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How the value stocks behave in the responsible portfolios?

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ABSTRACT:

In the existing financial literature, the value investing style has been confessed as one of the investment styles to gain risk-adjusted returns. The aim of value investors has been to seek stocks that the market keeps undervalued in relation to their fundamental values. To evaluate firms' undervaluation the most useful measures for the investors have been the market-based fundamental ratios in which the firm's market value has proportioned against the variables such as earnings, book value, and cash flows. However, even though the financial researchers have agreed with the higher returns of value stocks, the reasons behind them have been more unknown. Primarily, the explanations have been searched from the assumptions of modern finance theory and behavioral finance theory.

Anyway, the accelerating climate change and prevailing Covid-19 pandemic have increased investors' concerns of the risks that could harm the society and environment. Therefore, besides the optimal risk-return relationship the investors have started to emphasize irrational factors such as personal values and preferences in their investment behavior. Thus, nowadays even more investors have incorporated environmental, social and governance (ESG) issues to their investment decision process at the risk of leaving behind the average market return which the modern portfolio theory has suggested.

However, the purpose of this paper has been to investigate how the returns of value stocks behave in the responsible portfolios. So far, this topic has been somewhat new amongst the financial researchers which is why its financial literature has remained restricted. Also, the results that have already been obtained have varied from each other because of their different methods and approaches. Nevertheless, the results that have been gained in this paper by constructing the ESG integrated value portfolios from the OMXH companies have pointed out that this blended investment strategy has not been as profitable as pure value and ESG investing strategies between the years 2015-2019. Also, the alphas of the ESG integrated value portfolios have been mostly negative which indicates that they have underperformed the market on average. However, the doubts are that the outcome has been mainly affected by the diminished effect of value premium after the 21st century and by the current macroeconomic situation.

KEYWORDS: Value investing, Responsible investing, ESG, OMXH, performance

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TIIVISTELMÄ:

Olemassa olevassa rahoituskirjallisuudessa rahoitustieteilijät ovat olleet jokseenkin yksimielisiä arvosijoittamiseen liittyvistä ylituotoista. Arvosijoittamisella viitataan sijoittajan pyrkimykseen etsiä markkinoilta osakkeita, joiden markkina-arvoa pidetään alihinnoiteltuna suhteessa niiden fundamenttiarvoon. Hyödyllisimpinä tunnuslukuina aliarvostuksen havaitsemiseksi on sijoittajien keskuudessa toimineet markkinapohjaiset tunnusluvut, joissa yrityksen markkina-arvo suhteutetaan muuttujiin, kuten tuottoihin, kirja-arvoon tai kassavirtoihin. Vaikka rahoitustieteilijät näkevät arvosijoittamisen keinona ansaita riskikorjattuja tuottoja ovat syyt tuottojen takana jääneet arvoitukseksi. Pääosin tutkimukset ovat selittäneet korkeampia tuottoja moderniin rahoitusteoriaan ja behavioristiseen rahoitusteoriaan liitetyillä oletuksilla.

Jatkuvasti kiihtyvä ilmastonmuutos ja vallitseva Covid-19 pandemia ovat viime vuosina lisänneet sijoittajien huolta yhteiskuntaan ja ympäristöön kohdistuvista riskeistä. Sen takia, sijoittajat ovat alkaneet etenevissä määrin painottamaan sijoituskäyttäytymisessään epärationaalisia piirteitä, kuten arvoja ja mieltymyksiä optimaalisen tuoton ja riskin välisen yhteyden tavoittelun sijaan. Siten, nykypäivänä yhä useampi sijoittaja ottaa huomioon yrityksen ympäristö-, yhteiskunta- ja hallintotapavastuun (ESG) periaatteet tehdessään sijoituspäätöksiä silläkin uhalla, että heidän tuottonsa jäävät alle markkinoiden keskimääräisen tuoton. Tätä väitettä tukee moderni portfolioteoria, joka uskoo, että vastuullisen sijoittamiseen liitetyt huonommat tuotot ovat seurausta epäoptimaalisesta hajauttamisesta, jota puolestaan heikentää sijoituskohteiden rajallisuus.

Tämän tutkielman tarkoituksena on selvittää miten arvo-osakkeiden tuotot käyttäytyvät, kun sijoituskohteita suodatetaan arvofaktoreiden lisäksi ESG-faktoreilla. Rahoitustieteilijöiden keskuudessa tämä strategia on ollut varsin uusi, jonka haittapuolena voidaan kuitenkin pitää tutkimusten vähäisyyttä, erilaisia lähestymistapoja ja tulosten poikkeavuutta. Siitä huolimatta tulokset, jotka on saavutettu tässä tutkimuksessa rakentamalla ESG integroidut arvoportfoliot OMXH yhtiöistä, tukevat väitettä, että tämä yhdistelmästrategia ei ole ollut yhtä tuottoisa kuin yksittäiset arvo- ja ESG-strategiat vuosina 2015–2019. Sen lisäksi, tulokset osoittavat, että strategiaan liitetyt keskimääräiset vuosituotot ovat jääneet markkinoiden keskimääräisiä tuottoja alhaisemmiksi tutkitulla aikavälillä. Tämän tutkielman pääasiallinen uskomus kuitenkin on, että strategian huonoa menestystä kyseisinä vuosina ovat ajaneet arvopreemion 2000-luvun jälkeinen heikkeneminen sekä vallitseva makrotaloudellinen tilanne.

AVAINSANAT: Arvo-sijoittaminen, Vastuullinen sijoittaminen, ESG, OMXH, osakkeiden suorituskyky

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Abbreviations

AMEX	American Express American Stock Exchange
CAPM	Capital Asset Pricing Model
CML	Capital Market Line
CSR	Corporate Social Responsibility
ESG	Environmental, Social and Governance
GSIA	Global Sustainable Investment Alliance
MSCI	Morgan Stanley Capital International
NASDAQ	National Association of Securities Dealers Automated Quotations
NYSE	New York Stock Exchange
OMXH	OMX Helsinki
OMXH25	OMX25 Helsinki
PRI	Principles of Responsible Investment
TSE	Tokyo Stock Exchange
VIX	Cboe Volatility Index

1 Introduction

1.1 The research problem

Various studies have discovered that by using the investing style called value investing several investors have been able to obtain risk-adjusted returns. The purpose of value investor has been to seek stocks that the market keeps underpriced in relative to their fundamental value. By using the well-known fundamental ratios such as P/E-, P/B-, P/CF- and dividend yield ratio the investor has been able to evaluate the firm's undervaluation in the market. Also, the famous Capital Asset Pricing model from Sharpe (1964) has offered a useful tool for the value investors to predict the firm's intrinsic value based on its risk level. Anyway, in the financial literature the value investing style has considered as a one of the anomalies that has not followed the principles of Fama's (1970) efficient market hypothesis because it has confessed the appearance of mispricing effects as well as the investors irrational behavior from the markets.

Moreover, another fairly recent and popular investing style that has also shown conflicting signs with the modern finance theory has been responsible investing. The roots of responsible investing exceed the very religious times in the middle of 1700s when the money has seen to be possessing secondary status besides the New Testament. During the 1700s investors followed mainly the principles of ethical investing which guided investors to avoid investing in any harmful business. (Schueth 2003.)

However, nowadays the concept of responsible investing replicates mostly its roots from the 1960s when it was understood as an investing approach that could also help the investors to influence things such as climate change, working conditions, and gender equality. Thus, in the current financial literature, responsible investing has determined along with the UN Principles of Responsible Investment (PRI) which describes it as an investment activity where the investor incorporates environmental, social, and governance issues (ESG-issues) to their investment decision-making process without sacrificing the financial return of an investment. Anyway, one of the main reasons for its high

popularity during the past decade has been the rapidly accelerating climate change and the Covid-19 pandemic of which the world has been facing after March 2020.

However, according to the well-known portfolio theory from Harry Markowitz (1952), neither value investing nor responsible investing should be able to provide higher risk-adjusted returns to the investors because their preferences set limitations on the total investment population. When the total investment universe becomes restricted, the investors are not able to maximize their diversification which denies investors opportunity to reach the optimal point from the efficient frontier. Nevertheless, against these theoretical odds, some financial researchers have still been able to confess the higher risk-adjusted of these two investment approaches.

The financial researchers that have proved the existence of value premium have been, for example, Basu (1977), Fama & French (1992), Lakonishok, Shleifer & Vishny (1994), Chan, Hamao & Lakonishok (1991), Fama & French (1998) and Petkova & Zhang (2005) which studies have also discussed in this paper. However, recently the profitability of the value investing style has been under investigation because it has lost its strength during the past years. Therefore, also the papers from Fama & French (2020) and Miller & Prondzinski (2020) have been discussed in this paper which has examined this recent phenomenon. Anyway, Miller et al. (2020) believe that the lower returns of value investing seem to be only a temporary effect that receives support from the current macroeconomic situation.

Lastly, also the papers that have observed the returns of responsible investing have been discussed in this paper. However, the findings related to the returns of responsible investing have not been as straightforward as the results related to value stocks because the financial researchers have proven mixed outcomes of its strategies performance. Therefore, in this paper, the findings from Kempf & Osthoff (2007) and Yen, Shiu & Wang (2019) studies have been discussed which have provided pieces of evidence from the US and Asian markets regarding the profitability of ESG screening strategies.

1.2 The purpose of the study

Anyway, the purpose of this paper is to observe how the returns of value stocks behave in the responsible portfolios. As mentioned earlier the value investing style has been an extremely studied topic amongst financial researchers since the value premium has been discovered but recently the returns have remained a bit lower than has been expected. In addition, also the responsible investing approach has received a lot of attention during the past years, but the researchers have not been as unanimous concerning its higher performance. However, the mixed approach of these two factors, value and ESG, has reared its head not until recently and the financial researchers have been extremely curious to measure its returns.

The financial researchers that have observed this blended value + ESG investment strategy's performance during the 21st century have been, for example, Abramson & Chang (2000), Bauer, Koedijik & Otten (2005) and Kaiser (2020) which studies have discussed in this paper. However, the results concerning this ESG integrated value investing strategy have varied a bit from each other between these three papers which may be due to their different approaches. Anyway, a part of the results of these papers has still supported the higher profitability of this ESG integrated value investing strategy.

Thus, more accurately explained, in this paper, the behavior of the value stocks in the responsible portfolios has been examined in the Finnish stock market. The data has covered all companies that have belonged to the OMXH index during the timeline of 2015-2019. Between this observation period, the risk-adjusted returns of ESG integrated value factor portfolios have been measured and compared against the risk-adjusted returns of pure value, pure ESG and market portfolios. Lastly, all portfolios' performance has been measured with the Sharpe ratio and the alphas has been estimated with the famous Capital Asset Pricing Model.

1.3   Development of hypotheses

As discussed earlier, in the prevailing financial literature several financial researchers have agreed that the returns regarding the value stocks have been higher than the returns of growth stocks which have led to the joint acknowledgment of value premium. However, recently Fama et al. (2020) and Miller et al. (2020) have found that the value premium has weakened from its superior times. Fama et al. (2020) have proved this phenomenon from the period of 1991-2019 when they have compared the value stocks returns against the market portfolio in the US. Also, Miller et al. (2020) have confirmed this same evidence from the US during the period of 2002-2019 when they have assessed value stocks and growth stocks performance and compared them with each other.

However, because most of the research papers concerning value premium have supported its higher risk-adjusted returns, the hypothesis of this paper has been formulated accordingly. Anyway, deviating from the approaches that the authors such as Basu (1977), Fama et al. (1992), Lakonishok et al. (1994), Chan et al. (1991), Fama et al. (1998) and Petkova et al. (2005) have used in their researches, in this paper the value premium has measured as a difference of returns of value portfolios and the average returns of the market portfolio between 2015-2019. Fama et al. (2020) have supported this approach in their paper as well. Thus, the first research question and hypotheses could be formulated as follows:

1. *Has the value premium existed in the Finnish stock market between the years of 2015-2019?*

H0: Value portfolios returns have been equal with the returns of the market portfolio in the Finnish stock market between 2015-2019.

H1: Value portfolios returns have been higher than the returns of the market portfolio in the Finnish stock market between 2015-2019.

In their paper, Yen et al. (2019) have pointed out that the higher performance of high-performing CSR companies has mostly been recognized in western countries. Conversely, in other markets the studies regarding to responsible investing have remained somewhat lower. In the Asian countries the reason for this can be found, for example from the poor ESG data which has suffered from the investors' trust. Thus, investors have not been as willing to direct their funds towards responsible investments which is why the financial research has remained limited as well.

In line with Yen et al.'s (2019) assumption, Kempft et al. (2007) have found that with almost every different ESG score metric the highly rated portfolios have produced higher returns than the market portfolios in the US between 1991-2004. Conversely, Yen et al. (2019) by themselves have executed almost similar research from the three regional areas in Asia which have discovered more inconsistent results than Kempft et al. (2007). The findings from Yen et al. (2019) paper have proved out that the highly-rated ESG portfolios have offered higher returns only in Japan's equity market but lower returns in other markets such as other developed Asian countries and all emerging Asian markets. In both papers, the highly rated ESG portfolios have formed based on the positive and best-in-class ESG screening strategies.

Anyway, even though the results of Kempft et al.'s (2007) and Yen et al.'s (2019) have not been exactly in line with each other, a somewhat larger part of the findings have still found that highly rated ESG portfolios provide higher returns than the market on average which has used as a base to construct the second research question and its hypotheses. However, in this paper, only the profitability of positive ESG screening strategy has been examined which has received a bit lower attention in the financial literature than the other screening strategies. On that account, the second research question can be formulated in the following way:

2. *Have the positively screened highly rated ESG portfolios offered higher returns than the market portfolio in the Finnish stock market during 2015-2019?*

H0: The returns of highly rated ESG portfolios have been equal with the returns of the market portfolio in the Finnish stock market during 2015-2019.

H1: The returns of highly rated ESG portfolios have been higher than the returns of the market portfolio in the Finnish stock market during 2015-2019.

Lastly, after measuring the returns of individual value and ESG investing strategies returns in the Finnish stock market, the final step of this paper has been to evaluate the returns of ESG integrated value investing strategy. As mentioned earlier in this paper, so far, the ESG integrated value investing strategy has been a new investment strategy amongst the investors which is why there have not been executed as many research papers from it yet. However, the authors such as Abramson et al. (2000), Bauer et al. (2005) and Kaiser (2020) have evaluated this blended investment strategy's performance in the US and Europe, but the papers have followed slightly different approaches. Therefore, the results of these papers have deviated a bit from each other as well. Anyway, the last research question and hypotheses of this paper have formed as follows:

3. *Has the performance of ESG integrated value portfolios deviated from the performance of pure value, pure ESG and market portfolio during 2015-2019?*

H0: The performance of ESG integrated value portfolios has been equal with the performance of pure value, pure ESG and market portfolio between 2015-2019.

H1: The performance of ESG integrated value portfolios has been unequal with the performance of pure value, pure ESG and market portfolio between 2015-2019.

1.4   Contribution

The primary contribution of this paper has been made to the literature related to value investing and corporate social responsibility. Even though both topics have been quite widely examined in the past there have still raised some gaps which have received somewhat lower attention amongst the financial researchers. For example, regionally most of the existing financial research papers related to value investing and responsible investing have been executed from the major markets such as the US and Europe, but these styles' performance has remained more unknown in the other markets. Therefore, one of the main purposes of this paper has been to provide regional contribution and evidence from the Finnish stock market to the financial literature related to both investment styles.

Moreover, another purpose of this paper has been to contribute the recent literature related to the value premium such as the papers from Fama et al. (2020) and Miller et al. (2020) which have noticed the weakening effect of value premium after the 21st century. The empirical analysis of this paper has been executed within the same period as the studies from Fama et al. (2020) and Miller et al. (2020) which is why the findings of this paper could serve as evidence of the weakening effect of a value premium in the Finnish equity market.

On the other hand, besides the regional contribution to the financial literature related to CSR, the purpose of this paper has been to evaluate the profitability of positive screening ESG investing strategy which has received a bit lower attention amongst the financial researchers in comparison to the other screening strategies. Also, the majority of the existing financial papers that have observed the returns of highly rated ESG portfolios have used only the total ESG score to construct the ESG portfolios or total environmental, social and governance scores (Yen et al. 2019). Thus, besides only measuring the profitability of positively screened ESG portfolios, the purpose of this paper has been to examine the returns of positively screened six-individual environmental, social and governance portfolios.

Lastly, the final contribution of this paper has been made to the financial literature regarding the ESG integrated value investing strategy. So far, this topic has been somewhat new amongst the financial researchers and primarily the existing papers have been executed from the major US and European markets (Abramson et al. 2000, Bauer et al. 2005 and Kaiser 2020). In addition, the approaches that have been used to measure this ESG integrated value investing strategy's performance in the existing financial research papers have almost always varied. Thus, the purpose of this paper has been to fulfill these results by offering evidence from Finnish equity markets as well as from the performance of positively screened ESG + value factor portfolios.

1.5   The structure of the paper

The structure of this paper has been splatted into two major parts which are the theoretical part and the empirical part. The theoretical part of this paper has first discussed the theoretical background which purpose is to provide help for the reader to understand the topics of value investing and responsible investing more deeply. However, after the theoretical background, the aim of this paper has been to explain both value and responsible investing strategies and their concepts separately in sections three and four. Finally, before the empirical part, this paper has discussed the previous studies related to the major three investing strategies which have located in section five.

Lastly, in the empirical part of this paper has discussed the data, methodology, descriptive statistics, and main results of the executed empirical analysis. This part has been divided into two sections, sections six and seven. Also, at the end of this paper, has provided a final discussion of the main empirical results and suggestions of the approaches that could be used to examine this same topic in the future.

2 Theoretical Background

2.1 Efficient Capital Markets

The efficient capital market theory has been first developed by Eugene Fama (1970). According to Fama (1970), efficient capital markets can be generally understood as markets where the prices of the securities "fully reflect" all available information. Fama (1970) has opened this conception by explaining that the prices of the securities can be directly linked to the main role of the capital markets called capital allocation. The reason for this has been that the capital allocation has enabled the funds' movement from the surplus actors to the adverse. (Fama 1970.)

Often the investors and firms have represented the surplus actors which have constantly sought new places to invest their funds. However, at the same time, they have been relying on the assumption that at any time all available information has been incorporated to the prices of the securities. Any informational distortions have been causing the effect that the funds have become drawn to the places where they have not been in their most profitable use. Therefore Fama (1970) has seen that the capital markets can be only stated efficient if the prices of the securities "fully reflect" all available information. (Fama 1970.)

2.1.1 Efficient Market Hypothesis

In addition to the theory of efficient capital markets, another revolutionary invention from Fama (1970) has been the theoretical model called efficient market hypothesis. Before the development of the efficient market hypothesis Fama (1970) thought that the phrase "fully reflect" has not explained enough sufficiently that what information exactly the prices of securities must reflect. On that account, Fama (1970) has developed a model which he has splatted up into three parts such as weak form test, semi-strong form test and strong form test. These three tests have allowed him to determine the

level of information that has been incorporated into the prices of the securities in the capital markets and thus, confirmed the market efficiency. (Fama 1970.)

Hence, in order that the markets first to be weakly efficient the expectation has been that the prices of the securities should reflect all historical price information. In this case, the investors should not be able to predict the future price changes even with the technical analysis because the historical prices of the securities have not contained any dependencies and serial correlations. Thus, the acceptance of the weak form market efficiency has demanded that the test should not find any dependencies and serial correlations of the daily price changes of securities. (Fama 1970.)

