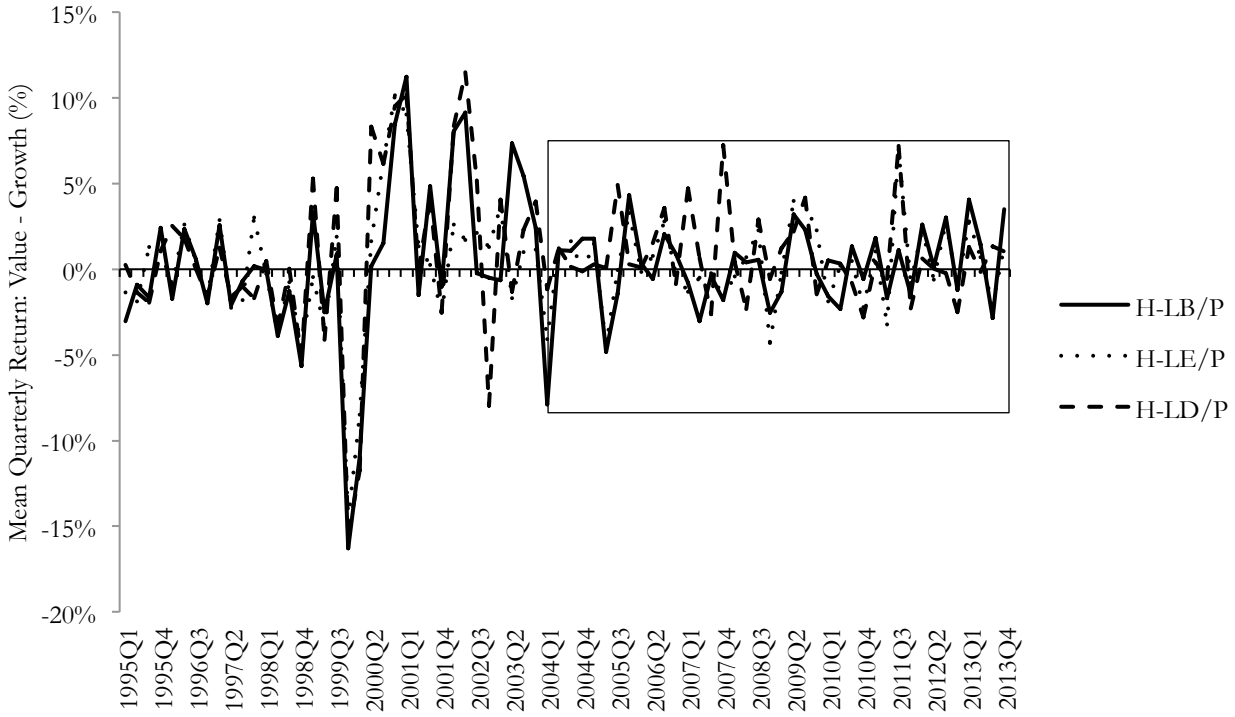
4.1 Sample Design

In order to obtain valid and unbiased results that are consistent with returns during normal market conditions after the new millennium, extreme deviations related to the dot-com bubble 2000 have been excluded. To determine these outliers, data on monthly returns for growth and value stocks on the Swedish market have been sourced from Kenneth French's website (French, 2014) and portfolio formation is identical to Fama and French (1998). The data has then been transformed into a quarterly difference in return between growth and value stocks[2]. The results can be seen in Graph I.

Graph I

Mean Quarterly Return (%): Value – Growth based on Data from Kenneth French

B/P: Book-to-Price, E/P: Earnings-to-Price, D/P: Dividend-to-Price. H: Value portfolio, L: Growth portfolio. H-L: Differential return between value and growth. Note that the graph is based on value-weighted portfolios, whereas this paper will form equally weighted portfolios. The difference in methodology does not distort this paper's findings in any way as the data from Kenneth French's website solely is used to locate deviations from normal market trends.



As seen in the graph, the years prior to the dot-com bubble burst show excessive return for growth stocks compared to value stocks. Furthermore, the three years following the burst of the dot-com

[2] Taking the cubic root of the product of the difference in returns for all three months in each quarter.

bubble contain market counter reactions. These, together with the years 1995-1997, have been excluded from the population resulting in a final coherent sample stretching from 2004-2014 (an adjusted graph of the differential return during 1975-2014 can be seen in Appendix: Exhibit A).

4.2 Data Collection

The lion's share of the data has been collected in collaboration with Handelsbanken Equity and Credit Research[3] through FactSet. Historical data on quarterly returns, earnings announcement dates, earnings consensus estimates and actual earnings have been retrieved for an extensive sample, covering large-, mid- and small cap at OMX Stockholm for the time period 2004-2014. The consensus earnings forecast is calculated as the median of all earnings estimates reported by analysts covering the company. Moreover, the company specific financial ratios Book-to-Price (B/P), Earnings-to-Price (E/P) and Dividend-to-Price (D/P) have been collected from Bloomberg as of December 31st 2003-2012. Despite the extreme market conditions during the dot-com bubble burst in early 2000, attempts have been made to complement the data and extend the time period, however both Bloomberg and I/B/E/S report earnings consensus estimates for OMXS from 2006 onward while FactSet starts reporting the same estimates from 2004 onward. Before then, all three databases report missing values for the consensus estimates. The 10-year interval examining the premium is identical to the period of which reactions are examined. To ensure the preciseness of the earnings announcement dates and price impact estimates of the FactSet data used, all measures have been double checked against their counterparties in I/B/E/S, Bloomberg and Datastream. This thorough data collection has been made to minimize the risk of sample biases, such as survivorship bias and backfilling errors, which many previous studies are subject to (Andrikopoulos, et al., 2006).

Historical stock returns have been collected on a quarterly basis with the first numbers from Q1 2004 and the last from Q4 2013. The returns have been calculated as stock price 90 days prior to the quarterly earnings announcement until one day thereafter for all release dates during the time period. Consistent with the methodology of Fama and French (1998), we do not require the companies to have data on all three financial ratios (B/P, E/P, and D/P). In the original data set, we find missing values in quarterly return corresponding to 12.24% of the total number of observations. The reason

[3] Handelsbanken Capital Markets (Equity and Credit Research) provide equity research in the Nordic region. For further information, refer to http://www.handelsbanken.se/research/equity

for the relatively high number of missing values is that all firms in the sample are not listed on OMXS throughout the whole time period, and reports missing values when they are not.

4.3 Data Treatment

Firstly, Bloomberg reports the measures Price-to-Book, Price-to-Earnings and Dividend-to-Price. To ease the portfolio formation process, the price-to-book and price-to-earnings ratios retrieved by Bloomberg have been inverted into Book-to-Price and Earnings-to-Price. This has been done to be consistent in the denotations for the value and growth portfolios. Rearranging P/B and P/E into B/P and E/P allows all portfolios with high figures (top 30%) in the respective financial ratio (B/P, E/P, D/P) to be allocated into value portfolios (denoted with an indicating "H", for High). The same is true for the firms with low B/P, E/P and D/P (lowest 30%), being allocated into growth portfolios (denoted with an indicating "L", for Low). Details of portfolio formation are provided in section 5.1.

Secondly, outliers in the return and surprise variables have been disregarded from the data set. The highest and lowest 0,135% of the observed values in the variables return and surprise have been dropped through omitting outliers:

$$\text{Outlier}_1 < \mu - 3\sigma \text{ and } \mu + 3\sigma < \text{Outlier}_2$$

Furthermore, concerning the regressions aiming to test the surprise effect on stock returns, all observations with missing values in the surprise variable have been dropped. This is due to the lack of news-value from the observations where the consensus earnings forecast is missing.

5. Methodology

5.1 Portfolio Formation

The stocks have been divided into growth and value portfolios based on the measures Book-to-Price (B/P), Earnings-to-Price (E/P) and Dividend-to-Price (D/P). Consistent with the study of Fama and French (1998), the value portfolios include firms whose B/P, E/P or D/P are among the highest 30% of all listed stocks at OMXS. The growth portfolios include firms whose respective measures are among the lowest 30%. This yields a total of six portfolios – HB/P, LB/P, HE/P, LE/P, HD/P and LD/P – where the initial letter H denotes High, and L denotes Low. The portfolios were created based on the B/P, E/P and D/P measures reported for each firm on December 31st 2003, and are then rebalanced on a yearly basis, with the last rebalancing on December 31st 2012. The middle segment of the market, consisting of the remaining 40% of the firms listed on OMXS, has been disregarded from further study. For further clarification regarding the respective key figures in the portfolios, see Table I (below).

