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# A STUDY ON FINNISH PUBLICLY LISTED UNDERVALUED COMPANIES RETURN BEHAVIOUR: COMPARISON BETWEEN SIZE AND PRICE-TO-BOOK RATIO

Bachelor's thesis
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Supervisor: Kaido Kepp, MBA

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I hereby declare that I have compiled the thesis independently
and all works, important standpoints and data by other authors
have been properly referenced and the same paper
has not been previously presented for grading.
The document length is 7282 words from the introduction to the end of conclusion.

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# ABSTRACT

The main objective of this study is to analyse OMX Helsinki's companies' price-to-book values and their returns in different capitalization segments. Data analysed in this study is set between years 2017 and 2019. The study compiled all the OMX Helsinki companies, noted their annual price-to-book ratio, annual return and divided them to their market capitalization segments set by NASDAQ Nordic.

The data was analysed with descriptive statistics as well as regression analysis. The results retracted from the data indicate, that small price-to-book values give less return in comparison with higher price-to-book values. The results suggest that it might not be the case with large and mid cap companies, but with small cap companies the case turned out quite clear.

**Keywords:** Price-to-book ratio, Market capitalization, Factor investing, Undervalued listed companies

# INTRODUCTION

Financial researchers and investment analysts have studied market capitalization and the ratio of price-to-book value for decades now. Several studies have found significant relationships between price-to-book ratio and profitability and growth (Hunter and Wall, 1989). Evidence of small firm and low price-to-book premium has changed the investment behaviour of many investors (Jensen, Johnson and Mercer, 1997). Chan and Chen (1991) and Fama and French (1995) argued that small cap companies and low price-to-book companies are especially risky during adverse economic conditions, therefore they must provide relatively high returns during periods of economic decline. Under this scenario, the P/B and small size premiums will be more outstanding during expansive monetary periods. Historically, average returns are higher on small cap companies compared to large cap companies and companies with low price-to-book ratios earn better premiums compared to high P/B ratios (Jensen, Johnson and Mercer, 1997). During the years of 2017 to 2019, euribor rates have been very low (negative), which would indicate of an expansionsive monetary period[1].

The main objective of this study is to interpret publicly listed Finnish companies and their return predictability at different price-to-book values and at different market capitalization sizes. This thesis will discuss of wether there is evidence, that there are Finnish publicly listed companies that have low price-to-book ratio which give reasonable returns.

The literature written on stock market predictability is vastly extensive and includes coverage of variables used, methods applied and time periods analysed. The majority of literature on the matter indicate strongly that stock market predictability is very possible (Steiner, 2009).

This study is not excessively extensive, particularly considering the time span being only three years, from 2017 to 2019, when making findings and conclusions, the more data points the more desirable the findings. Furthermore, the study is constructed to give background and analysis which are informative to anyone interested in studying and or investing in OMX Helsinki.

[1] https://www.euribor-rates.eu/en/euribor-rates-by-year/
https://www.reuters.com/article/us-ecb-policy-rates-explainer/explainer-how-does-negative-interest-rates-policy-work-idUSKCN1VY1D2
https://www.thestreet.com/politics/what-is-fiscal-policy-14697367

Based on the main objective, following research questions have been set up:

RQ1: Does lower P/B ratio correlate with higher returns?
RQ2: What kind of effect does market capitalization size have on the return?
RQ3: What combination of market capitalization and P/B ratio has the highest returns, the lowest returns and where does P/B ratio have the most impact?

First and foremost, the research questions above formate the main motivations behind this study. During reading this thesis, you will first be given some background regarding this study. The next part, background includes the explanation, history and speculation behind the key concepts and terms behind this study. After adequeate knowledge behind the title and research questions has been found, the following part will establish the foundations of this research, the analysis methods on how to answer the research questions. After the questions “what”, “why” and “how” regarding this thesis have been established, the next part will have the foundations to put all the theory into action; the analysis and the results of this study. When all in the above is internalised, the question; “How well did the companies at different market capitalization sizes yield returns at different values of price-to-book ratio and why?” should look a lot more clearer. This Thesis is structured as follows. Section I contains theory behind this study, then section II tells the methodologies used and sample selection. The III section will include results of the study, followed by; IV with conclusions.

# 1. BACKGROUND AND TERMINOLOGY

## 1.1. Undervalued company

Value investors are evaluating their potential investments by using relatively simple accounting based fundamental analysis strategy, mainly low price-to-book ratio (Piotroski, 2000). A high-profile value investor Warren Buffett (2009) states that the essence of value investing is buying stocks at less than their intrinsic (built-in or natural) value. This strategy has been proven by research to yield higher returns than market beta (Rosenberg, Reid and Lanstein (1985); Fama and French (1992); Lakonishok, Shleifler and Vishny (1994)). A company is considered undervalued, when its stock price is lower than its asset value according to Farlex Financial Dictionary (2009). A part of the undervalued company category are value stocks, as briefly referred above; they are trading at a lower rate than the company's performance would otherwise indicate. Common characteristics of value stocks are high dividend yield, low price-to-book ratio and low price-to-earnings ratio (Smith, 2019). Value stocks have a relatively low market price in relation to their earnings per share, cash flow per share and book value per share (Bashu, 1977; Lakonishok, Shleifer and Vishny 1994; Fama and French 1992).

Undervalued companies are in reality, difficult to define, because the share price cannot be defined fully by its asset value, nor the dividend pay-out, the discount value of future cash flows, volatility, different risk indicators etcetera, but the combination of all. There are many different factors to take into count, when evaluating a stock's value. This is why there have been created models and indicators (some of them mentioned above), tested by researchers to give direction on a stock's "true value". In this research the focus will be at price-to-book ratio at its lower values, which is a typical indicator of undervalued stock, or at least at finding undervalued companies to then further analyse. (Dechow, Sloan and Zha, 2014)

## 1.2. Price-to-book ratio

Before all, it should be stated, that even though financial ratio analysis simplifies data and helps analysts substantially with comparison of other companies and industries, the ratios can be manipulated, have differentiation on formulas and they can be misunderstood. The industry, country, cap size, etcetera, may have a vast impact on the interpretation of a ratio.

With a newly established company, its value can be seen that it equals the investments made by owners and then in after a while, when operations show promise to long-term returns, the market value starts to shape after the present value of cumulative future returns. However, the book value of the company stays relatively unchanged, being the initial investments value plus the reinvestments of undistributed profits. Therefore, the change in the value of a firm can be considered as change in price-to-book ratio (Agrawal, Monem and Ariff, 1996).
Fama and French (1991) demonstrate that book-to-market (price-to-book can be known also as market-to-book) value explains the differences in return better than beta (a measure of how volatile stock is, in comparison to overall market)[2] does. Publicly listed companies include their price-to-book ratio, P/B ratio for short, normally in their annual and quarterly reports. It is a commonly known ratio amongst investing and finance, because it tells the company's market value relative to its book value as the name of the ratio indicates. Book value is also known as the net asset value, it is calculated by taking total assets and subtracting intangible assets and liabilities from it (Haynes, 2020). P/B ratio is calculated by dividing the company's market price per share with its book value per share. A lower P/B ratio could mean that the stock is undervalued, but it can also mean there is something wrong with the company (Haynes, 2020). A P/B ratio of under 1 means it has a lower market value than net asset value.
A trading strategy based on a ratio of price-to-book value, yields positive returns over time. An explanation for this is that P/B provides a useful measure of the intrinsic value (measure of what an asset is worth) (Rosenberg, Reid and Lanstein, 1985). The P/B anomaly is already well known in the financial literature, this is why price-to-book ratio was chosen in this study, to further widen the knowledge on the matter and to possibly find new evidence of unknown behaviour patterns. As implied in the introduction, any findings made in this thesis, should be properly investigated further, before stating any permanent conclusions.

## 1.3. Capitalization Size Effect

Empirical research in corporate finance, consider company size to have an important and fundamental role in research (and practice), how the "size effect" affects, in many situations the empirical results (Dang, Li and Yang, 2017). Rajan and Zingales (1995) discover that when firm capitalization gets larger, the leverage increases. In finance, a standard presumption is that small cap stocks tend to outperform large cap stocks (Switzer 2010). However, there are researchers

[2] https://www.investopedia.com/investing/beta-know-risk/

like Schwert (2003), who have been challenging this anomaly. He states that "small-firm anomaly has disappeared since the initial publication of the papers that discovered it", based on the returns that extend to the 1982 to 2002 period (Schwert, 2003). Switzer and Fan (2007) demonstrate that high returns of small cap companies may vary substantially by country.
Large cap companies tend to have slower growth in comparison with mid cap and small cap companies (Ross 2020). Large cap stocks are usually more mature companies and significantly less volatile, because of having large amount stocks on the market in comparison to small or even mid cap stocks. Large caps are also the safe haven where investors tend to go during downturns in the economy.
Institutional investors tend to circulate small and mid cap stocks, because they do not want to find themselves owning controlling positions of these small companies. Some known characteristics with large cap companies are transparency, hefty dividend pay-out, stability and their tendency to be impactful to the overall market (Ross 2020), whereas small cap companies tend to lean to the opposition. Mid cap companies, as the name refer are somewhere in between small cap and large cap companies.
In this thesis the objective is not to concentrate on any capitalization size, unlike with P/B ratio, this research tends to concentrate on the lower values. The objective is to observe how the returns may vary at different capitalization segments, at different price-to-book values. Furthermore, as implied earlier (value stock), larger capitalization stock tends to have higher returns at lower P/B values, but this does not mean that even with large cap stock, the returns may not get higher as the price-to-book gets lower. One thing to note regarding the segmentation classification is that they differ greatly at different exchanges. In comparison, New York Stock Exchange or NYSE for short, classifies large cap as 10 billion dollars or above, mid cap as 2 to 10 billion dollars and small cap as under 2 billion in market capitalization[3], compared to NASDAQ OMX Nordic where large cap is classified as 1 billion euros or above, mid cap as 150 million to 1 billion euros and small cap as under 150 million euros (referred at chapter 3.2.1). This matter may have a slight effect regarding the empirical studies referred but will not have an effect on the actual results.