Next, in the semi-strongly efficient markets, the prices of the securities should reflect all publicly available information. With the publicly available information, Fama (1970) has meant, for example, the details of firms' stock splits, share issues and financial statements which announcements should not cause any significant price reactions in the markets. Also, in the semi-strongly efficient markets any historical price data should not offer any advantage for the investor to predict future price changes as well. Thus, Fama's (1970) conclusion from the semi-strongly efficient markets has been that both the technical analysis and the fundamental analysis have been useless for the investor and should not provide any help to seek higher returns in the future.

Lastly, the final confirmation of the strongly efficient capital markets has been required that all available information should be incorporated to the prices of the securities. In this kind of market also none of the group of investors should enjoy monopolistic right to some relevant information which could offer additional benefit to earn higher risk-adjusted returns than the market. On that account, Fama (1970) has believed that the last strong form of efficient market hypothesis could be accepted if all portfolios in the markets locate near the market line.

Finally, to conclude, the main insight of Fama's (1970) efficient market hypothesis has been that in the financial markets all relevant information has incorporated to the prices of the securities. However, if new information arises the prices should respond it properly and without any delay. Thus, in efficient markets, none of the investors should be able to beat the market on a risk-adjusted basis. (Fama 1970.)

However, as many other theories also the efficient market hypothesis has received criticism from other financial researchers. One of these researchers has been Malkiel (2003) which has seen that the main problem of the efficient market hypothesis has been its expectation that the prices of the securities should not follow any constant pattern. In his paper Malkiel (2003) has discussed the findings of several existing financial research and has ended up to the result that historically the prices of the securities have constantly shown different patterns at least in the short-term. The evidence from this has been, for example, the greater returns of both momentum investment strategy and different fundamental analysis-based investment strategies. Also, Malkiel (2003) has reviewed the literature related to behavioral finance which has reminded us that psychological distortions have a markable impact on humans' investment behavior as well.

2.1.2 Random Walk

One of the theories that has closely attached to the Fama's (1970) efficient market hypothesis has been the theory of random walks. To simplify, the theory of random walks has been referred to the price changes of securities that are independent. In this context the independence of price changes has understood similarly as in the weak form of efficient market hypothesis that the future price changes have not been able to predict because prices of the securities have not acquired past memory. (Fama 1965.)

Anyway, as discussed earlier the expectation of efficient market hypothesis has been that prices of securities should reflect all available information at any point of time. In this kind of markets, the future price changes have been independent because the prices

have adjusted to the new level only after the arrival of new unexpected information. Thus, the assumption has been that in the efficient markets the securities price formation should follow the theory of random walks. (Fama 1965.)

However, the theory of the random walks has argued that the high level of competition has been the main factor to keep the securities' price formation efficient. The markets have contained several investors that have been trying to maximize their future profits by predicting the new prices of securities. Thus, the vigorous actions of several investors have led to the situation where the actual prices of securities have not only reflected the information of preceding events but also the information that had been related to the forthcoming events which have already been on record. Therefore, in the efficient markets it has been highly dependable to assume that the actual prices of the securities have been same as their intrinsic values. (Fama 1965.)

However, often the investors predictions of the future prices of the securities have caused two-way deviation to the actual prices of securities which have followed from the imbalance between the supply and demand. In this case the actual prices of the securities have varied mutually above and below the intrinsic value of securities. Anyway, it has been highly possible that at some point the fluctuations in the securities' actual prices have started to follow systematic pattern, but the high-level competition has always brought back the effect of random walk. (Fama 1965.)

Moreover, in efficient markets the competition amongst investors has also been the main reason why the new information became immediately incorporated to the actual prices of securities. Nonetheless, it would have been reasonable to keep in mind that the appearance of new unexpected information has always contained uncertainty. Therefore, Fama (1965) has ended up to a conclusion that two assumptions could be drawn from the immediate adjustment of securities' prices in efficient markets.

The first assumption believe that investors as often have either overreacted or underreacted to the sudden arrival of new information whereas the second assumption presume that investors have been able to forecast or realize afterwards the event that have caused some reaction to the securities' prices. Thus, if these two assumptions have beame fulfilled in the financial markets, it has been stated that the securities' price changes are independent, and they follow random walk. (Fama 1965.)

2.1.3   Portfolio Theory

Another theory that has been directly linked to the efficient market hypothesis has been the well-known portfolio theory from Markowitz (1952). The main invention of portfolio theory has been the mean-variance analysis which has been able to provide framework to the investors to seek optimal relationship between portfolio's expected returns and variance. To identify the optimal portfolio, the theory has suggested that investors should only give emphasize to the portfolio's expected returns, variance, and covariance. Also, because the derivation of optimal portfolio has included the allowance of portfolio's returns, the theory has expected that the price formation of securities should follows efficient market hypothesis. (Markowitz 1952.)

One of the main arguments of the portfolio theory has been that investor's primary goal should be portfolio's return maximization. On that account investors should always end up choosing the portfolio which has offered highest expected and discounted returns. However, besides the return maximization investors' investment behavior has been widely affected by the action of risk avoidance. Rational investors have always paid attention to the portfolio's rate of variance and tried to minimize it. Therefore, it could be concluded that investors have mainly preferred two types of portfolios. The first preference has been the portfolio with highest expected returns for a given level of risk and the second has been portfolio with the lowest risk for given expected returns. Individual investors choices have been largely dependent on their attitudes towards risk. (Markowitz 1952.)

Finally, to obtain portfolio which has maximized its future expected returns but at the same time minimized its variance the theory has suggested that investors should increase their rate of diversification. However, instead of increasing the number of individual securities investors should pay more attention to the inner covariance between portfolio's securities. If the intercorrelation between securities has been too high, it has directly led to the higher risk of the portfolio as well. Therefore, in the ideal situation investors should select securities that have provided highest expected returns but possessed lowest covariance with each other. Anyway, it should be kept in mind that diversification has not been able to cut portfolio's all variance, but it has reduced its efficiently. (Markowitz 1952.)

Under these assumptions Markowitz (1952) has created a set of optimal portfolios which have maximized portfolio's expected returns with the given level of risk. All these optimal portfolios have located in the so-called efficient frontier which has illustrated in the following figure 1. The central point in the figure 1 represents the optimal mean-variance portfolio which has had the smallest variance with the given expected returns. In addition, in the figure 1 can be noticed that if the portfolio has been transferred on the right side of the efficient frontier its risk has increased substantially in relation to its returns. On the other hand, from the figure 1. Can be understood that if the portfolio has fallen below the efficient frontier, the portfolio has not maximized its returns with the given level of risk. Hence, one of the key insights of Markowitz (1952) portfolio theory has been that if the investor wants to beat the market portfolio in the efficient markets the investor should also take higher risk.
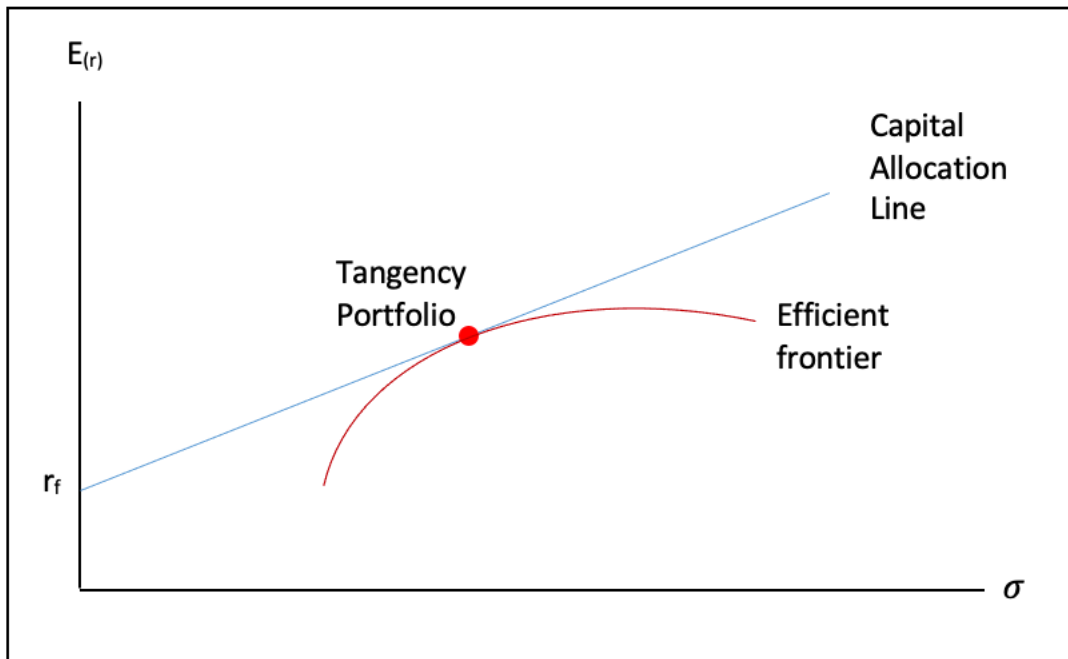
Figure 1. Efficient Frontier (Markowitz 1952.)

2.1.4   Behavioral Finance Theory

As discussed earlier, the modern finance theory has been based on the idea that the investors are rational profit maximizers which competitive actions have led the financial markets towards its maximal level of efficiency. Primarily, the investors' rationality has seen to be caused by two actions of which the first one has expected that the investors rely on their decisions mainly on utility theory and the second one has seen that their future expectations are unbiased. Thus, the prevailing notion after the 1950s has been that the whole economy has included only actors that have behaved according to these two assumptions. (Thaler 1999.)

However, after the rise of behavioral finance theory in 1990s many economists have become enlightened by the knowledge that the actions of the investors have not been as rational as the Fama's (1970) efficient market hypothesis and Markowitz's (1952) modern portfolio theory have suggested (Ricciardi & Simon 2000). Thus, instead of complete market efficiency and investors fully rationality, the behavioral finance theory has

confessed that in some cases the financial markets have consisted of informational inefficiencies as well as that the behavior of the market participants have been in some way irrational. These both approaches the behavioral finance theory has discussed in its two major disciplines.

The first discipline of behavioral finance called cognitive psychology has focused on examining the process of human thinking. During the past years, the results of several tests have proved that after regular time intervals the human's brains have caused periodic errors in their thinking process. Also, besides the systematic errors the researchers have noticed that different preferences have distorted the human thinking process as well. Thus, relying on this information the cognitive psychologists have created several varying models to explain the investors' irrational behavior in the financial markets. These models have been called heuristics, overconfidence, mental accounting, framing, representativeness, conservatism, and disposition effect. All in all, the advocates of behavioral finance have seen that these seven models have been able at least partly to explain the different misvaluations in the financial markets. (Ritter 2003.)

In addition, another major discipline of behavioral finance theory has been called as the limits of arbitrage. The conception of the arbitrage has understood as simultaneous buying and selling effect of a security. Simply, the arbitrageurs have been aiming to benefit from the existing price differences in the markets to be able to gain higher returns. The prices of the securities have, for example, varied regionally which have led the arbitrageurs to buy the security from the low-price market and sell it in the high-price market. However, when the massive group of arbitrageurs have followed this effect, the prices of the securities have recovered soon close to their fundamental values. Therefore, the effect of arbitrage has had a critical role in the financial markets because its purpose has been to keep the prices of the securities correctly priced and the markets efficient. (Shleifer & Vishny 1997.)

Different mispricings of the securities have been however very regular in the financial markets. Ritter (2003) has classified mispricings in two categories of which the first one has referred to the frequent and short-term misvaluations and the second one to the non-recurring and long-term misvaluations. From these two categories the first one has disappeared rapidly from the financial markets because the aggregate actions of several arbitrageurs have led the prices toward their fundamental values.

On the other hand, the second category such as long-term and non-recurring misvaluations have not followed as simple mechanism as the short-term and frequent misvaluations. The reason for this has been the long-term misvaluations that have been extremely difficult to notice in the real time. Thus, Ritter (2003) has believed that it has been highly possible that the investors have reacted these kinds of misvaluations either too early or too late which have led to the severe buying and selling pressure in the financial markets. In this kind of situation, the markets have become even more distorted than they were in the first place.

Hence, to conclude, the purpose of the limits of arbitrage has been to observe different situations in the financial markets where the arbitrage has worked either efficiently or inefficiently (Ritter 2003). So far, the financial researchers have noticed that at least in the markets where the prices of the securities have deviated significantly from the fundamental values and the investors have invested their all funds, the effect of arbitrage has not worked as efficiently as possible. Also, in these kinds of markets, the investors have been closed to withdraw their funds out from the markets which could have caused even higher harm to the function of the arbitrage. (Shleifer et al. 1997.) However, the supporters of modern finance theory have defended the notion of the optimal level of market efficiency with the argument that it has been enough sufficient that at least the most significant investors have followed fully rational behavior that the theory have been able to kee its validity (Thaler 1999).

2.2 Capital Asset Pricing Model (CAPM)

By far the best theoretical model to predict future expected returns of the securities in the financial markets has been the model called Capital Asset Pricing model (CAPM). The derivation of the CAPM model has replicated the principles of the Markowitz's (1952) modern portfolio theory. In line with the assumptions of the portfolio theory also the CAPM model has expected coherence in the investors' behavior. Mainly, the investors have been expected to have similar forecasts in the future expected returns, standard deviations, and correlation coefficients of the securities but also to possess inherent aim towards the maximal diversification of the funds. However, especially from these assumptions the CAPM model has received criticism because it has been very unlikely that the investors would have followed this kind of behavior in the actual investment world. (Sharpe 1964.)

The main insight of the CAPM model has been that the price of a risky security could be predicted with two components, with its future expected returns and with its level of risk. From these two components the security's expected returns have been possible to determine with its total level of risk because the model has expected linear relationship between these two variables. On the other hand, the total risk of the security has been able to measure as its return's standard deviation. (Sharpe 1964.)

In addition, one of the primary inventions of the CAPM model has been that the total risk component is able to split into two components such as risk-free rate and the risk premium. With the risk-free rate Sharpe (1964) has referred to the prevailing rate of interest which investors have been able to lend funds in the financial markets with equal terms. Thus, the risk-free rate has generally understood as a compensation from the securities that carry zero risk and has used as a reference point for the riskier assets. By contrast, from the riskier asset's investors have been able to require higher compensation which is why they have been paid with the risk premium. Simply, the risk premium referred to the amount of risk that have exceeded the risk-free rate. (Sharpe 1964.)

In addition, similarly as the total risk component of an investment, the CAPM model have expected that also the risk premium is able to divide in two components. These two components have been systematic risk and unsystematic risk. The systematic risk has been understood as a risk that have belonged to all securities in the financial markets. The variation of the securities' prices has been caused by for example the changes in the interest rates, inflation, recession, or other major macroeconomic occurrences in the financial markets. Thus, the systematic risk has not been able diversified away. Conversely, the unsystematic risk has referred to the type of risk that has been able to diversify by minimizing the correlation coefficient between the portfolio's securities. Thus, the prediction of the future prices of the securities has assumed that their future expected returns have been only dependent on the level of systematic risk. In the CAPM model the level of systematic risk has measured with the beta ratio. (Sharpe 1964.)

Also, the theory behind the CAPM model has expected that all investors have chosen their optimal set of assets by following two steps. The first step has consisted of finding the efficient set of securities and the second step has included the selection of optimal securities from this group. The efficient security has referred to the asset which has not had a similar duplicate in the markets that could have had either same expected return and lower risk, same risk and higher expected returns or higher expected returns and lower risk. (Sharpe 1964.)

When investors have followed these two steps to find an efficient set of securities, they have had an opportunity to reach their desired point in the capital market line (CML). The purpose of the CML has been to illustrate all different mixtures of portfolios that have possessed optimal relationship between its risk and expected returns. All these optimal portfolios have combined risky free and risky assets in different proportions to satisfy the preferences of many individual investors. (Sharpe 1964.)

In the mathematical terms the CML has referred an ascending tangent line in which the y-axis has measured the expected returns of portfolio and the x-axis its level of risk. The

zero point of future expected returns has been the prevailing risk-free rate which has been expected to remain unchanged over the time. From this point the future expected returns of portfolio have been expected to rise linearly in relation to its level of risk. Lastly, in the middle of CML has located tangency point M, also called as market portfolio, which has been determined as average of all combinations of risky free and riskier assets. The beta ratio of the market portfolio has been 1. (Sharpe 1964.)

To conclude, under these assumptions of CAPM the expected returns of a security have been predicted with the following formula:

$$E(R_i) = R_f + B_i[E(R_m) - R_f], \qquad\qquad (1)$$

where:

$E(R_i)$ = means the expected return of an individual security i,

R_f = means the prevailing risk-free rate,

B_i = means the beta ratio of an individual security i, and

$E(R_m)$ = means the expected return of market portfolio.

2.3 Portfolio's Performance

In addition to the invention of Capital Asset Pricing Model, Sharpe (1966) has also introduced a one of the most meaningful portfolio performance measures called Sharpe ratio. The purpose of Sharpe ratio has been to help an investor to evaluate portfolio's performance by adjusting the portfolio's expected returns to its risk. As in the CAPM model, the idea behind the Sharpe model has been that the investors are expected to select amongst the large group of portfolios only the portfolios that have been enough efficient to be able to obtain the preferred point from the capital market line. However, the theory of the CAPM model has not provided any guide for the investor to select the most desirable portfolio from the group of efficient portfolios which has later been the aim of Sharpe ratio. (Sharpe 1966.)

Simply, the Sharpe ratio has been able to be calculated by extracting the risk-free rate from the portfolio's expected returns and dividing the outcome with portfolio's standard deviation. The result has announced the percentual amount of expected return that has been received from the one unit of risk. From the group of efficient portfolios, the highest performing portfolio has been the one with highest Sharpe ratio. In addition, if the Sharpe ratio has turned out to be over 1 the value has indicated that the portfolio has produced excess returns over its risk. Also, this would have mean that the risk has not merely explained the higher expected returns of a portfolio. (Sharpe 1966.)

$$Sharpe\ ratio = \frac{(\bar{r}_p - r_f)}{\sigma_p},$$ (2)

where:

$\bar{r}_p$ = means an average return of portfolio's securities,

r_f = means a prevailing risk-free rate and

σ_p = means a standard deviation of portfolio's returns.

In addition to the Sharpe ratio, portfolio's performance has also calculated with the two other performance ratios such as Treynor ratio and Jensen's Alpha. From these two ratios, the Treynor ratio has had a lot of similarities with the Sharpe ratio. The only difference has been related to the risk variable which has been replaced with the beta ratio instead of standard deviation. However, the result has usually interpreted similarly as the result of Sharpe ratio even though the portfolios' expected returns have observed in relation to its level of systematic risk. On that account, the higher Treynor ratio has indicated higher performance of a portfolio. (Hübner 2003.)

Conversely, the last performance measure called Jensen's Alpha has acquired somewhat different calculation method than the Sharpe ratio and Treynor ratio to been able to measure the excess returns of a portfolio. Instead of directly evaluating the relationship of portfolios' expected returns and risk, the Jensen's Alpha has compared portfolio's returns in relation to the returns of market on average. The higher alpha has been referred to the higher performance of a portfolio. (Jensen 1967.)

3 Value investing

3.1 Fundamental analysis

The fundamental analysis has referred to the method that has used to estimate the intrinsic value of a stock. The evaluation of the stock's intrinsic value has been possible to make by analyzing the information of the firm's financial statement analysis but also by assessing the effect of different factors such as returns, risk, future growth prospects and market position. The purpose of the fundamental analysis has been to provide an estimation about the stock's intrinsic value that could have been compared against the stock's current market value. If the market value has not been able to replicate stock's intrinsic value it reveals that the stock has been either overvalued or undervalued. (Baresa, Bogdan & Ivanovic 2013.)

One of the trading strategies that has seen to be based on fundamental analysis is the strategy called value investing. The ancestors of value investing strategy have been Benjamin Graham and David Dodd who have discovered the approach in the 1920s and 1930s. However, the approach of value investing has referred to a trading strategy where the investors have been aiming to seek stocks that are undervalued in the market. The undervaluation has noticed to be caused by the investor's diminished interest. The lack of interest has primarily been related to investors' estimations about the limited future growth prospects that investors have associated with that firm. On that account, investors have not wanted to pay the price that corresponds stock's intrinsic value. (Capaul, Rowley & Sharpe 1993.)