Table I
Mean Financial Ratio per Portfolio and Year

Table I shows the mean of the financial ratios for the companies in each portfolio. B/P: Book-to-Price, E/P: Earnings-to-Price, D/P: Dividend-to-Price. For example, the mean Book-to-Price ratio in the B/P value portfolio (HB/P) for 2013 is 1.27. The mean Book-to-Price ratio in the B/P growth portfolio (LB/P) for 2013 is 0.22. The mean Earnings-to-Price ratio in the E/P value portfolio (HE/P) for 2013 is 0.09. The mean Earnings-to-Price in the E/P growth portfolio (LE/P) for 2013 is 0.04. For all portfolios, H>L.

	HB/P	LB/P	HE/P	LE/P	HD/P	LD/P
2004	0.84	0.22	0.11	0.03	0.11	0.00
2005	0.75	0.17	0.10	0.03	0.06	0.00
2006	0.68	0.14	0.11	0.03	0.09	0.00
2007	0.89	0.14	0.15	0.02	0.16	0.00
2008	2.04	0.28	0.29	0.05	0.21	0.00
2009	1.23	0.22	0.11	0.02	0.10	0.00
2010	1.13	0.19	0.21	0.03	0.15	0.00
2011	1.51	0.26	0.15	0.04	0.18	0.00
2012	1.81	0.23	0.12	0.04	0.17	0.00
2013	1.27	0.22	0.09	0.04	0.18	0.00

Regarding the portfolios formed on the E/P measure, Bloomberg reports missing values for all firms whose earnings were negative in the previous period. Consistent with Fama and French (2006), these firms have not been included in the portfolios for the subsequent year. Moreover, as

previously stated, we do not require that the firms have reported measures for all three financial ratios.

5.2 Econometric Methods

Section 6: Empirical Results provides paired t-tests for the difference in quarterly returns for growth and value stocks in each of the different portfolios (H-LB/P, H-LE/P and H-LD/P). The purpose of the tests is to answer question (i) stated in the introduction, namely whether a stock return differential can be observed between value and growth stocks on OMXS 2004-2014.

Following the results from the t-tests, quarterly stock returns are regressed on portfolio belonging, sign of earnings surprise and magnitude of the earnings surprise. Furthermore, variable interaction between portfolio belonging and the independent variables are included in the regression models. These variables' coefficients provide the differential return in regards to portfolio allocation. The regressions aim to investigate whether a potential difference in return between the growth and value portfolios can be explained by asymmetrical stock price reactions to surprises between the portfolios. The regression equations are analogous to the ones used by Skinner and Sloan (2002).

Regression model 1:

$$R_{f\tau} = \alpha + \beta_1 * Growth_{f\varphi} + \beta_2 * SignSurprise_{f\tau} + \beta_3 * (SignSurprise_{f\tau} * Growth_{f\varphi}) + \beta_4 * Surprise_{f\tau} + \beta_5 * (Surprise_{f\tau} * Growth_{f\varphi}) + \varepsilon_{f\tau} \quad (1)$$

Where:

f indexes firms, τ indexes calendar quarters and φ indexes the year of which the portfolios are formed

$R_{f\tau}$: The quarterly return for a specific stock

$Growth_{f\varphi}$: Binary variable generating 1 if the firm is in a growth portfolio in year φ and 0 if it is in a value portfolio in year φ

$\text{SignSurprise}_{f\tau}$: Indicator variable generating 1 if the $\text{Surprise}_{f\tau}$ is positive and -1 if the $\text{Surprise}_{f\tau}$ is negative

$\text{Surprise}_{f\tau}$: The magnitude of the forecast error defined as actual earnings for the firm in quarter τ minus the consensus forecasted earnings for the quarter τ (determined 90 days prior to the earnings announcement date), divided by the consensus forecasted earnings for quarter τ.

Regression model (1) tests how the quarterly return depends on the deviations from consensus earnings forecasts and how the effect varies with the magnitude of the surprise. The purpose of this regression is to get an overview of how the portfolio samples react to the inclusion of different earnings surprise variables. Therefore, we take a step-by-step approach and add variables one after the other, starting with a simple regression with Growth as the only independent variable and continue by adding SignSurprise and SignSurprise*Growth and thereafter Surprise and Surprise*Growth:

(i) $R_{f\tau} = \alpha + \beta_1 * \text{Growth}_{f\varphi} + \varepsilon_{f\tau}$

(ii) $R_{f\tau} = \alpha + \beta_1 * \text{Growth}_{f\varphi} + \beta_2 * \text{SignSurprise}_{f\tau} + \beta_3 * (\text{SignSurprise}_{f\tau} * \text{Growth}_{f\varphi}) + \varepsilon_{f\tau}$

(iii) $R_{f\tau} = \alpha + \beta_1 * \text{Growth}_{f\varphi} + \beta_2 * \text{SignSurprise}_{f\tau} + \beta_3 * (\text{SignSurprise}_{f\tau} * \text{Growth}_{f\varphi}) + \beta_4 * \text{Surprise}_{f\tau} + \beta_5 * (\text{Surprise}_{f\tau} * \text{Growth}_{f\varphi}) + \varepsilon_{f\tau}$

This regression specification allows for a simple, straightforward, interpretation of the coefficients. The intercept measures the mean return of a value stock, while the coefficient of Growth provides the estimated difference in return between growth and value stocks. If Growth loads with a positive (negative) coefficient, this infers that there is a higher (lower) return for growth stocks than value stocks. The coefficient of SignSurprise states whether the sign on the surprise is a determinant factor of quarterly returns. This coefficient is expected to be positive and significant, assuming that quarterly returns correlates with the earnings surprises. Going forward, the coefficient of the variable Surprise determines if the magnitude of the surprise has an impact on quarterly returns. The interaction terms SignSurprise*Growth and Surprise*Growth measures incremental return for growth stocks reporting non-zero surprises, accounting for sign and magnitude, respectively.

To explain differences in stock returns between growth and value stocks, we form additional regressions where the differences in response to positive and negative earnings surprises are accounted for. The reason being that if value (growth) stocks outperform growth (value) stocks, we want to examine if this could be explained by a more pronounced reaction to good earnings surprises for value (growth) stocks; or a less pronounced reaction to negative earnings surprises. The second regression model control for such factors:

Regression model 2:

$$R_{f\tau} = \alpha + \beta_1 * \text{Growth}_{f\varphi} + \beta_2 * \text{Good}_{f\tau} + \beta_3 * \text{Bad}_{f\tau} + \beta_4 * (\text{Good}_{f\tau} * \text{Growth}_{f\varphi}) + \beta_5 * (\text{Bad}_{f\tau} * \text{Growth}_{f\varphi}) + \varepsilon_{f\tau} \quad (2)$$

Where all variables are defined as above and:

$\text{Good}_{f\tau}$: Binary variable generating 1 if the firm reports a positive earnings surprise for the quarter τ and 0 otherwise.

$\text{Bad}_{f\tau}$: Binary variable generating 1 if the firm reports a negative earnings surprise for the quarter τ and 0 otherwise.

As opposed to regression model (1), regression model (2) does not take the magnitude of the surprise into consideration, but rather focuses on the portfolio allocation and the sign of the surprise. It allows for asymmetric responses to positive and negative surprises between stocks with value versus growth characteristics.

Similar to regression (1), regression (2) allows for an intuitive interpretation of the coefficients. The intercept is interpreted as the expected return for a value stock reporting a zero surprise (Surprise = 0). The coefficient of the variable Growth measures the incremental expected return from being allocated into a growth portfolio and reporting a zero surprise. If Growth loads with a positive (negative) coefficient, the performance of the value portfolio is inferior (superior) to the growth portfolio. The coefficient of the variable Good (Bad) gives the incremental expected return for a value stock from reporting a positive (negative) earnings surprise. The Good*Growth (Bad*Growth) variable is the expected return differential between a growth stock reporting a positive (negative)

surprise and a value stock reporting a positive (negative) surprise. If the coefficient on Good*Growth is positive (negative), growth stocks react more (less) pronounced to positive surprises than value stocks. Further, if the coefficient on Bad*Growth is negative (positive), growth stocks react more (less) pronounced to negative surprises than value stocks.