[3] https://financialengines.com/education-center/small-large-mid-caps-market-capitalization/

## 1.4. Factor investing

The capital asset pricing model or CAPM for short, marks the birth of asset pricing theory, resulting in a Nobel Prize in economic sciences at 1990 (Sharpe, 1964; Lintner 1965; Fama and French, 1992). The theory was enhanced by Eugene Fama and Kenneth French in 1992, adding value and size factors in addition to market factor, hence creating the three-factor model. After the FF3, research for factor investing expanded vastly, new factors have been found since and are waiting to be found still. What is a factor, when thinking of a factor-based portfolio constructing? Factors are the underlying exposures that explain the investment's risk (Amenc, Goltz and Le Sourd, 2009). "For example, the underlying factor affecting the risk of a broad market-cap-weighted stock portfolio is the market factor, also called the equity risk" (Pappas and Dickson 2015).
Here are some of the most commonly known factors which have been studied to have a higher performance in portfolios:

- *Market:* Stocks have earned above risk-free rate (Sharpe, 1964; Lintner, 1965).
- *Value:* Inexpensive stocks relative to some measure of fundamental value, outperform stocks that are more expensive (Banz, 1981; Fama and French, 1992).
- *Size:* Small cap companies stocks earn more than large cap companies' stocks (Fama and French, 1992; Lakonishok, Shleifer and Vishny, 1994).
- *Momentum:* Stocks with high returns in the past earn better than stocks with low returns in the past (Jagadees and Titman, 1993; Carhart, 1997).
- *Low volatility:* Low volatility stocks earn higher risk-adjusted returns than high volatility stocks (Baker, Bradley and Wurgler 2011; Frazzini and Pedersen, 2014).
- *Term:* Long-maturity bonds earn higher returns than short-maturity bonds (Blitz, 2012)
- *Credit:* Low-credit bonds have earned better than high-credit bonds (Avramov, Chordia, Jostova and Philipov, 2007).

Factor investing is a way to simplify investing strategies, by constructing a portfolio based on chosen factors characteristics. Given factor have to be studied broadly to ensure that the factor-based portfolio is earning the expected returns and can ensure the predictive power of set factor. On this thesis, the focus is, as the title implies, at *value* and *size* factors or the combination of the two well-known factors. In contrast, research on the performance of different variations of

investment funds, show that almost no investment instrument can beat the market, and these findings make value and economic significance for the evidence of predictability (Steiner, 2009).

## 1.5. The Efficient Frontier

Modern portfolio theory or MPT for short, argues that return and risk should not be viewed alone and should be evaluated by how an investment affects the whole portfolio's risk and return. MPT assumes that investors are risk-averse, they prefer a portfolio with less risk if the return stays the same. The theory includes the Efficient Frontier, where all possible combinations of assets can be plotted on a graph, where the portfolio's risk is shown on the X-axis and return on the Y-axis, this plot reveals the most desirable portfolios (Chen and Westfall, 2020).
MPT and Efficient Frontier are briefly included in this thesis to give the reader a brief background and more depth onto portfolio constructing. This thesis is based on the idea that bases the Efficient Frontier, that is; to construct a portfolio with the highest expected return with the lowest possible risk level.

# 2. DATA AND RESEARCH METHODOLOGY

## 2.1. Methodology

Methods chosen for this study are common analysis methods in empirical research of finance at this level. For structuring of this thesis, several Aalto University School of Business's bachelor's theses were reviewed, and many of them used methods similar to this study (Hagman, 2017; Harju, 2019; Hjulgren, 2018; Hav, 2017), as well as several research papers have (Agrawal, Monem and Ariff, 1996; Markowitz, 1952; West, 2006; Switzer, 2010). The central research methodology of this thesis is quantitative analysis of secondary data, which means, in this case, that the data was collected from Morningstar's reports. The analysis starts with descriptive charts, graphs and tables showing the impact of price-to-book values and their returns in the different market capitalization classifications and the whole OMX Helsinki. The descriptive statistics give a vital role to the analysis, because it summarises the raw data into a visually simple to understand representation. For example, figure 1, summarises in a simplistic way the status of 750 units of observation, to a relatively small space. There are arithmetic mean of return tables (tables 5 and 6) attached to widen the perspective in a slightly different manner. The tables are quite the self-explanatory, one thing to explain briefly is in table 6, the "low and high 50%", it basically means that the average returns were split in half, to show the arithmetic mean of lower half and higher half of price-to-book values.
The second part of the analysis is regression analysis, which is a powerful statistical method, used commonly in financial research. Regression gives a more accurate representation of the relationship between the two variables (P/B values and returns). To measure the accuracy there are t-tests done to tell how statistically reliable the impact (between the two variables) is.

## 2.2. Sample Selection

The sample used in this study is between 2017 and 2019 annual data. The data is from NASDAQ OMX Helsinki, Morningstar's report[4], which is based on the data given by the companies' annual report. The sample is limited to companies that have been in NASDAQ OMX Helsinki from the end of the year 2016 and ended up with a sample of 125 companies. The data collected was the price-to-book annual ratio, the annual rate of return and then divided them by their market capitalization classification; small, medium or large cap.

### 2.2.1. The Nasdaq OMX Nordic market capitalization classification[5]

Market capitalization refers to the total amount of shares outstanding times the current market price of one share. Here are the capitalization segments set by Nasdaq OMX Nordic:

- Large cap: Companies with a market capitalization of over 1 billion EUR
- Mid cap: Companies with a market capitalization between 150 million and 1 billion EUR
- Small cap: Companies with a market capitalization under 150 million EUR

## 2.3. Chart-Based Comparison

Firstly, the arithmetic mean value of each company's returns between the years 2017 to 2019 is taken. Secondly, the arithmetic mean value of each company's price-to-book ratios in the same time span is illustrated.

$$A = \frac{1}{n} * \sum_{i=1}^{n} x_i \qquad (1)$$

$A$=Arithmetic mean

$n$=The Number of terms

$x_i$=The value of each individual item

The mean is calculated for the charts and graphs to show the average trend between price-to-book ratio and return within the time span, at different capitalization segments. It also clarifies the data to some extent. To simplify more, the averaged P/B ratios are rounded to the first decimal (to avoid graphs that are too large to fit horizontally). Then a pivot table is created in Microsoft Excel (version 16.36 for mac os) with the rounded P/B ratios on the left side and the average return mean return on the right side. From that data a simple column graph is designed, where the X-axle shows the P/B value and Y-axle the return of a given P/B value. The procedure is repeated for all the market capitalization segments (small, mid and large), as well as to all of them combined also known as OMXH.

[4] http://www.nasdaqomxnordic.com/shares

[5] https://www.nasdaq.com/about/press-center/market-cap-segment-review-nasdaq-omx-nordic-exchanges

Second visual analysis is compiled from the same arithemic mean values used in the previous analysis. The first part does not visually tell about the density or the real representation of the data. This is why there are similar graphs as in the first part, but this part shows the scatter map of the data. In addition, the trendline is included to show each segment's price-to-book impact on return trend, where more horisontal the trendline, the less impact there is. If the trendline is tilted downwards, it means that the lower P/B ratio the higher the return. The same goes for the other way, when the trendline is tilted upwards; a lower P/B ratio means lower returns.

## 2.4. Regression Analysis and Hypothesis testing

For the regression analysis, the arithmetic mean values are not used, it was done year-by-year to get a more accurate representation and to get a more extensive analysis. The software used to do regression analysis, was Microsoft Excel (version 16.36 for mac os) data-analysis-input. The data-analysis-tool was utilized to do the regression analysis for the data twelve times in total, one per year of each given segment (small, mid, large and the whole of OMXH). In the Y-range there is the return data of given year and segment. In the X-range there is the P/B data of the same year and segment.
The ordinary least squares (OLS) linear regression analysis gives a lot of information, including data that is not relevant for this analysis, this is why I have chosen the following information, given in the list below. I chose them, because they have explanotary power for regression model results and they give the impact level result of P/B value to return, also they give a measurement of goodness of fit (R squared) and the statistical significance (t-test).

Next, a brief explanation of the meaning of the particulars and some insight for reading the results of the regression analysis tables later:
*P/B coefficient*: The key take away of the regression analysis. It tells the predicted impact, when moving 1 P/B value higher. It is also known as the standard error.
*P/B t-stat*: $t = b_1 / SE$, where; $b_1$ is the slope of the regression line and SE is the standard error of the slope.
*Multiple R*: Shows the correlation of the variables Y and X(1 means fully correlated and 0 means zero correlation, between the two variables).

*R square*: How much Y's movement is due because of X. Also can be said that, variance explained by the model divided by total variance (basically, how close the data points are to the regression line on average)
*Adjusted R square*: R square, with sample size taken into account.
*Observations*: Shows the company amount for each segment.

This thesis has one null hypothesis and it is for the regression slope test. The null hypothesis ($\boldsymbol{H_0}$: $\boldsymbol{\beta_1}$=0) states that there is no statistically significant linear relationship between company's price-to-book ratio and company's returns, hence the alternative hypothesis ($\boldsymbol{H_a}$: $\boldsymbol{\beta_1}\neq$0), that there is statistically significant linear relationship between the two variables. The hypothesis will be tested to all capitalization segments. The null hypothesis is created to test the statistical significance of the regression analysis results.