However, still the key factor for the value companies' high profitability has been their unnoticed earning potential. Often investors have built up their investment decision only to the future cash flows that have already been on record, but they have passed some other relevant information that has affected the firm's future success. (Greenwald, Kahn, Bellissimo, Cooper & Santos 2020.) Thus, the financial researchers have believed that the reason for the higher profitability of the value firms have been investors' too pessimistic

future growth expectations because that has caused them eventually to surprise if the firm has published positive quarterly earnings announcements (La Porta, Lakonishok, Shleifer & Vishny 1997). Therefore, it has been highly recommended that besides the evaluation of the firm's future cash flows the investors should also pay attention to the micro- and macroeconomic factors that have crucial effects on the firm's future earning potential as well. (Greenwald et al. 2020.)

3.2   Definition of value stocks

In the fundamental analysis the valuation of the company has primarily made by utilizing different financial ratios. Most commonly the value firms have identified with four ratios such as price-to-earnings, price-to-book, price-to-cash flow, and dividend yield ratios (Bauman, Conover & Miller 1998). The purpose of all these ratios has been to measure firm's intrinsic value by proportioning its fundamental information to the firm's price in the marketplace.

The price-to-book (P/E) ratio has been one of the most utilized financial ratios that investors have used to seek value companies. Basu (1977) has been one of the first researchers who has confirmed the outperformance of the firms with low P/E-ratios. Equities with low P/E-ratios have gained higher absolute and risk-adjusted returns between the period of 1957-1971.

The purpose of the P/E-ratio has been to provide an estimation of how many years it will take until the firm's future earnings are able pay back its market price. It has calculated by dividing the firm's market price with its future earnings or in the other way around if the ratio has called E/P-ratio. In the financial literature the P/E-ratio has considered one of the ratios that measure firm's future growing potential as well as changes that may appear in the firm's upcoming earnings. (Fairfield 1994.)

Typically, the value firms have had lower P/E-ratios than the market on average because the investors have not reflected them as high growing potential than other firms. This effect has caused firm's market price to go down in relation to its fundamental earnings which has led to the lower P/E-ratio and undervaluation. However, if the investor has used E/P-ratio to find value firms the ratio should be interpreted in the other way around. In this case the firms with high E/P-ratio have known as value firms. (Fairfield 1994.)

In addition, another very popular financial ratio to find value firms has been the price-to-book (P/B) ratio, also known as market-to-book (M/B) ratio. The P/B-ratio has replicated greatly the intention of the P/E-ratio because its purpose has also been to measure the firm's future profitability. However, the P/B-ratio has also understood as a measure of how much the investors are willing to pay for the firm's book value. (Fairfield 1994.)

The P/B-ratio has been possible to determine by dividing the firm's market price with its fundamental value or in the other way around which has leaded to the B/P-ratio. For the value firms the P/B-ratio has seen to be approximately one or lower because of the limited growth expectations of the value firms. (Fairfield 1994.) However, even though the firm has had low P/B-ratio it does not directly mean that the company could be classified as a value firm because the low P/B-ratio might be due from the firm's poor financial situation (Piotroski 2000).

Among the first researchers Chan, Hamao & Lakonishok (1991) and Fama & French (1992) have discovered the success of the firms with high B/M-ratio. Chan et al. (1991) have registered that in the Japanese stock market the equities with high B/M-ratio have produced economically and statistically significant expected returns between 1971-1988. Fama et al. (1992) have noticed this same phenomenon in the US stock market between the years of 1963-1991.

Finally, besides the P/E- and B/M-ratio, Lakonishok, Shleifer & Vishny (1994) has also discovered that the higher returns could be related to the firms with high CF/P-ratio. The

price-to-cash flow or the reverse cash flow-to-price ratio has also been one the popular financial ratios to find value firms. In comparison to the net cash flows of which the P/E-ratio has paid attention, the purpose of the P/CF-ratio has been to evaluate the level of the firm's gross cash flows. Thus, the P/CF-ratio has not been as vulnerable to the adjustments that may occur in the firm's financial statements. For the value firms the P/CF-ratio has normally been lower than for the other firms. (Lakonishok et al. 1994.)

Lastly, one of the signs of the value firms has also been high dividend yield which can be determined as the proportion of the firm's dividend yield to its current market value (Lakonishok et al. 1994). In the financial literature it has discovered that the firms that pay higher dividend yield have possessed steadier financial situation and higher returns than other firms which is why investors have often been more interested on those firms. Also, the firm's dividend income has seen to be consisting lower risk than the increase in the firm's stock price which has also made the highest paying dividend yield firms most attractive. Blume (1980) has been one of the first researchers that has identified the higher returns of high dividend yield companies.

4   Responsible Investing

4.1   Responsible investing and its terminology

One of the fastest growing phenomena amongst during the past decades has been the investing approach called responsible investing. The responsible investing has referred to the investment approach of which the investors have put more emphasize to the environmental, social and governance issues while making investment decisions. Primarily, the reason for its popularity has been able to find from the rapidly accelerating climate change which has increased investors' actions towards its mitigation. However, also the Covid-19 pandemic of which the world has been facing after March 2020 has been one of the major triggering points which has raised investors interest towards firm's social issues.

The central theme of responsible investing has originated from the principles of ethical investing which has been the only prevalent investment approach in the middle of 1700s. During those very religious times the Jewish law contained several directives which guided investors to avoid investing in the firms that benefit from the unethical and harmful business. Also, in the 1700s the prevailing notion in the society was that money has secondary status besides the New Testament. These features are still possible to notice in the present society, for example from the investors avoidance of the firms that operate in the alcohol, tobacco, and gambling industries, also known as sin stocks. (Schueth 2003.)

However, the more recent and modern roots of responsible investing have been in the 1960s century when the concerns of climate change, working conditions and gender equality have reared their heads in the first time. Also, in the 1980s the approach of responsible investing has faced rapid increase because many public societies have invested their funds in South Africa to help the government to prevent the racism in the country. In the current conception of responsible investing these themes have also had an essential role even though it has expanded to cover also other very important areas. (Schueth 2003.)

According to the United Nation's principles for responsible investing the responsible investing has understood as an investment activity where the investor incorporates environmental, social and governance issues (ESG-issues) to their investment decision making process. The purpose of the environmental issues has been to pay attention to the climate change and deforestation mitigation, efficient resource use and the reduction of waste and pollution whereas the purpose of the social issues have been of trying to impact on the communities' activity, cultural factors, human rights, and employee conditions. Also, lastly, the purpose of the governance issues has been to enhance the mitigation of corruption, bribery, and political lobbying as well as the tax strategies and diversity of the government. However, besides the consideration of the ESG-issues, the responsible investors have been aiming to increase the financial performance of the investment. Thus, the utilization of responsible investing should not sacrifice the returns of an investment because as the normal investors also responsible investors have been aiming to enhance the risk-return relationship of their investments. (PRI 2021.)

In the existing financial literature, the terminology of the responsible investing has often mixed up with the terms of sustainable investing and socially responsible investing which has caused sometimes misunderstanding in the meaning of the terms. However, after the entrenchment of the terms the researchers have agreed that the term responsible investing has differed from the other concepts in terms of the investor's investment behavior. In the approach of responsible investing, it has been clearly separated the investors emphasize to both requirements such as economic and non-economic factors. Conversely, in the other approaches the investors' primary purpose has been social impacting which is why they have seen to be also allowing the investments financial loss more easily. (PRI 2021.)

4.2   Responsible investing strategies

The UN PRI (2021) has defined five different responsible investing strategies which investors have been able to use to invest responsibly. From these five strategies the integration, screening and thematic strategies have separated to their own group called ESG incorporation which investors have utilized if they have constructed new investment portfolio. On the other hand, the engagement and proxy voting have created another group called active ownership of which could have been followed if investors have wanted to enhance the ESG issues in the companies that they have already invested. However, according to UN PRI (2021) the five prevailing responsible investing strategies have described in Table 1 as follows:

Table 1. Responsible Investing Strategies UN PRI (2021).

Strategy	Description
Integration	Integrating ESG-information to the investment decision making process and analysis which should improve investments long-term return and risk profile.
Screening	The usage of different criteria which either include or exclude certain investments from the total universe. Often investor's ethics, values, and preferences impact to the criteria selection. Possible screening strategies are negative screening, positive screening, and best-in-class screening.
Thematic	Investing in certain themes of sustainable investing which enable investor to impact in the specific area of environmental, social or governance issues.
Engagement	The utilization of the firm's proprietary rights in terms of improving its ESG-issues and future profitability. Investor can engage individually or together with other investors.
Proxy voting	One of the forms of active ownership. Enhancing firm's ESG issues by voting in the shareholder's meetings.

Global Sustainable Investment Alliance (2020) has founded in their 2020 Global Sustainable Investment Review that from all responsible investing strategies the ESG Integration has raised to become the most popular responsible investing strategy during 2020 in worldwide. According to GSIA (2020) in total 25,2 trillion US dollar was invested through the ESG integration investment strategy in Europe, United States, Canada, Australia, New Zeeland, and Japan. The second place went to the negative screening strategy (15,9 trillion US dollar) and the third place to the engagement strategy (10,5 trillion US dollar). However, the negative screening strategy has dropped its popularity after 2018 when the strategy was measured to be the most popular responsible investing strategy amongst the responsible investors.

4.3   Rising interest towards responsible investing

The interest towards ESG investing has increased rapidly during the past years. According to GSIA (2020), the aggregated value of the assets directed to the sustainable investments has reached 35,5 trillion US dollars in the five major financial markets. The highest peak has been registered in Canada where the assets have grown by 48 % between the years of 2018-2020. Therefore, currently Canada has been the owner of the largest proportion 62 % of the sustainable assets.

However, also in other regions the asset inflow towards sustainable investments have developed favorably during 2018-2020. For example, in United States sustainable assets have grown by 42 %, in Japan 34 % and in Australasia 25 %. Only decrease has been measured in Europe -13 % where the drop has seen to be caused by the change of measurement methodology. All in all, during 2018-2020 the increase has been in total 15 %. (GSIA 2020.)

Morgan Stanley Institute for Sustainable Investing (2019) has implemented a survey for individual investors in US and noticed the rising interest towards sustainable investing as

well. The most fascinating finding of this survey has been that 95 % of the US Millenials have been interested to invest in sustainable investments in 2019. However, also 85 % of the general population has been showing this same interest. These percentages have increased 9 % and 10 % from the year 2017, respectively. From this same population of individual investors, 71 % of the general population and 85 % of the Millenials have believed that their investing behavior have had preventive impact to the climate change. Moreover, the results have shown that the main reason for these both groups to invest sustainable has been plastic reduction (46 % "very interested").

Besides the continuously accelerating climate change, the researchers have believed that the covid-19 pandemic has had a triggering impact to investors behavior. During the pandemic UN PRI (2020) have executed a survey to their ESG signatories to see if the covid-19 has impacted to their mindset to put more value on ESG issues. The results have proven that 64 % of the respondents have increased their engagement especially towards firms' social issues. Things such as "occupational health and safety, social safety nets, worker protection, responsible purchasing practices and supply chain issues, as well as diversity and digital rights, including privacy" have increased their value amongst investors (UN PRI 2020).

4.4 ESG ratings

The investors rising interest towards responsible investing has also entailed changes in the firm's reporting practices. The amount of ESG data has increased massively during the past years because the investors have demanded more information about the firm's ESG performance. To communicate the firm's ESG efforts more transparently even more firms have decided to sign, for example the UN Principles of Responsible Investment. UN PRI (2021) has reported in its 2021 annual report that the number of signatories of PRI has increased 42 % from the previous year. Also, in the March 2021 the assets under management (AUM) within the PRI signatories has risen to 121 trillion US dollar which has implied 17 % increase from the year 2020. (UN PRI 2021.)

However, to help the investors to understand the validity of the firms' ESG data the different rating agencies have developed ESG ratings to evaluate the firm's ESG efforts. The purpose of these ratings has been to assess the firm's performance in all ESG dimensions. In other words, the ESG ratings has been understood as the evaluation of the risks and opportunities that each firm has concerning to their environmental, social and governance practices. (Serafeim & Yoon.) Some of the most popular ESG rating agencies have been ASSET4 by Thomson Reuters, Ethical Investment Research Service (EIRIS), KLD by MSCI and Sustainability Asset Management Group (SAM). (Dorfleitner, Halbritter, Nguyen 2015.)

Also, a part of the agencies have provided so called ESG disclosure scores which have reported the percentage value of the amount of ESG data that the firm has announced publicly. The ESG disclosure scores have enabled the investors to compare the amount of firm's ESG data within the same industry. One of the ESG disclosure rating providers is Bloomberg Sustainability. (Dorfleitner et al. 2015.)

5 Previous studies

5.1 The profits of value strategy

One of the first researchers that have examined value premium in US market has been Basu (1977). Besides the investigation of value premium Basu (1977) has also been one of the first financial researchers that have questioned the validity of the efficient market hypothesis. As discussed earlier in this paper the correctness of efficient market hypothesis has required that at any point of time the securities should fully reflect all available information which is why the technical analysis, nor the fundamental analysis cannot provide any additional benefit for the investor to predict securities future returns. However, unlike the advocates of efficient market hypothesis Basu (1977) has believed that the firm's lower P/E-ratio could explain the higher performance of some firms. Thus, Basu (1977) has executed a research in the US market between the timeline of 1957-1971 to confirm his beliefs.

In his research Basu (1977) has constructed the portfolios from the NYSE industrial firms that possesses equal risk levels and P/E-ratios. To evaluate portfolios performance Basu (1977) has used the commonly used performance measures such as Sharpe ratio, Treynor ratio and Jensen's alpha. However, besides the measurement of the firm's performance dependency on its low P/E-ratio, Basu (1977) has also assessed these portfolios systematic risk level to support his belief of the validity of efficient market hypothesis. The firm's systematic risk Basu (1977) has measured with beta ratio.

Overall, the results of Basu's (1977) research have confirmed his both beliefs. The results have proved that during the 1957-1971 the low P/E-companies have provided significantly higher performance than the other firms. Also, the results discovered that the higher systematic risk has not been the reason for the higher returns. Thus, in the financial literature Basu's (1977) paper could be categorized as one of the evidences against efficient market hypothesis.

In addition, also Fama and French (1992) have investigated the value premium in the US market. In their paper Fama et al. (1992) have measured the relationship of the firm's average returns to their B/M ratio and size. Also, similarly as Basu (1977) Fama et al. (1992) have assessed the validity of efficient market hypothesis as well by measuring the power of systematic risk to explain the higher returns of value firms. Fama et al. (1992) have executed their research in the timeline of 1963-1990.

All in all, the results of Fama et al. (1992) paper have discovered that the higher B/M factor and smaller market equity have been two essential factors to explain the higher returns of NYSE, AMEX, and NASDAQ firms during 1963-1990. Interestingly, the results also proved that during this same observation period the relationship between the firm's returns and its systematic risk has disappeared which have meant that the firm's higher beta could not explain the higher returns of these stocks. However, unlike Basu (1977), Fama and French (1992) founded that the higher returns of value companies seem to be due to the higher level of unsystematic risk.

Moreover, also Lakonishok, Shleifer & Vishny (1994) have examined value stocks returns in the US market during 1963-1990. The value portfolios Lakonishok et al. (1994) have constructed by sorting the firms according to their B/M-, C/P- and E/P-ratios as well as their sales development from the past five years. From the companies that have belonged to the NYSE or AMEX indices Lakonishok et al. (1994) have chosen those ones which had highest ratios but lowest sales development during the observation period.

Also, besides measuring the returns of value firms, the purpose of Lakonishok et al.'s (1994) paper has been found reasons to the existence of value premium. In line with the previously discussed papers from Basu (1977) and Fama et al. (1992) also Lakonishok et al. (1994) have suspected that the reason for the higher returns of value stocks could be found from the higher risk. However, if explanation could not be founded from the higher risk Lakonishok et al. (1994) believed that the abnormal returns are due from the investors' overreaction. The overreaction causes investors to buy the firms that overperform

and sell the firms that underperform which creates a gap for the value investors to earn abnormal returns from the under valuated companies.

First, the results of Lakonishok et al. (1994) paper have approved the existence of value premium in US market. The average returns of value portfolios were founded to exceed the average returns of growth portfolios by 10,7 % during the observation period. Also, when the risk of these portfolios was measured the results discovered that the betas and standard deviations were equal for the value and growth portfolios. Thus, Lakonishok et al. (1994) ended up to a conclusion that the higher returns are caused by investors irrational overreaction.

However, the financial literature related to value stocks have remained a somewhat limited in the other markets than US. The first researchers that wanted to examine value premium outside US were Chan, Hamao & Lakonishok (1991) which observed value firms returns in the Tokyo stock exchange (TSE) during the years of 1971-1988. Also, besides the regional difference Chan et al. (1991) wanted to reach more comprehensive results than the previous papers which is why they chose longer timeframe. Anyway, the value firms Chan et al. (1991) have sorted from the TSE with the fundamental factors such as E/P-, B/M-, C/P and they only targeted on choosing the firms that have belonged to the industrials industry. Overall, besides proving the existence of value premium in the Japanese stock market Chan et al. (1991) discovered that the fundamental factors such as B/M- and C/P-ratios have been the most significant factors to explain the higher returns of the value stocks during the observation period.

In addition, Fama & French (1998) have been the first researchers who have extended the examinations of value premium to a worldwide. Besides US their research has covered 12 another markable European, Australian, and East-Asian countries where the value firms' returns have compared against the returns of growth stocks during 1975-1995. Overall, the results of Fama et al.'s (1998) research provided significant value premium in twelve of thirteen markets which proved the existence of value premium

universally. The returns of stocks with high B/M-, E/P-, C/P- and dividend yield ratios were annually on average 7,68 % higher than the returns of stocks with lower ratios. Only exception was Italy where the returns of value portfolios have remained lower than the returns of growth portfolios. Lastly, also Petkova and Zhang (2005) have founded similar results as Fama et al. (1998) and discovered value premium in four major global markets during 1927-2001.

Conversely, recently some of the financial researchers have perceived that the strength of the value premium has declined during the past decades. Before this finding most of the existing research papers were agreeing that the average value premium in US has been approximately 4,7 % per year during the timeline of 1926-2018. However, when a shorter period was screened from this sample it was discovered that from 2008 to 2018 the value premium has turned out to be negative on average -2,3 % per year. (Löffler 2020.)

For instance, Fama & French (2020) have been one of the financial researchers that have paid attention to the weakening effect of value premium. In their most recent working paper, Fama et al. (2020) have investigated value stocks returns in two time periods of which the first one covers the period from July 1963 to June 1991 and the second from July 1991 to June 2019. Also, the total period between 1963-1991 has been under an observation.

The value firms Fama et al. (2020) have collected from the NYSE, AMEX and NASDAQ indices with the B/M-ratio. From this sample two value portfolios have been formed according to the high B/M companies end-of-month market cap. The first size portfolio in included companies above the median and the second one the companies below the median.

Overall, the results pointed out that in the total timeframe from July 1963 to June 2019 the average returns of the value portfolios have been above the average return of market

portfolio. However, when the total period was splatted in two shorter timeframes the results were in line with the Löffler's 2020 findings. In the first observation period from 1963 to 1991 the value premium has been 0,36 % per month for the bigger firms and 0,58 % per month for the smaller firms whereas in the second observation period from 1991 to 2019 these same values have been 0,05 % and 0,33 %, respectively. Also, the value portfolio that does not included the size screen proved that in the first period the average monthly return has been 0,42 % but only 0,11 % in the second period. On that account, Fama et al. (2020) have ended up to a conclusion that the value premium has disappeared or at least weakened during the past years.

