UNIVERSITY OF VAASA

FACULTY OF BUSINESS STUDIES

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INDUSTRIAL CONFIDENCE PREDICTING STOCK MARKET RETURNS: NORDIC EVIDENCE

Master's Thesis in Finance

VAASA 2016

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UNIVERSITY OF VAASA

Faculty of Business Studies

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Topic of the Thesis:	Industrial confidence predicting stock market returns: Nordic evidence	
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Degree:	Master of Business Studies	
Department:	Department of Finance	
Major Subject:	Finance	
Year of Entering the University:	2012	
Year of completing the Thesis:	2016	**Pages:** 65

ABSTRACT

The outcome of monthly confidence surveys is an important piece of economic information and provides a stable indicator for business sentiment. The purpose of this thesis is to examine the relationship between industrial confidence indicators and the stock markets of Nordic countries. Especially, whether the industrial confidence indicators provided by European Commission predict stock market returns in Finland, Sweden, Norway or Denmark. The countries that are dependent on trading with European's greater markets.

The simple OLS –regressions reveal that the industrial confidence of euro area has some predictive power over stock market returns in Nordic countries. This relationship is further analyzed with vector autoregressive methods. The VAR and VECM models disprove the findings. However, the dummy variable of positive change is proven to be statistically significant at 1% level in all studied regions while the dummy variable of negative change is zero. Thus, the magnitude of change seems to be rather irrelevant.

The results of positive dummy variables are used with the industrial confidence based investment strategy. In the empirical part of this study, back testing shows that investors would have been able to generate up to three times the market profits with less risk by timing their investment according the changes in industrial confidence. This would have meant 3283% returns in 27 years in Norway versus the index return of 990%.

Keywords: industrial confidence, market anomaly, efficient market theory

1 INTRODUCTION

Since the work of Keynes (1936) introduced the concept of animal spirits, the ways in which consumer and investor sentiment might influence the real economy, economist have pondered the answer. The outcome of monthly confidence surveys is an important piece of economic information and provides a stable indicator for the business. Consumer and business sentiment is the feel that consumers and corporates have about the state of their current financial situation and the economy as a whole. Consumer/Business sentiment is measured by consumer/business confidence indices (CCI/BCI), which are indicators designed to measure consumer/business confidence as a degree of optimism or pessimism. Consumer confidence is one of the most used statistical indicator of the market sentiment. In this study, we try to approach subject from the different angle. Rather tiny portion of earlier studies have focused on the industrial confidence indicators.

Simultaneously, market efficiency continues to be one the most arguable topics in the field of finance. Imagine all the professional portfolio managers, analysts and traders examining same securities all over again. How could anyone beat that kind of army? Hence, the market efficiency hypothesis claims that the information is already merged into securities' prices and one could not create a lasting abnormally profiting investment strategy. However, the unlimited amount of information we have nowadays challenges this theory. We know that in the real world, the stock prices fluctuate and psychology affects decision-making. Therefore, information may often be interpret incorrectly and some phenomenon could be explained by cognitive psychology. We approach this possibility from the perspective of behavioral finance.

1.1 Purpose of the study

The consumer confidence indicators are widely studied and have strong contemporaneous correlations with the stock market indexes. Consumer confidence is also found to predict consumer spending in the near future. Consumers feel more confident about their financial situation when the value of their assets is higher, even if the income is stable. In this study, we will investigate further if the industrial confidence indicator published by European Commission may anticipate coming upward and downward trends in the stock market. If consumers are able to predict their spending in the near future, this could be the case for

companies as well. Therefore, the industrial confidence indicator may predict business cycles and stock market returns. This thesis provides results from the four Nordic countries: Finland, Sweden, Norway and Denmark. In addition, Germany is used as a benchmark.

1.2 Contribution of the study

The study hypothesizes that the predictive power of industrial confidence indicators are greater for the smaller stock markets. Particularly, for the Nordic countries that export great share of their domestic product to other Western Europe and data collected from their most precious trading partners. The change in industrial confidence indicators are expected to predict stock market returns, the positive change designate a positive indicate for the equity returns and vice versa. If hypothesis accepts and the industrial confidence indicators predict stock market returns, then the abnormally profiting investment strategy could be based on the change of these indicators. Null hypothesis, part of the efficient market hypothesis, claims that the industrial confidence indicators fail to predict any upcoming stock market returns.

This thesis will seek to examine if the industrial confidence based investment strategies are able to perform better than the stock market indexes. The performance of the strategy against the average stock markets returns are compared with risk-adjusted measurements. Risk-adjusting is essential for measuring the true performance of a portfolio. This will be explained thoroughly in the second part of the study. Also, the research inspects the results between different stock indexes, such as the index of industrials, consumer staples, value and growth companies. The industrial confidence may be a better predictor for specific industries. The content of this thesis will be on the field of finance and the paper will rely mostly on the previous research published in the most well-known business journals.

If the first hypothesis holds and the industrial confidence indicator truly predicts stock market returns in the following month, this study could help to create a tool for professional portfolio managers. Portfolio managers and economists are known to follow the consumer confidence indicators very closely and this study examines whether the industrial confidence indicators provide also vital information. In practice, this would mean that portfolio managers could time their stock purchases on given positive signals or sell on given negative signals. The empirical part of this study shows differences between industrial confidence indicators. The industrial confidence indicator of a country, it’s most valuable trading partner and whole

Euro area are studied. There are no certainties that a whole investment strategy could be based on industrial confidence strategy because the study is executed with historical data, but the value of information should be noted.

1.3 Structure of the thesis

The structure of the thesis will be as follows.

The second part of this study presents the classical theories of finance and market efficiency. The modern portfolio theory demonstrates the simple valuation of a security. The vital part of valuation is to define risk because it is obvious that a rational investor considering two equally profiting investments would choose one with the lower level of risk. Hence, profits should be risk-adjusted to be comparable. In other words, the performance of a portfolio is measured by its total risk and returns. The second part lays out some risk measurements, namely variance, size, value, profitability and investment factors.

The third part of this study offers a different approach to financial markets, behavioral finance, in which financial phenomenon can be understood without expecting agents to be rational all the time. Behavioral finance attempts to point out the friction which occurs in the real world and cognitive psychology which affects decision-making. Undoubtedly, the theories will not perfectly fit the real world conditions. In addition, the most well-known market anomalies are discussed. The anomalies that have persisted in the markets, even after documentation in academic literature.

The fourth part of this study includes literature review, mostly the past research conducted about consumer confidence. The basic idea in confidence indicators and the economy relationship research is that implication has value as information. The future expectations of a sample group reflect the whole market sentiment. Industrial confidence indicators could be used in same way than consumer confidence indicators. The relationship between consumer confidence and the economy as a whole is examined and, whether consumer confidence affects expected stock market returns.

The fifth part of this study comprehends the empirical part of the research. The data inquiries and key statistics are presented. The methodology to address the research question is

discussed. The results part elaborate the findings with tables and written notes. The back testing part of this study presents the cumulative results of the suggested investment strategy in Nordic countries.

Finally, the sixth and the conclusions part draws discoveries together and suggest ways to evaluate the study of industrial confidence indicators.

2 MARKET EFFICIENCY

The efficient market theory is a natural way to approach the subject because it claims that one could not create a lasting abnormally profiting investment strategy. This study examines if an industrial confidence based strategy would generate more profits with less risk than markets on average which is against the efficient market theory. Classical theories of finance such as capital asset pricing model are foundation of assessing risks to certain assets. In this section we are looking more into different efficiency levels and what kind of an anomaly would violate them. Also, earlier studies about market efficiency are observed. Studies in favor of market efficiency are presented in this part of the thesis.

2.1 The capital asset pricing model

Brealey, Myers & Allen (2011:192-193) describes the *capital asset pricing model* (CAPM) to be both startling and simple. This centerpiece of modern financial economics is developed by Treynor (1961), Sharpe (1964) and Lintner (1965) after Markowitz (1952) laid down the foundation of modern portfolio management. Bodie, Kane & Marcus (2011:280) state that the CAPM gives us precise prediction what is linkage between the risk of an asset and its return. This relationship provides a benchmark for different portfolios like the one we are simulating in this study. Defining risk is vital part of this study to proceed into next chapters where we talk more about market efficiency and single anomalies. The model of the CAPM is as follows:

$$E(r) = r_f + \beta(r_m - r_f) \quad (1)$$

Where $E(r)$ is the expected return of an asset, r_f is the return of a risk-free asset, β is beta and r_m is the return of a market portfolio.

Bodie et al. (2011:280-281) express that the CAPM is a set of predictions concerning equilibrium expected returns on risky assets. The CAPM is admittedly simplified and avoids the complexity of the real world. Brealey et al (2011:195-196) argument that there are other tools to capture risk, but nearly three-quarters of financial managers still uses CAPM because

its simplicity. The model is often used as a basis of risk and the hypothesized environment is added one step at a time to see how the conclusions must be amended. Bodie et al. (2011:281) summarize that the underlying assumptions are as follows:

1. Investors are price-takers. Every investor owns only a small piece of a market and is therefore forced to follow prices, not to set them.
2. All investors have same holding period.
3. Investments are unlimited. For example, investors borrow and lend any amount at a fixed risk-free rate.
4. There are no taxes or transaction costs.
5. Investors are rational. Every investor uses the modern portfolio theory to value investments.
6. Homogeneous expectations. Information is perfect and every investor ends up with the same results when valuating an asset.

It is clearly obvious that a rational investor considering two equally profiting investments would choose one with the lower level of risk. Hence, profits should be risk-adjusted to be comparable. In other words, the performance of a portfolio is measured by its total risk and returns. Pointed out by Brealey et al. (2011:160-165) that the determination of risk is the difficult part because we only have information about the past and we seek to determine future events. All possible outcomes cannot be expressed. Therefore, we have to make the crucial assumption that the expected future risk premium can be measured by the average past risk premium. The used statistical measures are *variance* (2) and *standard deviation* (3). The variance of the market return is the expected squared deviation from the expected return. In other words,

(2) Variance $(\tilde{r}_m)$ = the expected value of $(\tilde{r}_m - r_m)^2$

Where $\tilde{r}_m$ is the actual return and r_m is the expected return. The standard deviation is simply the square root of the variance:

(3) Standard deviation of $\tilde{r}_m = \sqrt{\text{Variance } (\tilde{r}_m)}$

A variance and standard deviation are used to summarize the spread of possible outcomes and they are denoted by σ and σ^2.

Moreover, Brealey et al (2011:168-170) introduce that a stock has so-called *specific* and *market risk*. A single stock may have enormous risks which means quite turbulence for investors holding only a stock or company. This derives from sensitivity that one business could experience like the change of laws or the cost of raw materials. Luckily, by diversifying our investments we can eliminate the specific risk and reduce the standard deviation of a portfolio. However, there is *market risk* which cannot be avoided. Market risk includes economy wide threats that would affect most businesses. The sensitivity of an individual security to market movements is called a beta (β). A beta of 1.0 has average market risk, below is less risky and above riskier. The beta greater of 1.0 tend to amplify the movements of whole market and vice versa. With well-diversified portfolio market risk is all that needs to be taken account. Beta can be measured:

(4) $\beta_i = \sigma_{im}/\sigma^2{}_m$

Where σ_{im} is the covariance between the stock returns and the market returns, $\sigma^2{}_m$ is the variance of the returns on the market.