For this part of the analysis, a simple linear regression slope two-tailed t-test is conducted. This part is interconnected with the regression analysis to examine the statistical significance of the linear relationship between the two variables.
The following assumptions must be made before conducting the simple linear regression tests: The dependent variable Y has a linear relationship to the independent variable X. For each of X, the probability distribution of Y has the same standard deviation. For any given value of X; the Y values are independent, and the Y values are relatively normally distributed (Brooks, 2008).
The t-statistic is calculated by using data-analysis tool; regression with Microsoft Excel, which uses the formula referenced in the list above.
If computed t-stat is larger than the upper limit t-critical or below the lower limit t-critical (two tailed), then the null hypothesis ($\boldsymbol{H_0}$: $\boldsymbol{\beta_1}$=*0*) can be rejected; the P/B coefficient is statistically significant and then go with alternative hypothesis ($\boldsymbol{H_a}$: $\boldsymbol{\beta_1}\neq$*0*).

The OLS linear regression formula:
$y_t = \alpha + \beta x_t + u_t$ *(2)*
Where:
$y_t$ = Dependent variable (*return* of year *t*)
$\alpha$= *y* intercept
$\beta$= Regression slope
$x_t$ = Independent variable (*price-to-book* of year *t*)
$u_t$ = Error term (impact coefficient)

$t$ = Year t

The linear regression formula can be found on any econometrics book. This study used Chris Brooks book: Introductory Econometrics for Finance (2008).

## 2.5. Limitations

Along the process of collecting data, it was noticed that financial data that is needed is not truly easy to gather, free of charge at least. It would have been ideal to gather more data than 3 years annually. More representative option regarding the findings would have been decades of annual data, quarterly or monthly data to gain a strong representation of the findings. This would have enabled the use of some valuation models (FF3, FFC4, FF5 or CAPM) and to carry out cross sectional regression analysis.

# 3. RESULTS AND DISCUSSION

## 3.1. Chart-Based Comparison

Throughout this part the charts are laid out to be as clear as possible for the reader (first is column chart of the segment, then comments, then scatter plot for the same segment). At this part there will be comments of what are noticed and what can be seen from the figure. All analysis, additional insight and speculation behind different trends and patterns are going to come at the last part of this chapter, the discussion. As previously mentioned; the X-axle shows the P/B value and Y-axle the return of a given P/B value, in both cases, the column charts and scatter plots.

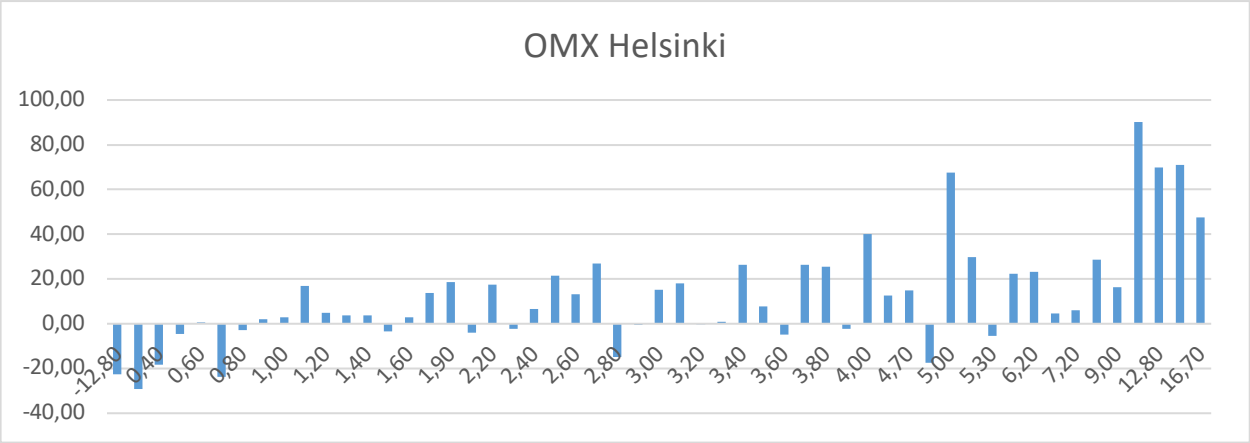


**Figure 1.** Average return of price-to-book ratios, column chart, OMX Helsinki, 2017-2019

As Figure 1 shows, taken the whole Helsinki OMX, we can see strong evidence of returns growing with higher P/B value. P/B values from negative until 1,1 show very low, mainly negative annual returns. At P/B 1,1 and again around 1,7 there are visible some significant returns, but as Figure 2 trendline shows, the returns get substantially higher, when the P/B value is higher.

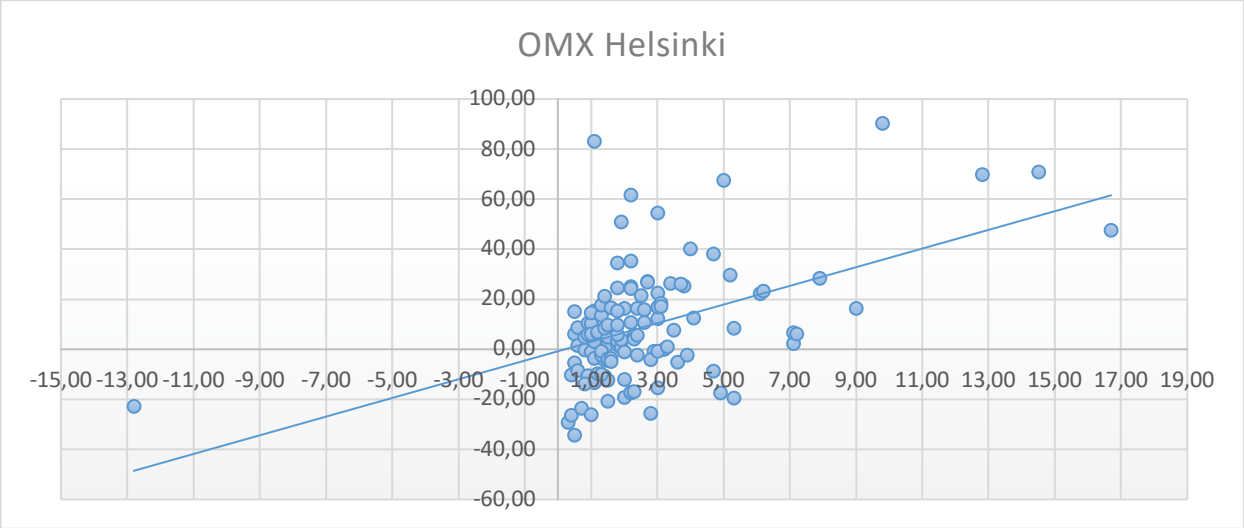


**Figure 2.** The average return of price-to-book ratios, scatter plot, OMX Helsinki, 2017-2019

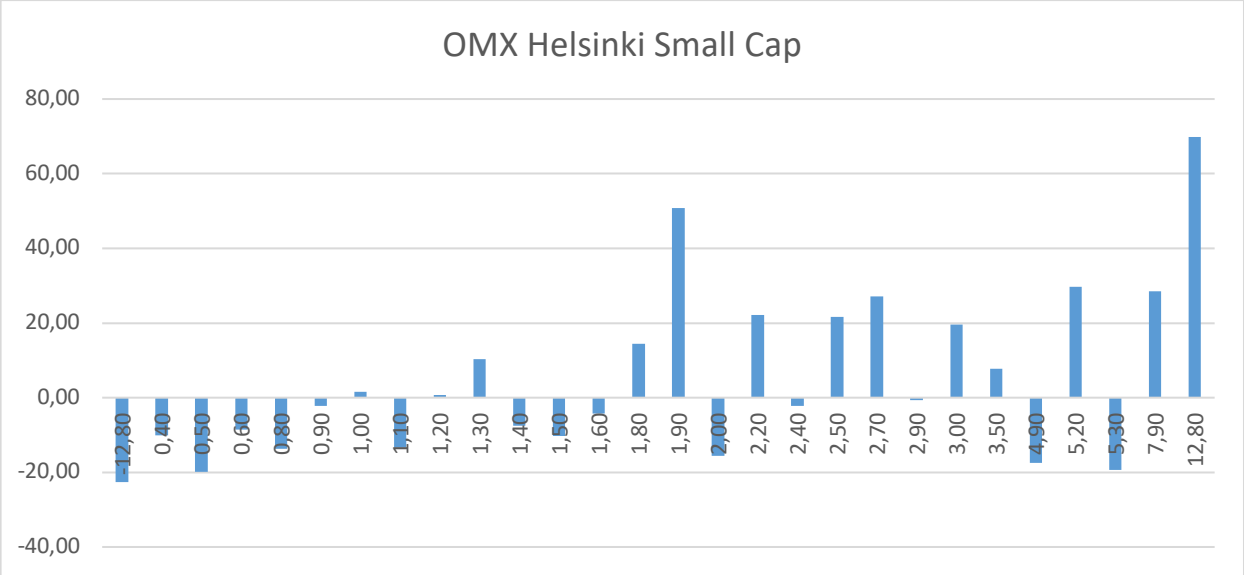


**Figure 3.** The average return of price-to-book ratios, column chart, OMX Helsinki Small Cap, 2017-2019

Figure 3 shows either very low or negative returns until P/B value 1,3 and even then, there are not decent returns until getting up to 1,8. The small cap scatter plot trendline shows to be trending upwards, meaning that higher P/B values generate higher returns, as can be interpreted from both figures regarding small cap. The scatter plots spread shows to be quite sparse vertically.