Lastly, also Miller & Prondzinski (2020) have confirmed the temporary disappearance of value premium. In line with Fama et al. (2020) findings the results of Miller et al.'s (2020) paper indicate that during period from October 2002 to June 2019 the performance of value stocks has been weaker than growth stocks. Both the Sharpe ratios and risk-adjusted returns have been lower for the value stocks than growth stocks but the difference in returns has not been statistically significant.

However, Miller et al. (2020) believe that the current macroeconomic situation may explain at least partly the lower returns of value stocks. In the existing financial literature, it has confessed that the value stocks tend to outperform growth stocks during the bear market but conversely the growth stocks tend to outperform value stocks during the bull market. Thus, before the appearance of Covid-19 pandemic the equity markets have possessed a slow growth trend which could be the reason for the low performance of value stocks in the recent years. Also, the long-lasting era of low interest rates have supported the investors to turn their funds to more fast-growing investments which could also reduce the power of value premium. (Miller et al. 2020.)

5.2   The profits of responsible strategy

As discussed earlier, the responsible investing approach has been very popular phenomenon amongst the investors and managers during the past decades. Also, constantly more and more funds have directed to the responsible investments all around the world which is why the financial researchers have been especially interested to measure the profitability and performance of these investments. One of the papers that have observed the performance of socially responsible screening strategies at the beginning of 21st century have been Kempf & Osthoff (2007).

In their paper Kempf et al. (2007) have employed all dimensions of SRI to measure the profitability of negative screened, positive screened, and best-in-class screened equity portfolios in US between 1991-2004. The firm's social responsibility Kempf et al. (2007) have evaluated with the six qualitive KLD ratings such as community, diversity, employee relations, environment, human rights, and product ratings but the exclusion has been made based on the firm's business areas. The negative screening criteria that Kempf et al. (2007) have followed are alcohol, tobacco, gambling, military, nuclear power, and firearms businesses.

To measure the performance of these strategies Kempf et al. (2007) have used a long-short strategy. Thus, two portfolios have constructed each year of which the highest performing portfolio have bought, and the lowest performing have sold. The holding period of each portfolio has been one year.

Overall, this long-short investment strategy that Kempf et al. (2000) have utilized with negative-, positive- and best-in-class SRI screens has offered -1.11 % alpha for the negatively screened portfolio, 4.46 % alpha for the positively screened portfolio and 4.90 % alpha for the best-in-class screened portfolio. The results have also provided positive and strong alphas for the positive and best-in-class screened portfolios even though Kempf et al. (2007) control transaction costs. Lastly, also 5 % and 50 % screens were applied for both positive and best-in-class portfolios which turned out to offer over 8 % alpha for

the best-in-class screened portfolio with 5 % cut-off. Thus, Kempf et al. (2007) findings recommend that investors should mainly focus on the highest performing SRI companies and utilize best-in-class screening strategy.

However, even though in the western countries the SRI has been a huge phenomenon amongst the investors and financial researchers in the Asian markets it has received much lower attention. The reason for this can be found from the poor ESG data which has suffered from the lack of reliability amongst investors. Thus, because of the investors diminished interest, the topic has also remained somewhat unknown for the financial researchers outside western countries. (Yen, Shiu and Wang 2019.)

Hence, Yen et al. (2019) have conducted a research from the three regions in Asian markets to observe the performance of SRI positive screening and best-in-class screening strategies during the years of 2009-2013. The regions that Yen et al. (2019) have covered in their paper have been Japan, other developed Asian countries, and all emerging Asian countries. Thus, in all these regions each observation year both highly and low rated equity portfolios have constructed to measure if the highly rated portfolios perform better than the low rated portfolios.

The positively and best-in-class screened portfolios Yen et al. (2019) have constructed based on the ASSET4 ESG ratings. To the both positive and best-in-class screening strategies Yen et al. (2019) have derived 50 % cut-off which means that the highly rated portfolio has consisted of 50 % of the highest ESG performing firms and the low rated portfolio 50 % of the lowest ESG performing firms. All these portfolios have also annually rebalanced. However, to compare the returns of highly and low-rated portfolios, Yen et al. (2019) have used Carhart (1997) four factor of which the dependent variable has announced the portfolios' monthly returns over the risk-free rate. Moreover, the portfolios' performance has measured with the Sharpe ratio.

All in all, the results of Yen et al.'s (2019) paper have founded that the annualized average monthly returns of highly rated ESG portfolios have turned out to beat the low rated ESG portfolios only in Japan market during 2009-2013. In Japan the highly rated positive and best-in-class portfolios have offered 15.87 % and 15.43 % average returns whereas the low rated portfolios have provided only 11.83 % and 12.21 %, in respective order. Conversely, in the other two regions such as other developed Asian countries and all emerging Asian markets the annualized average monthly returns have remained much lower than the returns of low rated portfolios.

On the other hand, the findings regarding to these portfolios' Sharpe ratios have proven that the highly rated portfolios have overperformed the low rated portfolios in Japan and other developed Asian countries. However, in all emerging Asian markets only the highly rated best-in-class screened portfolio have beaten out the low rated portfolio in risk-adjusted basis. Thus, to conclude the findings of Yen et al.'s (2019) paper, the positively and best-in-class screened ESG portfolios tend to overperform conventional equities in Japan but in other Asian markets the results have been somewhat inconsistent.

5.3 The profits of the value stocks in responsible portfolios

One of the first studies that have observed value stocks behavior in the responsible portfolios have been Abramson & Chang (2000). In their research Abramson et al. (2000) have evaluated the performance of two different value investing strategies. However, instead of selecting the value firms from the common equity index Abramson et al. (2000) have created portfolios from the firms that have belonged to the Domini Social Index during 1990-1999. The purpose of Abramson et al.'s (2000) paper is to compare these portfolios performance to the performance of regular value portfolios.

However, unlike many other well-known financial research papers Abramson et al. (2000) have selected value firms based on their market capitalization-to-revenues-ratio and dividend yield ratio. Abramson et al. (2000) believe that firm's revenues stay more stable

over the quarters, and they are less vulnerable to accounting manipulation in comparison to firm's earnings. Anyway, the value strategies that Abramson et al. (2000) have utilized in their research are called "rebalance strategy" and "buy-and-hold strategy". In the rebalance strategy, the portfolios have rebalanced every quarter of a year and each time only the stocks that have provided relatively highest dividend yields and market capitalization-to-revenues ratio have included to the portfolio. On the other hand, in the buy-and-hold strategy the portfolios have created only once which means that the same portfolios have kept from the beginning of the observation period until the end.

The results of Abramson et al.'s (2000) paper have discovered that from the two value investing strategies only the rebalance strategy has been able to beat the normal value portfolios during the research period. On a risk adjusted basis the average returns of rebalance strategy have exceeded the returns of pure value portfolios by 2,2 % per year. Moreover, the Sharpe ratio of these strategy has turned out to be 0.87 in comparison to the average Sharpe ratio 0.80 to the three benchmark value portfolios. Also, the another value investing strategy, buy-and-hold strategy, has been able to provide higher average returns than the three value portfolios in the risk-adjusted basis the performance have remained lower than the benchmark portfolios.

In addition, also Bauer, Koedijik & Otten (2005) have been one of the first researchers that have examined the returns of value and ESG combined strategy before 21st century. However, instead of observing the returns of individual stocks Bauer et al. (2005) have measured the returns of conventional and ethical mutual funds in Germany, UK and United States between 1990-2001. The purpose of Bauer et al.'s (2005) paper has been to compare the risk-adjusted returns of these both funds with each other and measure their exposure to the B/M-ratio.

To measure how the returns of conventional and ethical mutual funds change after the control of funds B/M-ratio, Bauer et al. (2005) have utilized the well-known Carhart 4-factor model. Before running the model, all stocks have sorted with the B/M-ratio and

30 % of the stocks with the highest B/M-ratio have included to the value portfolio. Conversely, 30 % of the stocks with lowest B/M-ratio have selected to the growth portfolio. The Carhart 4-factor model's HML (high minus low) factor has been determined as the difference of the high B/M and low B/M stocks.

The results of Bauer et al.'s (2005) study have founded that in German and UK the HML values turned out to be negative for the ethical funds (-0.03 and -0.05) and positive for the conventional funds (0.00 and 0.30). On the other hand, in US both the ethical and conventional funds have provided positive HML values but again the returns have been higher for the conventional portfolio (0.10) than for the ethical portfolio (0.01). Thus, the results mainly indicate that the portfolios that combine both ethical issues and value factor have performed worse than traditional value portfolios.

Lastly, this paper discusses the financial research from Kaiser (2020) which has also measured the performance of ESG and value blended investment strategy with individual stocks. More accurately, the purpose of Kaiser's (2020) paper has been to investigate the effect of ESG-integration to the value and momentum portfolios in US and Europe. The regional samples have consisted of 1072 European and 1756 US firms of which the European firms have had correlation of 0,97 with STOXX EUROPE 600 index and US firms the correlation of 0,987 with the S&P500. The observation period of Kaiser's (2020) research has been from January 2002 to December 2005.

The value mixed ESG portfolios Kaiser (2020) have constructed in two sections by following the Morningstar Style Box methodology. First the total sample of the firms have sorted with the value factors and second with the ESG-factor. The value factors that Kaiser (2020) have utilized to select value firms are P/E-, P/B-, P/CF-, P/S -ratio and dividend yield which each one has had 20 % equal weight from the overall value score of a firm. This same process has conducted also with the growth factors which have leaded each company for having an equally weighted growth rating as well. Lastly, to obtain the final value style score each firm's value rating has been subtracted from its growth rating. If

the style score has turned out to be negative the company has selected to the value portfolio.

After screening the value firms from the total regional samples Kaiser (2020) has re-arranged the firms according to their ESG-scores. The ESG scores that Kaiser (2020) have used in his paper have been the environmental, social and governance scores from the Thomson Reuters Asset4 database. However, besides utilizing them directly Kaiser (2020) has adjusted each score to correspond firm's size and industry. After the adjustment, the best-performing companies from each ESG dimensions have selected to the ESG integrated portfolios.

Overall, the findings of Kaiser's (2020) paper have proven that the mean returns of ESG integrated value portfolios have been slightly better than the average returns of pure value portfolios in both regions between 2002-2015. In US the ESG-, environmental-, social- and governance integrated value portfolios have produced annually mean returns of 12.00 %, 12.19 %, 11.46 % and 12.07 %, respectively while the pure value portfolio have offered 10.91 % mean return in the same timeframe. Similarly, in Europe the mean returns have been 10.86 %, 11,68 %, 11.83 % and 10.58 % for all ESG integrated value portfolios and 10.22 % for the pure value portfolio. Also, in both regions the Sharpe ratios have been higher for all ESG integrated value portfolios in comparison to the pure value portfolios. However, besides the slightly higher mean returns Kaiser (2020) has highlighted that the integration of ESG to the value portfolio could bring lower risk and higher ESG scores to the portfolio.

6   Data and Methodology

This section has focused on explaining the empirical analysis of this thesis. The empirical analysis of this paper has been executed by observing the returns of value portfolios, ESG-portfolios and the returns of the combined portfolio which consists of both factors; ESG and value. All portfolios have been constructed from the companies that have belonged to the OMX Helsinki index and the observation period has been between 2015-2019. Totally, this research has analyzed the performance of 154 portfolios of which 15 have been normal value portfolios, 35 ESG-portfolios and 104 combination portfolios.

The reason why this study has carried on between these specific years has been the coronavirus disease which has started to spread out globally at the end of 2019. After the first notices of this disease in Wuhan the virus began to spread rapidly across the world and caused significant uncertainty to the global equity markets. The first negative signs were noticed in China's stock market in early 2020 which later caused negative spillover effect on the other stock markets. (He, Liu, Wang & Yu 2020.) This negative spillover effect spread also to the Finnish equity markets because between the 1st and 18th of March 2020 the OMXH25 index dropped approximately by 28,11 %. The 18th of March 2020 has been the lowest closing price for this index during 2020. (Nasdaq OMXH25 2021).

In 2020 also the Chicago Board Options Exchange (CBOE) VIX index proved that the equity markets have consisted of a substantial amount of uncertainty because the index peaked several times after the pandemic was declared publicly. The highest level was measured on the 16th of March 2020 when the President of the US announced the national pandemic distress. VIX index is a measurement of the implied volatility of the S&P500 index which has been based on the S&P500 index options bid and asks quotes. The negative correlation between these indices has caused the rise of the VIX index if the S&P 500 index has fallen. (Kose & Jingrui 2021.)

On the other hand, after the most uncertain times of this covid-19 pandemic, the extensive government policy responses and covid-19 vaccinations have stabilized financial markets (Rouatbi, Demir, Kizys & Zaremba 2021). However, the prices of the equities have risen enormously high in relation to the firm's fundamentals during the first half of 2021. In addition, same time firms have revised their cost structure to be able to increase their earnings. However, the firms' revenues have improved weakly and have not corresponded with the market prices. Also, the minimized costs have kept firms' P/E-ratios from not spiking. Thus, the current P/E-values of the equities have been misleadingly low and have not been comparable to the time before the pandemic. (Tully 2021). All in all, this empirical analysis has decided to execute during stable market conditions that the impact of Covid-19 crisis on the equities returns and financials has been able to minimize. Therefore, the observation period for this analysis has been restricted to the years 2015-2019.

6.1 Data

The data that this study has utilized are all collected from the Thomson Reuters (ex. ASSET4) database. The purpose of this empirical analysis has been to create separate value, ESG and value + ESG combined portfolios and to compare their returns as well as performance with each other. All portfolios have formed from the companies that belong to the OMX Helsinki index during the observation period 2015-2019.

The data of the firm's financials covers the changes in the firms' prices, book values, dividend yields and earnings per shares during the years of 2015-2019. This data has used to calculate the firms' P/E- and P/B-values for each observation year. Also, all financial data has gathered on a yearly basis.

In addition to the firm's financials, the data from the OMX Helsinki firms' environmental, social and governance scores have collected from the same database. This analysis has measured firms ESG success with seven different ESG scores, with one total ESG score

and with six individual ESG category scores. Overall, the data has also collected on an annual basis, but the number of companies increases each year due to the growing interest towards CSR-reporting.

6.1.1 ESG Data

Thomson Reuters has measured firms ESG performance globally with two different ESG-scores, with Thomson Reuters ESG Scores and with Thomson Reuters ESG Controversy Scores. Thomson Reuters ESG Score is based on the publicly available information that the company has reported by itself whereas the Thomson Reuters ESG Controversy Score is an assessment made by Thomson Reuters. The idea of the Thomson Reuters ESG Controversy Score has been to fulfill the sustainable information that company has published by itself which has helped to avoid the informational gaps that has usually related to the firms' corporate sustainability reporting. However, to keep this analysis as coherent as possible, only the Thomson Reuters ESG Scores have been collected from the firms that have belonged to the OMX Helsinki index during 2015-2019. (Thomson Reuters ESG Scores 2017.)

Thomson Reuters total ESG Score has constructed from ten different environmental, social and governance factors. Firms' environmental performance has been assessed with three different factors which are emissions-, resource use- and innovation scores. On the other hand, firms' social performance has evaluated with four separate factors such as human rights-, workforce-, community-, and product responsibility scores. Lastly, also companies' governance performance has been measured with three different factors which are management-, shareholders- and CSR strategy scores. To conclude, all these ten separate scores have built the total ESG score that has used to sort the best performing ESG companies from the OMX Helsinki index in this analysis. (Thomson Reuters ESG Scores 2017.)

In addition, two individual scores from each environmental, social and governance categories have collected from the OMX Helsinki firms that this analysis could understand more extensively the performance of ESG portfolios. The total ESG score and chosen individual ESG scores have been introduced and explained thoroughly in the following table 2.:

Table 2. ESG Categories (Thomson Reuters ESG Scores 2017).

Score	Description
ESG Score	ESG Score measures firms overall environmental, social and governance performance. The score is based on the information that company publishes by itself.
Emissions Score	Emissions Score evaluates firms' overall emissions production and its one of the Thomson Reuters' environmental category scores. Especially the emissions that result from the firm's production and operational processes are under an observation.
Resource Use Score	Resource Use Score is also one of the environmental category scores. Primarily it measures company's ability to increase its use of environmentally friendly solutions. Besides that, it evaluates firm's water use and its commitment to reduce harmful materials from its value chain.
Human Rights Score	Human Rights Score assess firm's effort to respect human rights. It belongs to the Thomson Reuters' social category scores.
Workforce Score	Workforce score is one of the Thomson Reuters social category scores. It measures firm's working conditions in several areas such as employees' satisfaction and diversification, firm's career advancement opportunities and the overall healthiness, safeness, and equality of the working place.

Management Score	Management score is part of the Thomson Reuters governance category scores. Primarily management score observes firm's leadership skills but besides that it also evaluates firm's management commitment to follow best possible corporate governance.
Shareholders Score	Finally, the Shareholders score which is also one of the Thomson Reuters governance category scores. Mainly this score evaluates the equality between stockholders but also assesses the protection devices that the firm uses to detect takeovers.

The methodology behind the Thomson Reuters ESG Score is a weighted average from the ten individual category scores. Each category score has its own weight (11 % for the resource use-, 12 % for the emissions-, 11 % for the innovation-, 16 % for the workforce-, 4,5 % for the human rights-, 8 % for the community-, 7 % for the product responsibility-, 19 % for the management-, 7 % for the shareholders- and 4,5 % for the CSR strategy score). (Thomson Reuters ESG Scores 2017.) From the table 3. can be noticed that Thomson Reuters has given biggest emphasize to the social performance 35,5 % while evaluating firms total ESG score.

Table 3. The methodology the ten ESG categories. (Thomson Reuters ESG Scores 2017.)

Pillar	Category Score	Indicators in Rating	Indicators in Pillar	Weights	Pillar weights
Environmental	Resource Use	20		11,0 %	
	Emissions	22		12,0 %	
	Innovation	19	61	11,0 %	34 %
Social	Workforce	29		16,0 %	
	Human Rights	8		4,5 %	
	Community	14		8,0 %	
	Product Responsibility	12	63	7,0 %	35,5 %
Governance	Management	34		19,0 %	
	Shareholders	12		7,0 %	
	CSR Strategy	8	54	4,5 %	30,5 %
	Total	**178**	**178**	**100 %**	**100 %**

In addition, each category score has multiple amounts of indicators which signals the score's level of coverage. In this case, 34 indicators build the management category score

which has the highest level of coverage. In line with the pillar weights, social pillar has also the highest number of indicators, 63 in total. Overall, the table 3. illustrates that Thomson Reuters has valued most firms' social sustainability, secondly their environmental sustainability and least their governance sustainability while estimating firms' total ESG score.

6.1.2   The criticism towards ESG Ratings

Nowadays more and more investors have made their investment decisions based on the ESG ratings to be able to obtain an external opinion about the firms' ESG performance. Also, the rising interest in sustainable investing has explosively increased the amount of financial research in this area and which in most cases have been relying on the ratings given by different ESG rating agencies. However, at the same time, financial researchers have started to be concerned about the creditability of the ESG ratings because a large part of the world's funds has already been directed to responsible investments. (Chatterji, Durand, Levine & Touboul 2016.)

The researchers who have observed more carefully the validity of the ESG ratings have noticed that different rating agencies have offered different ESG ratings for the same firm. Berg, Koelbel, and Rigobon (2020) have believed that the reason for this discrepancy can be found from two different explanations. The first interpretation has leaned on the concept of ESG performance which has been understood differently amongst ESG rating agencies. The concept of ESG performance has still been somewhat new in the financial literature which is why ESG rating agencies have created different definitions from it. Another explanation may be that ESG rating agencies have used diverging methodologies while developing their ESG ratings. (Berg et al. 2020.)