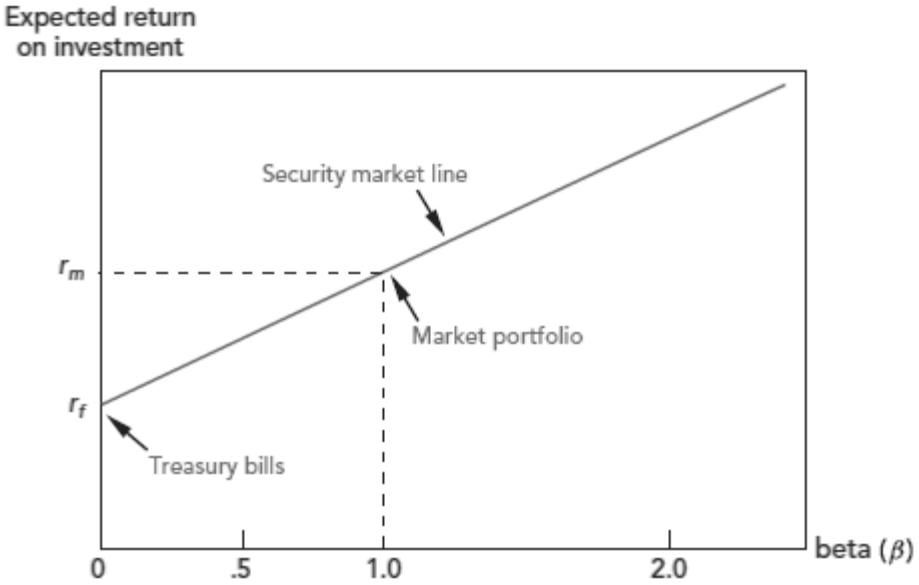

Figure 1. The security market line. (Brealey et al. 2011:192)

The beta is the appropriate risk indicator of a security because beta is proportional to the risk that the security contributes to the portfolio. Brealey et al. (2011:192-193) argument that rational investors do not take risk for fun, they are risk-averse and require a higher return for riskier assets. In order to determine the price of risk, we suppose that government bonds are somewhat risk-free and have beta of 0 because governments are not likely to default. Risk-free rates are further explained later. Whereas market portfolio has average market risk and beta of 1. Hence, pointed out by Bodie et al. (2011:289) that the expected return of an asset and its risk can be portrayed graphically as the *security market line* (SML). All investments must plot along the SML to have appropriate risk-return relationship. SML is valid for both portfolios and individual assets. The expected risk premium of an investment is beta times the expected risk premium on the market and is called the *market risk premium*. SML displayed in figure 1.

Expected risk premium on stock = beta x expected risk premium on market

(5) $$r - r_f = \beta(r_m - r_f)$$

Bodie et al. (2011:290) present that all investments do not plot along the SML all the time in the real world, in other words, all investments are not fairly priced in the essence of CAPM. Simple assumptions behind the CAPM do not apply in this case. Rational investors are especially seeking for underpriced securities plotting above the SML. Brealey et al. (2011:195) imply that investors would not invest into overpriced assets plotting under the SML because they could create a mixture of risk-free rate and market portfolio to gain higher expected returns. These deviations, more precisely abnormal returns, are denoted by an alpha (α). If investors are able to surpass the average or zero alpha consistently, that would prove the performance of active portfolio management. In the empirical part of this study, the industrial confidence based investment strategy and its alpha are measured.

2.2 Three- and five-factor models

Fama & French (2004) comment that the CAPM overestimates the cost of equity capital. The average return is flatter than predicted with the CAPM and betas change over time. The estimates for a high beta expects too high returns, and estimates for a low beta are thereby underpriced. The problem is that, because of the empirical failing, even passively managed portfolios can produce abnormal returns.

Study of Fama & French (1993) expand the set of asset returns to be explained by firm size and book-to-market equity with their three-factor-model. These three stock-market factors show to produce most common variation in stock returns. The factors are able to explain some deviations from the CAPM returns because firm size and book-to-market factors isolate the firm-specific components of returns. Later, Fama & French (2015) add two factors, profitability and investment to the model. A five-factor model performs better than the three-factor model in their study.

Therefore, multi-factor-models should be used in any application that requires estimates of expected stock market returns. However, multi-factor-models are not applicable estimating the risk in the investment strategy presented in this study because the strategy is a combination of market portfolio and risk-free returns. However, multi-factor-models are important piece of debate about market efficiency and claim to explain some anomalies presented in the behavioral finance part of this study.

2.3 Risk free rate and the money market

Last section comprised how prices are assessed and why there is risk in stocks even after diversification. Fortunately, stocks are not only option for investors. In this part, riskless options are stated. Companies, municipalities and governments issue bonds for other market participants. Companies and municipalities carry market and specific risk, because their earnings are much affected by markets, but Brealey et al. (2011: 45) state that government bonds are generally thought to be paid in full and on time, in other words risk-free. Moreover, Brealey et al. (2011:156) and Bodie et al. (2011:29) continue that Treasure bills (T-bills) have even shorter maturity and they are thought to be as safe an investment as you can make. This is because there is no virtually risk of default and short maturity guarantees them to be relatively stable. A certain payoff can be achieved by purchasing a three-month T-bill and holding it for three months. However, inflation affects a real rate of return.

Brealey et al. (2011:771) present that companies usually do not have huge cash surpluses which are not essential into short-term investments, but when they do, they invest them into the money market. There is no physical market place for the money market, but it is a collection of banks and dealers linked together with a huge volume of securities. The money market distributes investments into low-risk short-term securities which are relatively riskless options. This is popular especially at times of financial stress. The money market rates are used in the back testing part of this study, because it is presumable that investor could lend money at rate of 1-month Euribor or 1-month Frankfurt's lending rate for an example.

2.4 Random Walk

Kendall (1953) presented the first controversial paper on the behavior of stock and commodity prices. Up to then, scientists had expected cyclical movements with securities' prices. However, the author was not able to distinguish any patterns by statistical methods because stock prices followed a *random walk*. Brealey et al. (2011:314-317) describe that random walk refers to independent changes in values which do not correlate to any past movements. Bodie et al. (2011:343-344) imply that even if any cycle appeared, smart investors would try to eliminate it by trading and benefit superior profits. In Brealey et al.'s (2011:314-317) opinion Kendall's (1953) discovery is one the early signs of efficient markets

or otherwise investors would have used this cyclical movement to profit superior returns until it would have not exist. However, markets were enough efficient back then, that market were as likely to go up as down on any particular day. Bodie et al. (2011:343-344) evaluate that traders and analysts would only improve efficiency with their analysing work by finding mispriced securities. In this point of view any anomaly, like the one we are seeking to find, would be corrected after somebody finds it and benefits from it.

2.5 The efficient market hypothesis

The innovative paper by Fama (1970) is considered to be the origin of the efficient market hypothesis. The author's definition to "efficient" is a market in which prices always "fully reflect" available information. The author states that the definition is rather general and must be modified in essence to be more precise. Market equilibrium stated in the terms of expected returns elevates the mathematical concept of expected returns not necessarily the general notion of the market efficiency. The efficient market hypothesis more thoroughly means that a forecast about favourable future performance leads to favourable current performance instead, as all investors try to take the action before the movement. More generally, any information that predicts stock movement should already be reflected in prices. Investors are constantly looking for opportunities to push back assets to their fair values by betting against drop or rise. Therefore, as soon as there is new information indicating future movement, prices adjust immediately. However, new information must be unpredictable by definition, otherwise the prediction would be part of today's information. Thus, stock prices react only to a new unpredictable piece of information. Fama's (1970) study present three forms of market efficiency.

Fama (1970) conclude the assumption that in competitive markets easy profits do not last because of all the market participants. There are and have been many professional and retail investors trying to find mispriced securities and profitable investing strategies. As a result, all the past information of price changes reflect today's prices. This is called *weak market efficiency*, which is the first level of market efficiency. The weak-form hypothesis implies that technical analysis is pointless. Past trading data such as stock prices, volumes and shorting rates are already included in a current price of a security.

Fama (1970) note that the second level (of market efficiency) includes the first one but also that all the public information is adjusted into prices immediately. Public meaning information that is accessible to the most of investors, like financial statements, announcements and stock splits. This is known as *semi-strong market efficiency*. The fundamental analysis would not create abnormal returns in the semi-strong market environment. An investment strategy presented in this study later would violate semi-strong because European Commission's business surveys are publicly available.

In this essence, Fama (1970) present that s*trong-market efficiency* includes the first two, but also that prices reflect all information which can be acquired by a company or the economy. In such a market no investor, not even insider, could consistently beat the market. Researching strong-market efficiency is challenging because inside information is not easily collected and not likely to be perfect. Also, defining insider trading is difficult because for an example stock analysts try to reveal information before publication.

2.6 Criticism against event studies

Fama (1998) defends market efficiency against many long-term anomalies that have been found recently back then. The study finds that the market efficiency should not be discarded for two apparent reasons. Firstly, consistent with the market efficiency hypothesis is that stock prices tend to overreact as likely than underreact to new information. Secondly, the presented long-term anomalies do not last after reasonable changes in methodology. Anomalies are sensitive to changes and become marginal or disappear when exposed to different statistical approaches.

3 BEHAVIORAL FINANCE AND MARKET ANOMALIES

Behavioral finance is seen as a new approach to financial markets, in which financial phenomenon can be understood without expecting agents to be rational. In contradiction to the classical capital asset pricing models, behavioral finance seek to understand financial markets using models in which agents are irrational, in other words not maximizing their satisfaction consistently. Under the classical conditions of rational agents, McKenzie & Lee (2006:100) present the following assumptions:

1. The individual has an identifiable preference
2. The individual is capable of ordering his/her wants consistently
3. The individual will choose consistently from these ordered preferences to maximize his/her satisfaction

Tversky & Simonson (1993) disprove that these three fundamental assumptions could hold for most people in the actual world. The principal problem is that humans and decisions tend to be context dependent and natural human nature is inconsistency. Preferences under one set of conditions are easily reversed under another. *Attitudes toward risk* have been observed in many psychological studies (see for example Fiegenbaum & Thomas 1988) and it is seen that people tend to loath to incur losses. Emotions should not affect investment decisions and therefore, risk attitude may lead only to bigger losses.

Barberis & Thaler (2003) introduce two key parts to behavioral finance, in which, limits to arbitrage is the first one. In the traditional framework, the value of a security is its discounted sum of expected future cash flows. Rational agents would quickly undo any dislocations caused by irrational agents and arbitrage risk-free profits. However, in the actual world pushing back a security to its fair value is not that simple, correcting mispricing can be both risky and costly, rendering them unattractive. The arbitrageur faces fundamental risk with substitute securities that are rarely perfect. Traders are exploited to noise trader risk when the deviation will not be exploited immediately, the gap might even widen to force arbitrageurs liquidate their positions too early. Lastly, implementation costs such as commissions, bid-ask spreads and price could impact attractiveness of a mispricing. Therefore, rational traders are often powerless to exploit any deviation from the fundamental value of a security.