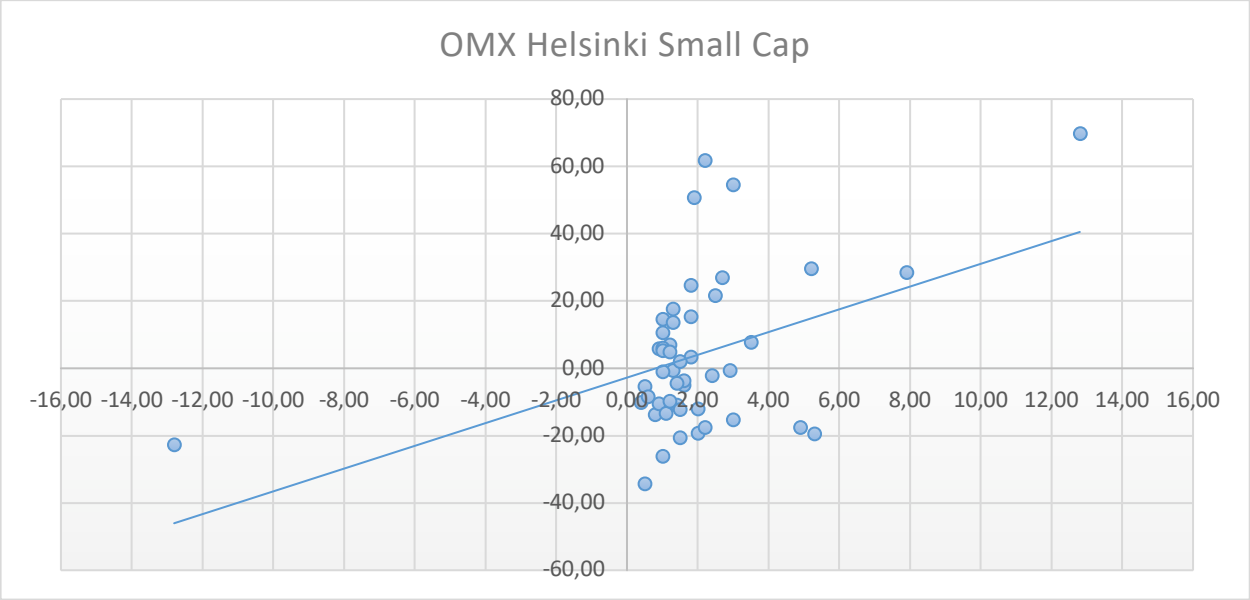


**Figure 4.** The average return of price-to-book ratios, scatter plot, OMX Helsinki Small Cap, 2017-2019

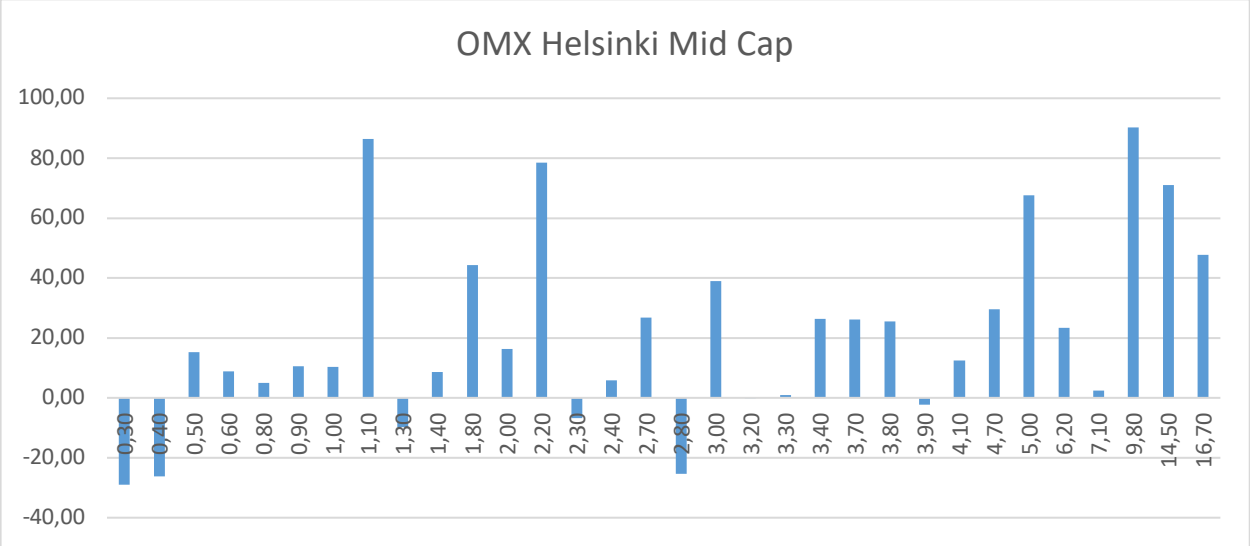


**Figure 5.** The average return of price-to-book ratios, column chart, OMX Helsinki Mid Cap, 2017-2019

Mid cap's Figure is showing much higher returns in general, but also at relatively low P/B values. As can be seen, the returns turn to almost constant positive from 0,5 until 2,2 P/B. Figure 6, the mid cap scatter plot, shows upwards trending trendline as before in figures 2 and 4, but this time with a more gentle slope, indicating that lower P/B values have more impact on return than the previous cases. The scatter plot spread at figure 6 is relatively compact between P/B values of 0 and 4.

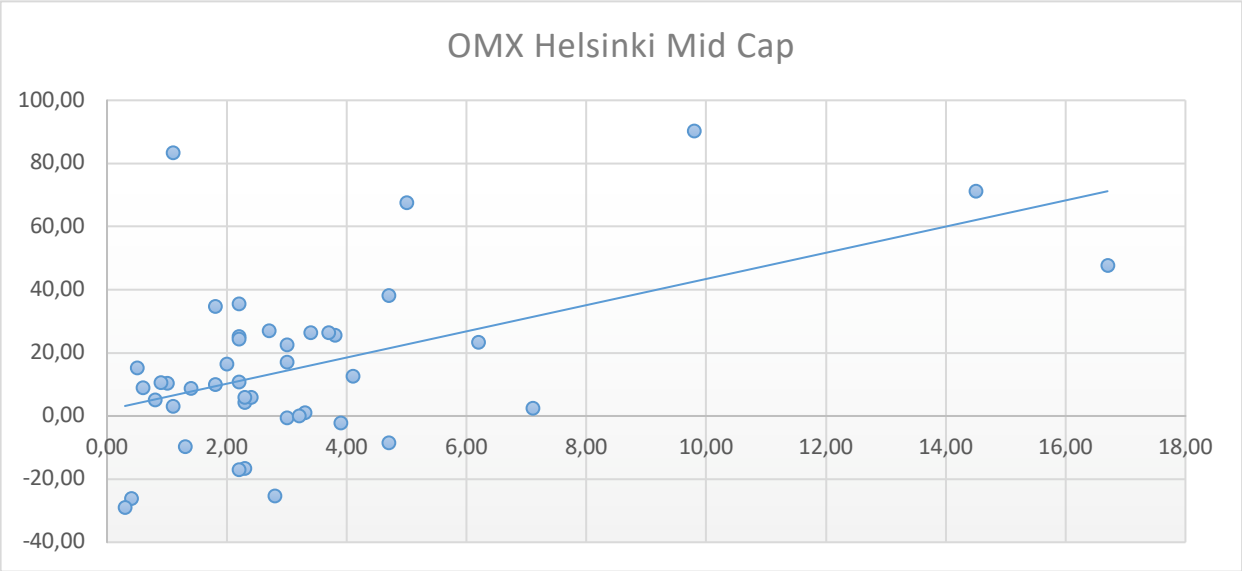


**Figure 6.** The average return of price-to-book ratios, scatter plot, OMX Helsinki Mid Cap, 2017-2019

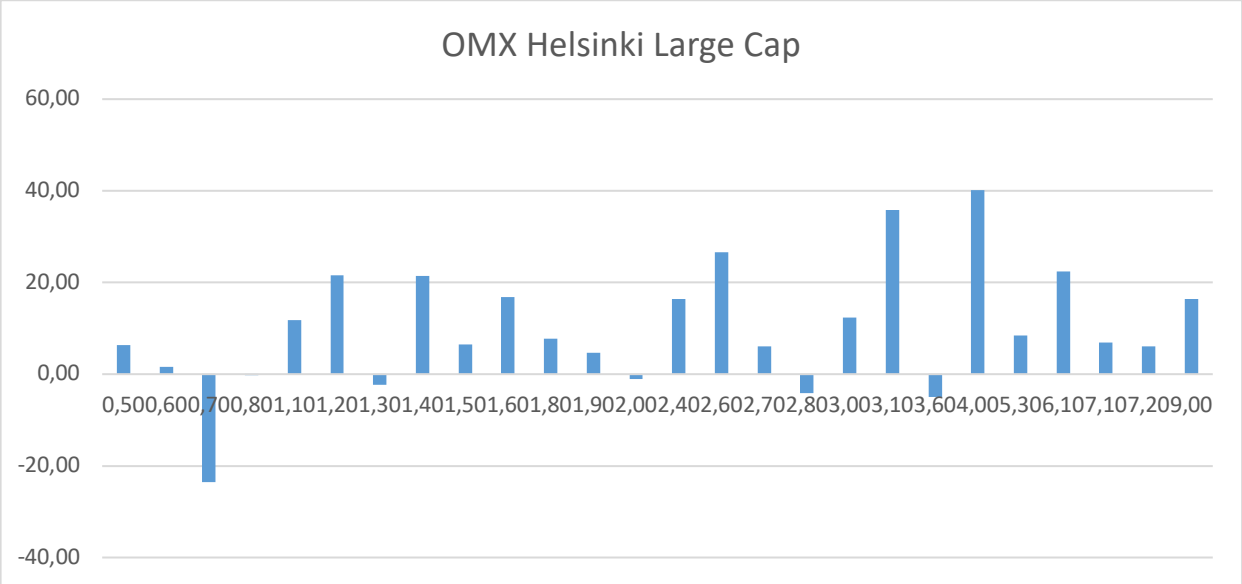


**Figure 7.** The average return of price-to-book ratios, column chart, OMX Helsinki Large Cap, 2017-2019

Here can almost be seen a trending, where lower P/B values get us higher returns, compared to the previous segments. At 0,5 and 0,6 there are positive returns and relatively high returns between values 1 and 2 P/B. The scatter plot trendline has substantially gentler upwards slope compared to previous figures. Here the scatter plot is tight between P/B values of 0 and 3, also the data points seem to be closer to the trendline in comparison to other segments.