In addition to these two possible explanations, Berg et al. (2020) have also highlighted that the current form of ESG reporting could cause trouble if the rating agencies utilize data directly from the firms' ESG reports. ESG reporting has still been in its development

phase and firms have been able to select from many different ESG reporting standards. Correspondingly companies have been able to choose of being not to report because none of the reporting standards have been mandatory. From this underlying data, ESG rating agencies have had a freedom to develop ESG ratings which have also caused variation to them. (Berg et al. 2020.)

Chatterji et al. (2016) have evaluated on a global scale firms' social ratings from six well-known SRI rating agencies. As Berg et al. (2020), also Chatterji et al. (2016) have believed that SRI rating agencies have used different approaches when they have assessed firms' social performance. Chatterji et al.'s (2016) paper have included rating agencies such as KLD, Asset4, Innovest, DJSI, FTSE4Good and Calvert and have investigated the convergence of these providers social ratings during the years of 2002-2010.

The results have found that the social ratings have varied significantly from each other during the observation period 2002-2010. The same firm has received different social ratings from each of these rating providers. However, even if Chatterji et al. (2016) have re-constructed all social ratings to correspond each other by adjusting the small methodological differences the results have still discovered low agreement with social ratings. Thus, these findings have proven that social ratings from rating agencies such as KLD, Asset4, Innovest, DJSI, FTSE4Good, and Calvert have not been able to compare with each other because of their low commensurability.

Also, Berg et al. (2020) have found consistent results with Chatterji et al. (2016). At first, Berg et al. (2020) have measured the correlation of ESG ratings between six large ESG rating agencies such as KLD (MSCI Stats), Sustainalytics, Vigeo Eiris (Moody's), RobecoSAM (S&P Global), Asset4, and MSCI. The results have shown that on average the correlation between these providers' ESG ratings has been 0.54 and separately for the three ESG dimensions ratings (environmental, social, and governance) the correlations have been 0.53, 0.42, and 0.30, respectively. This result has unavoidably confirmed the doubts of diverging ESG ratings. (Berg et al. 2020.)

In addition, Berg et al. (2020) have wanted to extend their research to investigate the reasons behind the differing ESG ratings. They have picked out three possible factors which may have caused the divergence between ESG ratings and compared these factors between the rating agencies. The first factor has measured the scope of different attributes that rating agencies have used to assess firm ESG performance. For example, some rating agencies have included the firm's use of water in their ESG rating, but other agencies have excluded this. (Berg et al. 2020.)

The second factor has compared the approaches that rating agencies have used to measure different attributes. The same attribute, for example, equality between genders, has been able to assess in several ways by using percentages or another method. Finally, ESG rating agencies have also given different emphasis to the attributes that they have used to construct the total ESG rating which is why the last factor has focused on measuring the differences between the weights of ESG ratings. (Berg et al. 2020.)

Interestingly, the results have proven that the second factor, the measurement approach, have caused the highest discrepancy between ESG rating agencies. This evidence has been in line with Chatterji et al.'s (2016) results which have founded that the ESG ratings from different rating agencies have not been comparable with each other because of their low commensurability. However, despite these results, both papers have highlighted that ESG ratings can still be useful measures to assess firms' ESG performance. Anyway, investors and researchers should understand the methodology behind the ratings before they make any conclusions about their analysis.

6.2   Portfolio Construction

6.2.1   Construction of value portfolios

From the most well-known value factors, this paper has used P/E-, P/B- and dividend yield to the value stock selection. After screening the OMX Helsinki companies with these factors, the value portfolios have been constructed by following the method from Fama et al. (2020). This paper has created each observation year between 2015-2019 three equally weighted value portfolios. The holding period of each portfolio has been one year which means that the re-construction of the portfolios has completed annually. In addition, this paper has created only long portfolios which has been more reasonable portfolio formation method for the individual investors (Madhavan, Sobczyk & Ang 2020). Also, if any financial data has been missing on the firm this samples have excluded from the analysis.

Thus, the first value portfolio has included 30 % of the firms with highest dividend yield, the second 30 % of the firms with lowest P/E-ratios and the third 30 % of the lowest P/B-ratios. This 30th percentile selection criteria have been in line with the Fama et al.'s (2020) paper. Fama et al. (2020) have sorted value firms according to their B/M-ratio and have selected 30 % of the firms with highest B/M-ratio to the value portfolios.

However, instead of using only one value factor as Fama et al. (2020), this paper has used three value factors. In addition, Fama et al. (2020) have used three size factors to divide the value firms according to their size which has deviated from the method of this paper. In this paper, only one value portfolio has created from each value factor. Also, Fama et al. (2020) have compared the performance of the value portfolios to the performance of the growth portfolios which has not been the purpose of this paper.

6.2.2   Construction of ESG-portfolios

In this paper, the ESG portfolios have formed roughly similarly as the value portfolios. This construction method of the ESG portfolios has derived from the Kempf and Osthoff's (2007) paper. Kempf et al. (2007) have created ESG portfolios by applying three ESG approaches, negative screening, positive screening, and best-in-class screening. Nevertheless, this paper has paid only attention to the Kempf et al.'s (2007) positive screening method because the purpose of this paper has been to measure the performance of the high scoring ESG companies without industry weights.

Kempf et al. (2007) have used percentile screen when they have sorted firms to the ESG portfolios. Each observation year firms have arranged according to their KLD ESG ratings and 10 % of the highest scoring firms have selected to the high-rated portfolio. However, the total sample size of Kempf et al.'s (2007) research is 650 firms which has been much higher than this paper. Also, Kempf et al. (2007) have followed the long-short strategy which means that besides the highly rated portfolios they have also created low-rated portfolio and sought these portfolios each year. The purpose of this paper has been to measure only the profitability of the long strategy which is why the low-rated portfolios have excluded from this analysis.

Instead of following straightly the construction method from Kempf et al. (2007), this paper has shaped it to correspond this analysis. As Kempf et al. (2007) also this paper has used percentile screening while selecting firms with the positive screening approach to the ESG portfolios. However, due to the narrower sample size, this paper has applied higher, 30 % screen. Thus, at the beginning of each observation year firms have arranged according to their ESG scores and 30 % of the highest scoring companies have selected to the ESG portfolios.

In addition, instead of using the same ESG scores as Kempf et al. (2007), this paper has screened companies based on their ESG-, emissions-, resource use-, human rights-, workforce-, management- and shareholders scores. All portfolios have formed by

following the construction process that has explained above. All in all, this paper has created each observation year seven positively screened ESG portfolios. All portfolios have been equally weighted, and their holding period has been one year. Also, firms with missing scores have excluded from this paper.

6.2.3   Construction of value + ESG-portfolios

In addition to the individual value and ESG portfolios, the purpose of this analysis has been to create portfolios that combine both investment strategies, value and ESG. These combined value + ESG portfolios have constructed by selecting only the firms that score high in both metrics. The idea for this investment strategy has originally derived from Kaiser (2019) which has observed the financial performance of ESG integrated value portfolios in Europe and US between 2002-2015. However, this paper has created combined value + ESG portfolios slightly differently than Kaiser (2019) by mixing the methods from Fama et al. (2020) and Kempf et al. (2007).

In this paper, the combined value + ESG portfolios have constructed by following two steps. First, in line with the construction process of the individual value portfolios, companies have arranged from highest to lowest based on their three value factors: dividend yield, P/E-ratio, and P/B-ratio. Overall, this step has created three value portfolios which have formed based on the 30th percentile construction method from Fama et al. (2020).

Next, all these three value portfolios have looked through separately with the positive ESG screening approach which follows the method from Kempf et al. (2007). All value firms have arranged from lowest to highest based on their ESG scores and only the firms that have passed the 30 % positive ESG screen have included to the combination portfolio. This means that companies inside the value portfolios have been must to cross the lowest acceptable ESG score which have also used in this paper to build the individual ESG portfolios. Overall, this construction process has produced three value + ESG score

mixed portfolios in each observation year, such as dividend yield + ESG portfolio, P/E + ESG portfolio and P/B + ESG portfolio.

Lastly, this same process has run through with the firms' emissions-, resource use-, human rights-, workforce-, management- and shareholders scores. As the value + ESG portfolios, also these portfolios have formed by following the same construction method. All in all, this paper has formed 21 value + ESG combined portfolios in each observation year. All portfolios have been equally weighted and re-constructed annually. Also, in line with Kaiser (2019), this paper has utilized only long-strategy.

6.3 Descriptive Statistics

6.3.1 Value portfolios

The following tables 4-6 have illustrated the descriptive statistics of all three value factors which have calculated for the OMX Helsinki firms during 2015-2019. Minimum, maximum, mean and median values have calculated annually for each value factor. From each value factor have presented two tables of which the table above has illustrated minimum, maximum, mean and median values for the total sample and the table below has illustrated these same values for the value portfolios.

Table 4. OMXH firms' dividend yields in euros (Thomson Reuters).

Dividend yield - data	2015	2016	2017	2018	2019	2015-2019
Mean	0.23	0.25	0.25	0.25	0.25	0.25
Min	0.00	0.00	0.00	0.00	0.00	0.00
Max	1.92	2.12	2.27	2.56	2.81	2.34
Median	0.07	0.09	0.09	0.06	0.09	0.08

Dividend yield - value portfolio	2015	2016	2017	2018	2019	2015-2019
Mean	0.67	0.70	0.70	0.73	0.72	0.70
Min	0.25	0.30	0.26	0.29	0.29	0.28
Max	1.92	2.12	2.27	2.56	2.81	2.34
Median	0.51	0.55	0.52	0.55	0.53	0.53

The numbers in table 4 presents that during the observation period 2015-2019, the average dividend yield for all OMX Helsinki firms have been 0.25 €. Correspondingly, the average dividend yield for the companies that have been chosen to the value portfolio has been 0.70 €. Depending on the year, the total sample has varied from 161 companies to 196 companies and the size of the sample has been growing each observation year. From the total sample, 30 % of the companies that have offered highest dividend yield have selected to the value portfolio.

Table 5. OMXH firms' P/E-ratios (Thomson Reuters).

P/E - data	2015	2016	2017	2018	2019	2015-2019
Mean	30.3	27.7	28.1	22.1	29.3	27.5
Min	0.0	0.8	5.0	0.2	1.8	1.6
Max	590.0	259.5	220.0	168.0	234.0	294.3
Median	17.8	19.4	19.2	15.1	19.1	18.1

P/E - value portfolios	2015	2016	2017	2018	2019	2015-2019
Mean	6.9	10.8	10.7	8.0	10.3	9.3
Min	0.0	0.8	5.0	0.2	1.8	1.6
Max	12.2	14.3	15.1	10.3	15.4	13.5
Median	7.6	11.9	10.5	8.6	10.5	9.9

The total sample of the OMX Helsinki firms' P/E-ratios has been ranging yearly from 93 companies to 111 companies which can be seen from the table 5. Between 2015-2019 the average P/E-ratio for all firms have been 27.5. Each year 30 % of the firms with lowest P/E-ratios have selected to the value portfolio. P/E-ratio has been on average 9.3 for the OMX Helsinki value firms during 2015-2019.

Table 6. OMXH firms' P/B-ratios (Thomson Reuters).

P/B - data	2015	2016	2017	2018	2019	2015-2019
Mean	2.6	2.8	3.7	2.7	3.4	3.0
Min	0.1	0.1	0.1	0.1	0.1	0.1
Max	14.6	15.4	77.0	46.7	29.2	36.6
Median	1.9	2.1	2.4	1.7	1.9	2.0

P/B - value portfolios	2015	2016	2017	2018	2019	2015-2019
Mean	0.8	1.0	1.1	0.7	0.9	0.9
Min	0.1	0.1	0.1	0.1	0.1	0.1
Max	1.2	1.5	1.6	1.2	1.4	1.4
Median	0.8	1.0	1.1	0.7	1.0	0.9

Lastly, the table 6. has illustrated the mean, minimum, maximum and median values of the OMX Helsinki firms' P/B-ratio. Firms with P/B-ratio lower than zero has removed from this analysis. On average the P/B-ratio has been 3.0 for all OMX Helsinki companies between 2015-2019. Overall, the total sample have varied yearly from 125 companies to 153 companies. Each year value portfolio has formed by selecting 30 % of the firms that has the lowest positive P/B-value. This has resulted on average P/B-ratio of 0.9 for the OMX Helsinki value firms.

6.3.2 ESG portfolios

The following tables 7-10 have summarized the total ESG scores data that has used in this paper. As mentioned earlier in the ESG data section, the ESG scores of the OMXH firms have collected from the Thomson Reuters database. During the observation period of 2015-2019 the total sample size of all OMXH firms' scores has been growing each year, ranging from 31 to 49 firms. This rising pattern have proven that also amongst OMX Helsinki firms the interest towards CSR reporting has increased.

Anyway, the following tables 7-10 have organized in the following order: 1) ESG-scores 2) environmental scores 3) social scores and 4) governance scores. Each individual scores inside the environmental, social and governance dimensions has presented two tables of which the first one has described the minimum, maximum, mean and median values of the total sample and the second one has described this same information for the constructed portfolios. Overall, Thomson Reuters has rated firms ESG- and individual environmental-, social- and governance performance on scale 0-100.

Table 7. OMXH firms' ESG scores (Thomson Reuters Asset4).

ESG-scores data	2015	2016	2017	2018	2019	2015-2019
Mean	61.8	63.3	64.0	60.8	61.9	62.4
Min	18.8	25.6	37.7	13.0	23.9	23.8
Max	88.3	84.9	89.0	87.8	88.4	87.7
Median	63.2	62.7	62.8	63.1	64.8	63.3

ESG-portfolios	2015	2016	2017	2018	2019	2015-2019
Mean	78.6	78.7	77.8	78.6	79.1	78.6
Min	68.8	70.7	70.1	72.5	72.3	70.9
Max	88.3	84.9	89.0	87.8	88.4	87.7
Median	78.1	79.5	78.0	77.7	78.3	78.3

Table 8. OMXH firms' environmental scores (Thomson Reuters Asset4).

Emissions-scores data	2015	2016	2017	2018	2019	2015-2019
Mean	72.9	73.2	73.8	68.6	71.3	72.0
Min	0.0	26.0	26.9	5.5	12.8	14.2
Max	99.8	97.7	98.0	98.7	98.9	98.6
Median	76.8	77.3	76.5	75.9	76.5	76.6

Emissions-portfolios	2015	2016	2017	2018	2019	2015-2019
Mean	91.6	92.5	92.2	90.9	92.0	91.9
Min	86.0	87.9	86.4	86.5	86.4	86.7
Max	99.8	97.7	98.0	98.7	98.9	98.6
Median	91.7	92.5	91.1	89.8	91.8	91.4

Resource use-scores data	2015	2016	2017	2018	2019	2015-2019
Mean	72.6	72.8	73.8	69.2	69.7	71.6
Min	5.7	0.0	0.0	0.0	0.0	1.1
Max	97.1	99.5	99.5	99.6	99.6	99.1
Median	76.4	76.0	74.3	72.6	75.5	74.9

Resource use-portfolios	2015	2016	2017	2018	2019	2015-2019
Mean	92.1	91.6	92.6	91.7	91.0	91.8
Min	87.9	83.2	86.1	84.9	84.3	85.3
Max	97.1	99.5	99.5	99.6	99.6	99.1
Median	90.4	91.6	92.8	92.0	91.0	91.5

Table 9. OMXH firms' social scores (Thomson Reuters Asset4).

Human rights-scores data	2015	2016	2017	2018	2019	2015-2019
Mean	62.5	64.6	71.7	70.3	71.4	68.1
Min	0.0	0.0	10.2	0.0	0.0	2.0
Max	95.3	94.8	97.6	98.0	98.1	96.8
Median	67.8	75.2	79.3	75.7	77.1	75.0

Human rights-portfolios	2015	2016	2017	2018	2019	2015-2019
Mean	93.1	91.6	94.6	94.2	93.6	93.4
Min	90.0	88.3	92.6	91.3	91.2	90.7
Max	95.3	94.8	97.6	98.0	98.1	96.8
Median	93.3	92.4	94.3	93.9	92.8	93.3

Workforce-scores data	2015	2016	2017	2018	2019	2015-2019
Mean	73.3	77.8	76.5	74.1	73.9	75.1
Min	20.4	52.2	44.3	23.7	22.2	32.5
Max	96.2	99.0	99.1	99.2	99.4	98.5
Median	77.5	80.2	78.4	75.2	75.3	77.3

Workforce-portfolios	2015	2016	2017	2018	2019	2015-2019
Mean	88.9	92.2	93.4	92.2	91.9	91.7
Min	86.3	86.1	88.8	86.4	86.1	86.7
Max	96.2	99.0	99.1	99.2	99.4	98.5
Median	87.5	92.9	92.5	89.5	91.6	90.8

Table 10. OMXH firms' governance scores (Thomson Reuters Asset4).

Management-scores data	2015	2016	2017	2018	2019	2015-2019
Mean	51.7	51.9	52.4	50.3	50.1	51.3
Min	1.9	1.9	1.8	1.3	0.3	1.4
Max	98.1	98.1	98.2	98.7	98.8	98.4
Median	53.8	53.8	55.4	50.0	50.0	52.6

Management-portfolios	2015	2016	2017	2018	2019	2015-2019
Mean	86.5	84.8	84.6	85.2	85.4	85.3
Min	75.0	71.2	72.1	70.5	72.9	72.3
Max	98.1	98.1	98.2	98.7	98.8	98.4
Median	86.5	84.6	83.9	85.9	84.6	85.1

Shareholders-scores data	2015	2016	2017	2018	2019	2015-2019
Mean	46.7	46.8	44.4	46.7	46.8	46.3
Min	1.9	1.9	0.7	1.3	1.2	1.4
Max	98.1	98.1	98.2	98.7	98.8	98.4
Median	44.7	46.2	42.0	44.9	42.7	44.1

Shareholders-portfolios	2015	2016	2017	2018	2019	2015-2019
Mean	80.8	80.9	82.5	84.1	85.5	82.8
Min	63.5	64.4	66.1	68.0	72.0	66.8
Max	98.1	98.1	98.2	98.7	98.8	98.4
Median	80.8	80.8	83.9	84.6	86.6	83.3

Between the years of 2015-2019 the average ESG score for the OMX Helsinki companies has been 62.4. Similarly, the average emissions- and resource use scores have been 72.0 and 71.6, human rights- and workforce scores have been 68.1 and 75.1, and management- and shareholders scores have been 51.3 and 46.3, respectively. Overall, these statistics have indicated that between the period of 2015-2019 the OMX Helsinki firms have had highest performance in their environmental and social areas. Thomson Reuters has classified highest the OMXH firms' workforce performance. Conversely, the OMXH firms' performance in the governance areas has differed substantially from the other areas and have reduced their total ESG score.