For the guidance of irrationality and the second part of behavioral finance presented by Barberis et al. (2003) is cognitive psychology. Psychology seeks to specify how agents form expectations. The customs of people learned by psychologists do not meet the requirements set by the classical financial theories. People fail badly to estimate their own abilities and other objects. This might cause extreme deviations from the fundamental values of securities. The specified list of Barberis et al.'s (2003) findings can be found in Appendix 1. This thesis focuses on industrial confidence indicator which is formed by the responses given by the actual people working in the industrial field. Also, confidence indicator and investor sentiment are used as synonyms. Hence, the confidence indicators should be affected by these behavioral factors.

3.1 Definition of an anomaly

Schwert (2002) describes anomalies as empirical results that are inconsistent with maintained theories of asset-pricing behavior. Market anomalies are inefficiencies or inadequacies in the underlying asset-pricing model. Dictionary defines an anomaly as a deviation from the common rule. Brealey et al. (2011:321) point out that the early researchers truly believed that the *efficient market hypothesis* (EMH) is a good description of reality. All the research against efficient markets theory was regarded with suspicion which makes the EMH the common rule. But eventually market participants grew to know that there are a few violations of the EMH which investors have failed to exploit. The EMH expects market participants to use all the available information in their fundamental valuations. To be exactly precise, the EMH implies that every security trades at its fundamental value:

$$P = \sum_{t=1}^{\infty} \frac{C_t}{(1+r)^t} \tag{6}$$

Where P is the price of a security, C is the future cash flows of a security and r is the opportunity cost of capital.

Brealey et al. (2011:321) continue that if price equals fundamental value, the opportunity cost of capital must equal to the expected rate of return. Otherwise, investor would get rid of an asset for being too expensive or buy it on sale. Still, there are notable studies publicly

available which claim to generate superior returns for decades, even after when adjusting risk with the capital asset pricing models. Anomalies that survive even adjustments for exposure to the multi-factors of Fama et al. (1993, 2015) are presented in the next few pages. However, Schwert (2002) comment that there is possibility that anomalies are more apparent than real. Authors might create puzzling anomalies by further investigating unusual findings. Some anomalies have become effectively weaker after the first documentation in the academic literature. This raises the question of whether profit opportunities have been arbitraged away or whether the anomalies were simply statistical aberrations.

3.2 Market anomalies

Schwert (2002) comments that in the early years of the efficient market literature, the random walk model was often confused with the hypothesis of market efficiency. Fama (1970, 1976) correct that the assumption of constant equilibrium expected returns over time is not a part of the EMH. Bodie et al. (2011:360) note that if we assume that the CAPM and its expansions capture most of the risk, we may say that for example calendar market anomalies violate even the weak market efficiency. The second level, semi-strong is violated as well, because key ratios are public information and easily accessible to everyone. Some apparent violations of market efficiency are introduced briefly which have persisted many years.

Banz (1981) and Reinganum (1981) are the first to discover the size effect by dividing companies into different portfolios according to their size. Their studies document that small-capitalization firms on the New York Stock Exchange (NYSE) grossed higher average returns than is predicted by the CAPM from 1936 to 1975. Schwert (2002) state that numerous subsequent papers were published to extend and clarify the foundation of this so called small-firm effect. Also, Dimensional Fund Advisors (DFA) picked up small-firm effect and began closely mimic the strategy described by Banz (1981) in 1981. The average difference between the monthly return to the DFA fund and the return predicted by the CAPM are between -0,2% and 0,4% per month. Thus, it seems that the small-firm anomaly has disappeared since the initial publication of the studies or the risk premium for small-capitalization stock has been much smaller since 1981 than it was before. The firm size effect is also captured by the multi-factor-models.

Keim (1983) and Reinganum (1983) show that much of the superior returns for small firms occurs during the beginning of January. An anomaly that is called turn-of-the-year effect or January effect. Roll (1983) hypothesize that investors might want to realize short-term capital losses for income tax purposes before the end of the year and the small-capitalization stocks more likely because of the higher volatility. This selling pressure reduces the stock prices in December, leading to a rebound in the first two week in January as investors reestablish their investment positions. Schwert (2002) document the positive alpha of 0,4 – 0,8% per day from 1962 to 2001. The effect is smaller than the original observation by Keim (1983) and Reinganum (1983), but still consistently positive. Interestingly, Booth & Keim (2000) find no reliably different returns from zero over the period of 1982-1995. Apparently, the lowest-priced and least-liquid stocks explain the turn-of-the-year anomaly. Therefore, there is possibility that market microstructure effects, especially the cost of illiquidity, could affect some anomalies.

Another calendar anomaly observed is the weekend effect by French (1980). The study notes that the Standards & Poor's (S&P) 500 average return is consistently negative over weekends in the period of 1953-1977. Schwert (1990) replicate the study and has consistent findings with French (1980). The estimate of the weekend effect for 1928-1952 is even more negative and the previous period 1985-1927 is about one-third of its size. Moreover, the estimate of the weekend effect since 1978 is not significantly different from the other days of the week and therefore, the anomaly seems to have disappeared since the documentation.

Basu (1977, 1983) note that higher earning-to-price (E/P) ratios indicate positive abnormal returns relative to the CAPM. Subsequent papers follow the hypothesis with different ratios. Fama & French (1992) research the book-to-market ratio as a predictor of market returns. The study divides firms into 10 portfolios according the value of ratio, the smallest to portfolio 1 and so on. Results show that the average monthly rate of return is dramatically higher with higher ratio than lower, the highest portfolio averaged 16,78% while the lowest decile only 10,51%. Also, Fama & French's (1988) study show that the stocks with higher dividend-to-price ratio have higher returns. Campbell & Shiller (1988) find that the earnings yield predicts the stock market returns as well. The interpretation of any market efficiency violation is difficult because it could be simply a proxy for another market risk premium which would not be anticipated. Fama & French (1996) use the three-factor model with size

and value factors to explore several of the key ratio anomalies and are able to exploit some of them.

Jegadeesh & Titman (1993) find a *momentum effect* in which past returns indicate next 3 to 12 –month holding periods' return. Investors could simply earn more than markets on average by placing their bets into the best performers in the past. In contrast to the short- and intermediate- horizon momentum effect, DeBondt, Werner & Thaler (1985) find that in a long horizon markets tend to have reverse affection than momentum. In other words, the best performing stocks in the past will most likely underperform markets in the following long periods, while the worst over perform. Bodie et al. (2011:358-359) comment that this so called *reversal effect* suggests that markets fail to adapt new information by overreacting to it. Fama & French (1996) test these two version of momentum strategies with their three-factor model. They find no significant results on the long-term reversal strategy of DeBondt et al. (1985), but fail to exploit short-term momentum effects by Jegadeesh et al. (1993).

Some other anomalies presented by Brealey et al. 2011: (322) are the earnings announcement puzzle and the new-issue puzzle. The stock prices of companies with the best earnings news outperform significantly companies with the worst earnings news. The efficient market theory assumes that new information has an immediate impact to stock prices and superior returns are not made in the long run. The earnings announcement puzzle seems that investors underreact to both, positive and negative, news. The new-issue puzzle tends to create a puzzle that when buying stock in initial public offering (IPO), the investment is profitable in the short run of days to months, but these early gains turn into losses in the longer holding period. Holding IPO-stock generated average annual returns less than 3,8% than a similar-sized stock portfolio.

Even these presented anomalies have lasted quite a long in time the stock markets, the multi-factor-models founded by Fama & French (1993, 2015) explain many of them. Anomalies could be as well a sign of inadequate asset pricing models. However, Barberis et al. (2003) add that there are still market anomalies which cannot be explained any rational way, for example *twin shares*. Twin shares means two separately securities which claim for same profits. For example Royal Dutch and Shell Transport agreed to merge their interests on a 60:40 basis while remaining separate entities. The value of Royal Dutch should have been relative to Shell transport 1.5 times greater and there were a persistent inefficiency. This kind

of an irrational behavioral could be only explained by behavioral finance and the flaws of human rationality.

4 LITERATETURE REVIEW AND HYPOTHESIS

Ludvigson & Lettau (2001:817) elaborate that the basic idea in confidence indicators and the economy relationship research is that the implication has value as information. The future expectations of a sample group reflect the whole market sentiment. The agents are expected to act rationally which means that positive sentiment means more consuming and vice versa. Slacalek (2006) states that household's wealth is a major determinant of consumption expenditure. The author elaborates that academics use the term, *wealth effect,* for the reaction of consumers when changes in their capital occurs. For example, consumers are willing to spend more money when stock prices rally and vice versa, even if their actual income stays stable. Industrial confidence and its relationship between the stock market is rather unexplored field in the field of finance. Therefore, the literature review follows the past research conducted on the consumer confidence and its relation to the economy and the stock market returns. The past studies examine consumer confidence as a proxy for investor sentiment and whether it affects expected stock market returns. Most studies have been conducted in industrialized countries.

4.1 Consumer confidence and economy

Carroll, Fuhrer & Wilcox (1994) study the correlation between the Michigan's Index of Consumer Sentiment and the growth of household spending. The correlation may reflect poor economic prospects when households curtail their spending and give gloomy responses to surveys. However, the contemporaneous correlation does not refute traditional life-cycle or permanent income models of consumption. The paper studies whether the consumer confidence forecasts spending or the consumer confidence is an independent driving factor in the economy, and the changes in the sentiment causes spending. They find evidence that the lagged consumer confidence has some explanatory power for the current changes in household spending. The predictive power is impressive and stacks up relatively well against the track record of other variables that have been noted, for example interest rates, stock prices and the unemployment rate. Campbell and Mankiw's (1989) model provides results that lagged sentiment does not affect consumption growth only through an income channel in most cases.

Howrey (2001) presents that the monthly release of the index of consumer sentiment (ICS) is highly featured in the financial press, especially during the periods of economic uncertainty, even while the considerable predictive power is quite marginal. The study addresses the predictive power of consumer confidence alone and in conjunction with the interest rate spread, the New York Stock Exchange composite price index, and the Conference Board index of leading indicators. The study questions whether the indicators sharpen the near-term probability of recession and recovery and whether the indicators help to predict the personal consumption expenditure. ICS is a statistically significant predictor itself, and in conjunction with one or more of the other indicators, of the future rate of growth of real GDP. It produces discernible increase in the accuracy of one to four quarter ahead forecasts in comparison to a model based on lagged GDP only. ICS along with the other indicators are informative about the probability of recession. Moreover, as the predictor of consumption expenditure, ICS is statistically significant and economically meaningful in terms of point to forecast the growth rate of personal consumption expenditure. The monthly values fluctuate a lot and are considered to be noisy.