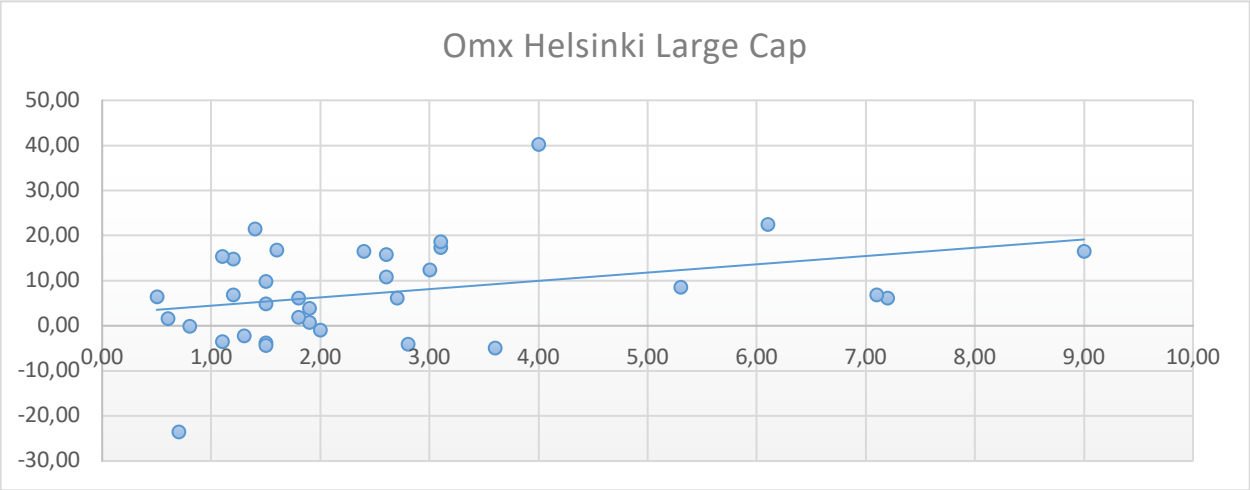


**Figure 8.** The average return of price-to-book ratios, scatter plot, OMX Helsinki Large Cap, 2017-2019

## 3.2. Regression Tables

The following tables are arranged year-by-year horizontally and the regression analysis output vertically. All of the statistically significant results are highlighted in bold.

TABLE 1

*OMX Helsinki*

| | *2017* | *2018* | *2019* |
|---|---|---|---|
| *PB Coefficient* | **1,108** | **3,640** | **6,261** |
| *PB t-stat* | 2,006 | 3,510 | 10,367 |
| *Multiple R* | 0,178 | 0,302 | 0,683 |
| *R sq.* | 0,032 | 0,091 | 0,466 |
| *Adj. R sq.* | 0,024 | 0,084 | 0,462 |
| *Observations* | 125 | 125 | 125 |

Source: Author's calculations based on Morningstar's reports[6]

[6] http://www.nasdaqomxnordic.com/shares

TABLE 2

*OMX Helsinki Small Cap*

| | *2017* | *2018* | *2019* |
|---|---|---|---|
| *PB Coefficient* | 1,107 | 0,243 | **6,442** |
| *PB t-stat* | 1,787 | 0,112 | 6,991 |
| *Multiple R* | 0,255 | 0,017 | 0,718 |
| *R sq.* | 0,065 | 0,000 | 0,515 |
| *Adj. R sq.* | 0,045 | -0,021 | 0,505 |
| *Observations* | 48 | 48 | 48 |

Source: Author's calculations based on Morningstar's reports[6]

TABLE 3

*OMX Helsinki Mid Cap*

| | *2017* | *2018* | *2019* |
|---|---|---|---|
| *PB Coefficient* | 1,798 | **3,650** | **6,303** |
| *PB t-stat* | 0,861 | 2,284 | 5,818 |
| *Multiple R* | 0,133 | 0,336 | 0,672 |
| *R sq.* | 0,018 | 0,113 | 0,452 |
| *Adj. R sq.* | -0,006 | 0,091 | 0,439 |
| *Observations* | 43 | 43 | 43 |

Source: Author's calculations based on Morningstar's reports[6]

TABLE 4

*OMX Helsinki Large Cap*

| | *2017* | *2018* | *2019* |
|---|---|---|---|
| *PB Coefficient* | -2,186 | **5,402** | **3,507** |
| *PB t-stat* | -1,474 | 2,988 | 2,747 |
| *Multiple R* | 0,249 | 0,461 | 0,431 |
| *R sq.* | 0,062 | 0,213 | 0,186 |
| *Adj. R sq.* | 0,033 | 0,189 | 0,161 |
| *Observations* | 35 | 35 | 35 |

Source: Author's calculations based on Morningstar's reports[6]

When evaluating the table 1, there can be seen a trend of growth in the P/B value impact on returns. Table 2 has only one statistically significant result, but it shows as expected; higher P/B has a high impact on returns. At table 3 the same trend as in table 1 and 2 combined; the growth on impact level from 2018 to 2019 and the high level on impact regarding higher P/B value to the higher annual return.

At table 4, the large cap table, there are striking differences visible. In the year 2017, even if not statistically significant, it is the first P/B coefficient to show a negative return with higher P/B value. What is also very interesting on that table is that the impact drops from the year 2018 to 2019 from 5,4% to 3,5%, this does not happen at any of the other tables. These two anomalies strongly indicate that on the large cap companies, high P/B value does not mean high return, results indicate the opposite.

## 3.3. Mean Tables

**Table 5.** Mean table (year-by-year)

| | *Small cap* | *Mid cap* | *Large cap* | *OMXH* |
|---|---|---|---|---|
| *2017* | 6,21 | 14,63 | 10,35 | 10,40 |
| *2018* | -24,35 | -8,22 | -10,44 | -14,34 |
| *2019* | 25,27 | 41,80 | 24,35 | 30,47 |
| *2017-2019* | 2,37 | 16,07 | 8,09 | 8,84 |

Source: Author's calculations based on Morningstar's reports[6]

**Table 6.** Mean table (P/B values)

| | *Small cap* | *Mid Cap* | *Large Cap* | *OMXH* |
|---|---|---|---|---|
| *Low 50%* | -4,05 | 9,65 | 4,16 | 2,61 |
| *High 50%* | 11,03 | 21,43 | 10,68 | 15,46 |
| *0-0,99* | -10,20 | -2,62 | -4,00 | -6,50 |
| *1-1,99* | 2,85 | 19,99 | 5,43 | 6,35 |
| *2-2,99* | 11,17 | 9,07 | 8,99 | 9,78 |

Source: Author's calculations based on Morningstar's reports[6]

In addition to column charts, scatter plots and regression tables, two mean table of returns, tables 5 and 6, are added to give possible reference at chart-comparison and regression discussion, also

to give a deeper clarification overall, especially considering the research questions. Next there will be a couple comments on the tables 5 and 6 results, that should be noted. At table 5, there is a visible trend going through all the segments; at 2017 all segments have a positive mean return, unlike 2018, when all segments have a negative mean return, at 2019 all the segments have rather great mean return. At table 6, the trend of higher P/B values, giving higher returns is quite visible, the only exception seems to locate at mid cap, P/B values 1-1,99 and 2-2,99, where the returns drop substantially.

## 3.4. Discussion and Analysis

First of all, one may have noticed the negative P/B values. They indicate that the company has a negative book value. Negative book valued companies are not attractive investments for an investor and they do not give positive returns. The analysis will not be including further interpretations of negative P/B values, even though they are included in the data and results.
In addition, one may have noticed that the relatively high P/B values (around 5 and higher) seem to have very high returns at some occurrences. When the price of stock rapidly grows, its market value grows, which then results to high return from the stock (P/B is the market value divided by book value). This study is more focused on P/B values, which are not highly influenced by market build-up. Market build-up means that either a publicly listed company has either intentionally or unintetionally caused a relatively high rise in stock price, resulting from a trend, media coverage, rumour, speculation, well publicied initial public offering, etcetera.

