Finding Value Through Sustainable Performance


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Kind Regards

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Summary

Problem background and discussion: Emerging countries economies are growing substantially; one of these is India which stock market has been one of the best performing in the world in recent years. Analysts are forecasting further development and some claims that India has the most business- and investment-stimulating political leaders in the world. However, stock markets in emerging countries are highly volatile and normally more risky than in developed economies. One approach to emphasise the more common risks in emerging countries are by including Environmental, Social and Governance (ESG) rating into the fundamental investment model. However, there is a conflict of what previous studies suggest regarding ESG investments. Some argue there is a positive relation and others a negative relation between ESG factors and risk-adjusted return.

Research question: “Is there a relation between risk-adjusted return and ESG performance at the Indian stock market?”

Objective: The objective is to determine if there is a relationship between ESG performance and risk-adjusted return in India. Another objective is to determine if there is a relationship between ESG performance and risk-adjusted return among companies with high Total ESG rating as well as for companies with low Total ESG rating.

Theoretical framework: ESG is an established approach to describe sustainability issues, where screening is a process designed to select those companies that meet ESG criteria. A basic description of Capital Asset Pricing Model CAPM, which calculates an asset's expected return, has been used to calculate risk-adjusted return. Efficient Market Hypothesis EMH is the basic theory of market efficiency and is used to explain any non-linear relationship between ESG factors and risk-adjusted returns. Adaptive Market Hypothesis AMH has been taken into account as it deals with financial behaviour.

Method: A quantitative study using a deductive approach has been selected to perform this study. The practical approach is a cross sectional study where the relationship in the Indian market has been analysed and significance-tested during 2014. ESG information for 126 companies listed on the Bombay Stock Exchange (BSE) has been purchased from Sustainalytics, a global leader in research for responsible investment.

Empirical findings and analysis: The results of the study demonstrate no significant relationship between Total ESG rating and risk-adjusted return during 2014. In the examination of individual categories, Environmental and Social rating does not have a significant association with the risk-adjusted Return. Though, the results display a negative relationship between Governance rating and risk-adjusted return. This relationship is also obtained among companies in with low Total ESG rating but not companies with high ESG rating.

Conclusion: Results implies that investors have not been able to use the information of Total ESG performance to obtain a better risk-adjusted return on the Indian stock market in 2014. However, this can be achieved by using Governance rating.

Key words; ESG, India, Risk-adjusted return, Screening, Efficient markets
Sammanfattning

Problembakgrund & problemdiskussion: Tillväxtländernas ekonomier växer kraftigt; en av dessa är Indien där aktiemarknaden har visat ett av de bästa resultaten i världen under de senaste åren. Analytiker prognostiserar en fortsatt utveckling och vissa påstår att Indien har den mest företags- och investerings- stimulerande politiska ledarna i världen. I relation till detta är marknaderna i tillväxtländer mer volatila och riskfyllda än i utvecklade ekonomier. Ett sätt att inkludera de trendande riskerna i den fundamentala investeringsmodellen är genom att inkludera Environmental, Social and Governance (ESG) faktorer. Däremot finns det en konflikt mellan tidigare forskning, där vissa hävdar att det finns en positiv relation och andra en negativ relation mellan ESG-faktorer och riskjusterad avkastning.

Problemformulering: "Finns det ett samband mellan riskjusterad avkastning och ESG faktorer på den Indiska aktiemarknaden?"

Syfte: Syftet med denna studie är att avgöra om det finns ett samband mellan ESG-faktorer och riskjusterad avkastning på den Indiska aktiemarknaden. Dessutom, att undersöka om det finns ett samband mellan ESG-faktorer och riskjusterad avkastning bland företag med hög ESG samt för företag med låg ESG.


Empiri/analys: Resultaten av studien visar inget signifikant samband mellan Total ESG betyg och riskjusterad avkastning på den indiska aktiemarknaden under 2014. Vid prövningen av enskilda kategorier, har Environmental och Social betyg inget signifikant samband med den riskjusterade avkastningen. Däremot visar resultatet ett negativt samband mellan Governance betyg och riskjusterad avkastning. Samma relation visas och bland företag i med lågt ESG betyg men inte bland företag med högt ESG.