The mechanisms by which household attitudes influence the real economy are less well understood despite the widespread attention given to the surveys of consumer confidence. Ludvigson (2004) focuses more thoroughly to the relation between consumer confidence and consumer spending. The study examines the two most widely followed measures in the U.S., the University of Michigan's Consumer Sentiment Index and the Conference Board's Consumer Confidence Index. The two indexes have some differences in questions, sample size, survey methodology, timing, release schedule, and index formulation. Thus, the indexes give sometimes conflicting signals, but still measure the same concept and are highly correlated with each other. The study postulates whether to use index-level or month-to-month changes and whether to focus on the present conditions or the expectations component in consumer confidence. The study finds that consumer confidence has some forecasting power for the future labor income growth and some evidence that consumer attitudes lead the stock market. Although, these results are not robust to the inclusion of a proxy for the log consumption wealth ratio.

Oest & Franses (2008) find it complicated that consumer and business surveys require data from a different set of respondent in each month. The monthly cross-sections may not be comparable and changes are difficult to assess. The amount of respondent switching their

opinions is not seen and the net changes might be driven by the different respondent samples used over time. The study proposes a new methodology to address the issue. The findings imply that monthly changes in consumer confidence are not often statistically significant in the US, nor in the Netherlands. The authors warn to straw too much conclusions from the changes in indicators. Also, the study find significant differences between the sample countries. The US respondents were more likely to switch their attitude than their Dutch counterparts do. The paper hypothesize that this could be cause by the differences in the social security systems.

4.2 Consumer confidence and stock markets

Otoo (1999) examine whether changes in stock prices have an important influence on consumer confidence and how it may be accomplished. The study pointed out that U.S. equity markets had soared from the beginning in 1995 along with the consumer sentiment. Then, both the stock market and sentiment fell abruptly in the mid-1998s. Later in the same year, sentiment staged a recovery and equities revived. Study questions whether sentiment and stock prices were influenced by other set of economic developments contemporaneously or rather movement affected one in another. Earlier, Otoo (1997) find that income and sentiment are positively related after controlling for a variety of other factors. The way in which consumer confidence measured are constructed, a more favorable current financial situation or the expectation of higher income in the future raises sentiment. Thus, factors that could affect positively to current or expected income also would boost consumer confidence. Therefore, rallying stock markets might reflect higher expectations of current wealth and directly boosting sentiment. Also, Poterba & Samwick (1995) and Morck, Shleifer & Vishny (1990) find that rising stock markets boost consumer spending by acting as a leading indicator of higher labor income.

Moreover, in Otoo's (1999) study, the correlation and causality between consumer and confidence and the stock market is inspected using aggregate data. Simple regressions are made by using the first difference of the log of the Michigan SRC index of consumer sentiment (MICH) and the first difference of the log of the Wilshire 5000 stock price index (STOCKS). The data applied in the equations are monthly points from June 1980 to June 1999. Otoo's (1999) equations indicate that consumer sentiment and the stock market are correlated with the statistically significant coefficients on the current values of the variables.

The relationship between the coefficients seems to be fairly robust, although explaining only 10 percent of the variation. The coefficients of lagged growth are not significant and therefore, it seems that the change in consumer confidence fails to forecast stock market returns. The results hold for subsamples in different time frames such as run-ups in stock prices. In addition, Otoo (1999) examine the relationship between the two by running unrestricted vector auto regression (VAR) and using individual responses. VAR fails to exploit anything significant where as individual responses from Michigan surveys do not rule out a traditional wealth effect.

Jansen & Nahuis (2003) base their study to the fact that stock market has substantially increased in many industrialized countries. As a percentage of GDP, market capitalizations have doubled or tripled in a few decades. The research has been stimulated into the linkage between the stock market and the real economy because of this development. However, the ability of the stock market to predict output growth does not imply a causal relationship between these two factors. The stock market may just appear as an information processor. The conventional wealth effect is one of three well known causal links between the stock market and the real economy. The second, Tobin's Q theory is related to investments and the third, balance sheet channel, is about credit market imperfections and their consequences for expenditures. Once again the rising stock markets increase the feel about the future and so induce consumers to spend more.

Jansen et al. (2003) conduct first analyze in the Europe on the short-run relationship between stock market developments and consumer confidence. Similarly as the results of Oest et al. (2008), the study postulates that the traditional wealth effect would be less important in Europe than in the US, because in Europe fewer household own stocks with a smaller share of their wealth than in the US. Study focuses different aspects of the linkage between the stock market and consumer confidence in eleven European countries published by the European Commission in the period of 1986-2001. Firstly, the higher stock prices would make consumers wealthier and therefore, more optimistic. Secondly, the higher stock prices may be interpreted by economic agents as a positive sign of future economic condition. The leading indicator influence the behavior of all consumer, regardless whether they own stocks directly or not.

Jansen et al. (2003) reveal that nine out of eleven countries have contemporaneous correlation between stock markets and consumer confidence. Moreover, Germany seems to be the sole country for which developments appear to be disconnected. Granger-causality tests denote more insight into the nature of the relationship. The study reports marginal significance in both directions. Most of the countries indicate no Granger causality running from the stock market to consumer confidence, but Denmark, Italy and the Netherlands do at the 5% level and Ireland at the 10% level. After equations are modified, results show stock prices positively affecting confidence in seven countries with a very short lag of two weeks at 5% level. Granger causality running from consumer confidence to stock markets is seen in two out of eleven countries. However, authors do not have explanation for this type of causality. In conclusion, Jansen et al. (2003) study confirm results of Otoo (1999) in the US that equity prices are a leading indicator for economic activity for all households, not only for those that have invested in stocks. Therefore, the confidence channel in an independent transmission between the stock market and the real economy, and not an adjunct to the traditional wealth effect.

Fisher & Statman (2003) comment that financial advisors have to work hard to restrain the exuberance during the bubble and equally hard to lift their desperation after the burst. The study uses Michigan and the Conference Board Consumer Confidence Indexes, the same as Otoo (1999). Caffrey & Ip (2002) state that automakers follow these consumer confidence trends closely, and factor them into decisions about the production volume. Fisher et al. (2003) study finds statistically significant positive relationship between monthly changes in confidence indexes. Also, boosted confidence is seen as positive confidence in the future as well. The correlation between the changes in expectations component and changes in the present conditions component is positive and statistically significant. However, the relationship between the stock market returns and consumer confidence is measured with the level of indicator, not the change.

Fisher et al. (2003) compares consumer confidence to two measures of investor sentiments which have been collected from newsletter writers. Study postulate that consumers and investors view the economy and the stock market as the same side of a coin. Healthy economy leads to bullish opinions about the stock market. In contradiction, writers of investment newsletters find more in this relationship. Study finds that the consumer confidence has positive and significant relationship with the S&P 500 index returns where as Otoo (1999)

find the same with the Wilshire 5000 index. Furthermore, the consumer confidence change and the returns of small stocks relationship is no stronger than with S&P500. Also, Chow tests reveal that the response of consumer confidence to the stock returns has faded in the late 1990s compared to the earlier period.

Fisher et al. (2003) findings are that the consumer confidence indicator predicts NASDAQ and small cap stock returns. The forecasting power for S&P 500 stock returns are not found. The level of the expectations component of the Conference Board consumer confidence in one month has statistically significant and negative correlation with NASDAQ and small cap stocks in the following month. The changes in consumer confidence are not measured with stock market returns. However, the consumer confidence and stock returns do not follow each other in an endless downward spiral, rational investors should regain their confidence toward investment possibilities when it is lost as consumer.

Lemmon & Portniaguina (2006) explore the time-series relationship between investor sentiment and stock returns using consumer confidence in times of optimistic and pessimistic assessment of market conditions. Study compares primarily small and large firms, under the presumption that small stocks are disproportionately held by individuals where as large are held by institutions. For example, Chan & Chen (1991) find that small firms with a higher likelihood of financial distress are more sensitive to changes in the business cycle. Lemmon et al. (2006) uses same the Conference Board and Michigan Survey indexes than Fisher et al. (2003) and Otoo (1999). The study expects consumers to anticipate changes in interest rates, unemployment, inflation, real gross domestic product, house sales and therefore, spending.

Firstly, Lemmon et al. (2006) regress consumer confidence on a set of macroeconomic variables and find the coefficient of determination to be high (around 0.8). Then, residuals from this regression are treated as the measure of excessive sentiment unwarranted by fundamentals. Large sample removes the criticism that applies to separating fundamental and sentiment components. The findings are consistent with the view, small stocks earn low returns relative to large stocks in the following quarters when the consumer confidence is high. Therefore, study approves the idea that investors appear to overvalue smalls stock more likely than large stocks during the periods when sentiment is high and vice versa. Furthermore, the stock held predominantly by individual investors are vulnerable to mispricing. The study argues that one explanation could be the risen influence of individual

investors in the financial markets. The results show that the sentiment component of consumer confidence do not exhibit any significant predictive power for the book-to-market or the momentum factors.

Schmeling (2009) elaborates the past studies done in the U.S. and explores 18 other industrialized countries, the study uses consumer confidence as a proxy for individual investor sentiment. The findings are in-line with Fisher et al. (2003), the level of consumer confidence has negative correlation with stock market returns in the following periods. When the sentiment is low, the future stock market returns tend to be high and vice versa. This relation also remains for different portfolios like value stock, growth stock, small stock, and for different forecasting horizons. The value, growth and small stock are expected to be hard to arbitrage. Also, the results hold after controlling for other standard risk factors and expected business conditions. To support the perspective of behavioural finance, the study finds that stock market returns are higher for countries with less market integrity and countries that are culturally more prone to herd-like behaviour.

Chen (2011) continues the work of consumer confidence examination and whether the effect of shocks varies during different phases of the market cycle. The study focuses on the S&P 500 stock price index and the Michigan Consumer Sentiment index. The sample span is from 1978 to 2009. The previous studies have focused on the effects of negative sentiment for stock returns. The study examines whether the impact of loss of confidence is asymmetric during the bull and bear markets. Moreover, if the increased pessimism about the economy leads to a bearish stock market. Strong and robust evidence is found that the lack of confidence has an asymmetric effect for stock market returns, and the impact is greater in bear markets. Also, the stock market stays in a bear regime for a longer when the market pessimism rises. The study shows that consumer confidence actually has affection to the stock market returns.

4.3 Hypothesis development

The academic literature has consistent findings that the contemporaneous relationship between consumer confidence and stock market returns is fairly robust. However, the predictive power of consumer confidence for stock market returns may be weak or non-existent. The literature review presents mostly findings that low or high consumer confidence

level might forecast future stock market developments, see Fisher et al. (2003) and Schmeling (2009). Also, the small stocks are expected to be more affected when the investor sentiment plummets, see Fisher et al. (2003).

The investor sentiment used in this study, industrial confidence is still rather unknown variable in this essence and could have different kind of characteristics. One could assume that companies are able to collect more data and information about the future, for example the order books of the following months and price developments of components. The industry could base their answers to given facts whereas consumers are more likely to be affected by cognitive psychology presented in the behavioral finance part of this study. Therefore, I hypothesize that the industrial confidence of Commission could predict the stock market returns in export-dependent countries. This causality is more likely to run from the greater areas to the smaller ones and therefore, the country's own industrial confidence does not predict the stock market returns in the same country. Also, the prices of industry stocks are more affected than for example consumer staples stocks. The growth stock are more affected than value stocks. Lastly, I hypothesize that more developed stock markets, like Germany in this study, are less affected by the changes in industrial confidence.