### 3.4.1. Chart-Comparison

As figures 1 and 2 show; low P/B values do not indicate very high results on the whole of OMX Helsinki. Most consistent returns (given the time period) are made at P/B values between 1 and 4 as the scatter plot and column chart show. Before P/B value 1 the returns are closer to zero or negative. The density fades at P/B values after 4, therefore they are interpreted more as random occurrences and many of them can be explained by market build-up.
Moving on to figures 3 and 4, small cap. Low P/B values or undervalued companies show very low, if any returns. Scatter plot shows us that there are companies with low P/B values generating a return, but more companies are generating a loss, which leads to negative or close to zero returns on average. This makes sense, when thinking of risk, because the risk exposure is usually higher on smaller companies, so they need a higher market value based more on

intangible assets leading the company's discounted value higher. Interestingly, figure 4 scatter plot density between P/B values 0 and 2 is compact, if compared with the next scatter plot, figure 6. At figure 6 the density focuses between P/B values 0 and 4. Overall as can be seen from figures 5 and 6, the mid cap companies are generating relatively high returns, but the undervalued companies, not so much. Table 5 demonstrates clearly that mid cap companies have generated constantly the highest returns of all segments from 2017 to 2019.

Moving on to figures 7 and 8, there are visible more constant relatively high returns at lower P/B values. The scatter plot density is focused between P/B values 1 and 3, with a slightly upward sloping trendline, unlike previous trendlines, which were sloping upwards more steeply. Unfortunately, this sample does not have too many large cap companies undervalued (<1), but what has been shown, slight positive returns at a very low P/B value of 0,5 to 0,6 and then again negative return until around P/B value of 1. Figure 7 shows the semi-constant positive returns between values 1 and 2. The fact that Large Cap companies are even at low P/B values generating positive returns, is not peculiar, because they are known as the value companies. Large capitalization, safe liquidity rates, constant dividend and most importantly market value is below intrinsic value.

To conclude, the chart-comparison, large cap companies seem to generate higher returns at lower P/B values compared to other segments. Mid cap companies, naturally in the middle, but overall give the highest returns. Small cap companies have high variability and low-to-non-return at lower P/B values, whereas mid cap and large cap seemed to have a more linear, less variable, positive returns.

### 3.4.2. Regression

As previously mentioned, the regression tables show the return rate impact for every P/B value increase. Table 1, the whole exchange, shows quite aggressive impact level growth from 2017 to 2019. These can be partially explained with table 5 mean returns, but not fully, because from 2017 to 2018 the mean returns fall drastically, but the price-to-book impact level grows from 1,1% to 3,6%, interestingly. Furthermore, the jump from 3,6% to 6,3% is not odd, because the mean returns grew drastically between the years 2018 and 2019.

Unfortunately, table 2 regression output only gave one statistically significant result of 6,4% in the year 2019. Gladly, all the tables have statistically significant results from the same year. The relatively strong explanatory power of the models fit, given by the R values and the statistical significance given by t-statistic concludes that mid and small cap companies during a given period are strongly impacted by higher P/B values.

Moving on to table 4, as previously mentioned, 2017 has weak evidence of large cap companies generating higher returns with lower P/B values. At the same table can be seen as something peculiar, as earlier implied; the 2018 coefficient drops from 5,4% to 3,5% at 2019(with strong statistical significance and relatively good fit from the model), even when table 5 shows that the returns grow substantially during that time. It would indicate that large cap stocks would have an inverse behaviour with small and mid cap stock, at least in this case. Furthermore, table 4 coefficients indicate that with large cap companies, higher P/B values have lower impact on return in comparison with small and mid cap companies.

### 3.4.3. Hypothesis and regression slope

The two-tailed t-tests have been conducted to understand the statistical significance of the regression analysis results. The null hypothesis ($H_0$: $\beta_1 = 0$) stated that there is no statistically significant linear relationship between OMX Helsinki's companies' price-to-book ratios and companies' returns. The hypothesis was tested twelve times (one for every year of every segment). The results of statistically significant findings are highlighted in bold at the regression tables (chapter 4.2.). The t-tests were conducted with a significance level of 95% or alpha of 5, which is a commonly accepted significance level in academic research.
T-critical values for each of the tables:
*Table 1*: 1,96
*Table 2*: 2,013
*Table 3*: 2,020
*Table 4*: 2,035
These values are taken from a standard t-table[7]. The degrees of freedom are calculated with the following formula:
$Df = n - p - 1$ (3)
$n$=sample size
$p$=number of predictors

During the hypothesis testing, eight regression outputs (as seen in the regression tables) were accepted, hence rejecting the null hypothesis ($H_0$: $\beta_1 = 0$) and moving on with the alternative hypothesis ($H_a$: $\beta_1 \neq 0$), stating that the eight given results are statistically significant. Moreover, the different R values given in the tables, measuring the goodness of fit of the model, are not

[7] http://www.ttable.org

defined to limit the significance of the results by any given percentage. They are to give the measurement of how close the data points are to the regression slope, as earlier indicated. Higher R values indicate higher predictive power of the results, given by the model.

## 3.5. Results and discussion

To answer the first research question, “does lower price-to-book ratio correlate with higher returns?”. The results would indicate, with the given data, time span and methods applied, to have a slight support, that they do, but being mainly negative. There was thin evidence for the opposite, since the large cap at table 4, where the year 2017 was negative, but it was not statistically significant, and the goodness of fit was weak. At the same table, there was a peculiar phenomenon, with statistically significant results and decent fit of the model; the drop on P/B impact from 2018 to 2019, showing that large cap companies can be profitable at lower end of price-to-book values. Furthermore, at table 6, there is a small indication of lower P/B values generating higher returns at mid cap segment between values of 1-1,99 to 2-2,99, where the mean return drops from 19,99 to 9,07, interestingly. In conclusion to the first research question, companies with larger capitalization might yield higher returns at lower P/B values and smaller companies tend to yield higher returns at higher P/B values.

Moving on, to the second research question, “what kind of effect does market capitalization size have on the return?”. At table 5 it is strongly indicated that the mid cap segment is the most profitable segment, out of the three under observation. Small cap segment seems to have the lowest returns in comparison to large and mid cap, stated at table 5, row 2017-2019. During the years 2017 to 2019 small cap seems to have the most variability, therefore variance, with the lowest returns overall, except 2019, when small cap had 0,92% better mean return than large cap. The least variance, not surprisingly, was with the large cap segment. To conclude the second research question, mid cap yielded highest returns and lowest losses, small cap yielded highest losses and on average, the lowest returns and large cap yielded returns from the middle, losses from the middle and had the least variance out of all three. The mentioned conclusions are very visible when observing figures 3 to 8.

Furthermore, to observing results regarding the third research question, “what combination of market capitalization and price-to-book ratio has the highest returns, the lowest returns and

where does P/B ratio have the most impact?". When observing the figures from 3 to 8 and looking at table 6, it comes across that obviously the highest returns will yield from the mid cap segment. At table 6, mid cap yields the highest returns at all different P/B values except 2-2,99, where small cap dominates the returns. Table 6 is limited to show the lower end of different P/B values, but there the highest returns yield from P/B values 1-1,99, looking at figure 5, P/B values 1,1 and 9,8 yield clearly the greatest returns, but as the scatter reveals at figure 6, they are more of an random occurrences. When observing at figures 3 and 4, small cap, in comparison to large and mid cap, it can be clearly visualized that small cap companies at lower P/B values yield the lowest returns. Table 6 states that small cap price-to-book values 0-0,99 yield -10,2% loss. As expected, the highest impact from P/B value to return, comes from small cap with a P/B coefficient of 6,4 during 2019. Mid cap comes pretty close with a coefficient of 6,3 during 2019. Large cap has the least impact during that year (3,5) and mid cap had the least impact during 2018 (3,7), when analysing the regression output results. To conclude the last research question, mid cap segments P/B values 1-1,99 yielded the highest returns, from the lower end of P/B values. Small cap segments any low P/B value (under 2), yielded either very low or negative. Small cap segments P/B values had the largest impact on return (when P/B values get higher, returns get higher), and large cap gave the lowest impact level.

# CONCLUSIONS

The research questions presented in this thesis could also be summarised to the question presented in the introduction: “How well did the companies at different market capitalization sizes yield returns at different values of price-to-book ratio and why?”. To summarise the “how well”, it can be said, based on results, that there were some surprises. The effect of low P/B values at large cap companies was weaker than expected, but still there was some effects seen. The small cap segments returns were also weaker than expected, when usually smaller, riskier companies yield higher returns than larger, steadier companies. The mid cap segment gave substantially the highest mean returns, at almost all P/B values and overall during this time, which was not expected. (A small side-note needed to be mentioned; out of all empirical research written on the matter of company capitalization sizes, there very little mention on mid cap companies, usually just small versus large (a hint for possible future studies).) The results regression output gave, showed that the larger a companiy’s market capitalization the less impact on the return, when examening a higher price-to-book value.

Furthermore, to concluding the “why” of this study. As for the surprise at low P/B value and large cap, the studies indicate that this is more of a long-run effect and usually studied at wider scale. As for this study we studied annual returns of 3 years and in large cap segments there are only 35 companies to observe in the OMXH. For the small cap anomaly, research indicates that it is very much country dependent of how small cap companies perform. To make further conclusions, small cap finnish companies should be studied more excessively. What goes for the mid cap companies, it should be studied further.

Some findings in this thesis could be summarised with the higher than expected mid cap returns at practically all counts (mean value of 16,07%), and weaker than expected returns with small cap segment (mean value of 2,37%) and large cap giving close to market beta returns (mean value of 8,09%, while beta was 8,84%), which could be interpreted as neutral. Large and mid cap segments gave slight indications of yielding possibly higher when lowering P/B values, but nothing well grounded. For future studies on the matter of value and size, mid cap section should be studied as an independent, not melded so that there are only two size classifications.