To summarize the interpretation of regression (2), the intercept equals the return of a value stock with no surprise. Adding the coefficient of the variable Growth to the intercept gives the expected return for a growth stock reporting a zero earnings surprise. If the coefficient of the Good (Bad) variable is added to the intercept, we get the expected return of a value stock reporting a positive (negative) surprise. To obtain the expected return for a growth stock reporting a positive (negative) surprise, we simply add the coefficients of the intercept, Growth, Good (Bad) and Good*Growth (Bad*Growth). For further clarification regarding the interpretation, see Table II below.

Table II
Interpretation of Regression (2)

Regression (2): $R_{f\tau} = \alpha + \beta_1 * Growth_{f\varphi} + \beta_2 * Good_{f\tau} + \beta_3 * Bad_{f\tau} + \beta_4 * (Good_{f\tau} * Growth_{f\varphi}) + \beta_5 * (Bad_{f\tau} * Growth_{f\varphi}) + \varepsilon_{f\tau}$

	Value Portfolio	Growth Portfolio
Zero Surprise	α	$\alpha + \beta_1$
Positive Surprise	$\alpha + \beta_2$	$\alpha + \beta_1 + \beta_2 + \beta_4$
Negative Surprise	$\alpha + \beta_3$	$\alpha + \beta_1 + \beta_3 + \beta_5$

As previously stated, regression model (2) does not take the magnitude of the surprise into account. Regression model (3) (below) is highly similar to (2). The only difference is that magnitude is taken into consideration by including the variable Surprise instead of SignSurprise. If stock price reactions are proportional to the size of the surprise, regression specification (3) is better suited for capturing responses to earnings surprises. Whereas, if investors are not concerned with the scale of the earnings surprise but only the sign of it, regression (2) would be a more appropriate model.

Regression model 3:

$$R_{f\tau} = \alpha + \beta_1 * Growth_{f\varphi} + \beta_2 * Good_{f\tau} + \beta_3 * Bad_{f\tau} + \beta_4 * Surprise_{f\tau} + \beta_5 * (Growth_{f\varphi} * Good_{f\tau} * Surprise_{f\tau}) + \beta_6 * (Growth_{f\varphi} * Bad_{f\tau} * Surprise_{f\tau}) + \varepsilon_{f\tau} \quad (3)$$

Where all variables are defined as above.

6. Empirical Results

6.1 The Growth Premium

Table III

Inferential Statistics per Portfolio: Calculated on Quarterly Return (%)

Table III shows the number of quarterly observations in each portfolio after the elimination of outliers. H=High, L=Low and H-L=High-Low for the portfolio formation ratios; Book-to-Price (B/P), Earnings-to-Price (E/P) and Dividend-to-Price (D/P). The value portfolios (indicated with a leading "H", for high) contain firms whose E/P, B/P or D/P is among the highest 30% on the OMXS. The growth portfolios (indicated with a leading "L", for low) contain firms whose B/P, E/P or D/P is among the lowest 30% on the OMXS. For example, the HB/P portfolio contains firms with high Book-to-Price ratios (value firms) and LB/P portfolio contains firms with low Book-to-Price ratios (growth firms). The average number of firms in each portfolio after elimination of outliers is stated in column Avg Nr of Firms Per Year. Mean return is calculated on all 40 quarters. The asterisks in the second column indicate the p-value for the t-test if mean return is different from zero (***p<0.01; **p<0.05; *p<0.1). Note that there is equal number of observations in each portfolio type.

	Number of Observations	Mean Quarterly Return (%)	T-stat $\mu \neq 0$	Robust St Dev	Avg. Nr of Firms Per Year
HB/P	1492	1.64**	2.56	0.64	40
LB/P	1492	4.11***	6.63	0.62	40
H-LB/P	1492	-2.48***	-3.28	0.76	-
HE/P	1268	3.91***	6.43	0.61	33
LE/P	1268	5.60***	7.63	0.79	33
H-LE/P	1268	-2.09***	-2.58	0.81	-
HD/P	1468	3.81***	7.56	0.50	41
LD/P	1468	3.49***	4.55	0.77	41
H-LD/P	1468	0.32	0.41	0.79	-

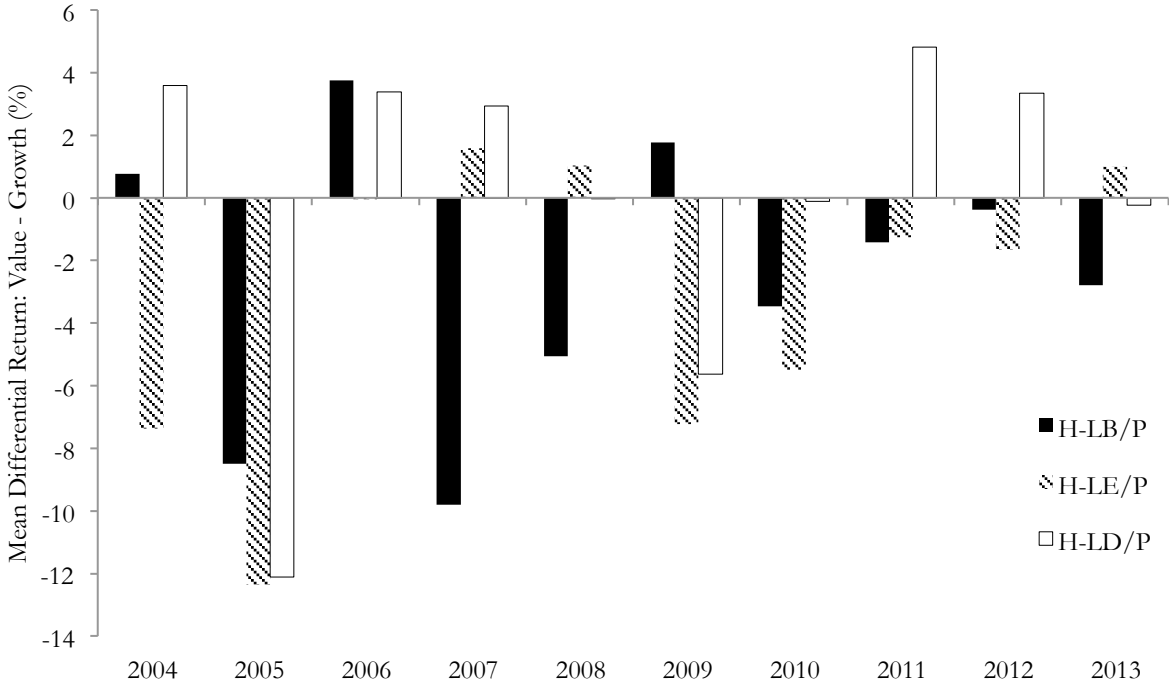
Focusing on the inferential statistics for H-LB/P in Table III, growth stocks have experienced higher returns than value stocks during the period. The same holds for the H-LE/P portfolio. Both portfolios show statistically significant, negative mean returns (both with p-values of less than one percent). In turn, the H-LD/P portfolio shows no statistical evidence of a difference in mean return between value and growth stocks.

The findings contradict previous research in the field. However, we have seen no indication on any study being carried out on the OMXS for 2004-2014. As stated by Andersson and Ådahl (2005), the Swedish market went through a large transition during the time around the dot-com bubble burst. It is reasonable to assume that market characteristics may have changed since the study of Fama and French (1998). (See Graph II below for information on differential yearly returns).

Graph II

Mean Yearly Differential Return (%): Value – Growth

H-L=High-Low for the portfolio formation ratios; Book-to-Price (B/P), Earnings-to-Price (E/P) and Dividend-to-Price (D/P). The value portfolios (indicated with a leading "H", for high) contain firms whose E/P, B/P or D/P is among the highest 30% on the OMXS. The growth portfolios (indicated with a leading "L", for low) contain firms whose B/P, E/P or D/P is among the lowest 30% on the OMXS.