H0: The industrial confidence indicators do not predict stock market returns.

H1: The industrial confidence indicator of euro area (EA) predicts stock market returns in Finland, Sweden, Norway and Denmark.

H2: The industrial confidence indicator of Germany (DE) predicts stock market returns in Finland, Sweden, Norway and Denmark.

H3: The industrial confidence indicator of a country does not predict stock market returns in the same country.

H4: The industrial confidence indicators predict industrial companies better than consumer staples companies.

H5: The industrial confidence indicators predict growth companies better than value companies.

5 EMPIRICAL PART OF THE STUDY

While the consumer confidence indicators have been quite topical and closely followed by academic literature and economists, the industrial confidence indicators have not yet attracted the interest. The empirical part of this study addresses this subject with the same methods than consumer confidence studies and provide the first empirical outlook to the research question.

5.1 Data collection

The European Commission's harmonized EU Programme of Business and Consumer Surveys was set up in 1961 and is managed by the Directorate-General for Economic and Financial Affair (DG EFCIN). The data is derived from the surveys conducted by the national institutes in the member states and candidate countries. DG EFCIN builds the composite indicators to track cyclical movements in the specific sectors or in the economy as a whole to produce a set of comparable data for all the consisting countries. The manufacturing industry was the first harmonized business survey. The program was later extended to the construction sector, investment plans in the manufacturing sector, consumers, retail trade and financial services. (European Commission 2014)

Industry, construction, consumers, retail trade, services, and financial services are six surveys conducted on a monthly basis. Some supplementary questions are asked on a quarterly basis excluding retail trade. Also, an investment survey of the manufacturing sector is conducted twice a year to gather information about companies' investment plans. The sample size is generally related to the population size and varies across countries according to the heterogeneity of their economies. Answers obtained from the surveys are aggregated as the difference between the percentage of respondents giving positive and negative replies. These balanced series are then used to build composite indicators, confidence indicators by taken arithmetic means of answers. The timing of the fieldwork for the monthly surveys is commonly executed in the first two to three weeks of each month. (European Commission 2014)

This thesis uses only the monthly answers obtained from the industry survey. Oest et al. (2008) criticize that the monthly changing respondents weakens the comparability of the

results. The industrial confidence surveys are fundamentally qualitative. The recent trends in production, the current levels of order books/stocks and expectations about production, selling prices and employment are the main questions submitted. (European Commission 2014) The questions of the survey are as follows:

1. Excluding seasonal variations, do you consider that in volume terms:
   (a) Your present total order book is: above normal, normal, below normal, n/a
   (b) Your present export order book is: above normal, normal, below normal, n/a
2. Your present stock of finished goods are:
   More than adequate, adequate, less than adequate, n/a
3. Excluding seasonal variations, what has been the trend over the past three months and what are the expected trends over the next three month with regard to:
   Volume of output: Past three months: up, same, down, n/a
   Next three months: up, same, down, n/a
4. Excluding seasonal variations, please indicate the expected trend over the next three month with regard to:
   Average selling prices at which domestic orders/sales are booked: up, same, down, n/a
   Number employed: up, same, down, n/a

The publication occurs at the end of month which enables to create an investment strategy presented in this study. (European Commission 2014.) The strategy takes into account change in business consumer surveys and more closely, the change in the industrial confidence level. This change determines if one should invest into the money market or the equity market in the following month. The data obtained to the thesis is from December 1987 to August 2015. The thesis uses industrial confidence collected from euro area (EA), Germany (DE), Finland (FI), Sweden (SE) and Denmark (DK). The industrial confidence indicator of Norway is not available from the same source and therefore, not reliably comparable. The data is collected from Germany because it is the top export destination of Sweden, Norway and Denmark. Finland's top destination is Sweden, but Germany is the second. (OEC 2016)

The results are tracked with the MSCI Equity total return indexes which measure the performance of a set of equity securities over time. The indexes are calculated using the Laspereys' concept of a weighted arithmetic along with concept of chain-linking. The

indexes are calculated in local currency and therefore hedged against impact from the foreign exchange fluctuations. The indexes consist traditional mid plus large cap, value and growth indexes from all studied regions: Finland, Sweden, Norway and Denmark. The MSCI mid + large cap index of Germany is studied as a benchmark. All the MSCI indexes consist data from December 1987 to August 2015. (MSCI 2016)

In addition, the industrials and consumer staples total return indexes of Finland, Sweden, Norway and Denmark are studied. These specific indices are obtained from the DataStream with local currencies. Industrial sectors are allocated using Industry Classification Benchmark (ICB) jointly created by FTSE and Dow Jones. Industrial index of Sweden, Norway and Denmark are obtained from December 1987 to August 2015 and Finland's from March 1988 to August 2015.

5.2 Summary statistics

The following pages contain summary statistics for the data used in this study. Tables 1-5 present the summary statistics for standard mid plus large, industrials, consumer staples, value and growth indexes of a country. Table 1 – 4 shows the monthly stock returns of these indexes in Finland, Sweden, Norway and Denmark. Table 5 contains the summary statistics of industrial confidence indicators used in this study.

Table 1. The monthly stock market returns of Finland.

Finland	Mid+Large	Industrials	Consumer staples	Value	Growth
Time period	Dec 1987 – Aug 2015	Mar 1988 – Aug 2015	Mar 1988 – Aug 2015	Dec 1987 – Aug 2015	Dec 1987 – Aug 2015
Mean	*1,2%*	1,1%	1,0%	0,9%	1,4%
Median	*1,4%*	1,1%	0,5%	0,9%	1,1%
Maximum	*32,9%*	33,9%	39,7%	40,2%	37,0%
Minimum	*-31,0%*	-24,0%	-23,5%	-21,9%	-35,0%
Std. Dev.	*8,8%*	7,6%	7,5%	7,8%	10,3%
Skewness	*0,18*	0,04	0,77	0,81	0,06
Kurtosis	*4,61*	4,71	6,72	6,98	4,28
Jarque-Bera	*37,73*	40,16	222,16	255,86	22,83
Probability	*0,000*	0,000	0,000	0,000	0,000
Sum	*3,865*	3,612	3,337	2,841	4,783
Sum Sq. Dev.	*2,550*	1,872	1,821	2,025	3,492
Observations	*332*	329	329	332	332

Table 2. The monthly stock market returns of Sweden.

Sweden	Mid+Large	Industrials	Consumer staples	Value	Growth
Time period	Dec 1987 – Aug 2015	Dec 1987 – Aug 2015	May 1996 – Aug 2015	Dec 1987 – Aug 2015	Dec 1987 – Aug 2015
Mean	1,3%	1,4%	1,4%	1,3%	1,2%
Median	1,2%	1,4%	1,3%	1,6%	1,3%
Maximum	35,0%	23,6%	17,9%	42,5%	30,2%
Minimum	-21,5%	-23,5%	-16,1%	-20,2%	-26,6%
Std. Dev.	6,7%	6,9%	5,1%	6,7%	7,9%
Skewness	0,12	-0,36	0,31	0,44	-0,04
Kurtosis	5,62	4,41	4,06	7,97	5,52
Jarque-Bera	95,47	34,51	14,59	352,59	88,01
Probability	0,000	0,000	0,001	0,000	0,000
Sum	4,275	4,692	3,252	4,454	4,044
Sum Sq. Dev.	1,479	1,587	0,588	1,482	2,078
Observations	332	332	231	332	332

Table 3. The monthly stock market returns of Norway.

Norway	Mid+Large	Industrials	Consumer staples	Value	Growth
Time period	Dec 1987 – Aug 2015	Dec 1987 – Aug 2015	Dec 1987 – Aug 2015	Dec 1987 – Aug 2015	Dec 1987 – Aug 2015
Mean	1,0%	1,1%	1,7%	1,3%	0,8%
Median	1,5%	1,8%	2,1%	1,5%	1,0%
Maximum	16,4%	36,9%	31,4%	17,8%	24,8%
Minimum	-24,8%	-25,4%	-31,3%	-26,5%	-30,8%
Std. Dev.	0,07	0,09	0,09	0,07	0,07
Skewness	-0,69	-0,14	-0,30	-0,52	-0,64
Kurtosis	4,52	4,22	4,39	3,93	5,05
Jarque-Bera	58,26	21,74	31,99	26,97	80,37
Probability	0,000	0,000	0,000	0,000	0,000
Sum	3,352	3,683	5,644	4,256	2,620
Sum Sq. Dev.	1,383	2,433	2,573	1,638	1,632
Observations	332	332	332	332	332

Table 4. The monthly stock market returns of Denmark.

Denmark	Mid+Large	Industrials	Consumer staples	Value	Growth
Time period	Dec 1987 – Aug 2015	Dec 1987 – Aug 2015	Dec 1987 – Aug 2015	Dec 1987 – Aug 2015	Dec 1987 – Aug 2015
Mean	1,2%	1,1%	0,9%	1,1%	1,4%
Median	1,4%	1,5%	1,1%	1,2%	1,6%
Maximum	18,6%	33,4%	19,2%	28,2%	17,7%
Minimum	-17,8%	-28,3%	-33,9%	-23,9%	-17,8%
Std. Dev.	0,05	0,08	0,06	0,06	0,06
Skewness	-0,32	-0,02	-0,50	-0,14	-0,27
Kurtosis	3,80	4,61	5,68	5,13	3,64
Jarque-Bera	14,55	35,65	112,91	63,67	9,77
Probability	0,001	0,000	0,000	0,000	0,008
Sum	4,144	3,748	2,980	3,699	4,544
Sum Sq. Dev.	0,953	2,162	1,301	1,267	1,234
Observations	332	332	332	332	332

Table 5. The summary statistics of industrial confidence indicators.

Confidence	EA	DE	FI	SE	DK
Time period	Dec 1987 – Aug 2015	Dec 1987 – Aug 2015	Jan 1993 – Aug 2015	Jan 1996 – Aug 2015	Dec 1987 – Aug 2015
Mean	-6,01	-6,83	1,19	-4,74	-0,97
Median	-4,90	-5,00	0,45	-3,75	0,10
Maximum	7,90	16,00	31,30	15,80	16,70
Minimum	-38,10	-42,50	-37,30	-38,50	-34,50
Std. Dev.	9,46	11,79	13,65	9,93	8,91
Skewness	-0,93	-0,63	-0,19	-0,59	-0,71
Kurtosis	3,81	3,14	2,74	3,60	3,98
Jarque-Bera	57,11	22,20	2,46	17,24	41,58
Probability	0,000	0,000	0,293	0,000	0,000
Sum	-2000,50	-2275,30	324,60	-1119,30	-324,00
Sum Sq. Dev.	29738,19	46125,39	50460,33	23167,74	26330,04
Observations	333	333	272	236	333

5.3 Methodology

The literature review of this thesis follows closely the past studies conducted on consumer confidence and its relationship to stock market returns. Industrial confidence is usually assessed with different questions, but same methods than consumer confidence, and therefore equivalent equations are applicable for both. However, there are some differences between the research institutes, for example European Commission and University of Michigan, and how the confidence indicators are constructed. This causes some alternations in the equations which are presented more thoroughly in the following pages.