Nyckelord: ESG, India, Risk-adjusted return, Screening, Efficient markets
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1. Introduction

The introductory chapter gives the reader a basic understanding of emerging countries and Environmental, Social and Governance (ESG). In connection with this, it illustrates the increase of investments in emerging markets despite the higher risk compared to other parts of the world, where India is a country with an exceptional development in 2014. Further, the trending risks in emerging markets are presented with an explanation of how ESG account for these risks and may be of great importance in an investment model. The introduction also explains the research gap, implying a limited research on which ESG factors that are most associated with a superior risk-adjusted return. Finally, a description of the research question, objective, delimitations and definitions is made.

1.1 Problem Background

Emerging countries account for a growing part of the global purchasing power and contributed with roughly half of the global gross domestic product (GDP) in 2010, an increase in the proportion of 10% between 2000 and 2010 (OECD, 2010). Furthermore, long-term forecasts suggest that emerging countries are likely to account for 60% of the world GDP by 2030 (OECD, 2010). According to The Hong Kong and Shanghai Banking Corporation Limited, HSBC (2015), an emerging country is defined as:

“A country with low-to-middle per capita income as measured by the World Bank”

While GDP in the emerging BRIC countries (Brazil, Russia, India and China) have increased by 16% over the last decennium, which is four times higher than in developed countries like the US or Germany, emerging markets also had difficult years of low growth within this period (MSCI, 2013, p. 4-5). In India for example, inflation got high, growth declined and interest rates on the country's ten-year government bonds were almost up to 10% (Glassman, 2013, p. 22). Nevertheless, in recent years the Indian stock market has performed sensational well. In September 2014, 29 of 30 shares in the S&P Bombay Stock Exchange Sensitive Index (S&P BSE Sensex) had risen over the year and the benchmark index for the best performance among the world's 10 largest stock markets had increased by 26% (Financial Post, 2014). Christopher Wood, the chief equity strategist at CLSA Asia-Pacific Markets in Hong Kong claims that India's government is controlled by the most business- and investment-stimulating political leaders in the world and will be the most interesting stock market in Asia over the next five years (Financial Post, 2014).

However, emerging countries are highly volatile and if share prices fall, they usually fall hard. Data from Morningstar illustrates that shares in emerging markets are 50% more risky than in the US market (Glassman, 2013, p. 22). With a different set of risks, businesses and private investors have increases their interest for challenges and opportunities in emerging economies (United Nations Global Compact, 2010, p. 6). According to University of Oxford and Arabesque Partners (2014), one approach to emphasise the more common risks in emerging countries are by including Environmental, Social and Governance (ESG) performance into the investment model (Clark et. al., 2014. p. 10). Additionally, limited corporate transparency, differences in corporate culture and business regulation leads to the perception of ESG risks to be higher in emerging countries compared to developed countries (van Dijk et. al., 2012, p.
3-5). Thereby, an investment strategy involving ESG performance enables investors to identify risks and through a determination of effective risk management, investors might be more profitable in the long run (van Dijk et. al., 2012, p. 6).

Even if ESG is a subjective measurement for sustainability it has become established in the financial world. Deutsche Bank (2012) presented some characteristics typically included in ESG: (i) public concern focus, (ii) concerns that traditionally have been considered non-financial or non-material, (iii) patterns arising throughout a company’s supply chain, (iv) changing policy and regulatory framework, (v) external effect not well captured by market mechanisms and (vi) other public concerns (Deutsche Bank, 2012, p. 19). Deutsche Bank (2012) declares that ESG should be incorporated in investment processes and in any corporate strategy that cares about shareholder value (Deutsche Bank, p. 5. 2012). Today it is mainly Social Responsible Investment (SRI) fund managers who include ESG in the investment process. However, studies of actual return display that SRI fund managers historically have failed to capture positive abnormal risk-adjusted returns through the use of screening with ESG rating (Deutsche Bank, p. 8. 2012). This may be one reason why several investors still exclude ESG in their investment model.