Also, in the following figure 2 has presented the advancement of all OMXH firms' ESG-, emissions-, resource use-, human rights-, workforce-, management- and shareholders scores based on the Thomson Reuters ESG Scores. Overall, the development during the years of 2015-2019 has been quite steady but it has indicated downward direction. However, the figure 2 has pointed out that the average human rights scores have improved positively. Conversely, both scores that measure OMXH companies' environmental performance such as emissions scores and resource scores have dropped since 2017.
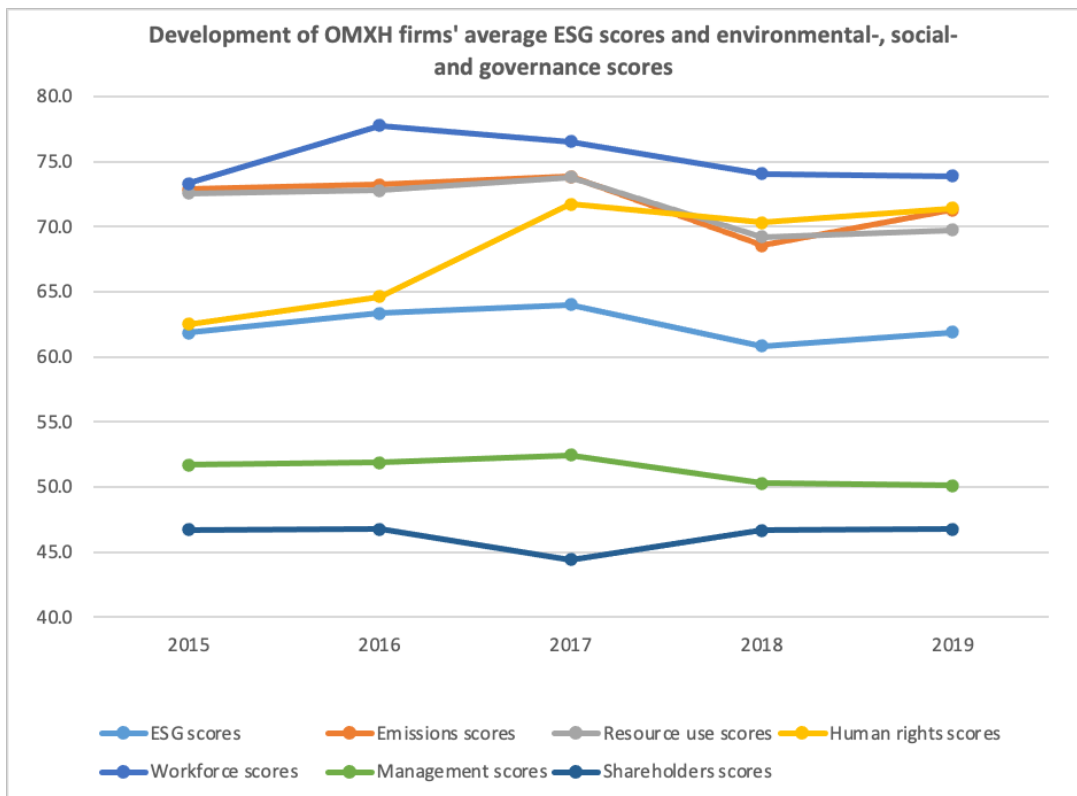
Figure 2. Development of OMXH firms' average ESG-, environmental-, social- and governance scores.

6.3.3 Value + ESG portfolios

The following tables 11-12 have illustrated the descriptive statistics of the combined value + ESG portfolios. The first table has summed up the mean values of the three value factors which have been calculated for the OMXH firms that have selected to the combination portfolios. In addition, the second table has illustrated the mean values of the

ESG-, emissions-, resource use-, human rights-, workforce-, management- and share-holders scores for these same portfolios.

Table 11. Average Dividend Yields (€), P/E-ratios, and P/B-ratios of ESG integrated value portfolios.

Portfolio	2015	2016	2017	2018	2019	2015-2019
ESG (DY)	0.5	0.5	0.6	0.7	1.0	0.7
Emissions (DY)	0.8	0.8	1.0	1.1	1.1	1.0
Resource Use (DY)	0.6	0.8	0.7	0.8	0.9	0.8
Human Rights (DY)	0.7	0.8	0.9	1.0	1.1	0.9
Workforce (DY)	0.8	0.9	0.9	0.9	1.0	0.9
Management (DY)	0.6	0.6	0.7	0.7	0.9	0.7
Shareholders (DY)	0.7	0.5	0.5	0.6	0.7	0.6
ESG (P/E)	4.8	12.0	13.2	8.6	13.3	10.4
Emissions (P/E)	8.2	11.6	13.6	9.1	13.2	11.1
Resource Use (P/E)	11.1	10.3	14.1	9.2	13.1	11.6
Human Rights (P/E)	7.3	11.5	9.8	8.2	9.7	9.3
Workforce (P/E)		14.1	15.1	9.4	11.3	12.5
Management (P/E)	6.9	11.6	13.2	9.4	13.3	10.9
Shareholders (P/E)	8.2	12.2	10.8	7.5	14.9	10.7
ESG (P/B)	1.0	1.2	1.2	0.6	1.1	1.0
Emissions (P/B)	0.5	1.2	1.0	0.4	1.1	0.9
Resource Use (P/B)	0.7	1.3	1.0	0.1	0.9	0.8
Human Rights (P/B)	0.7	0.8	1.5	0.9	1.0	1.0
Workforce (P/B)	0.7	1.1	1.0	0.9	0.9	0.9
Management (P/B)	0.7	1.2	1.2	0.6	1.0	0.9
Shareholders (P/B)	0.7	0.9	1.0	0.5	0.6	0.8

The table 11 above has divided into three separate parts. The first part has consisted of the information of the dividend yields of the OMXH firms that have been chosen to the combination portfolios. The OMXH value companies that have performed well with the ESG dimensions have offered higher dividend yields than the OMXH companies on average 0.25. Also, almost all portfolios have crossed the average dividend yield 0.7 that has related to the pure value portfolios. Thus, the investors that have been seeking firms that have promoted responsible business have not been forced to settle to the lower dividend yields. On average the highest dividend yields 1.0 have related to the companies that have paid attention to the emissions production.

On the other hand, both the P/E-ratios and P/B-ratios of the combination portfolios have been slightly above the average values of the pure value portfolios which can be also seen from the table 11. The average ratios of the pure P/E-value portfolio and P/B-value portfolio have been 9.3 and 0.9, respectively. However, these both values have been way lower than the average ratios for all OMXH companies. These ratios have been 27.5 for the P/E-ratios and 3.0 for the P/B-ratios.

Table 12. Average ESG-, environmental, social and governance scores of ESG integrated value portfolios.

Portfolio	2015	2016	2017	2018	2019	2015-2019
ESG (DY)	79.0	79.7	77.1	78.7	78.2	78.5
Emissions (DY)	91.5	92.0	91.8	90.5	91.7	91.5
Resource Use (DY)	90.9	90.8	91.3	90.9	90.0	90.8
Human Rights (DY)	93.9	91.4	95.0	94.2	94.0	93.7
Workforce (DY)	88.9	92.7	92.7	91.1	91.7	91.4
Management (DY)	86.0	82.0	87.5	84.5	86.6	85.3
Shareholders (DY)	81.9	79.1	83.2	83.3	85.6	82.6
ESG (P/E)	80.1	78.6	79.7	79.5	80.9	79.8
Emissions (P/E)	66.7	91.0	92.2	94.0	91.6	87.1
Resource Use (P/E)	87.9	94.3	87.8	92.5	93.8	91.3
Human Rights (P/E)	93.1	91.1	92.6	95.2	94.6	93.3
Workforce (P/E)		92.4	93.2	92.4	90.7	92.2
Management (P/E)	84.0	85.3	87.4	84.4	89.6	86.1
Shareholders (P/E)	86.5	87.9	87.3	92.3	76.8	86.2
ESG (P/B)	80.1	79.1	77.9	75.9	81.5	78.9
Emissions (P/B)	90.9	90.6	92.6	94.7	92.0	92.2
Resource Use (P/B)	89.1	98.5	92.4	90.9	94.0	93.0
Human Rights (P/B)	93.0	90.6	93.4	94.3	93.9	93.0
Workforce (P/B)	86.6	92.4	93.0	90.4	91.7	90.8
Management (P/B)	86.5	85.7	85.7	89.3	86.1	86.7
Shareholders (P/B)	80.1	90.4	86.6	90.4	85.4	86.6

Moreover, the table 12 has shown the mean values of the ESG-, emissions-, resource use-, human rights-, workforce-, management- and shareholders scores of the OMXH companies that have been selected to the combination portfolios. As the table 11, also table 12 has divided to three parts. The first part has illustrated the average scores of the dividend yield + ESG portfolios, the second P/E + ESG portfolios and the third P/B + ESG portfolios. Overall, the average ESG scores and individual environmental, social and

governance scores of the combination portfolios have been approximately equal with the pure ESG portfolios.

All in all, from the table 11 and 12 can be noticed that in total 104 combination portfolios have been created during the observation period 2015-2019. However, only exception has been the year of 2015 when none of the OMXH firms that were first sorted with the P/E -value factor have been able to pass the 30 % positive ESG screen after that. Thus, this portfolio has been excluded from the analysis.

6.4 Methodology

As discussed earlier, the first intention of this paper has been to observe the value premium in the Finnish stock market. Historically the most common way of measuring value premium in the financial literature has been by calculating it as a difference between returns of value stocks and growth stocks. For example, the studies that have also introduced in this paper's theoretical section such as Basu (1977), Chan et al. (1991), Fama et al (1992) and Lakonishok et al. (1994) have followed this comparative approach of value and growth stocks when they have assessed the profitability of value premium.

However, recently in their newest paper Fama et al. (2020) have brought out that in the investment and asset pricing related context it would be more reasonable to measure value premium as a difference of value stocks returns and market returns. The reason for this has been that the investors receive much more relevant information about the actual profitability of the value stocks when the comparison has been made between the average market returns rather than the sample of growth stocks. Fama et al. (1998) have also utilized this same approach when they have executed a worldwide research of the value premium in the 1970s. Thus, also in this paper the value premium has evaluated by comparing the value stocks returns against the average returns of total Finnish stock universe.

In addition, most of the previous researchers have agreed that the returns of value stocks have been higher than the reference growth or market portfolios which works also as an assumption in this paper. The very well-known papers from Basu (1977), Chan et al. (1991), Fama et al (1992) and Lakonishok et al. (1994) have all founded that the returns of value stocks have been significantly higher than the returns of growth stocks. Also, the results of Fama et al.'s (1998) worldwide examination have been historically striking because the findings have proved that the value stocks' returns have beaten the market returns in twelve out of thirteen countries. Firms with high B/M-, E/P- and C/P-ratios have provided 3.07 % - 5.16 % higher returns than the market portfolios.

However, as discussed earlier in this paper, Fama et al. (2020) have pointed out that the value premium has become significantly weaker during the past decades, more accurately between the years of 1991-2019. Therefore, one of the intentions of this paper has been to investigate the magnitude of value premium in the Finnish stock market within these years. Anyway, because most of the previous financial researchers have agreed with the superior returns of value stocks the first research question and its hypotheses can be formulated as follows:

1. *Has the value premium existed in in the Finnish stock market between the years of 2015-2019?*

H0: Value portfolios returns have been equal with the returns of the market portfolios in the Finnish stock market between the years of 2015-2019.

H1: Value portfolios returns have been higher than the returns of the market portfolios in the Finnish stock market between 2015-2019.

After measuring the value premium in the Finnish stock market, the next aim of this paper has been to evaluate the returns of positively screened ESG portfolios. In the previous ESG investing related financial literature, the positive screening approach has

received much lower attention than the most popular approaches such as negative screening and best-in-class screening. Moreover, in almost all these papers the researchers have employed the long-short strategy while measuring the profitability of different ESG investing approaches. However, as highlighted earlier in this paper, this paper has concentrated on measuring only the returns of highly rated ESG portfolios which have had a long position.

From the existing financial literature Kempft et al. (2007) and Yen et al. (2019) have been one of the few researchers which have included the assessment of positive screening ESG approach to their papers. Also, both papers have observed the returns of highly rated ESG portfolios which results have summarized in this section before moving on formulating the second hypothesis of this paper. Both Kempft et al.'s (2007) and Yen et al.'s (2019) papers have also discussed more accurately in the theoretical section of this paper.

Kempft et al. (2007) have founded that with almost every different ESG score metrics the highly rated portfolios produce higher returns than the US market portfolios. For all market portfolios the gained alpha has been approximately 1 % but for the highly rated community score, employee relations score and environment score portfolios the alpha has been statistically significant and over 3 %. On the other hand, the results that Yen et al. (2019) have obtained in the Asian markets have been somewhat inconsistent. In Japan the highly rated ESG portfolio has barely beaten out the market by providing alpha of 1.057 % while the market has offered alpha of 0.856 %. Conversely, while measuring the returns of highly rated ESG portfolio in all emerging Asian markets the alpha has turned out to be lower than the alpha of the market portfolio.

Anyway, even though the results of Kempft et al.'s (2007) and Yen et al.'s (2019) have not been exactly in line with each other, a larger part of the results have still indicated that highly rated ESG portfolios have provided higher returns than the market portfolios. Thus,

based on the aggregate results of Kempft et al.'s (2007) and Yen et al.'s (2019) papers, the second research question and hypotheses of this paper have formed as follows:

2. *Have the positively screened highly rated ESG portfolios offered higher returns than the market portfolio in the Finnish stock market during 2015-2019?*

H0: The returns of highly rated ESG portfolios have been equal with the returns of the market portfolio in the Finnish stock market during 2015-2019.

H1: The returns of highly rated ESG portfolios have been higher than the returns of the market portfolio in the Finnish stock market during 2015-2019.

Finally, the last purpose of this paper has been to observe the performance of the equity portfolios which has combined both metrics value and ESG. So far, in the financial literature this investment strategy has been somewhat new amongst the financial researchers which is why only few papers have existed from this subject. Also, in almost all existing financial research related to this investment strategy the value + ESG mixed portfolios have constructed by using very different methodological approaches.

However, despite to the deficiency and dissimilarity of the previous financial literature the common feature between these papers have been the comparative approach between the value investment strategy and ESG integrated value investment strategy. In addition, most often these strategies performance has investigated by measuring portfolios mean returns, standard deviations, Sharpe ratios and alphas. Therefore, also this paper has decided to follow this same approach and measures while evaluating the performance of value and ESG integrated value investment strategies.

Anyway, the purpose of this paper has not only been to follow the same approach as previous financial literature but also to extend their research and compare ESG integrated value portfolios performance with the pure ESG portfolios and market portfolios.

Also, in this case the portfolios' performance has been measured with their mean re-turns, standard deviations, Sharpe ratios and alphas. Moreover, results significance has assessed with the T-test. Finally, before framing the last hypothesis of this thesis, this paper has summarized the results of Abramson et al.'s (2000), Bauer et al.'s (2005) and Kaiser's (2019) papers relating to the performance of combined ESG + value portfolios.

From the previous studies the results of Abramson et al.' (2000) and Kaiser et al.' (2019) papers have agreed that the integration of ESG to the pure value portfolios have been a profitable add for the value investor. Abramson et al. (2000) have founded that by using two different investment strategies which have screened the responsible Domini Social index's companies with two value factors such as relative dividend yield and market cap-italization to revenues ratio have offered higher average returns than the pure value portfolio in US stock market during the observation period of 1990-2000. Similarly, also Kaiser (2019) has discovered that the best-in-class method combined with value factors such as dividend yield, P/E-, P/B-, P/S- and P/CF-ratio have provided higher mean returns than pure value portfolios in US and Europe during the years of 2002-2016. However, both papers have also observed the standard deviations and Sharpe ratios of value and ESG integrated value portfolios but the results concerning these measures have been somewhat inconsistent with each other.

In addition to Abramson et al.'s (2000) and Kaiser's (2019) papers, also Bauer et al. (2005) have observed the returns of this blended value and ESG investment strategy. However, instead of observing individual stocks, Bauer et al. (2005) have investigated the success of ethical equity mutual funds which have been screened with the book-to-market factor. Interestingly, the results from the observation period 1990-2001 indicate exactly oppo-site results as Abramson et al.'s (2000) and Kaiser's (2019) papers. The Carhart 4-factor model's HML factor have turned out to be lower for all ethical portfolios than for the conventional value portfolios in US, UK, and Germany. Anyway, despite the poor results of Bauer et al.'s (2005) research, the two papers from Abramson et al. (2000) and Kaiser

(2019) have spoken on behalf of the higher average returns of this mixed value and ESG investment strategy.

In conclusion, the previous literature related to the combined value + ESG strategy have still been somewhat inadequate and the methodologies that have used in the existing papers have slightly deviated from each other. Also, the methodology that this paper has used to construct the combination portfolios have not exactly replicated the formation methods of Abramson et al.'s (2000), Bauer et al.'s (2005) and Kaiser's (2019) papers. Therefore, the purpose of the last hypothesis of this paper has been to find out if the performance of value + ESG combination portfolios has been statistically different from the performance of market portfolios, value portfolios and ESG portfolios. Thus, the last research question and its hypotheses have formulated as follows:

3. *Has the performance of ESG integrated value portfolios deviated from the perfor-mance of pure value, pure ESG and the market portfolio during 2015-2019?*

H0: The performance of ESG integrated value portfolios has been equal with the perfor-mance of pure value, pure ESG and the market portfolio between 2015-2019.

H1: The performance of ESG integrated value portfolios has been unequal with the per-formance of pure value, pure ESG and the market portfolio between 2015-2019.

7 Empirical Results

In this section all empirical results of this paper have presented. First, this paper has discussed the results related to pure value portfolios, second the results related to pure ESG portfolios and lastly, the results related to ESG integrated value portfolios. In all sections the statistical significance of the results has measured with the T-test, and it has indicated in the following way: *** means 1 % significance, ** means 5 % significance and * means 10 % significance.

7.1 The results of value portfolios

Table 13. Average annualized returns, mean returns, t-stat values, and average standard deviations of value portfolios (*** 1 % significance, ** 5 % significance and * 10 % significance).

	2015	2016	2017	2018	2019	Mean	T-stat	Std
Value portfolios				Panel A				
DY	0.156	0.111	0.096	-0.145	0.305	0.105	-0.414	0.145
P/E	0.399	0.239	0.172	-0.212	0.323	0.184**	2.724	0.213
P/B	-0.009	0.160	-0.021	-0.374	0.160	-0.017	-3.295	0.195
				Panel B				
Market portfolio	0.259	0.183	0.093	-0.201	0.256	0.118		0.171

The table 13 above has divided in two panels. The Panel A has reported the annual returns, average returns and average standard deviations of the dividend yield-, P/E- and P/B-value portfolios and the Panel B has informed these same values for the market portfolio. In addition, the market portfolio has constructed on the firms that have belonged to the OMXH index during 2015-2019. Also, all values that have illustrated in the table x have been calculated for this same observation period.

Overall, the results in table 13 have discovered that only one out of three value portfolios have beaten out the market portfolio during 2015-2019. Within this observation period the highest performing P/E-value portfolio has offered average annual return as high as

18.4 % while the other two value portfolios' average returns have remained considerably lower. The average annual returns of dividend yield- and P/B-value portfolios have been 10.5 % and -1,7 %, respectively which have also turned out to be substantially lower than the average return of market portfolio. However, the value premium of the P/E-value portfolio has been on average 6.6 % per year and interestingly the difference between the returns of market portfolio has been statistically significant at 5 % significance level.

Moreover, from the results in table 13 can be also observed that the risk-return relationship of dividend yield value portfolio, P/E-value value portfolio and market portfolio increases somewhat linearly. This finding can be associated to the Markowitz's (1952) portfolio theory which believes that the investors should be compensated with the higher returns if the portfolio's risk increases. However, only portfolio that does not meet the requirements of this theory has been the P/B-value portfolio which risk has been on average 19.5 % annually but the returns have been on average lowest from all portfolios.

To conclude, the results in table 13 indicate that during the observation period of 2015-2019 only one out of three value portfolios have been able to offer higher average annual returns than the market portfolio while the other two value portfolios returns have remained much lower. Thus, even though this paper has managed to find one positive and significant value premium from the Finnish stock market with the P/E-value portfolio, the aggregate average return of all three value portfolios would result in near the average return of the market portfolio. Therefore, to sum up, the results in table 13 prove the value premium have not existed in the Finnish stock market at least between the years of 2015-2019 which would speak on behalf of accepting the first null hypothesis "H0: Value portfolios returns have been equal with the returns of the market portfolios in the Finnish stock market between the years of 2015-2019." of this paper. Lastly, these findings have also been roughly in line with the evidence of Fama et al.'s (2020) paper which have found that the value premium has weakened during the past decades.