In Otoo's (1999) study, the correlation and causality between consumer and confidence and the stock market, is inspected using aggregate data. Simple ordinary least square (OLS) regressions are made by using the Michigan SRC index of consumer sentiment (MICH) and the Wilshire 5000 stock price index (STOCKS). The data applied in the equations are monthly points from June 1980 to June 1999. The equation are as follows:

$$\Delta \ln(STOCKS)_t = \alpha + \Delta \ln(MICH)_t + \Delta \ln(MICH)_{t-1} \quad (7)$$

Where $\Delta \ln(STOCKS)$ is the first difference of the log of the Wilshire 5000 stock price index and $\Delta \ln(MICH)$ is the first difference of the log of the Michigan SRC index of consumer sentiment. In this study, similar approach as equation (7) is executed with some modification. The MICH is constructed with different methods than Commission's industrial confidence and MICH does not get value of less than zero. Therefore, the first difference of the log of the Commission's industrial confidence is not functional. The change in industrial confidence is given as level –based variable. The variables are regressed individually to avoid multicollinearity and to see valid results about any individual predictor. Also, the level of current and lagged industrial confidence are added to the model:

$$R_{stocks,t} = \alpha + IC_{EA,t} \quad (8)$$

Where $R_{stocks,t}$ is the monthly stock market returns of a country and IC_{EA} is the industrial confidence indicator of euro area. The current level of confidence indicator would not predict stock market returns in the following periods, but it explains the relationship between these two variables.

(9) $$R_{stocks,t} = \alpha + \Delta IC_{EA,t}$$

Where $\Delta IC_{EA}$is the change of industrial confidence of euro area. The change in current industrial confidence is supposed to be statistically significant if industrial confidence and stock market returns have a positive relationship.

(10) $$R_{stocks,t} = \alpha + IC_{EA,t-1}$$

Where $IC_{EA,t-1}$is the industrial confidence indicator of euro area at the time t-1. The lagged level of industrial confidence may predict stock market returns in the following period as the literature review of consumer confidence proposed.

(11) $$R_{stocks,t} = \alpha + \Delta IC_{EA,t-1}$$

Where $\Delta IC_{EA}$is the change of industrial confidence of euro area at the time t-1. The lagged change in industrial confidence is hypothesized to predict stock market returns in the following period.

To obtain a better understanding of the dynamic relationship between consumer confidence and the stock markets, Otoo (1999) run a simple unrestricted VAR of the form below:

(12) $$\Delta \ln(STOCKS)_t = \alpha_1 + \sum_{i=1}^{8} \beta_{2i} \Delta \ln(MICH)_{t-i} + \sum_{i=1}^{8} \delta_{2j} \Delta \ln(STOCKS)_{t-j} + \varepsilon_2,$$

Where the variables are defined as the same as in equation (7) and the ε_i are randomly distributed error terms with zero means. The parameters to be estimated are the α_i, $\beta_i$and the δ_i.

However, given the fact that industrial confidence may be highly correlated with the stock market as consumer confidence is proved to be, one should test the integration of industrial confidence and the stock market indices. The Johansen System cointegration test will be used to approach this question. If cointegration occurs, in order to avoid the problem of misspecification and imbalance, we estimate the cointegrating vector error correction model (VECM) for the relationships between stock market indices and industrial confidence. The VECM takes the form as follows:

(13) $$\Delta y_t = v + \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-1} + \varepsilon_t$$

Where $\Pi = \sum_{j=1}^{j=p} Aj - I_k$ and $\Gamma_i = -\sum_{j=i+1}^{j=p} Aj$

y_t is a K x 1 vector of variables, v is a K x 1 vector of parameters, and ε_t is a K x 1 vector of disturbances with mean 0 and covariance matrix Σ. The above cointegrating equation estimate the parameters of the cointegrating VECM for the time-series of the log of indices which are all shown to have unit root and integrated with the same order.

Moreover, the lagged change of industrial confidence is tested with dummy variables to see if the magnitude of the change is significant.

(14) $$R_{stocks,t} = D(pos)_{t-1} + D(neg)_{t-1}$$

Where, R_{stocks} is equivalent to the monthly stock market returns of a country. The dummy variable D(pos) takes the value of 1 if the change in industrial confidence is positive. The dummy variable D(neg) takes the value of 1 if the change in industrial confidence is negative. A potential investment strategy may be identified if dummies are acceptable at significant level. The different indices are tested with dummy variables to see if the industrials, consumer staples, value or growth indexes have different kind of a characteristics than standard large + mid cap index. Moreover, the industrial confidence of a country, euro area and Germany are used to see if the magnitude of the effect varies.

In the essence of capital asset pricing models presented in the market efficiency part of this study. We further test if the industrial confidence based investment strategy creates abnormal returns when measured with the capital asset pricing model. The multi-factor models are not applicable or would not make difference because the investment strategy (tactic) invest into same stocks as index.

(15) $$R_{tactic,t} = \alpha + \beta_1 R_{stocks,t} + \varepsilon_t$$

Where R_{tactic} is the monthly returns of the industrial confidence based investment strategy in a country. R_{stocks} is the monthly stock market returns of a country's standard index. The investment strategy attempts to beat the stock market index in the same country. Therefore, the strategy uses same index and only times stock purchases and sales.

5.4 Results

Table 6. The relationship between industrial confidence and stock market returns. $\mathbf{R}_{\text{country}}$ denotes the monthly stock market returns of a country: Finland (FI), Sweden (SE), Norway (NO), Denmark(DK) and Germany (DE). Standard errors are in parenthesis. Statistically significant at 10%(*), 5%(**), 1%(*) level.

Equation	*Variable*	R_{FI}	R_{SE}	R_{NO}	R_{DK}	R_{DE}
(8)	*Constant*	0,007	0,009**	0,010**	0,014***	0,009**
		(1,23)	(2,04)	(2,26)	(3,88)	(2,41)
	$IC_{EA,t}$	-0,001	-0,001	-0,000	0,000	0,000
		(-1,53)	(-1,74)	(-0,25)	(0,56)	(0,15)
(9)	*Constant*	0,012**	0,013***	0,010***	0,012***	0,009***
		(2,45)	(3,59)	(2,92)	(4,49)	(2,86)
	$\Delta IC_{EA,t}$	0,010***	0,009***	0,009***	0,011***	0,010***
		(3,50)	(4,11)	(4,45)	(6,50)	(5,12)
(10)	*Constant*	0,005	0,007*	0,008*	0,012***	0,008*
		(0,90)	(1,67)	(1,86)	(3,30)	(1,95)
	$IC_{EA,t-1}$	-0,001**	-0,001**	-0,000	-0,000	-0,000
		(-2,14)	(-2,45)	(-1,01)	(-0,51)	(-0,71)
(11)	*Constant*	0,012**	0,012***	0,010***	0,012***	0,009***
		(2,42)	(3,41)	(2,85)	(4,20)	(2,84)
	$\Delta IC_{EA,t-1}$	0,002	0,002	0,005**	0,004**	0,004**
		(0,76)	(0,83)	(2,33)	(2,11)	(2,07)

The industrial confidence indicator of euro area seems to have contemporaneous relationship with stock market returns in all studied countries. This finding is in contrast to consumer confidence and its relationship to stock market returns. Also, table 6 seems to provide some evidence that industrial confidence has predictive power over the stock market returns. The level of industrial confidence is significantly correlated with the returns of the following month in Finland and Sweden. Whereas the change of industrial confidence is significantly correlated with the returns of the following month in Norway and Denmark. Also, the stock

market returns in Germany has statistically significant relationship with the lagged change in industrial confidence.

Table 7. The results of VECM. $\Delta\ln(\text{country})_t$ denotes the first difference of the log of a country's stock index: Finland (FI), Sweden (SE), Norway (NO), Denmark(DK) and Germany (DE). Standard errors are in parenthesis. Statistically significant at 10%(*), 5%(**), 1%(*) level.

	$\Delta ln(FI)_t$	$\Delta ln(SE)_t$	$\Delta ln(NO)_t$	$\Delta ln(DK)_t$	$\Delta ln(DE)_t$
$\Delta ln(country)_{t-1}$	0,022***	0,088	0,109*	0,047	0,034
	(3,89)	(1,55)	(1,94)	(0,79)	(0,60)
$\Delta ln(country)_{t-2}$	-0,101*	-0,026	-0,051	0,020	-0,038
	(-1,79)	(-0,46)	(-0,87)	(0,34)	(-0,67)
$\Delta IC_{EA,t-1}$	-0,002	-0,000	0,004	0,002	0,002
	(-0,62)	(-0,14)	(1,35)	(0,71)	(0,93)
$\Delta IC_{EA,t-2}$	0,008**	0,004	0,002	0,003	0,003
	(2,15)	(1,53)	(0,69)	(1,10)	(1,21)
constant	0,007	0,009**	0,007**	0,010***	0,007**
	(1,44)	(2,57)	(1,97)	(3,23)	(2,09)

The table 7 provides the results of equation 13. The results of vector autoregressive model (VAR), not presented in this study, show no statistically significant relationship between the lagged terms of euro area industrial confidence and the monthly stock market returns of a country. This relationship is further tested with the vector error correction model because variables are cointegrated at the 5% confidence level. The results of vector error correction model (VECM) are similar to VAR. The industrial confidence indicator shows non-existent or only weak prediction power for the stock market returns.

Equation (14) tests whether the positive or negative change in industrial confidence predict stock market returns in the following month. The statistically reliably relationship between the dummy variable of industrial confidence and the stock market returns may prove that the magnitude of change in confidence indicator is insignificant. The results of equation (14) are presented in the following pages.

Table 8. The results of dummy variables. D(pos) denotes the positive change in industrial confidence in euro area (ea), Germany (de) or a country (Finland or Sweden). D(neg) denotes the negative change in industrial confidence in euro area (ea), Germany (de) or a country (Finland or Sweden). The indexes of a country are standard, industrials, consumer staples, value and growth. Statistically significant at 10%(*), 5%(**), 1%(*) level.