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# APPENDICIES

**Appendix 1.** OMXH companies and their annual price-to-book ratios by year.

| Company | P/B 2017 | P/B 2018 | P/B 2019 |
|---|---|---|---|
| Afarak Group Oyj | 1,30 | 1,20 | 1,50 |
| Ahlstrom-Munksjö Oyj | 1,70 | 1,40 | 1,40 |
| Aktia Bank PLC | 1,00 | 1,10 | 1,10 |
| Ålandsbanken Oyj A | 1,00 | 0,90 | 1,10 |
| Ålandsbanken Oyj B | 0,90 | 0,90 | 1,00 |
| Alma Media Oyj | 4,40 | 3,00 | 4,10 |
| Apetit Oyj | 0,80 | 0,50 | 0,50 |
| Asiakastieto Group Oyj | 4,70 | 1,90 | 2,30 |
| Aspo Oyj | 2,80 | 2,10 | 2,00 |
| Aspocomp Group PLC | 1,70 | 1,90 | 2,10 |
| Atria | 0,80 | 0,40 | 0,70 |
| Basware Oyj | 5,70 | 5,00 | 3,50 |
| Biohit Oyj | 3,10 | 2,60 | 3,30 |
| Bittium Oyj | 1,70 | 2,60 | 2,20 |
| CapMan Oyj | 2,00 | 1,80 | 2,90 |
| Cargotec Oyj | 2,10 | 1,00 | 1,40 |
| Caverion Oyj | 2,80 | 2,60 | 4,50 |
| Citycon Oyj | 0,90 | 0,70 | 0,80 |
| Componenta Oyj | -0,20 | 1,40 | 1,30 |
| Consti Group Oyj | 2,40 | 1,70 | 1,80 |
| Cramo Oyj | 1,60 | 1,20 | 1,50 |
| Digia Oyj | 1,40 | 1,70 | 2,20 |
| Digitalist Group Oyj | -51,00 | 3,60 | 8,90 |
| Dovre Group Oyj | 1,20 | 1,00 | 1,30 |
| EAB Group Plc | 4,40 | 2,50 | 1,90 |
| Elecster Oyj | 1,70 | 1,40 | 1,10 |
| Elisa Oyj | 5,40 | 5,50 | 7,40 |

| | | | |
|---|---|---|---|
| Endomines AB | 2,10 | 0,80 | 1,70 |
| Enedo PLC | 3,00 | 9,90 | 3,10 |
| eQ Oyj | 5,40 | 5,10 | 8,20 |
| Etteplan Oyj | 3,50 | 3,10 | 3,50 |
| Evli Pankki Oyj | 3,40 | 2,30 | 2,50 |
| Exel Composites Oyj | 2,80 | 1,70 | 3,10 |
| F-Secure Oyj | 9,10 | 5,40 | 6,70 |
| Finnair Oyj | 1,70 | 0,80 | 0,80 |
| Fiskars Oyj | 1,50 | 1,00 | 1,20 |
| Fortum Oyj | 1,10 | 1,40 | 1,60 |
| Glaston Oyj | 2,10 | 1,40 | 1,40 |
| HKScan Oyj | 0,50 | 0,20 | 0,80 |
| Hoivitilat PLC | 1,60 | 1,40 | 2,40 |
| Honkarakenne | 2,70 | 1,50 | 2,30 |
| Huhtamäki Oyj | 3,30 | 2,40 | 3,30 |
| Ilkka-Yhtymä Oyj | 1,10 | 1,10 | 0,70 |
| Incap Oyj | 2,80 | 2,60 | 3,60 |
| Innofactor Oyj | 1,30 | 0,60 | 1,20 |
| Investors House Oyj | 1,50 | 0,80 | 0,80 |
| Kemira Oyj | 1,60 | 1,30 | 1,70 |
| Keskisuomalainen Oyj | 1,40 | 1,20 | 1,40 |
| Kesko Oyj A | 2,10 | 2,10 | 3,00 |
| Kesko Oyj B | 2,20 | 2,30 | 3,20 |
| Kesla Oyj | 1,40 | 1,10 | 1,30 |
| Kone Oyj | 8,90 | 7,70 | 10,30 |
| Konecranes Oyj | 2,40 | 1,70 | 1,80 |
| Lassila & Tikanoja Oyj | 3,30 | 2,80 | 3,00 |
| Lehto Group Oyj | 5,70 | 1,60 | 1,20 |
| Marimekko Oyj | 2,80 | 4,30 | 7,90 |
| Martela Oyj | 1,30 | 0,70 | 0,90 |
| Metsä Board Oyj A | 2,30 | 1,70 | 1,70 |
| Metsä Board Oyj B | 2,30 | 1,40 | 1,60 |
| Metso Oyj | 3,20 | 2,60 | 3,60 |

| | | | |
|---|---|---|---|
| Neo Industrial Oyj | 3,20 | 1,30 | 2,10 |
| Neste Oyj | 3,30 | 3,80 | 4,90 |
| Nixu Oyj | 8,40 | 3,20 | 4,10 |
| Noho Partners Oyj | 3,20 | 2,50 | 0,90 |
| Nokia Oyj | 1,30 | 1,90 | 1,30 |
| Nokian Tyres Oyj | 3,80 | 2,60 | 2,10 |
| Nordea Bank Abp | 1,30 | 0,90 | 1,00 |
| Nurminen Logistics Oyj | 4,70 | 0,90 | 1,70 |
| Olvi Oyj | 2,90 | 2,80 | 3,30 |
| Oriola Oyj A | 2,70 | 1,90 | 2,30 |
| Oriola Oyj B | 2,50 | 1,90 | 2,30 |
| Orion Oyj A | 7,60 | 5,80 | 8,10 |
| Orion Oyj B | 7,30 | 5,80 | 8,10 |
| Outokumpu Oyj | 1,30 | 0,50 | 0,40 |
| Outotec Oyj | 2,70 | 1,20 | 2,80 |
| Ovaro Kiintestosijoitus Oyj | 0,50 | 0,50 | 0,50 |
| Panostaja Oyj | 1,90 | 0,90 | 0,90 |
| Pihjalanlinna Oyj | 2,80 | 1,60 | 2,90 |
| PLC Uutechnic Group Oyj | 2,10 | 2,20 | 1,80 |
| Ponsse Oyj | 4,60 | 3,80 | 4,00 |
| PunaMusta Media Oyj | 2,00 | 1,60 | 1,70 |
| QPR Software Oyj | 6,80 | 6,90 | 9,90 |
| Qt Group PLC | 5,90 | 9,50 | 28,00 |
| Raisio Oyj | 2,00 | 1,40 | 2,00 |
| Rapala VMC Oyj | 0,90 | 0,80 | 0,90 |
| Raute Oyj | 3,70 | 2,10 | 2,20 |
| Revenio Group Oyj | 19,20 | 19,00 | 11,80 |
| Robit Oyj | 2,60 | 0,40 | 1,10 |
| Saga Furs Oyj | 0,50 | 0,30 | 0,40 |
| Sampo Oyj | 2,10 | 2,00 | 1,70 |
| Sanoma Oyj | 3,30 | 2,20 | 2,40 |
| Scanfil Oyj | 2,40 | 1,70 | 2,00 |
| Sievi Capital Oyj | 2,00 | 1,30 | 1,10 |

| | | | |
|---|---|---|---|
| Siili Solutions Oyj | 4,20 | 2,90 | 3,30 |
| Solteq Oyj | 1,40 | 1,20 | 1,30 |
| Soprano Oyj | 1,50 | 0,70 | 0,80 |
| Sotkamo Silver AB | 1,30 | 1,50 | 2,00 |
| SRV Yhtiöt Oyj | 0,80 | 0,40 | 0,30 |
| SSAB AB A | 0,90 | 0,50 | 0,50 |
| SSAB AB B | 0,70 | 0,40 | 0,50 |
| SSH Communications Security Oyj | 5,90 | 5,40 | 3,40 |
| Stockmann Oyj Abp A | 0,70 | 0,20 | 0,20 |
| Stockmann Oyj Abp B | 0,40 | 0,20 | 0,20 |
| Stora Enso Oyj A | 1,80 | 1,40 | 0,50 |
| Stora Enso Oyj B | 1,80 | 1,20 | 0,40 |
| Suominen Oyj | 1,70 | 0,90 | 1,00 |
| Taaleri Oyj | 3,00 | 1,80 | 2,00 |
| Tecnotree Oyj | 1,20 | -1,00 | 38,30 |
| Telenom Oyj | 6,80 | 8,10 | 14,60 |
| Teleste Oyj | 1,70 | 1,30 | 1,40 |
| Telia Company AB | 1,70 | 1,80 | 1,80 |
| Tieto Oyj | 4,30 | 3,90 | 7,80 |
| Tikkurila Oyj | 4,20 | 3,50 | 3,90 |
| Tokmanni Group Oyj | 3,20 | 2,90 | 5,10 |
| Trainers' House Oyj | 1,40 | 1,00 | 0,90 |
| Tulikivi Oyj | 1,00 | 0,60 | 1,20 |
| UPM-Kymmene Oyj | 1,70 | 1,30 | 1,70 |
| Uponor Oyj | 4,60 | 2,10 | 2,80 |
| Vaisala Oyj | 4,50 | 3,50 | 6,20 |
| Valmet Oyj | 2,80 | 3,10 | 3,50 |
| Viking Line Abp | 0,90 | 0,70 | 0,90 |
| Wartsila Oyj | 4,70 | 3,60 | 2,60 |
| Wulff-Yhtiöt Oyj | 1,00 | 1,00 | 1,10 |
| YIT Oyj | 1,50 | 1,10 | 1,30 |
| Yleiselektroniikka Oyj | 1,90 | 1,50 | 1,90 |