Furthermore, we form equally weighted portfolios while Fama and French (1993; 2006) form value-weighted portfolios. The equally weighted portfolio formation was selected to disregard the size aspects of stock returns, a factor that Fama and French (1993; 2006) show have impact on stock return in itself. Additionally, Fama and French (1998) find the strongest result for the value premium on the Swedish market in the B/P-portfolios, with an observed t-value of 1.16 ($p \approx 25\%$). One can argue that such results are not sufficiently large to draw country specific conclusions regarding the existence of a value premium in Sweden.

Finally, Morningstar[4] has investigated the investment preferences of Swedish mutual fund managers. Subsequent to the new millennium a large fraction of Swedish fund managers have been focusing their investments towards growth stocks (Morningstar Inc., 2012). This indicates that they find growth stocks more attractive than value stocks on the OMXS, which in turn supports the discovered growth premium.

[4] Provider of investment research in North America, Europe, Australia and Asia (Morningstar Inc., 2012)

As mentioned in the introduction, Lakonishok et al. (1994) shows that there is little or no difference in fundamental company risk between value and growth firms. The next sections determine whether the newly found growth premium can be explained by differences in stock price reactions to earnings surprises.

6.2 Descriptive Statistics

Table IV
Mean Quarterly Return (%) and Positive- and Negative Surprises (%)

Table IV shows the mean return for growth and value stocks reporting positive and negative surprises, across the six portfolios. A surprise is defined as a deviation of the actual earnings for the quarter from the consensus earnings forecast (determined 90 days prior to the quarterly earnings announcement). A positive (negative) surprise is when the actual earnings for the quarter beat (fall short of) the consensus earnings forecast. Zero surprises (Surprise = 0) are excluded in Table IV. The share of surprises is stated as a percentage of non-zero surprises. The percentage is calculated by dividing the amount of positive and negative surprises by the total number of non-zero surprises in each portfolio formation (B/P, E/P and D/P). The sum of the share of negative surprises and the share of positive surprises in each of the three formations all yield a total of 100%. For example, in the B/P-portfolios; 27% negative and 23% positive surprises for the value portfolio together with 31% negative and 19% positive surprises for the growth portfolio sums to 100%.

	Return (%) Negative Surprise	Share Negative Surprise (%)	Return (%) Positive Surprise	Share Positive Surprise (%)
HB/P	-3.71	27	6.40	23
LB/P	-2.34	31	8.95	19
HE/P	-1.52	27	8.04	24
LE/P	-1.62	31	12.34	18
HD/P	-0.82	33	7.55	24
LD/P	-1.37	26	6.65	17

Table IV provides descriptive evidence of a difference in stock price reaction on positive surprises between value and growth stocks. In the B/P and E/P portfolios, the return of growth stocks reporting a positive surprise is higher than for value stocks reporting the ditto. The D/P portfolios show an opposite trend with modest figures. Firms are more likely to report negative surprises than positive surprises (an aggregate 58% in the B/P portfolios, 58% in the E/P portfolios and 59% in the D/P portfolios). This is consistent with previous research showing over-optimism in consensus earnings forecasts (Brown, 1998). In the case of a positive surprise, growth stocks experience highly superior mean quarterly returns in B/P and E/P compared to value stocks. The reactions to negative surprises are less pronounced for both stock classes and there is little difference between the portfolios.

6.3 Regression Analysis

Table V

Regression (1): Quarterly Return (%): Controlling for Sign and Magnitude of Surprise

Table V shows the regression model (1) on a step-by-step basis, specified in section 5.2:

$R_{f\tau} = \alpha + \beta_1 * Growth_{f\varphi} + \beta_2 * SignSurprise_{f\tau} + \beta_3 * (SignSurprise_{f\tau} * Growth_{f\varphi}) + \beta_4 * Surprise_{f\tau} + \beta_5 * (Surprise_{f\tau} * Growth_{f\varphi}) + \varepsilon_{f\tau}$

$R_{f\tau}$: The quarterly return for a specific stock

$Growth_{f\varphi}$: An indicator variable generating 1 if the firm is in a growth portfolio in year φ and 0 if it is in a value portfolio

$SignSurprise_{f\tau}$: An indicator variable generating 1 if the $Surprise_{f\tau}$ is positive and -1 if the $Surprise_{f\tau}$ is negative

B/P: Book-to-Price, E/P: Earnings-to-Price, D/P: Dividend-to-Price

Column (1) includes Growth as the only independent variable. Column (2) includes the independent variables Growth, SignSurprise and SignSurprise*Growth. Column (3) includes all variables as specified in regression model (1). The step-by-step approach is appropriate to see the behavior of the quarterly return across portfolios to the inclusion of different surprise variable. The first row reports coefficients with asterisks indicating the p-value (***p<0.01; **p<0.05; *p<0.1). The second row is the robust t-statistic testing whether the coefficients are different from zero (in parentheses).

	B/P			E/P			D/P		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Growth	2.96***	1.96*	1.94*	2.36**	2.09*	2.15*	-0.20	-0.73	-0.75
	(3.38)	(1.78)	(1.76)	(2.39)	(1.77)	(1.82)	(-0.22)	(-0.60)	(-0.61)
SignSurprise		5.05***	4.46***		4.78***	4.43***		4.18***	4.03***
		(6.24)	(5.11)		(6.54)	(5.37)		(7.02)	(6.33)
SignSurprise*Growth		0.59	0.31		2.20*	1.67		-0.18	0.31
		(0.54)	(0.25)		(1.86)	(1.30)		(-0.15)	(0.25)
Surprise			0.003			0.004			0.002
			(1.16)			(0.75)			(0.52)
Surprise*Growth			0.02			0.006			-0.004
			(1.34)			(0.77)			(-0.77)
Intercept	1.67***	1.34*	1.41*	3.92***	3.26***	3.23***	3.79***	3.35***	3.33***
	(2.68)	(1.66)	(1.74)	(6.50)	(4.47)	(4.42)	(7.78)	(5.65)	(5.58)
Number of observations	1959	1959	1959	1686	1686	1686	1953	1953	1953
Adj R^2 (%)	*0.33*	*4.59*	*4.82*	*0.18*	*5.77*	*5.97*	*0.00*	*2.58*	*2.55*

This section provides regression estimates of the surprise's impact on the return for growth and value stocks. In column (1) of Table V, the variable Growth loads with a positive and significant coefficient in the B/P and E/P portfolios (p-value < 5% in both cases). The results indicate that the growth stock returns in B/P and E/P are 2.96% and 2.36% higher than the value stock returns, respectively. Regarding the D/P measure, no statistical difference in return is observed. These results are expected considering the growth premium previously presented in the t-tests in section 5.1.

In column (2), the variable SignSurprise is positive and highly significant across all the three portfolio formations. This is expected given the large differences in return between firms reporting

positive versus negative earnings surprises (seen in Table IV). It also means that the quarterly return correlates with the quarterly earnings surprise. Evidently, the sign of the surprises is a determinant factor for the return (p-value < 1% in all three portfolio measures). Column (3) further includes the variables Surprise and Surprise*Growth. These variables do not have a significant effect on quarterly returns. To conclude, column (3) provides evidence that the sign of the surprise has a persistently large predictive power in the regression, while the magnitude of the surprise does not seem to have an effect on the stock price reaction.

Following the results from Table V, the insignificant variables Surprise and Surprise*Growth are omitted and the variable SignSurprise is divided into the new variables Good and Bad. The results are presented in Table VI (below).

Table VI

Regression (2) of Quarterly Return (%): Controlling for Asymmetric Reactions to Positive and Negative Surprises

The regressions run in Table VI are as specified in equation (2):

$$R_{f\tau} = \alpha + \beta_1 * Growth_{f\varphi} + \beta_2 * Good_{f\tau} + \beta_3 * Bad_{f\tau} + \beta_4 * (Good_{f\tau} * Growth_{f\varphi}) + \beta_5 * (Bad_{f\tau} * Growth_{f\varphi}) + \varepsilon_{f\tau}$$

$R_{f\tau}$: The quarterly return for a specific stock

$Growth_{f\varphi}$: An indicator variable generating 1 if the firm is in a growth portfolio in year φ and 0 if it is in a value portfolio

$SignSurprise_{f\tau}$: An indicator variable generating 1 if the $Surprise_{f\tau}$ is positive and -1 if the $Surprise_{f\tau}$ is negative

$Good_{f\tau}$: Binary variable generating 1 if the firm reports a positive earnings surprise for the quarter τ and 0 otherwise.