	Finland					Sweden				
	Standard	*Industrials*	Staples	*Value*	*Growth*	*Standard*	*Industrials*	Staples	*Value*	*Growth*
$D(pos)_{ea,t-1}$	0,019***	0,018***	0,011*	0,013**	0,023***	0,019***	0,020***	0,015***	0,019***	0,020***
	(2,83)	(3,20)	(1,94)	(2,17)	(2,99)	(3,84)	(3,86)	(3,34)	(3,81)	(3,27)
$D(neg)_{ea,t-1}$	0,004	0,003	0,009	0,004	0,005	0,006	0,007	0,013***	0,007	0,004
	(0,55)	(0,49)	(1,54)	(0,62)	(0,58)	(1,09)	(1,37)	(2,59)	(1,32)	(0,65)
$D(pos)_{de,t-1}$	0,019***	0,019***	0,015**	0,016***	0,022***	0,019***	0,021***	0,016***	0,020***	0,019***
	(2,79)	(3,30)	(2,54)	(2,59)	(2,81)	(3,67)	(3,90)	(3,55)	(3,83)	(3,07)
$D(neg)_{de,t-1}$	0,004	0,003	0,006	0,001	0,006	0,007	0,007	0,012**	0,007	0,005
	(0,63)	(0,44)	(0,95)	(0,23)	(0,80)	(1,30)	(1,37)	(2,41)	(1,34)	(0,89)
$D(pos)_{country,t-1}$	0,012	0,011*	0,014**	0,010	0,016*	0,015**	0,016**	0,011**	0,014***	0,015*
	(1,55)	(1,80)	(2,24)	(1,57)	(1,67)	(2,45)	(2,53)	(2,33)	(2,69)	(1,89)
$D(neg)_{country,t-1}$	0,017**	0,016**	0,009	0,009	0,023**	0,008	0,010	0,017***	0,011**	0,004
	(2,30)	(2,57)	(1,46)	(1,44)	(2,52)	(1,28)	(1,57)	(3,67)	(2,01)	(0,56)

Table 9. The results of dummy variables. D(pos) denotes the positive change in industrial confidence in euro area (ea), Germany (de) or a country (Norway or Denmark). D(neg) denotes the negative change in industrial confidence in euro area (ea), Germany (de) or a country (Norway or Denmark). The indexes of a country are standard, industrials, consumer staples, value and growth. Statistically significant at 10%(*), 5%(**), 1%(*) level.

	Norway					Denmark				
	Standard	*Industrials*	Staples	*Value*	*Growth*	*Standard*	*Industrials*	Staples	*Value*	*Growth*
$D(pos)_{ea,t-1}$	0,020***	0,023***	0,027***	0,021***	0,018***	0,018***	0,022***	0,014***	0,020***	0,019***
	(4,08)	(3,50)	(4,05)	(4,02)	(3,33)	(4,54)	(3,59)	(2,99)	(4,23)	(4,10)
$D(neg)_{ea,t-1}$	-0,000	-0,001	0,006	0,004	-0,003	0,006	-0,000	0,003	0,002	0,008*
	(-0,10)	(-0,22)	(0,88)	(0,64)	(-0,49)	(1,42)	(-0,04)	(0,66)	(0,37)	(1,64)
$D(pos)_{de,t-1}$	0,023***	0,025***	0,032***	0,024***	0,020***	0,019***	0,021***	0,017***	0,020***	0,020***
	(4,66)	(3,81)	(4,77)	(4,51)	(3,80)	(4,57)	(3,40)	(3,55)	(4,18)	(4,16)
$D(neg)_{de,t-1}$	-0,003	-0,003	0,002	0,001	-0,005	0,006	0,001	0,001	0,002	0,008
	(-0,57)	(-0,45)	(0,25)	(0,23)	(-0,87)	(1,45)	(0,21)	(0,15)	(0,49)	(1,63)
$D(pos)_{country,t-1}$						0,015***	0,015**	0,012**	0,012**	0,017***
						(3,55)	(2,26)	(2,32)	(2,51)	(3,43)
$D(neg)_{country,t-1}$						0,010**	0,008	0,007	0,010**	0,011**
						(2,47)	(1,36)	(1,38)	(2,13)	(2,37)

Tables 8-9 seem to provide consistent results that the positive dummy variable has statistically significant and positive relationship with the stock market returns in all studied countries. Meaning, that the positive change in industrial confidence predicts the positive stock market returns in the following month. The negative dummy variable of industrial confidence shows no consistent statistically significant relationship, but still has some reliable results. Thus, the magnitude of change seems to be rather irrelevant.

In Table 8, the returns of Finland's standard index are approximately 1,9% per month if the change in the industrial confidence of euro area or Germany has been positive in the previous month. The index of growth companies show even higher results, up to 2,3% returns per month. The positive dummy of euro area and Germany show to be statistically significant and positive for all the studied stock indexes of Finland. On the other hand, the positive dummy of Finland has reliable relation with three of them and only one at 5% level. The explanation for the positive and statistically significant results with the negative change in Finland's industrial confidence are unknown. The returns of Sweden's standard index are 1,9% and 1,5%. The highest returns, 2.1% per month, are created with the industrials index of Sweden and the industrial confidence of Germany. The positive dummy of euro area and Germany have a strong positive and statistically significant relationship with all the stock indexes of Sweden. Also, the positive dummy of Sweden's industrial confidence shows statistically reliable predicting power, although the p-values are weaker.

In Table 9, the returns of Norway's standard index show 2,0% and 2,3% returns per month. The highest returns are given by the consumer staples index of Norway, roughly 3,2% per month. The positive dummy variable of euro area and Germany show very strong relationships with Norway's stock indexes. The predicting power of Norway's industrial confidence is not available in this study. The returns of Denmark's standard index are 1,8%, 1,9% and 1,5% per month. The highest returns are achieved by the industrials index of Denmark, 2,2% per month. The positive dummy of Denmark's industrial confidence shows positive and statistically significant returns for all the stock indexes.

The results of table 8 and 9 accept the H1 that the industrial confidence indicator of euro area predicts stock market return in Finland, Sweden, Norway and Denmark. H2 is accepted that the industrial confidence indicator Germany predicts stock market returns in the same regions. H3 is rejected, because the industrial confidence indicator of a country may also

predict stock market returns in the same country. H4 is accepted with some consideration, the industrial confidence seems to predict industrials companies better than consumer staples, but not in Norway. H5 is rejected, the value and growth companies of studied regions seem to be as much predicted by the industrial confidence indicators.

Lastly, the classical approach with the capital asset pricing model is tested. The results are presented in Table 10.

Table 10. The results of the CAPM. R_{Tactic} denotes the return of the investment strategy presented in this study in a country. R_{country} denotes the return of the standard index in a country. Finland (FI), Sweden (SE), Norway (NO), Denmark (DK) and Germany (DE). Statistically significant at 10%(*), 5%(**), 1%(*) level.

	A	$R_{country}$
$R_{Tactic,FI}$	0,005**	0,399***
	(2,16)	(14,72)
$R_{Tactic,SE}$	0,005***	0,366***
	(2,96)	(13,61)
$R_{Tactic,NO}$	0,006***	0,407***
	(3,53)	(15,05)
$R_{Tactic,DK}$	0,005***	0,371***
	(3,33)	(13,66)
$R_{Tactic,DE}$	0,007***	0,395***
	(4,04)	(14,67)

In table 10, the results of CAPM are presented. The alphas of the tactic appear to be reliably positive in all studied regions. Therefore, the industrial confidence based investment strategy indicate positive abnormal returns.

5.5 Back testing

The investment strategy is based on the results of the empirical part of this study. The positive dummy variable of euro area seems to create abnormal returns and to be statistically significant. Therefore, whenever the change of industrial confidence is positive, the strategy chooses stocks in the following month. Otherwise, it avoids to be at the stock market and generate risk-free returns from the money market. The strategy does not use shorting because negative dummy shows no statistically significant negative relationship with the stock markets returns. Unfortunately, the monthly updated industrial confidence is not published at the end of December, but in the beginning of January. Therefore, we have to make crucial decision to exclude January from the calculations. Otherwise, January effect could alternate results if it occurs in Nordic countries. Also, staying out one 12th of year from equities would cost in the long run.

Table 11. The investment strategy in Finland and Sweden. Table 11 presents the results of the investment strategy with January excluded. Money market rates meaning Frankfurt's banks' 1-month lending rate from 1988 to 2012 and 1-month Euribor from 2012 to 2015. Index means the MSCI net total return index of Finland or Sweden. Tactic includes the results of industrial confidence based market timing in a country. Each countries' column includes the statistics of the investment strategy and an index.

		Finland		Sweden	
	Money market rates	Index	Tactic	Index	Tactic
Cumulative returns	150 %	645 %	**1752 %**	1703 %	**2875 %**
Average annual	3,40 %	7,60 %	**11,23 %**	11,12 %	**13,17 %**
Standard deviation	0,78 %	29,23 %	**18,52 %**	22,26 %	**13,45 %**
Risk/Reward	4,34	0,26	**0,61**	0,50	**0,98**
Observations	301	301	301	301	301
#periods per year	11	11	11	11	11
Year of data	27,42	27,42	27,42	27,42	27,42

Table 12. The investment strategy in Norway and Denmark. Table 12 presents the results of the investment strategy with January excluded. Money market rates meaning Frankfurt's banks' 1-month lending rate from 1988 to 2012 and 1-month Euribor from 2012 to 2015. Index means the MSCI net total return index of Norway or Denmark. Tactic includes the results of industrial confidence based market timing in a country. Each countries' column includes the statistics of the investment strategy and an index.

		Norway		Denmark	
	Money market rates	Index	Tactic	Index	Tactic
Cumulative returns	150 %	990 %	**3283 %**	1497 %	**2335 %**
Average annual	3,40 %	9,10 %	**13,70 %**	10,64 %	**12,35 %**
Standard deviation	0,78 %	21,21 %	**13,23 %**	17,58 %	**10,78 %**
Risk/Reward	4,34	0,43	**1,04**	0,61	**1,15**
Observations	301	301	301	301	301
#periods per year	11	11	11	11	11
Year of data	27,42	27,42	27,42	27,42	27,42

In Tables 11-12 the investment strategy based on industrial confidence indicator of euro area seems to have created superior returns when compared to market returns in the all studied regions. The investment strategy uses the same securities, in this case stocks and only competes with the market timing. For example, the investment strategy of Finland would contain the same portfolio of stocks as MSCI Finland does. Tables 11-12 provide incontrovertible evidence that the strategy would have worked in the last 27 years and would have provided exterior returns for investors. The risk to reward ratio measures the returns in relation to risk. The risk to reward ratio has been over two times the ratio of index in Finland and Norway. Also, the investment strategy of Sweden and Denmark would have beaten the market, not only with higher returns, but also with lesser risk. The yearly returns of the investment strategies and the indexes are presented more closely in appendix 2.

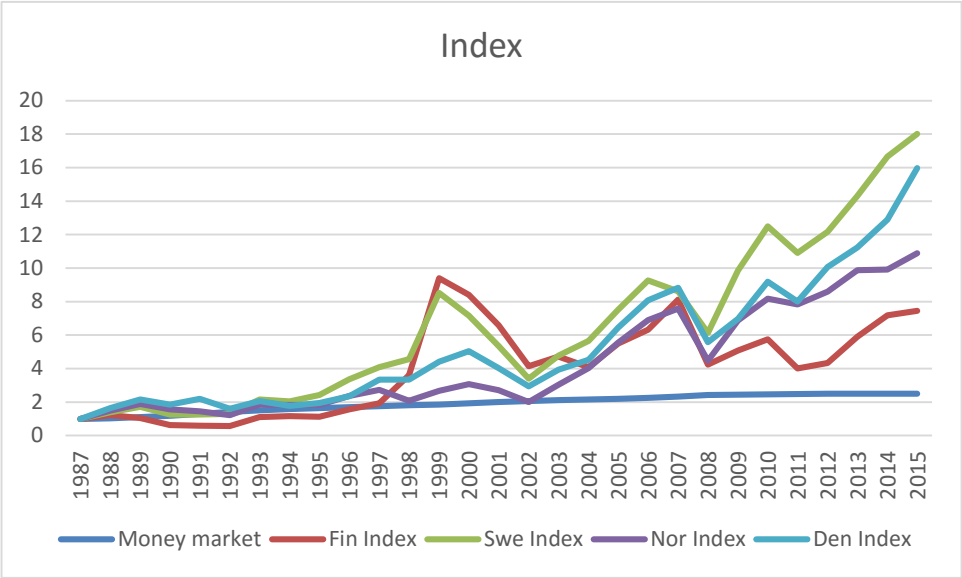

Figure 2. The returns of the indexes.