7.2 The results of ESG portfolios

Table 14. Average annualized returns, mean returns, t-stat values, and average standard deviations of ESG portfolios (*** 1 % significance, ** 5 % significance and * 10 % significance).

	2015	2016	2017	2018	2019	Mean	T-stat	Std
ESG portfolios					Panel A			
ESG	0.040	0.245	0.103	-0.041	0.099	0.089	-0.407	0.094
Emissions	-0.024	0.413	0.120	-0.108	0.207	0.122	0.042	0.182
Resource Use	0.026	0.326	0.122	-0.054	0.236	0.131	0.187	0.137
Human Rights	0.119	0.120	-0.019	-0.152	0.051	0.024	-2.223	0.102
Workforce	0.112	0.224	0.086	-0.042	0.228	0.122	0.074	0.100
Management	0.106	0.113	0.131	-0.007	0.071	0.083	-0.509	0.049
Shareholders	-0.011	0.323	0.100	-0.073	0.183	0.104	-0.182	0.141
					Panel B			
Market portfolio	0.259	0.183	0.093	-0.201	0.256	0.118	-	0.171

In table 14 has illustrated the results concerning ESG portfolios' and market portfolio's annual returns, average returns, and average standard deviation. Similarly, as table 13, also table 14 has divided in two panels. Panel A has reported the results of ESG portfolios and Panel B the results of market portfolio. The market portfolio has remained same as in table 13.

All in all, the results in table 14 point out that the returns of three out of seven positively screened ESG portfolios have beaten out the return of market portfolio between the years of 2015-2019. From all ESG portfolios the best returns have offered the resource use portfolio which average annual return has been 13.1 % and approximately 1.3 % above the market portfolio's return. Also, emissions- and workforce portfolio's average yearly returns have crossed the market portfolio's return in both portfolios by 0.4 %.

Conversely, the other four ESG portfolios in table 14 have provided lower returns than the market on average. During the observation period of 2015-2019 the average annual returns for ESG-, management- and shareholders portfolios have been only 8.9 %, 8.3 % and 10.4 %, in respective order. Also, the weakest returns have offered human rights portfolio which average annual return has been as poor as 2.4 %.

In addition, table 14 has also reported the average standard deviations of the ESG portfolios. In this case, the risk-return relationship is not as straightforward as it has been with the value portfolios. The highest deviation in the portfolios' yearly returns has been inside the emissions portfolio which standard deviation has been annually on average 18.2 %. On the other hand, the resource use portfolio which has offered highest average returns has had standard deviation below the market portfolio. Also, the average returns of the other ESG portfolios does not directly reflect their average level of risk between the years of 2015-2019.

All in all, the results in table 14 have turned out to be somewhat inconsistent. The results indicate that in three out of seven ESG portfolios the average returns have beaten out the returns of market portfolio but in the remainder portfolios the returns have stayed lower. As discussed earlier in this paper, also Yen et al. (2019) have discovered somewhat similar results from the emerging Asian countries but in their paper the results have varied regionally. However, to sum up, most part of the results still lean towards the finding that the average returns of ESG portfolios have remained either lower or roughly same than the market portfolio's returns during 2015-2019. Therefore, based on this conclusion also the second null hypothesis of this paper "H0: The returns of highly rated ESG portfolios have been equal with the returns of the market portfolio in the Finnish stock market during 2015-2019" has accepted.

7.3 The results of combined ESG + value portfolios

7.3.1 Comparison between the market portfolio

Table 15. Average annualized returns, mean returns, t-stat values, and average standard deviations of ESG integrated value portfolios (*** 1 % significance, ** 5 % significance and * 10 % significance).

	2015	2016	2017	2018	2019	Mean	T-stat	Std
Value + ESG portfolios				Panel A				
ESG (DY)	-0.008	0.066	0.208	-0.119	0.221	0.074	-0.641	0.129
Emissions (DY)	0.110	0.148	0.158	-0.075	0.243	0.117	-0.031	0.105
Resource Use (DY)	0.072	0.228	0.155	-0.096	0.299	0.132	0.266	0.137
Human Rights (DY)	-0.044	0.104	0.022	-0.150	0.111	0.009	-1.895	0.098
Workforce (DY)	0.148	0.087	0.064	-0.024	0.380	0.131	0.218	0.136
Management (DY)	0.038	0.111	0.204	-0.130	0.160	0.077	-0.691	0.117
Shareholders (DY)	0.092	0.064	0.143	-0.123	0.328	0.101	-0.334	0.145
ESG (P/E)	-0.196	0.751	0.181	-0.339	0.166	0.112	-0.033	0.378
Emissions (P/E)	-0.029	0.298	0.216	-0.243	0.260	0.100	-0.237	0.206
Resource Use (P/E)	0.052	0.269	0.296	-0.259	0.284	0.129	0.154	0.213
Human Rights (P/E)	-0.056	0.183	-0.029	-0.393	-0.107	-0.080**	-3.024	0.185
Workforce (P/E)		0.355	0.110	-0.292	0.151	0.081	-0.029	0.234
Management (P/E)	-0.113	0.298	0.181	-0.266	0.166	0.053	-0.749	0.209
Shareholders (P/E)	-0.029	0.827	0.074	-0.434	0.152	0.118	0.000	0.408
ESG (P/B)	0.000	0.337	0.001	-0.378	-0.044	-0.017	-1.675	0.227
Emissions (P/B)	-0.065	0.172	0.046	-0.348	0.070	-0.025*	-2.586	0.178
Resource Use (P/B)	0.090	-0.044	0.046	-0.280	-0.021	-0.042**	-3.679	0.128
Human Rights (P/B)	-0.196	0.024	-0.098	-0.411	-0.117	-0.160***	-4.806	0.144
Workforce (P/B)	-0.124	0.190	0.046	-0.349	-0.037	-0.055*	-2.359	0.180
Management (P/B)	-0.019	0.110	0.001	-0.308	0.037	-0.036**	-3.844	0.143
Shareholders (P/B)	-0.109	0.541	-0.053	-0.329	-0.078	-0.006	-0.953	0.290
				Panel B				
Market portfolio	0.259	0.183	0.093	-0.201	0.256	0.118		0.171

In table 15 has reported the results related to combined value + ESG portfolios and market portfolio. Panel A has illustrated the annual returns, average returns, and average standard deviations of the value + ESG mixed portfolios and panel B the same values for the market portfolio. As in table 13 and 14 the market portfolio has constructed from the OMXH index firms in this case as well.

Overall, the results in table 15 have proven that from all dividend yield + ESG combined portfolios two out of seven portfolios have provided higher average returns than market portfolio during the observation period 2015-2019. These two highest performing portfolios have been again the resource use portfolio with the average yield of 13.2 % and workforce portfolio with the average yield of 13.1 %. Moreover, also from the P/E + ESG combined portfolios the resource use portfolio has been the only portfolio which has

beaten out the market portfolio with 12.9 % average return. However, also the share-holders portfolio has reached the same average return 11.8 % than the market portfolio. All other portfolios have performed worse than the market on average.

In addition, in panel A has also illustrated the average returns of P/B + ESG combined portfolios which have proved out to be considerably lower than the returns of other combined portfolios. Table 15 show that the average returns for all P/B + ESG mixed portfolios have been below zero percent during the observation period 2015-2019. Also, after running the two-tailed t-test for these portfolios the results prove that five out of seven P/B + ESG combined value portfolios' returns differ significantly from the market portfolio's return.

Lastly, in table 15 has also reported the standard deviations of all combination portfolios and market portfolio. Interestingly the results have founded that in all dividend yield + ESG combined portfolios the risk has remained below the average market risk even though the resource use and workforce portfolios have provided higher returns than the market portfolio. By contrast, the results have shown exactly opposite results for the P/E + ESG combined portfolios in which the risk has been substantially higher than in other combined portfolios and market portfolio. Also, even though the returns of P/B + ESG combined portfolios have been below zero percent the risk has been in all portfolios almost same as the risk of market portfolio. Thus, to summarize the results related to portfolio's average returns and standard deviations, table 15 have proven that the risk-return relationship of this paper's value + ESG combined portfolios does not follow the Markowitz's (1952) portfolio theory and are evidence against the efficient market hypothesis.

As a conclusion, altogether only three out of 21 combined value + ESG portfolios have provided higher returns than the market portfolio. By contrast, the other combined port-folios have performed worse than the market on average during the observation period 2015-2019. Also, from the group of lower performing portfolios in total six out of 18

combination portfolios' average returns have differed significantly from the market portfolio's return. Thus, the results in table 15 have mostly supported on rejecting the third null hypothesis "H0: The performance of ESG integrated value portfolios has been equal with the performance of pure value, pure ESG and the market portfolio between 2015-2019" of this paper because overall the returns of ESG integrated value portfolios have not reached as high as the market portfolios' returns.

7.3.2 Comparison between value portfolios and ESG portfolios

Before completely rejecting the third null hypothesis of this paper the next step is to observe the results in table 16 and table 17. In table 16 the ESG integrated value portfolios returns have compared against the corresponding value portfolios and in table 17 similarly against the corresponding ESG portfolios. Anyway, both tables have reported the average returns, average standard deviations, alphas, and Sharpe ratios of ESG integrated value portfolios, pure value portfolios and pure ESG portfolios.

Table 16. Mean returns, T-stat values, average standard deviations, alphas, and Sharpe ratios of ESG integrated value portfolios and pure value portfolios (*** 1 % significance, ** 5 % significance and * 10 % significance).

	Mean returns	T-stat	Std	Alpha	Sharpe ratio
Dividend yield + ESG portfolios			Panel A		
ESG (DY)	0.074	-0.661	0.129	-0.022	0.488
Emissions (DY)	0.117	0.424	0.105	-0.047	1.002
Resource Use (DY)	0.132	0.791	0.137	0.014	0.880
Human Rights (DY)	0.009*	-2.236	0.098	-0.145	-0.014
Workforce (DY)	0.131	0.854	0.136	0.022	0.873
Management (DY)	0.077	-0.609	0.117	-0.045	0.567
Shareholders (DY)	0.101	-0.191	0.145	-0.010	0.620
Value DY	0.105	-	0.145	-0.023	0.649
P/E + ESG portfolios			Panel B		
ESG (P/E)	0.112	-0.403	0.378	0.080	0.271
Emissions (P/E)	0.100	-0.944	0.206	0.028	0.436
Resource Use (P/E)	0.129	-0.704	0.213	0.053	0.555
Human Rights (P/E)	-0.080**	-3.441	0.185	-0.163	-0.489
Workforce (P/E)	0.081	-0.824	0.234	-0.001	0.308
Management (P/E)	0.053	-1.287	0.209	-0.010	0.205
Shareholders (P/E)	0.118	-0.384	0.408	0.081	-0.213
Value P/E	0.184		0.213	0.088	0.818
P/B + ESG portfolios			Panel C		
ESG (P/B)	-0.017	0.003	0.227	-0.084	-0.118
Emissions (P/B)	-0.025	-0.286	0.178	-0.118	-0.046
Resource Use (P/B)	-0.042	-0.360	0.128	-0.176	-0.406
Human Rights (P/B)	-0.160**	-3.377	0.144	-0.265	-0.720
Workforce (P/B)	-0.055	-0.752	0.180	-0.131	-0.360
Management (P/B)	-0.036	-0.585	0.143	-0.160	-0.320
Shareholders (P/B)	-0.006	0.110	0.290	-0.045	-0.053
Value P/B	-0.017		0.195	-0.113	-0.116

Table 16 has divided in three panels. Panel A has illustrated the results of ESG integrated dividend yield value portfolios, Panel B the results of ESG integrated P/E-value portfolios and Panel C the results of ESG integrated P/B-value portfolios. In each panel has also represented the results related to the corresponding value portfolios.

In addition, all portfolios' alphas have determined by using Sharpe's (1964) Capital Asset Pricing model which has historically been one of the most powerful theoretical models to predict the expected return of an investment. The estimations of the portfolios' expected returns have been made based on the average return of the market portfolio from the years of 2015-2019. Also, as a risk-free rate this paper has used the average yield of German's 30-year government bond which has been determined from this same observation period.

All in all, the results in Panel A have proven that three out of seven ESG integrated dividend yield value portfolios have pointed out higher performance than the corresponding value portfolio. The best performing combination portfolios in this class have been emissions-, resource use- and workforce portfolios which mean returns have been higher than other combination portfolios and dividend yield value portfolio between the years of 2015-2019. In addition, when all portfolios performance has evaluated with the performance measure of Sharpe ratio, the results have discovered that these three-dividend yield + ESG portfolios have beaten out the corresponding value portfolio also in risk-adjusted basis.

On the other hand, the CAPM model has founded that only resource use- and workforce portfolios have provided positive alphas during the observation period. Conversely other combination portfolios' as well as dividend yield value portfolio have offered negative alphas which means that their performance have been under their theoretical expectations. However, even though the alphas have turned out to be negative in several ESG integrated dividend yield value portfolios the four of them have still gained higher alpha than the pure value portfolio.

Conversely, the results in Panel B have discovered that none of the ESG integrated P/E-value portfolios have been able to beat out the performance of superior P/E-value portfolio during the years of 2015-2019. As discussed earlier, the average return of the P/E-value portfolio has been annually as high as 18.4 % but also the average risk has

remained below the risk of several ESG integrated P/E value portfolios. Therefore, also the performance measurement Sharpe ratio has agreed that in risk-adjusted basis the pure P/E-value portfolio have proved higher performance than the P/E + ESG mixed portfolios.

In addition, also the CAPM model has provided as strong as 8.8 % alpha for the P/E-value portfolio which has been highest alpha for the whole portfolio group in Panel B. However, despite to the lower alphas of the combination portfolios, four of them have still provided positive alphas which can be interpret that four P/E + ESG combined portfolios have provided active returns over their theoretical expectation during 2015-2019. One of these portfolios has been again the resource use portfolio which has proven highest mean returns and risk-adjusted performance from all ESG integrated P/E value portfolios.

Lastly, the Panel C has shown same results also to the P/B + ESG combined value portfolios and to the pure P/B-value portfolio. Overall, the results discover that only one of the ESG integrated P/B-value portfolios has been able to beat the regular P/B-value portfolio's performance between the years of 2015-2019. In this time the highest performing portfolio has been shareholders portfolio which average return, alpha and Sharpe ratio has been higher than the pure P/B-value portfolio. However, still if all portfolios' performance in table 16 has considered the results prove that the performance of P/B value factor have been poorest during this observation period. Explicit evidence from this has been the negative alphas and negative Sharpe ratios of both ESG integrated P/B-value portfolios and P/B-value portfolio.

Overall, the results in table 16 have indicated that the inclusion of positive screening ESG approach to the construction process of three value portfolios such as dividend yield-, P/E- and P/B-portfolios has weakened the performance of these base value portfolios. This phenomenon can be noticed from each panel where the average returns, alphas and Sharpe ratios have turned out to be lower for the most ESG integrated value portfolios than their corresponding value portfolios. However, in Panel A and Panel C the fall

of these values has not been that striking but by contrast in Panel B the ESG integrated value portfolios have shown considerably lower performance than pure value portfolio.

On the other hand, the results concerning all portfolios' standard deviations in Panel A have illustrated that the risk of all ESG + value combined portfolios have remained some-what lower than the risk of the corresponding value portfolio during 2015-2019. This same pattern can be noticed from the portfolios' standard deviations in Panel B and Panel C where the standard deviations have proven out to be slightly lower in several ESG integrated value portfolios than in their corresponding value portfolios. However, the lower risk cannot still be the entire reason for the inferior returns of ESG integrated value portfolios because the standard deviations of the portfolios have taken into consideration in the Sharpe measurement. Thus, if the lower risk would explain the poorer returns of ESG integrated portfolios, the Sharpe ratios should have pointed out to be higher for these portfolios.

To sum up the results in table 16, the average returns, average standard deviations, alphas and Sharpe ratios in all panels have mainly discovered that the performance of value + ESG combined portfolios have turned out to be weaker than the performance of pure value portfolios. Therefore, also the findings of this section have supported the rejection of the third null hypothesis "H0: The performance of ESG integrated value portfolios has been equal with the performance of pure value, pure ESG and the market portfolio between 2015-2019" of this paper. Moreover, the results in table 16 have mostly supported the findings of Bauer et al.'s (2005) paper which have founded that in US, UK, and Germany the ethical + value combined equity mutual funds have offered lower performance than pure value equity mutual funds. However, a part of the results has been in line with the findings of Abramson et al.' (2000) and Kaiser's (2019) papers because some of the ESG integrated value portfolios have pointed out higher performance than pure value portfolios.

Finally, this paper has explained the results in table 17 which have compared the ESG integrated value portfolios performance against the performance of pure ESG portfolios. So far, the results in table 15 and 16 have mostly discovered that the ESG integrated value portfolios have performed worse than the benchmark portfolios which have either been the market portfolio or pure value portfolios. However, before ending up to the final rejection of the third null hypothesis of this paper the final purpose is to discuss the results in table 17 below.

Table 17. Mean returns, T-stat values, average standard deviations, alphas and Sharpe ratios of ESG integrated value portfolios and pure ESG portfolios (*** 1 % significance, ** 5 % significance and * 10 % significance).

	Mean returns	T-stat	Std	Alpha	Sharpe ratio
ESG + value portfolios			Panel A		
ESG (DY)	0.074	-0.279	0.129	-0.022	0.488
ESG (P/E)	0.112	0.161	0.378	0.080	0.271
ESG (P/B)	-0.017	-1.517	0.227	-0.084	-0.118
ESG	0.089		0.094	-0.033	0.735
Emissions + value portfolios			Panel B		
Emissions (DY)	0.117	-0.074	0.105	-0.047	1.002
Emissions (P/E)	0.100	-0.467	0.206	0.028	0.436
Emissions (P/B)	-0.025**	-3.551	0.178	-0.118	-0.046
Emissions	0.122		0.182	0.057	0.608
Resource Use + value portfolios			Panel C		
Resource Use (DY)	0.132	0.020	0.137	0.014	0.880
Resource Use (P/E)	0.129	-0.039	0.213	0.053	0.555
Resource Use (P/B)	-0.042*	-2.281	0.128	-0.176	-0.406
Resource Use	0.131		0.137	0.039	0.871
Human Rights + value portfolios			Panel D		
Human Rights (DY)	0.009	-0.386	0.098	-0.145	-0.014
Human Rights (P/E)	-0.080	-1.844	0.185	-0.163	-0.489
Human Rights (P/B)	-0.160**	-4.012	0.144	-0.265	-0.720
Human Rights	0.024		0.102	-0.155	0.137
Workforce + value portfolios			Panel E		
Workforce (DY)	0.131	0.195	0.136	0.022	0.873
Workforce (P/E)	0.081	-0.532	0.234	-0.001	0.308
Workforce (P/B)	-0.055**	-3.038	0.180	-0.131	-0.360
Workforce	0.122		0.100	-0.047	1.193
Management + value portfolios			Panel F		
Management (DY)	0.077	-0.154	0.117	-0.045	0.567
Management (P/E)	0.053	-0.337	0.209	-0.010	0.205
Management (P/B)	-0.036*	-2.288	0.143	-0.160	-0.320
Management	0.083		0.049	-0.206	1.534
Shareholders + value portfolios			Panel G		
Shareholders (DY)	0.101	-0.051	0.145	-0.010	0.620
Shareholders (P/E)	0.118	0.099	0.408	0.081	-0.213
Shareholders (P/B)	-0.006	-1.254	0.290	-0.045	-0.053
Shareholders	0.104		0.141	0.023	0.532

Table 17 has divided in seven different panels in which the results related to ESG integrated value portfolios and corresponding ESG portfolio have illustrated separately. Similarly, as in table 16 also in table 17 has reported the results related to combined value + ESG portfolios average returns, average standard deviations, alphas, and Sharpe ratios. The alphas of both group of portfolios have also estimated with the Sharpe's (1964) CAPM model.