$Bad_{f\tau}$: Binary variable generating 1 if the firm reports a negative earnings surprise for the quarter τ and 0 otherwise.

B/P: Book-to-Price, E/P: Earnings-to-Price, D/P: Dividend-to-Price

The first row reports coefficients with asterisks indicating the p-value (***p<0,01; **p<0,05; *p<0,1). The second row is the robust t-statistic testing whether the coefficients are different from zero (in parentheses).

	B/P	E/P	D/P
Growth	-1.87	-0.97	-1.77
	(-1.24)	(-0.41)	(-1.53)
Good	4.76***	5.98***	6.39***
	(2.53)	(4.88)	(4.36)
Good*Growth	4.43**	5.26*	0.88
	(1.97)	(1.76)	(0.39)
Bad	-5.34***	-3.59***	-1.98
	(-2.79)	(-2.76)	(-1.45)
Bad*Growth	3.24	0.87	1.23
	(1.55)	(0.31)	(0.65)
Intercept	1.63	2.07***	1.16
	(1.08)	(2.86)	(1.02)
Number of observations	1959	1686	1953
Adj. R^2 (%)	*4.50*	*5.66*	*2.48*

This regression allows for tests of asymmetric stock price reactions to good versus bad surprises. In Table VI, the intercept shows the expected return for a value stock reporting a zero surprise. The coefficient of the variable Growth gives the difference in return between growth and value stocks reporting zero surprises.

Observing the columns for B/P and E/P, the Good variable loads with a significantly positive coefficient. This indicates that value stocks react positively to positive earnings surprises. Significantly negative coefficients are seen on the variable Bad, implying that value stocks react negatively to negative surprises. The signs on the coefficients of both Good and Bad are therefore as expected.

Furthermore, the coefficient on Good*Growth is significantly positive, which indicates that growth stocks react more pronounced to positive earnings surprises than value stocks. The coefficients on Bad*Growth is not a determinant factor of the differential quarterly return. Interestingly, the Growth variable is not significant with this regression specification. This indicates that there is no significant difference in return between the growth and value portfolios when the one-sided asymmetric reaction to positive earnings surprises is accounted for.

Regarding D/P, the Good variable is significantly positive. As opposed to the other two portfolios measures, the Bad variable is not significant. This implies that the negative effect of a bad surprise is more modest for stocks in the D/P portfolios. We find no evidence of any asymmetric responses to earnings surprises between HD/P and LD/P. The lack of significant results for this portfolio measure is logical since we do not observe a difference in mean return in H-LD/P (Table III).

Summarizing our findings from section 6, this paper provides evidence of a significant growth premium on the OMXS during the time period 2004-2014 in the B/P and E/P portfolios. No differential return was observed in D/P portfolio measure. After adjusting for asymmetric reactions to earnings surprises, the difference in quarterly return between the stock classes is no longer explained by portfolio allocation in any of the three portfolio measures. The differential return is, instead, a consequence of more pronounced reactions to positive earnings surprises for growth stocks.

7. Robustness Tests

7.1 Controlling for the Magnitude of Positive and Negative Surprises

Table VII
Regression (3) to Explain Quarterly Differential Return (%) Between Value and Growth Portfolios by Controlling for Positive and Negative Surprise Magnitude

The regressions run are as specified in equation (3):

$$R_{f\tau} = \alpha + \beta_1 * Growth_{f\varphi} + \beta_2 * Good_{f\tau} + \beta_3 * Bad_{f\tau} + \beta_4 * Surprise_{f\tau} + \beta_5 * (Growth_{f\varphi} * Good_{f\tau} * Surprise_{f\tau}) + \beta_6 * (Growth_{f\varphi} * Bad_{f\tau} * Surprise_{f\tau}) + \varepsilon_{f\tau}$$

$R_{f\tau}$: The quarterly return for a specific stock

$Growth_{f\varphi}$: Indicator variable generating 1 if the firm is in a growth portfolio and 0 if it is in a value portfolio year φ

$Good_{f\tau}$: Binary variable generating 1 if the firm reports a positive earnings surprise for the quarter τ and 0 otherwise.

$Bad_{f\tau}$: Binary variable generating 1 if the firm reports a negative earnings surprise for the quarter τ and 0 otherwise.

$Surprise_{f\tau}$: The magnitude of the forecast error defined as actual earnings for the firm in quarter τ minus the consensus earnings forecast for the quarter τ (determined 90 days prior to the earnings announcement in quarter τ), divided by the consensus earnings forecast for quarter τ

B/P: Book-to-Price, E/P: Earnings-to-Price, D/P: Dividend-to-Price. The first row reports coefficients with asterisks indicating the p-value (***p<0,01; **p<0,05; *p<0,1). The second row is the robust t-statistic testing whether the coefficients are different from zero (in parentheses).

	B/P	E/P	D/P
Growth	2.86**	1.70	-0.29
	(2.45)	(1.40)	(-0.23)
Good	6.02***	7.54***	7.13**
	(3.24)	(5.02)	(5.95)
Bad	-3.29*	-2.95**	-1.40
	(-1.78)	(-2.09)	(-1.38)
Surprise	0.003	0.002	0.002
	(1.14)	(0.33)	(0.40)
Good*Growth*Surprise	-0.01	0.01	-0.01
	(-0.36)	(1.22)	(-1.04)
Bad*Growth*Surprise	0.04**	0.01	-0.002
	(2.41)	(1.04)	(-0.39)
Intercept	0.05	1.00	0.52
	(0.03)	(0.79)	(0.58)
Number of observations	1959	1686	1953
Adj. R^2 (%)	*5.00*	*5.84*	*2.64*

Despite the results obtained from regression (1), robustness tests controlling for the magnitude of the surprise have been performed through executing regression (3). The Good and Bad variables are significant with the expected signs on the coefficients (the coefficient of Good is positive while the coefficient of Bad is negative). Nevertheless, the coefficients of Surprise and Good*Growth*Surprise is not statistically significant for any of the portfolios, indicating that the magnitude of a positive surprise does not have any implications on the return difference between

value and growth stocks. In B/P, the variable Bad*Growth*Surprise shows a small but significant (p-value < 5%) coefficient. This coefficient is solely 0.04, thus it does not have a large impact on the quarterly return for growth stocks and therefore limited economic implications. Nonetheless, the coefficient shows that the magnitude of a negative surprise has a significantly less negative effect on the return of growth stocks relative to value stocks. The significant coefficient of Growth in B/P shows that regression (3) is not as successful as regression (2) in explaining the differences in return between growth and value stocks in the B/P portfolios. The coefficient of Growth in E/P is no longer significant on any reasonable level. However, the coefficient loads with the same sign as in regression (1) and has a value that is higher in absolute terms, and in relation to its standard deviation, than in regression (2). Thus, regression model (2) is better suited to explain the differential returns for the E/P portfolios as well. No asymmetric responses to earnings surprises were found in regression model (2) for the D/P portfolios. The same holds when accounting for the magnitude of the surprise in regression model (3).

7.2 Return and Surprises around Earnings Announcements

Analogous to the approach employed by Chopra et al. (1992), we execute a robustness test of the results to question (ii), using a shorter return window. The reason being that the surprise in quarterly earnings is far from the only news release that affects stock prices during a quarter. To isolate the stock price reaction caused by the deviation in actual earnings from the consensus earnings forecast, we use the same three-day period around quarterly earnings announcements as Chopra et al. (1992).