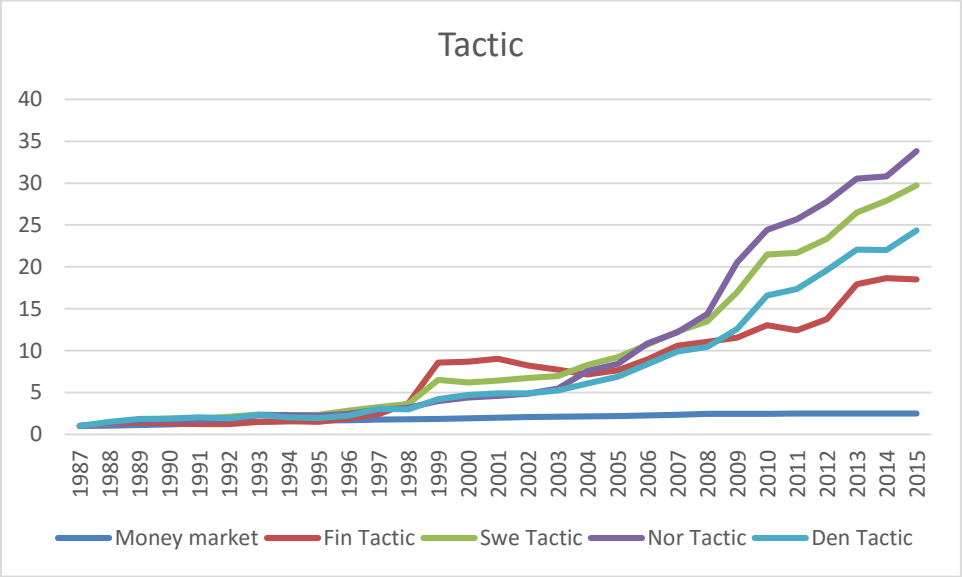

Figure 3. The returns of the investment strategy.

Figure 2 and 3 provide the graphical demonstration of the total returns for all portfolios. The vertical axle displays the cumulative returns. The fluctuations of index returns are easily spotted, the tactics seem to be steadier while still beating the index returns.

6 CONCLUSIONS

The efficient market hypothesis claims that information is already merged into the prices of securities. Although, the amount of information that companies and investors are able to collect is beyond understanding. The previous literature has found notable contemporaneous linkage between consumer confidence and the stock market indices. This thesis elaborates the same relationship between industrial confidence and the stock market. The industrial confidence indicator is measured in the whole euro area, as well as in its member and candidate states. The study hypothesizes that the information gathered from the greater market areas would reflect export-dependent market areas with short lag. Nordic countries, Finland, Sweden, Norway and Denmark, are studied in order to elaborate this relationship.

The movements of the stock market indices and confidence indicators seems to be synchronized. However, the thesis finds some evidence that the industrial confidence indicator of euro area may predict stock market returns in the following month. The OLS – regressions indicate that the level of industrial confidence predicts stock market returns in the following month in Finland and Sweden. Also, the change of industrial confidence predicts stock market returns in the following month in Norway and Denmark. The VAR – analysis and moreover, the vector error correction model of VAR disproves these results and shows no statistically significant relationship between the lagged terms of stock market returns and industrial confidence in any given countries.

Lastly, the empirical part of the study examines dummy variables based on the change in industrial confidence. Positive change in the industrial confidence of euro area, no matter the magnitude, is proved to have a strong relationship with positive stock market returns in the following month. The positive change in the industrial confidence of Germany predicts stock market returns. Also, the study finds some evidence that even the positive change in the industrial confidence of a country predict positive stock market returns in the same country. The predictive power is stronger for industrials companies than consumer staples. The thesis finds no differences between value and growth stocks.

The issue of active market efficiency has been, and will be, topical because the market efficiency might change over time. We have to imply that the more information collectors there are, the better the markets are. Therefore, not all investors could benefit from the same

investment strategy. One could research if stock market returns are higher or lower in a state of market optimism or pessimism measured by industrial confidence.

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APPENDICES

Appendix 1. Barberis & Thaler (2003) cognitive psychology.

- *Overconfidence*. Alpert & Raiffa (1982) show overconfidence in people's judgements when estimating their own abilities. In the financial markets, trading activity is highly predictive of poor investment performance which may be responsible for the prevalence of active versus passive investment management. Also, people are poorly calibrated when estimating probabilities.
- *Optimism and wishful thinking*. Weinstein (1980) study the unrealistic view of people's abilities and prospects. People see their driving skill, social skills, and sense of humor among other domains above average. Also, a systematic planning fallacy occurs, when tasks are predicted to be completed much sooner than they actually are.
- *Representativeness*. Kahneman & Tversky (1974) show that the representativeness heuristic is used when determining the probability of a data set or classifying an object to one. This causes severe biases, for example when the more detailed description of an object seems to be more likely than the less detailed which cannot be true if the first one includes the second one. In addition, people tend to base their opinion on the basis of too few data points.
- *Conservatism*. While representativeness leads to an underweighting of base rates, conservatism in an experiment run by Edwards (1968) over-emphasize subjects relative to sample evidence. People are too slow in updating their beliefs in response to new evidence. The efficient market hypothesis expects prices to fully reflect new information and conservative agents probably would not.
- *Belief perseverance*. Lord, Ross & Leppers (1979) find that when people form opinions, they cling to them tightly and are not willing to change them. The evidence that contradicts their beliefs are treated with excessive skepticism and they are reluctant to search for such evidence. Also, the evidence that goes against their hypothesis is actually misinterpret to support their own beliefs. In the context of classical theories of finance, it would take for a long time before people could change their beliefs about the efficient market hypothesis.
- *Anchoring*. Kahneman & Tversky (1974) present that people cling on the initial value of an object and adjustment is often insufficient. In the financial market, this would mean that the market price has affection to the valuation process of a security.

- *Availability biases*. Presented by Kahneman & Tversky (1974) is a common problem when investors place too much weight on a small number of recent events. People are confident that certain similar movements follow the same chain of events. They search their memories for relevant information. For example, in the upward slope of a trendy stock most are buyers and they turn into sellers without any change of fundamentals.

Appendix 2. Yearly data January excluded. The investment strategy (tactic) based on industrial confidence bolded when beating the index.

		Finland		Sweden		Norway		Denmark	
	Money market	Index	Tactic	Index	Tactic	Index	Tactic	Index	Tactic
1988	3,78 %	21,71 %	**25,55 %**	38,28 %	29,84 %	49,43 %	34,87 %	64,39 %	49,04 %
1989	6,35 %	-13,19 %	**13,07 %**	23,87 %	**36,55 %**	26,64 %	25,98 %	31,54 %	23,05 %
1990	7,66 %	-41,02 %	**-8,85 %**	-26,66 %	**5,26 %**	-16,92 %	**-0,96 %**	-14,10 %	**2,92 %**
1991	8,54 %	-3,99 %	-4,99 %	-0,40 %	**0,69 %**	-7,32 %	**0,73 %**	17,79 %	6,59 %
1992	9,06 %	-5,03 %	**-1,90 %**	4,34 %	**11,94 %**	-15,98 %	**5,90 %**	-26,66 %	**-4,19 %**
1993	7,13 %	94,09 %	23,70 %	64,71 %	12,92 %	50,44 %	28,43 %	28,78 %	21,56 %
1994	5,00 %	5,61 %	5,61 %	-4,95 %	-4,95 %	-0,97 %	-0,97 %	-13,76 %	-13,76 %
1995	4,21 %	-2,90 %	-4,27 %	18,38 %	2,46 %	0,30 %	-3,20 %	9,00 %	-3,76 %
1996	3,05 %	37,93 %	27,58 %	38,94 %	22,32 %	29,07 %	10,18 %	21,32 %	13,80 %
1997	2,98 %	23,09 %	**25,50 %**	21,64 %	15,51 %	15,24 %	**20,69 %**	42,14 %	37,47 %
1998	3,24 %	88,22 %	52,82 %	11,59 %	11,36 %	-23,35 %	**8,11 %**	-0,43 %	-1,66 %
1999	2,58 %	160,04 %	132,27 %	86,57 %	78,73 %	27,95 %	25,51 %	32,12 %	**40,57 %**
2000	3,87 %	-10,46 %	**1,11 %**	-15,88 %	**-4,94 %**	15,41 %	10,15 %	14,51 %	11,86 %
2001	4,10 %	-21,72 %	**4,10 %**	-25,21 %	**4,10 %**	-11,95 %	**4,10 %**	-20,27 %	**4,10 %**
2002	3,08 %	-37,22 %	**-8,83 %**	-36,70 %	**4,80 %**	-26,16 %	**6,39 %**	-26,90 %	**-0,42 %**
2003	2,18 %	13,95 %	-6,19 %	40,68 %	3,20 %	51,82 %	12,74 %	33,89 %	7,30 %
2004	1,89 %	-13,35 %	**-7,56 %**	18,60 %	**18,95 %**	32,40 %	**38,08 %**	14,89 %	**16,27 %**
2005	1,94 %	34,49 %	6,98 %	33,12 %	11,17 %	38,22 %	11,07 %	42,66 %	13,21 %
2006	2,65 %	15,08 %	**17,05 %**	23,06 %	16,35 %	23,80 %	**29,21 %**	25,27 %	21,34 %
2007	3,73 %	28,50 %	18,72 %	-7,03 %	**14,52 %**	10,23 %	**12,12 %**	9,12 %	**18,66 %**
2008	4,08 %	-47,71 %	**4,35 %**	-28,85 %	**10,12 %**	-41,16 %	**17,88 %**	-36,72 %	**5,05 %**
2009	0,84 %	19,82 %	4,32 %	60,91 %	25,52 %	53,85 %	42,81 %	25,01 %	20,67 %
2010	0,46 %	13,02 %	13,02 %	26,60 %	26,60 %	19,06 %	19,06 %	31,81 %	31,81 %
2011	1,05 %	-30,26 %	**-4,69 %**	-12,59 %	**0,89 %**	-4,35 %	**5,17 %**	-12,99 %	**4,83 %**
2012	0,30 %	7,86 %	**10,81 %**	11,44 %	7,91 %	9,92 %	8,27 %	25,88 %	12,83 %
2013	0,11 %	36,41 %	30,01 %	17,69 %	13,35 %	14,72 %	9,83 %	11,43 %	**12,49 %**
2014	0,13 %	21,60 %	4,14 %	16,35 %	5,32 %	0,36 %	**0,88 %**	14,93 %	-0,17 %
2015	0,00 %	3,78 %	-0,73 %	8,25 %	6,65 %	10,00 %	9,80 %	23,81 %	10,65 %