All in all, the results in table 17 have been in line with the table 15 and 16. In Panel A, the results have proven that from the three different ESG integrated value portfolios none of the portfolios have beaten out the pure ESG portfolio in risk-adjusted basis between 2015-2019. Only one of these portfolios such as P/E + ESG portfolio has provided higher average return and alpha than the pure ESG portfolio, but this portfolio's Sharpe ratio has remained lower.

Moreover, the results in Panel E have been exactly consistent with the results in Panel A. Also, in panel E only one of the ESG integrated value portfolios such as dividend yield + workforce has offered higher average return and alpha than the corresponding ESG portfolio but again the Sharpe ratio has stayed lower. The reason for the lower Sharpe ratios in Panel A and Panel E can be found from the ESG integrated value portfolios' higher standard deviations which decreases the overall efficiency of the portfolio.

In addition, also the results in Panel D and Panel F have founded that in risk-adjusted basis none of the ESG integrated value portfolios have been able to exceed the performance of the corresponding ESG portfolio. On the other hand, from these group of value + ESG combined portfolios a part of them such as dividend yield + human rights and all value factor + management score portfolios have gained higher alpha than the pure human rights or management portfolios. However, all portfolios in Panel D and Panel C have still produced negative alphas during 2015-2019 which means that both portfolio groups,

the ESG integrated value portfolios and their corresponding ESG portfolios have under-performed the market on average.

Finally, the only ESG integrated value portfolios that have offered higher risk-adjusted performance than their corresponding ESG portfolios have been in Panel B, Panel C and Panel G the dividend yield + emissions, dividend yield + resource use and dividend yield + shareholders portfolios. In all these portfolios the Sharpe ratios have exceeded the Sharpe ratio of the corresponding ESG portfolio with being 1.002 in dividend yield + emissions portfolio, 0.880 in the dividend yield + resource use portfolio and 0.620 in the dividend yield + shareholders portfolio. By contrast for the corresponding ESG portfolios the Sharpe ratios have been 0.608, 0.871 and 0.532, in respective order. However, the alphas of all dividend yield + emissions, dividend yield + resource and dividend yield + shareholders portfolios have remained somewhat lower than the alphas of pure ESG portfolios.

To conclude, the results in table 17 have mainly discovered that the ESG integrated value portfolios performance have remained somewhat lower than the performance of corresponding ESG portfolios. Only combination portfolios that have proved higher performance than their corresponding ESG portfolios have been the dividend yield + emissions, dividend yield + resource and dividend yield + shareholders portfolios. However, still a slight part of the ESG integrated value portfolios have been able to beat the corresponding ESG portfolios with their average returns and alphas during the observation period 2015-2019.

From the previous financial literature, Kaiser (2019) has been the only researcher who has included the measurement of both ESG integrated value portfolios' and pure ESG portfolios' performance, but in his research paper the results have founded completely opposite results. Kaiser (2019) has discovered in both European and US samples that the performance of all ESG integrated value portfolios have been higher than the performance of pure ESG portfolios which only matches a slight part of the results in this paper.

However, as discussed earlier in this paper the construction process of the value + ESG combined portfolios has slightly differed from Kaiser's (2019) construction method. Instead of using best-in-class ESG approach like Kaiser (2019) this paper has used positive screening approach. Therefore, the results of this paper have not been exactly comparable with the Kaiser's (2019) findings.

To summarize, the results in all three tables 15, 16 and 17 have agreed that a larger part of the ESG integrated value portfolios have performed worse than all three benchmark portfolios during 2015-2019. In this paper the performance of all three portfolio groups such as ESG integrated value portfolios, pure value portfolios and pure ESG portfolios had been measured with the portfolios' mean returns, standard deviations, alphas, and Sharpe ratios and compared with each other. Also, the comparison with the market portfolio has been made by observing these portfolios annual returns, mean returns and standard deviations. All these measurements have spoken in favor of the worse performance.

Moreover, as noted earlier in this paper, the results in table 15 and table 16 have both supported the rejection of the third null hypothesis "H0: The performance of ESG integrated value portfolios has been equal with the performance of pure value, pure ESG and the market portfolio between 2015-2019" of this paper because the performance of ESG integrated value portfolios have not crossed or even reached out the performance as the market portfolio or pure value portfolios. Anyway, also the results in table 17 have been in line with these results because the performance of the ESG integrated portfolios has not been as good as the performance of pure ESG portfolios. Therefore, the third null hypothesis of this paper can be totally rejected. However, even though this paper has ended up rejecting the third null hypothesis of this paper, the results in tables 15, 16 and 17 have still indicated that a slight part of the ESG integrated value portfolios has been able to provide better performance than the benchmark portfolios during 2015-2019. Interestingly one of these portfolios has been the dividend yield + resource use

portfolio which has been the only combination portfolio that has beaten out all three benchmark portfolios with its mean return and Sharpe ratio.

8   Conclusions

The primary purpose of this paper has been to measure the behavior of value stocks in responsible portfolios in the Finnish equity markets between the years of 2015-2019. However, besides evaluating the performance of ESG integrated value portfolios, the secondary aim of this paper has been to study the returns of value investing and responsible investing strategies individually. In the past both, value and responsible investing strategies have gained a lot of attention amongst the financial researchers, but the purpose of this paper has been to complement their existing financial literature by providing an evidence from the Finnish equity market. Also, the analyzing of the returns of individual value and responsible portfolios have provided help to understand the reasons behind the returns of ESG integrated value portfolios and served as benchmarks to compare the returns of this blended investment strategy.

In the existing financial literature, the value investing has recognized one of the investment strategies which has gained abnormal risk-adjusted returns for the investors. Anyway, Fama et al. (2020) and Miller et al. (2020) have founded that after the 21st century the strength of the value premium has diminished. Therefore, the aim of this paper has been to measure value premium within this period to analyze if this occurrence has realized in the Finnish equity markets as well. Overall, the results of this paper have supported the findings from Fama et al. (2020) and Miller et al. (2020) because only one out of three value portfolios have been able to provide positive alpha in the period of 2015-2019. Other two value portfolios have gained lower returns than the market portfolio.

Similarly, as the value investing literature, also a part of the financial research related to responsible investing has confessed that the incorporation of ESG issues to the investment decision making process should improve the returns of conventional equity portfolio. Kempf et al. (2007) have discovered that in the major US markets the highly rated positively screened ESG portfolios have provided positive alphas during 1991-2004. On the other hand, Yen et al. (2019) have founded similar results only from the Japan during 2009-2013. Conversely, the findings regarding to the other two regions in Asia have been

more inconsistent. However, in this paper, the results concerning the highly rated positively screened ESG portfolios have recognized only three out of seven positive alphas during 2015-2019 which have supported the evidence from Yen et al. (2019).

Lastly, as discussed earlier the main purpose of this paper has been to combine these two investment strategies, value strategy and positive screening ESG strategy, to the ESG integrated value investing strategy and to observe this strategy's performance in the Finnish equity market between 2015-2019. In the existing financial literature, the research papers regarding to this topic has been more limited than the literature related to the value and ESG investing strategies because the investors have not until recently adopted this investment strategy. Anyway, Abramson et al. (2000), Bauer et al. (2005) and Kaiser (2020) have been able to analyze the performance of ESG integrated value investing strategy in US, UK and Europe, but their studies have proved mixed results of its performance. However, also the approaches and methods that Abramson et al. (2000), Bauer et al. (2005) and Kaiser (2020) have utilized have been very different from each other.

All in all, the results of this paper have founded that the performance of ESG integrated value portfolios has remained lower the performance of all three benchmarks such as pure value, pure ESG and market portfolio. The clear evidence from this has been the lower average returns, alphas and Sharpe ratios of the ESG integrated value portfolios comparing to the average returns, alphas and Sharpe ratios of pure value and ESG portfolios. Also, the results have proved that only three out of 21 combined value + ESG portfolios have provided higher annual returns than the market portfolio between 2015-2019. However, despite to the overall results that this empirical analysis has obtained, some of the ESG-integrated portfolios' performance have still been able to beat out the performance of their benchmark portfolios during 2015-2019. One of these portfolios has been the dividend yield + resource use portfolio which has been the only combination portfolio that has beaten out all three benchmark portfolios with its mean return and Sharpe ratio.

Moreover, the primary doubts of this paper have been that the reason for the poor performance of ESG integrated value investing strategy has been the low performance of value investing strategy after the 21st century. In all combination portfolios the firms have been first selected based on their P/E-, P/B- and dividend yield ratios which after they have been screened with the positive ESG screen. Perhaps, if this would have been executed the other way around the results would have been better. Also, the outcome may have turned out to be different if another ESG data has integrated to the analysis, the timeline would have varied, or the period would have included macroeconomic downturn. Thus, the next observation of this strategy's performance could be executed, for example, during the years of Covid-19 and other bear markets because the existing financial literature related to value investing has supported value factor performance in the downward trend (Miller 2020).

Finally, this paper believes that the information which has obtained through this paper will be extremely relevant for the value investors and responsible investors. The current global situation regarding to the accelerating climate change and Covid-19 pandemic will force value investors to direct their funds from the conventional equities towards more responsible ones soon which is why the examination of ESG integrated value investing strategy's performance has been reasonable. Also, the responsible investors will benefit this analysis if they are willing to incorporate value factors to their investment strategies.

9 List of References

Abramson, L. & Chung, D. (2000). Socially Responsible Investing: Viable for Value Investors? The Journal of Investing, 9(3), 73-80. https://www.researchgate.net/publication/247907073_Socially_Responsible_Investing_Viable_for_Value_Investors

Baresa, S., Bogdan, S. & Ivanovic, Z. (2013). Strategy of Stock Valuation by Fundamental Analysis. UTMS Journal of Economics, 4(1), 45-51. https://www.econstor.eu/bitstream/10419/105304/1/766576175.pdf

Basu, S. (1977). Investment Performance of Common Stocks in Relation to Their Price-Earnings Ratios: A Test of The Efficient Market Hypothesis. The Journal of Finance, 32(3), 663-682. https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1540-6261.1977.tb01979.x

Bauer, R. M. M. J., Koedijk, C. G., & Otten, R. R. A. E. (2005). International Evidence on Ethical Mutual Fund Performance and Investment Style. Journal of Banking & Finance, 29(7), 1751-1767. https://doi.org/10.1016/j.jbankfin.2004.06.035

Bauman, W. S., Conover, M. & Miller, R. E. (1998). Growth versus Value and Large-Cap versus Small-Cap Stocks in International Markets. Financial Analysts Journal, 54(2), 75-89. https://www.tandfonline.com/doi/abs/10.2469/faj.v54.n2.2168

Berg, F., Kölbel, J. & Rigobon, R. (2019). Aggregate Confusion: The Divergence of ESG Ratings. MIT Sloan, Research Paper. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3438533

Capaul, C., Rowley, I. & Sharpe, W. F. (1993). Financial Analysts Journal, 49(1), 27-36. https://www.jstor.org/stable/pdf/4479610.pdf?refreqid=excelsior%3Abdb1b0681c93c5e00743218223af9acd

Chan, L. K. C., Hamao, Y. & Lakonishok, J. (1991). Fundamentals and Stock Returns in Japan. The Journal of Finance, 46(5), 1739-1764. https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1540-6261.1991.tb04642.x

Chatterji, A. K., Durand, R., Levine, D. I. and Touboul, S. (2016). Do ratings of firms converge? Implications for managers, investors, and strategy researchers. Strategic Management Journal, 37(8), 1597-1614.https://onlinelibrary.wiley.com/doi/abs/10.1002/smj.2407

Dorfleitner, G., Halbritter, G. & Nguyen, M. (2015). Measuring the level and risk of corporate responsibility – An empirical comparison of different ESG rating approaches. Journal of Asset Management, 16(7), 450-466. https://link.springer.com/article/10.1057/jam.2015.31

Fairfield, P. M. (1994). P/E, P/B and The Present Value of Future Dividends. Financial Analysts Journal, 50(4), 22-31. https://www.semanticscholar.org/paper/P%2FE%2C-P%2FB-and-the-Present-Value-of-Future-Dividends-Fairfield/7f6364a9897a2428a692388bf8099c9a76a49657

Fama, E. F. (1965). Random Walks in Stock Market Prices. Financial Analysts Journal, 21(5), 55-59. https://www.jstor.org/stable/4469865?seq=1#metadata_info_tab_contents

Fama, E. F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. The Journal of Finance, 25(2), 383-417. https://www.jstor.org/stable/2325486?seq=1#metadata_info_tab_contents

Fama, E. F. & French, K. R. (1992). The Cross-Section of Expected Stock Returns. The Journal of Finance, 47(2), 427-465. https://onlinelibrary.wiley.com/doi/full/10.1111/j.1540-6261.1992.tb04398.x

Fama, E. F. & French, K. R. (1998). Value versus Growth: The International Evidence. The Journal of Finance, 53(6), 1975-1999. https://onlinelibrary.wiley.com/doi/abs/10.1111/0022-1082.00080

Fama, E. F. & French, K. R. (2020). The Value Premium. Fama-Miller Working Paper No. 20-01. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3525096

Greenwald, B. C., Kahn, J., Bellissimo, E., Cooper, M. A. & Santos, T. (2020). Value Investing: From Graham to Buffet and Beyond. John Wiley & Sons. https://books.google.fi/books?hl=en&lr=&id=mNcBEAAAQBAJ&oi=fnd&pg=PR9&dq=value+investing+company+features&ots=BMHtETm5mL&sig=trgYqvWGXCe84Rmn6Nf6-KsphDA&redir_esc=y#v=onepage&q&f=false

GSIA (2020). Global Sustainable Investment Review. Global Sustainable Investment Alliance.

He, Q., Liu, J., Wang, S. & Yu, J. (2020). The impact of COVID-19 on stock markets. Economic and Political Studies, 8(3), 275-288. https://www.tandfonline.com/doi/pdf/10.1080/20954816.2020.1757570?needAccess=true

Hübner, G. (2003). The Generalized Treynor Ratio: A Note. University of Liege, Management Working Paper. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=375061

Jensen, M. C. (1967). The Performance of Mutual Funds in the Period of 1945-1964. The Journal of Finance, 23(2), 389-416. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=244153

Kaiser, L. ESG integration: value, growth, and momentum. Journal of Asset Management, 21(3), 32–51 (2020). https://doi.org/10.1057/s41260-019-00148-y

Kempf, A. & Osthoff, P. (2007). The Effect of Socially Responsible Investing on Portfolio Performance. European Financial Management, 13(5), 908-922. https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1468-036X.2007.00402.x

Kose, J. & Jingrui, L. (2021). COVID-19, volatility dynamics, and sentiment trading. Journal of Banking & Finance, 133. https://www.sciencedirect.com/science/article/pii/S0378426621001217?via%3Dihub

La Porta, R., Lakonishok, J., Shleifer, A. & Vishny, R. (1997). Good News for Value Stocks: Further Evidence on Market Efficiency. The Journal of Finance, 52(2), 859-874. https://www.jstor.org/stable/pdf/2329502.pdf?refreqid=excelsior%3A547527111d8eb7e301ae2e4c34166311

Lakonishok, J., Shleifer, A. & Vishny, R. W. (1994). Contrarian Investment Extrapolation, and Risk. The Journal of Finance, 49(5), 1541-1578. https://www.jstor.org/stable/2329262?seq=1#metadata_info_tab_contents

Madhavan, A., Sobczyk, A. & Ang, A. (2021). Toward ESG Alpha: Analyzing ESG Exposures through a Factor Lens, Financial Analysts Journal, 77:1, 69-88, DOI: 10.1080/0015198X.2020.1816366

Malkiel, B. G. (2003). The Efficient Market Hypothesis and Its Critics. Journal of Economic Perspectives, 17(1), 59-82. https://www.aeaweb.org/articles?id=10.1257/089533003321164958

Markowitz, H. (1952). Portfolio Selection. The Journal of Finance, 7(1), 77-91. https://www.jstor.org/stable/2975974?seq=1#metadata_info_tab_contents

Miller, M. & Prondzinski, D. (2020). Value Style Investing Versus Growth Style Investing: Evidence from the 2002-2019 Business Cycle. Journal of Accounting and Finance, 20(1). https://articlegateway.com/index.php/JAF/article/view/2748

Morgan Stanley Institute for Sustainable Investing (2019). Sustainable Signals: Individual Investor Interest Driven by Impact, Conviction and Choice. https://www.morganstanley.com/pub/content/dam/msdotcom/infographics/sustainable-investing/Sustainable_Signals_Individual_Investor_White_Paper_Final.pdf

Nasdaq 2021. Official Website. OMXH25.

Petkova, R. & Zhang, L. (2005). Is Value Riskier than Growth? Journal of Financial Economics, 78(1), 187-202. https://www.sciencedirect.com/science/article/abs/pii/S0304405X05000929

Piotroski, J. D. (2000). Value Investing: The Use of Historical Financial Statement Information to Separate Winners from Losers. Journal of Accounting Research, 38, 1-41. https://www.jstor.org/stable/2672906?seq=1#metadata_info_tab_contents

Ricciardi, V. & Simon, H. K. (2000). What Is Behavioral Finance). Business, Education and Technology Journal, 2(2), 1-9. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=256754

Ritter, J. (2003). Behavioral Finance. Pacific-Basin Finance Journal, 11(4), 429-437. https://www.researchgate.net/publication/222677551_Behavioral_Finance

Rouatbi, W., Demir, E., Kizys, R. & Zaremba, A. (2021). Immunizing markets against the pandemic: COVID-19 vaccinations and stock volatility around the world. International Review of Financial Analysis, 77. https://www.sciencedirect.com/science/article/pii/S1057521921001538

Schueth, S. (2003). Socially Responsible Investing in the United States. Journal of Business Ethics, 43(3), 189-194. https://www.jstor.org/stable/25074988?seq=1#metadata_info_tab_contents

Serafeim, G. & Yoon, A. (2021). Stock Price Reactions to ESG News: The Role of ESG Ratings and Disagreement. Forthcoming, Review of Accounting Studies. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3765217

Sharpe, W. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk. The Journal of Finance, 19(3), 425-442. https://onlinelibrary.wiley.com/doi/10.1111/j.1540-6261.1964.tb02865.x

Sharpe, W. F. (1966). Mutual Fund Performance. The Journal of Business, 39(1), 119-138. https://www.jstor.org/stable/2351741?seq=1#metadata_info_tab_contents

Shleifer, A. & Vishny, R. W. (2012). The Limits of Arbitrage. The Journal of Finance, 52(1), 35-55. https://onlinelibrary.wiley.com/doi/full/10.1111/j.1540-6261.1997.tb03807.x

Thaler, R. H. (1999). The End of Behavioral Finance. Financial Analysts Journal, 55(6), 12-17. https://www.jstor.org/stable/4480205?origin=JSTOR-pdf&seq=1#metadata_info_tab_contents

Thomson Reuters EIKON (2017). Thomson Reuters ESG Scores. https://www.esade.edu/itemsweb/biblioteca/bbdd/inbbdd/archivos/Thomson _Reuters_ESG_Scores.pdf

Tully, S. (2021). Bubble warning: The S&P 500 has only been this expensive for 4% of the past 140 years. Fortune. https://fortune.com/2021/07/14/s-and-p-500-bubble-stock-market-spx-history-excess-cape/

UN PRI (2021). Official Website.

Yen, M., Shiu, Y. & Wang, C. (2019). Socially Responsible Investment Returns and News: Evidence from Asia. Corporate Social Responsibility and Environmental Management, 26(6), 1565-1578. https://onlinelibrary.wiley.com/doi/10.1002/csr.1833