7.2.1. Descriptive Statistics

As stated, we examine whether the stock price reaction to earnings surprises differs between growth and value stocks around the quarterly earnings announcements. Therefore, stock price and surprise data two days prior to the release of the quarterly report until one day thereafter have been collected[5]. Returns have been calculated as stock price after the quarterly earnings announcements divided by the stock price prior to the release of the quarterly earnings announcements minus one. The definitions of the independent variables are identical to the definitions stated in section 5.1. Missing values in the three-day returns make up 11.12% of the total number of observations and are thus excluded from further analysis. Once more, the reason for the relatively high number of missing values is that all firms in the sample are not listed on OMXS throughout the whole time period, and reports missing values when they are not.

Table VIII
Inferential Statistics for the Three-Day Sample: Calculated on Returns 2 Days Prior to Quarterly Earnings Announcement Until 1 Day After (%)
The portfolio formation has been conducted in accordance with the description in section 5.1. Indicating letter H = High (value), Indicating letter L = Low (growth). H-L: High-Low. B/P: Book-to-Price, E/P: Earnings-to-Price, D/P: Dividend-to-Price
The asterisks in the second column indicate the p-value for t-test of whether mean return is different from zero (***p<0,01; **p<0,05; *p<0,1). Note that there is equal number of observations in each portfolio type.

	Number of Observations	Mean Three-Day Return (%)	T-stat $\mu \neq 0$	Robust St Dev	Avg. Nr of Firms Per Year
HB/P	1504	-0.13	-0.79	0.17	40
LB/P	1504	0.04	0.27	0.17	40
H-LB/P	1504	-0.18	-0.76	0.24	-
HE/P	1258	0.08	0.46	0.17	33
LE/P	1258	0.26	1.41	0.19	33
H-LE/P	1258	-0.19	-0.75	0.25	-
HD/P	1509	0.25	1.60	0.16	41
LD/P	1509	-0.41	-0.47	0.19	41
H-LD/P	1509	0.66***	2.73	0.24	-

[5] For example, if the report is released the 12th of April 2006, the stock price of two trading days before the release is collected (for simplicity, let's say the 10th of April 2006). If the stock is not traded on the 11th of April 2006, the price as per the 9th of April 2006 is collected and so forth. As the period's final date, the stock price for one trading day after the release date is collected (for simplicity, let's say the opening price of the 14th of April 2006). If the stock is not traded on the 13th of April 2006 the opening stock price as per the 15th of April 2006 is collected and so forth.

Table VIII shows no verified difference in mean return between growth and value stocks in the portfolios B/P and E/P around quarterly earnings announcements. As expected, the figures reported in table VIII are smaller, in absolute terms, than the corresponding numbers for the quarterly data (Table III). The return for the H-LD/P portfolio shows a significant value premium.

In the next section, we examine whether the difference in returns for HD/P and LD/P in Table VIII can be explained by a difference in reactions to positive and negative surprises. Further, we also examine whether there are asymmetric responses to earnings surprises within the B/P and E/P portfolios despite the lack of significant differential returns. This procedure replicates the one taken in Section 6: Empirical Results.

7.2.2 Regression Analysis

Table IX

Regression (1) of Three-Day Return (%): Controlling for Sign and Magnitude of Surprise

Table IX shows the regression model (1) on a step-by-step basis:

$R_{f\psi} = \alpha + \beta_1 * Growth_{f\varphi} + \beta_2 * SignSurprise_{f\psi} + \beta_3 * (SignSurprise_{f\psi} * Growth_{f\varphi}) + \beta_4 * Surprise_{f\psi} + \beta_5 * (Surprise_{f\psi} * Growth_{f\varphi}) + \varepsilon_{f\psi}$

f indexes firms, ψ indexes event date, τ indexes calendar quarter, φ indexes the years of which the portfolios are formed.

$R_{f\psi}$: The return two days prior to a quarterly report release until one day thereafter for a specific stock

$Growth_{f\varphi}$: An indicator variable generating 1 if the firm is in a growth portfolio in year φ and 0 if it is in a value portfolio

$SignSurprise_{f\psi}$: An indicator variable generating 1 if the $Surprise_{f\tau}$ is positive and -1 if the $Surprise_{f\tau}$ is negative

$Surprise_{f\psi}$: The magnitude of the forecast error defined as actual earnings for the firm in quarter τ minus the consensus earnings forecast for quarter τ (determined 2 days prior to the earnings announcement for the quarter τ) divided by the consensus forecasted earnings for quarter τ.

B/P: Book-to-Price, E/P: Earnings-to-Price, D/P: Dividend-to-Price. The first row reports coefficients with asterisks indicating the p-value (***p<0,01; **p<0,05; *p<0,1). The second row is the robust t-statistic testing whether the coefficients are different from zero (in parentheses).

	B/P			E/P			D/P		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Growth	0.23	0.37	0.36	0.26	0.42	0.41	-0.65**	-0.62**	-0.63**
	(0.84)	(1.34)	(1.32)	(0.87)	(1.48)	(1.45)	(-2.16)	(-2.09)	(-2.14)
SignSurprise		1.25***	1.40***		1.68***	1.81***		1.91***	2.03***
		(6.32)	(6.32)		(8.71)	(8.34)		(11.58)	(11.35)
SignSurprise*Growth		0.57**	0.41		0.23	0.10		-0.91***	-0.92***
		(2.09)	(1.37)		(0.79)	(0.33)		(-3.04)	(-2.82)
Surprise			-0.001			-0.002			-0.003
			(-1.27)			(-1.44)			(-1.63)
Surprise*Growth			0.001			0.002			0.002
			(0.62)			(0.95)			(1.01)
Intercept	-0.10	-0.22	-0.21	0.13	-0.01	0.001	0.35**	0.30*	0.31*
	(-0.48)	(-1.10)	(-1.07)	(0.68)	(-0.04)	(0.00)	(2.00)	(1.80)	(1.86)
Number of observations	2303	2303	2303	1956	1956	1956	2285	2285	2285
Adj R^2 (%)	*0.01*	*5.31*	*5.33*	*0.00*	*7.43*	*7.41*	*0.23*	*5.22*	*5.28*

In column (1), the B/P and E/P portfolios provide no evidence of a difference in return based on portfolio belonging. In the same column, D/P shows a statistically verified value premium. In column (2) the variable SignSurprise is highly significant in all the three portfolio formations, which indicates that the sign of the surprise has a significant impact on stock return during the three-day interval around quarterly report releases. SignSurprise*Growth is significant in the B/P and D/P portfolios. This implies that the sign of the surprise has an established impact on the differential return for growth stocks during the three-day interval. The variables accounting for the magnitude of the surprise (Surprise and Surprise*Growth) does not have an impact on the difference in return between the stock classes. This is consistent with the results obtained in regression (1) on quarterly data.

Following our findings, the same substitution as in Section 6.3 is done (variable Surprise is omitted and the variable SignSurprise is divided into the variables Good and Bad). The interpretation of Table X is explained in Table II (Section 5.2).

Table X

Regression (2) of Three-Day Return (%): Controlling for Asymmetric Reactions to Positive and Negative Surprises

The regressions run in Table X are as specified in equation (2):

$R_{f\psi} = \alpha + \beta_1 * Growth_{f\varphi} + \beta_2 * Good_{f\psi} + \beta_3 * Bad_{f\psi} + \beta_4 * (Good_{f\psi} * Growth_{f\varphi}) + \beta_5 * (Bad_{f\psi} * Growth_{f\varphi}) + \varepsilon_{f\psi}$

f indexes firms, ψ indexes event date, τ indexes calendar quarter, φ indexes the years of which the portfolios are formed.

$R_{f\psi}$: The three-day return for a specific stock around earnings announcements in quarter τ

$Growth_{f\varphi}$: An indicator variable generating 1 if the firm is in a growth portfolio in year φ and 0 if it is in a value portfolio

$SignSurprise_{f\psi}$: An indicator variable generating 1 if the $Surprise_{f\tau}$ is positive and -1 if the $Surprise_{f\tau}$ is negative

$Good_{f\psi}$: Binary variable generating 1 if the firm reports a positive earnings surprise for the quarter τ and 0 otherwise.

$Bad_{f\psi}$: Binary variable generating 1 if the firm reports a negative earnings surprise for the quarter τ and 0 otherwise.

B/P: Book-to-Price, E/P: Earnings-to-Price, D/P: Dividend-to-Price. The first row reports coefficients with asterisks indicating the p-value (***p<0,01; **p<0,05; *p<0,1). The second row is the robust t-statistic testing whether the coefficients are different from zero (in parentheses).