**Appendix 2.** OMXH companies and their annual stock returns by year (in percentages).

| Company | Return 2017 | Return 2018 | Return 2019 |
|---|---|---|---|
| Afarak Group Oyj | 11,60 | -14,10 | -26,90 |
| Ahlstrom-Munksjö Oyj | 17,80 | -25,70 | 22,40 |
| Aktia Bank PLC | -0,20 | -1,20 | 10,60 |
| Ålandsbanken Oyj A | -0,30 | -1,80 | 33,10 |
| Ålandsbanken Oyj B | 1,90 | -2,10 | 31,70 |
| Alma Media Oyj | 46,10 | -19,60 | 50,00 |
| Apetit Oyj | 14,30 | -31,30 | -8,40 |
| Asiakastieto Group Oyj | 28,80 | 6,90 | 31,90 |
| Aspo Oyj | 27,40 | -16,10 | 1,30 |
| Aspocomp Group PLC | 48,10 | 59,10 | 45,40 |
| Atria | 9,40 | -41,50 | 58,70 |
| Basware Oyj | 30,90 | -16,80 | -39,90 |
| Biohit Oyj | -37,70 | -21,50 | 13,50 |
| Bittium Oyj | 4,90 | 40,00 | -12,60 |
| CapMan Oyj | 48,80 | -10,60 | 68,10 |
| Cargotec Oyj | 12,30 | -41,20 | 17,30 |
| Caverion Oyj | -25,60 | -13,60 | 42,20 |
| Citycon Oyj | -4,50 | -20,20 | 24,00 |
| Componenta Oyj | -20,00 | 4,00 | -25,20 |
| Consti Group Oyj | -38,80 | -35,30 | 16,40 |
| Cramo Oyj | -13,80 | -20,20 | 59,90 |
| Digia Oyj | -19,10 | 23,00 | 42,50 |
| Digitalist Group Oyj | -30,70 | -32,90 | -4,30 |
| Dovre Group Oyj | -2,40 | -19,40 | 42,90 |
| EAB Group Plc | 27,50 | -32,40 | 2,90 |
| Elecster Oyj | 3,50 | -20,50 | -15,30 |
| Elisa Oyj | 10,60 | 15,30 | 41,40 |
| Endomines AB | -12,80 | -49,10 | 0,10 |
| Enedo PLC | -21,10 | -74,80 | 37,90 |
| eQ Oyj | 6,70 | -7,60 | 70,90 |

| | | | |
|---|---|---|---|
| Etteplan Oyj | 42,30 | 5,00 | 31,60 |
| Evli Pankki Oyj | 48,10 | -18,80 | 51,20 |
| Exel Composites Oyj | 32,90 | -34,60 | 66,50 |
| F-Secure Oyj | 15,20 | -39,50 | 31,50 |
| Finnair Oyj | 220,60 | 42,40 | -13,10 |
| Fiskars Oyj | 42,20 | -34,20 | 12,40 |
| Fortum Oyj | 20,80 | 22,40 | 20,90 |
| Glaston Oyj | 15,80 | -15,60 | -11,10 |
| HKScan Oyj | 3,10 | -51,70 | 94,10 |
| Hoivitilat PLC | -11,10 | 10,00 | 104,70 |
| Honkarakenne | 118,80 | -45,00 | 111,60 |
| Huhtamäki Oyj | 1,30 | -20,40 | 56,00 |
| Ilkka-Yhtymä Oyj | 27,70 | 4,80 | -0,30 |
| Incap Oyj | 13,40 | 17,30 | 132,80 |
| Innofactor Oyj | -18,70 | -61,30 | 98,30 |
| Investors House Oyj | 27,10 | -18,90 | 7,50 |
| Kemira Oyj | -0,80 | -9,70 | 40,00 |
| Keskisuomalainen Oyj | 33,60 | -9,20 | 28,70 |
| Kesko Oyj A | 5,10 | 3,90 | 40,20 |
| Kesko Oyj B | -0,50 | 9,00 | 38,90 |
| Kesla Oyj | 27,80 | -11,40 | 24,60 |
| Kone Oyj | 8,80 | -3,30 | 43,90 |
| Konecranes Oyj | 16,10 | -27,70 | 8,40 |
| Lassila & Tikanoja Oyj | -1,10 | -12,10 | 11,40 |
| Lehto Group Oyj | 26,40 | -63,70 | -39,00 |
| Marimekko Oyj | 10,80 | 110,90 | 81,00 |
| Martela Oyj | -38,90 | -56,10 | 16,90 |
| Metsä Board Oyj A | 8,40 | -10,90 | 4,70 |
| Metsä Board Oyj B | 7,90 | -25,40 | 22,80 |
| Metso Oyj | 8,90 | -15,90 | 58,90 |
| Neo Industrial Oyj | 4,10 | -57,90 | 1,50 |
| Neste Oyj | 49,70 | 29,40 | 41,50 |
| Nixu Oyj | 81,80 | -30,90 | 38,20 |

| | | | |
|---|---|---|---|
| Noho Partners Oyj | 47,60 | 4,90 | 22,90 |
| Nokia Oyj | -14,70 | 34,10 | -32,50 |
| Nokian Tyres Oyj | 11,00 | -24,90 | 1,50 |
| Nordea Bank Abp | 1,40 | -21,30 | 9,10 |
| Nurminen Logistics Oyj | 41,40 | -54,70 | 6,80 |
| Olvi Oyj | 9,40 | 8,10 | 33,70 |
| Oriola Oyj A | -26,10 | -31,30 | 7,10 |
| Oriola Oyj B | -31,80 | -26,10 | 6,80 |
| Orion Oyj A | -20,70 | -1,00 | 40,10 |
| Orion Oyj B | -22,80 | 2,10 | 41,20 |
| Outokumpu Oyj | -7,80 | -55,50 | -7,50 |
| Outotec Oyj | 42,20 | -56,70 | 87,30 |
| Ovaro Kiintestosijoitus Oyj | 0,60 | -4,00 | -12,70 |
| Panostaja Oyj | 15,60 | -4,20 | 3,30 |
| Pihjalanlinna Oyj | -26,80 | -34,20 | 78,40 |
| PLC Uutechnic Group Oyj | -29,10 | -6,50 | -0,60 |
| Ponsse Oyj | 12,50 | -3,30 | 28,50 |
| PunaMusta Media Oyj | 29,40 | -24,20 | 4,80 |
| QPR Software Oyj | 45,00 | -2,90 | 43,60 |
| Qt Group PLC | -4,20 | 51,60 | 165,80 |
| Raisio Oyj | 12,30 | -34,50 | 51,80 |
| Rapala VMC Oyj | -16,90 | -7,20 | -7,20 |
| Raute Oyj | 79,60 | -22,20 | 23,90 |
| Revenio Group Oyj | 20,50 | 11,20 | 111,20 |
| Robit Oyj | -16,80 | -73,10 | 76,80 |
| Saga Furs Oyj | -19,70 | -44,80 | 34,10 |
| Sampo Oyj | 12,90 | -10,50 | 9,20 |
| Sanoma Oyj | 34,30 | -18,70 | 16,60 |
| Scanfil Oyj | 24,40 | -9,20 | 33,90 |
| Sievi Capital Oyj | 27,90 | -26,10 | 4,50 |
| Siili Solutions Oyj | 37,50 | -26,80 | 12,60 |
| Solteq Oyj | -1,90 | -14,50 | 14,60 |
| Soprano Oyj | 33,60 | -46,90 | 10,20 |

| | | | |
|---|---|---|---|
| Sotkamo Silver AB | -17,10 | 3,30 | -0,90 |
| SRV Yhtiöt Oyj | -31,90 | -51,10 | -20,00 |
| SSAB AB A | 26,30 | -33,00 | 11,30 |
| SSAB AB B | 24,40 | -32,20 | 26,70 |
| SSH Communications Security Oyj | -8,80 | -5,10 | -38,40 |
| Stockmann Oyj Abp A | -35,20 | -56,50 | 13,00 |
| Stockmann Oyj Abp B | -38,40 | -55,90 | 7,10 |
| Stora Enso Oyj A | 30,50 | -13,20 | 27,10 |
| Stora Enso Oyj B | 33,10 | -20,60 | 33,50 |
| Suominen Oyj | 9,40 | -51,10 | 12,70 |
| Taaleri Oyj | -28,30 | 22,80 | 22,80 |
| Tecnotree Oyj | -23,20 | -37,00 | 269,60 |
| Telenom Oyj | 80,40 | 51,40 | 139,10 |
| Teleste Oyj | -21,80 | -19,80 | 5,30 |
| Telia Company AB | 2,60 | 15,40 | 0,10 |
| Tieto Oyj | 5,50 | -3,80 | 23,70 |
| Tikkurila Oyj | -1,10 | -28,00 | 22,20 |
| Tokmanni Group Oyj | -8,70 | 4,70 | 82,70 |
| Trainers' House Oyj | -23,30 | -26,10 | 9,30 |
| Tulikivi Oyj | -5,40 | -50,00 | 73,20 |
| UPM-Kymmene Oyj | 15,10 | -10,10 | 45,40 |
| Uponor Oyj | 4,40 | -45,70 | 41,10 |
| Vaisala Oyj | 35,00 | -16,40 | 95,90 |
| Valmet Oyj | 20,60 | 12,50 | 22,60 |
| Viking Line Abp | -17,70 | 38,10 | -5,26 |
| Wartsila Oyj | 26,30 | -15,50 | -25,70 |
| Wulff-Yhtiöt Oyj | 27,70 | 5,50 | 10,70 |
| YIT Oyj | -13,20 | -15,90 | 22,00 |
| Yleiselektroniikka Oyj | 44,40 | -14,50 | 44,20 |

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