	B/P	E/P	D/P
Growth	-3.77	1.23	0.83
	(-1.60)	(0.46)	(0.41)
Good	-1.70	1.71	2.60**
	(-0.76)	(1.56)	(2.48)
Good*Growth	4.74**	-0.58	-2.37
	(1.99)	(-0.22)	(-1.15)
Bad	-4.20*	-1.64	-1.23
	(-1.88)	(-1.47)	(-1.17)
Bad*Growth	3.60	-1.04	-0.55
	(1.51)	(-0.39)	(-0.27)
Intercept	2.71	-0.04	-0.38
	(1.22)	(-0.04)	(-0.38)
Number of observations	2303	1956	2285
Adj. R^2 (%)	*5.30*	*7.34*	*5.15*

Table X provides evidence that growth stocks in the B/P portfolio react more pronounced to positive earnings surprises (seen from the significant coefficients on Good*Growth). However, as no statistically verified difference in mean returns is observed in Table VIII, this effect is not sufficiently large to generate a growth premium for the period. No asymmetric reaction to positive or negative earnings surprises is seen in the E/P portfolios. Interestingly, the Growth coefficient in the D/P portfolio is no longer significant. This means that the portfolio belonging is no longer a determinant of the differential returns when asymmetric responses to positive and negative earnings surprises are considered. One should note that none of the independent variables in the D/P portfolio are significant on any reasonable level. We therefore fail to distinguish which of the variables that neutralize the value premium in the portfolio.

Finally, despite the results presented in Table IX, regressions taking the magnitude of the surprise into account have been performed. The results are displayed in Table XI.

Table XI

Regression (3) on Three-Day Return (%) Between Value and Growth Portfolios by Controlling for Positive and Negative Surprise Magnitude

The regressions run are as specified in equation (3):

$$R_{f\psi} = \alpha + \beta_1 * Growth_{f\varphi} + \beta_2 * Good_{f\psi} + \beta_3 * Bad_{f\psi} + \beta_4 * Surprise_{f\psi} + \beta_5 * (Growth_{f\varphi} * Good_{f\psi} * Surprise_{f\psi}) + \beta_6 * (Growth_{f\varphi} * Bad_{f\psi} * Surprise_{f\psi}) + \varepsilon_{f\psi}$$

f indexes firms, ψ indexes event date, τ indexes calendar quarter, φ indexes the years of which the portfolios are formed.

$R_{f\psi}$: The three-day return for a specific stock around earnings announcements in quarter τ

$Growth_{f\varphi}$: An indicator variable generating 1 if the firm is in a growth portfolio in year φ and 0 if it is in a value portfolio

$Good_{f\psi}$: Binary variable generating 1 if the firm reports a positive earnings surprise for the quarter τ and 0 otherwise.

$Bad_{f\psi}$: Binary variable generating 1 if the firm reports a negative earnings surprise for the quarter τ and 0 otherwise.

$Surprise_{f\psi}$: The magnitude of the forecast error defined as actual earnings for the firm in quarter τ minus the consensus earnings forecast for the quarter τ (determined 2 days prior to the earnings announcement for the quarter τ), divided by the consensus earnings forecast for quarter τ

B/P: Book-to-Price, E/P: Earnings-to-Price, D/P: Dividend-to-Price. The first row reports coefficients with asterisks indicating the p-value (***p<0,01; **p<0,05; *p<0,1). The second row is the robust t-statistic testing whether the coefficients are different from zero for each coefficient (in parentheses).

	B/P	E/P	D/P
Growth	0.55**	0.76**	-0.34
	(1.97)	(2.52)	(-1.06)
Good	1.07	1.79*	1.74
	(0.88)	(1.78)	(1.63)
Bad	-2.15*	-1.84*	-1.58
	(-1.77)	(-1.82)	(-1.48)
Surprise	-0.001	-0.002	-0.001
	(-1.72)	(-1.52)	(-0.83)
Good*Growth*Surprise	-0.002	-0.002	-0.003
	(-0.60)	(-1.01)	(-1.43)
Bad*Growth*Surprise	0.007**	0.01***	-0.002
	(2.38)	(3.28)	(0.97)
Intercept	0.31	0.03	0.23
	(0.26)	(0.03)	(0.22)
Number of observations	2303	1956	2285
Adj. R^2 (%)	*5.42*	*7.89*	*5.25*

The results are similar to the findings presented Section 7.1. In the B/P portfolio, the variable Bad*Growth*Surprise shows a small but significant (p-value < 5%) coefficient. The magnitude of this coefficient is solely 0.007, thus it does not have a large impact on the return for growth stocks and limited economic implications. The positive sign of the coefficient implies that growth stocks in the B/P portfolio react less pronounced to negative surprises in relation to the surprise magnitude

than value stocks. The same result (but with a p-value < 1%) can be seen in the E/P portfolio, and the same argumentation holds regarding the size of the coefficient. No difference in reaction to positive surprises is observed when taking its magnitude into consideration.

Concluding Section 7.2, we do not find a similar growth premium in the three-day data as the one observed in the quarterly data. Apart from the shortened return window, the executed regressions in this section are analogous the regressions on the quarterly data. Our quarterly sample contains observations affected by pre-earnings announcements in the form of profit warnings. The consensus earnings forecasts in the quarterly data are reported 90 days prior to the earnings announcements. This implicates that the profit warnings and their effect on stock price are taken into account in the regressions on quarterly returns. For the regressions on the shortened interval, the profit warnings' effect on stock price and earnings forecasts occurred before the three-day window. It is thus already adjusted for in both the earnings estimates and the stock price. As the majority of profit warnings occur when the firms fall short of the estimated earnings, the three-day period fail to account for these major declines in stock price.

Despite the absent growth premium in the three-day data, we provide evidence of more pronounced reactions to positive surprises for growth stocks in the B/P portfolio (see Table X). No asymmetric reactions to negative surprises are seen in any of the portfolios. These findings are in line with the regression results on the quarterly data.

8. Conclusion & Future Research

For many years, value stocks have earned higher average return compared to growth stocks. The value premium – denoting superior performance of value stocks – has since the discovery confounded economists. Studies of the value premium are mainly focused to the US equity market and are debated to be inconclusive on smaller stock markets. To contribute to the research, this paper focuses on the OMX Stockholm (OMXS) in 2004-2014.

We provide surprising evidence of a growth premium on the OMXS for the portfolios formed on Book-to-Price (B/P) and Earnings-to-Price (E/P) during the period 2004-2014. Our results contradict previous research, for which there are a number of potential reasons. Firstly, forming equally weighted portfolios disregards the size effect of companies and differs from previous methods. It might serve to further isolate the effect of the growth- and value characteristics on returns. Secondly, the time span differs from previous research. We have seen no indication that any study has been done on the OMXS during the period following the turbulent dot-com bubble burst. Thirdly, previous studies on the Swedish market lack significant results pointing towards either a value- or growth premium.

The found growth premium on OMXS during the time period 2004-2014 serve as further criticism toward the established concept of the value premium. The results show that the value premium is not consistently observed on all markets. One should note that previous research have shown that the value premium is dependent on portfolio formation (Brailsford, et al., 2012). The results of this paper primarily support this conclusion. However, it also shows that it is possible for investors to receive superior returns by investing in growth stocks rather than value stocks on the OMXS. To conclude, investors should not depend solely on financial ratios and value stock characteristics when forming portfolios but rather rely on other properties for determining stocks that will generate superior returns. Further research in the field has to be carried out in order to determine why the value premium during some periods, in certain portfolios, transforms into a significant growth premium.

This paper provides evidence that the growth premium on the OMXS during the study period can partly be explained by the fact that growth stocks react more pronounced to positive surprises than

value stocks. The findings show no difference in reaction to negative surprises. For both positive and negative surprises, the sign of the surprise is a determinant factor for quarterly returns while the magnitude is of lesser importance. It is safe to conclude that earnings announcements are far from the only surprises that firms encounter during a fiscal quarter. To assume that the surprises around the earnings announcements fully explain the difference in quarterly returns would therefore be inappropriate. We control for this fact by examining three-day returns around earnings announcements. Within this sample, the same pronounced reaction to positive earnings surprises for growth stocks is observed in the B/P portfolio. No asymmetric reaction to negative surprises was observed.

Our findings imply that, during times when investors expect reported earnings to beat the market's expectations on the OMXS, one should invest in stocks with growth characteristics as the price reactions within this category are more prominent than for value stocks. This investment strategy becomes even more attractive taking into account that the stock price reactions on shortcomings in earnings are indifferent between the value and growth portfolios. The conclusion regarding superior return of growth stocks during favorable market conditions is consistent with previous research (Skinner & Sloan, 2002). Nonetheless our study has been conducted during a period with fluctuating market conditions and still shows superior performance of growth stocks. Supplementary studies have to be carried out in order to determine whether this investment strategy holds for longer timeframes on the OMXS.

9. Problematization

Our data consists of an extensive sample of stocks listed on OMXS for the past ten years. In many studies examining the value premium, the time horizon is longer. We have limited our timeframe in accordance with the specifications in Section 4.1 in order to analyze the years subsequent to Fama and French (1998). Despite that our chosen period may seem short, we regard it as a sensible limitation since the aim is to analyze the market following the dot-com bubble burst.

Prior research data is known to be subject to survivorship biases (Kothari, et al., 1995; Andrikopoulos, et al., 2006). Survivorship bias skews the results as delisted companies and companies that have filed for bankruptcy are omitted from the sample. Attempts have been made to minimize the survivorship bias in our data by manually controlling for delisted firms during the period and through double-checking the data against Datastream, I/B/E/S and Bloomberg. However, the quarterly consensus forecasts used when examining the asymmetric reaction to surprises have been difficult to gather for delisted firms. This is something the reader should be aware of.

Finally, another important limitation worth mentioning concerns missing values in the data sample. In the initial years of the examined period, all companies were not covered by equity researchers and thus report missing surprise values. Also, smaller firms are less covered than large firms in our sample and some companies have only one earnings estimate as base for the consensus forecast. As the consensus earnings forecast is the median of all earnings estimates, this has a negative impact on the preciseness of the surprise estimates.

10. References

Andersson, B. & Ådahl, M., 2005. Den "nya ekonomin" och svensk produktivitet på 2000-talet. *Penning - och valutapolitik*, Volume 1, pp. 47-72.

Andrikopoulos, P., Daynes, A., Latimer, D. & Pagas, P., 2006. The value premium and methodological biases: Evidence from the UK equity market. *Investment Management and Financial Innovations,* Volume 3, pp. 40-59.

Basu, S., 1977. Investment performance of common stocks in relation to their price earnings ratios: A test of the efficient market hypothesis. *Journal of Finance,* June, 32(3), pp. 663-682.

Berk, J. B., Green, R. C. & Naik, V., 1999. Optimal Investment, Growth Options, and Security Returns. *Journal of Finance,* Volume 54, pp. 1553-1607.

Brailsford, T., Gaunt, C. & O'Brien, M. A., 2012. The investment value of the value premium. *Pacific-Basin Finance Journal,* 20(3), pp. 416-437.

Brown, L. D., 1998. *Managerial behavior and the bias in analysts' earnings forecasts,* Georgia State University: Unpublished paper.

Carlsson, M., Fisher, A. & Giammarino, R., 2004. Corporate Investment and Asset Price Dynamics: Implications for the Cross-section of Returns. *Journal of Finance,* December, 59(6), pp. 2577-2603.

Chan, L. K. C., Yasushi, H. & Lakonishok, J., 1991. Fundamentals and stock returns in Japan. *Journal of Finance ,* Volume 46, pp. 1739-1789.

Chopra, N., Lakonishok, J. & Ritter, J., 1992. Measuring abnormal performance: Do stocks overreact?. *Journal of Financial Economics,* 31(2), pp. 235-268.

Chui, A. C. W. & Wei, K. C. J., 1998. Book-to-market, firm size, and the turn-of-the-year effect: Evidence from Pacific-Basin emerging markets. *Pacific-Basin Finance Journal,* Volume 6, pp. 275-293.

Daniel, K., Hirshleifer, D. & Subrahmanyam, A., 1998. Investor psychology and security market under- and overreactions. *Journal of Finance,* December, Volume 53, pp. 1839-1885.

Daniel, K., Titman, S. & Wei, K. J., 2001. Explaining the cross-section of stock returns in Japan: Factors or characteristics?. *Journal of Finance,* Volume 56, pp. 743-766.

Fama, E. F. & French, K. R., 1992. The cross-section of expected stock returns. *Journal of Finance,* Volume 47, pp. 427-465.

Fama, E. F. & French, K. R., 1993. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics,* Volume 33, pp. 3-56.

Fama, E. F. & French, K. R., 1998. Value versus growth: The international evidence. *Journal of Finance,* December, 53(6), pp. 1975-1999.

Fama, E. F. & French, K. R., 2006. The value premium and the CAPM. *Journal of Finance,* Volume 61, pp. 2163-2185.

French, K. R., 2014. *Kenneth R. French.* [Online]
Available at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/
[Accessed 02 03 2014].

Gaunt, C., 2004. Size and Book-to-market effects and the Fama French three factor asset pricing model: Evidence from the Australian stockmarket. *Accounting and Finance,* Volume 44, pp. 27-44.

Halliwell, J., Heaney, R. & Sawicki, J., 1999. Size and book-to-market effects in Australian share markets: A time series analysis. *Accounting Research Journal,* Volume 12, pp. 122-137.

Jaffe, J., Keim, D. B. & Westerfield, R., 1989. Earnings Yields, Market Values, and Stock Returns. *Journal of Finance,* Volume 44, pp. 135-148.

Kassimatis, K., 2008. Size, Book to Market and Momentum Effects in the Australian Stock Market. *Australian Journal of Management,* 33(1), pp. 145-168.

Kothari, S. P., Shanken, J. & Sloan, R. G., 1995. Another look at the cross-section of Expected Stock Returns. *Journal of Finance,* March, 50(1), pp. 185-224.

La Porta, R., Lakonishok, J., Shleifer, A. & Vishny, R., 1997. Good news for value stocks: Further evidence of market efficiency. *Journal of Finance,* June, 52(2), pp. 859-874.

Lakonishok, J., Shleifer, A. & Vishny, R. W., 1994. Contrarian investment, extrapolation, and risk. *Journal of Finance,* December, 49(5), pp. 1541-1578.

Loughran, T., 1997. Book-to-market across firm size, exchange, and seasonality: Is there an effect?. *Journal of Financial and Quantitative Analysis,* September, 32(3), pp. 249-268.

Morningstar Inc., 2012. *Morningstar.* [Online]
Available at: http://www.morningstar.be/be/news/article.aspx?articleid=76871&categoryid=488
[Accessed 03 05 2014].

NASDAQ OMX Group, 2014. *NASDAQ OMX Nordic.* [Online]
Available at: http://www.nasdaqomxnordic.com/about_us
[Accessed 03 05 2014].

Poorebrahimi, M. R. & Mousavi, S. M., 2012. Market Over-Reaction And Rational Market Risk In Value And Growth Stocks In Teheran Securities Exchange. *International Research Journal of Applied and Basic Sciences,* 3(7), pp. 1490-1496.

Scislaw, K. E. & McMillan, D. G., 2012. The search for an exploitable value premium in market indexes. *Journal of Asset Management,* Volume 13, pp. 253-270.

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,* Volume 7, pp. 289-312.

Yen, J. Y., Sun, Q. & Yan, Y., 2004. Value versus growth stocks in Singapore. *Journal of Multinational Financial Management,* 14(1), pp. 19-34.

Zhang, L., 2005. The Value Premium. *Journal of Finance,* February, Volume 60, pp. 67-103.

11.Appendix

Exhibit A

This graph demonstrates the quarterly difference in return on the Swedish market between value and growth stocks during 1975 – 2014. The quarterly returns have been computed based on monthly data, sourced from Kenneth R. French's official website (Unpublished data). The portfolios are value weighted. H: High (Value), L: Low (Growth) B/P: Book-to-Price, E/P: Earnings-to-Price, D/P: Dividend-to-Price