Furthermore, ESG normally accounts for political uncertainty, corruption, working conditions and climate change which are particularly apparent in emerging countries (Clark et. al., 2014. p. 10). The success within emerging economies largely depends on how policy makers succeed in implementing structural policies to collect the benefits of capital flows and promote closer economic cooperation (OECD, 2013). Political uncertainty represents a major risk in emerging markets and unfavourable development that lead to political violence such as terrorism, war or revolution could lead to the confiscation of assets, creating a shortage of resources needed in order to operate in the market (Nolan M, 2013).

Another substantial risk in emerging countries is corruption, and includes both the meeting with authorities, public administration and between companies. Corruption can lead to huge losses and a survey conducted by Association of Certified of Fraud Examiners (ACFE) displays that companies generally lose about 5% of revenues to fraud each year, where the largest share relates to corruption (ACFE, 2014, p. 4). The same study also demonstrated that the median losses due to fraud were $145,000, where global losses for 2013 may have amounted to $3.7 trillion (ACFE, 2014, p. 4). Transparency International (TI) annually ranks countries and territories based on how corrupt their public sector is perceived in a Corruption Perception Index (CPI). Countries or territories included in the index receive a score between 0 (highly corrupt) to 100 (very clean) (Transparency International, 2014, p. 3). Successively, the index for 2014 reveals that India has a score of 38, which can be compared with the EU and Western Europe with an average score of 66 (Transparency International, 2014, p. 7).

Furthermore, The number of labour strikes in emerging countries has increased substantially in recent years (Lee, 2011), and especially in Asia where manufacturers of low margin consumer products have faced major difficulties (King, C., Chan, C. 2010. p, 5). This is partly because younger workers have gained knowledge regarding working rights and have greater contact with the outside world through new communication technologies (Lee, 2011). Contract manufacturers for high profile brands are especially vulnerable to cost of labour strikes, and the workers have demonstrated a keen sense for
the leverage they hold over the reputation of global companies (Lee, 2011). Furthermore, a survey by Morgan Stanley International Capital (MSCI) indicates that the numbers of accidents in the steel industry leading to death are four times higher in emerging countries than in developed countries (MSCI, 2012, p. 4).

Another problem in emerging countries is the climate change, which has resulted in increasing numbers of extreme rainfall and sea level rise (MSCI, 2012, p. 4) This is strongly associated with natural disasters that can result in economic disruption and large-scale damage to property and infrastructure, which ultimately may affect asset values in markets around the world (MSCI, 2012, p. 4). In 2013 natural disasters worldwide made 96.5 million people victims and caused $118.6 billion of damage, still this was below the annual average damages from 2003 to 2012, which amounted to $156.7 billion (Guha-Sapir et al., 2014, p. 1-2). According to the Annual Disaster Statistical Review (ADSR) of 2013, the numbers of natural disasters are globally by far the largest in Asia where the number of events also have increased in recent years (Guha-Sapir et al., 2014, p. 27). One of the five most affected countries in the world are India, and the cyclone Phailin that hit the country in October 2013 made 13.2 million people victims (Guha-Sapir et al., 2014, p. 2). The damage from natural disasters in Asia amounted to an annual average of $71.26 billion between 2003 and 2013, which was 49.3% of global disaster damages under that period (Guha-Sapir et al., 2014, p. 3). Since long-term forecasts by OECD suggest that today's emerging countries are likely to account for about 60% of world GDP by 2030 (IEA, 2011, p. 49). These areas are predicted to allocate more assets and become more sensitive to natural disasters in the future.

Whether one is an investor or a corporate management, ESG issues is one of today's most trending metrics to measure sustainability (Clark et al., 2014, p. 8). However, the method involves challenges since ESG is a subjective and non-financial measure where investors need to investigate the business to create standards that match their own values. Simultaneously, Researchers emphasises an overestimation towards the costs of ESG information (Derwall et al, 2005, p. 51). One established method to use ESG information in the investment process is screening, where positive screening is a method to select the best performing companies in terms of ESG rating.

Ultimately, there is a conflict between previous studies regarding the benefits from ESG investments. Some argues there is a positive relation and others a negative relation between ESG performance and risk-adjusted return. (Derwall et al, 2005, p. 61; Ma’nescu, 2011, p. 112). Also, there are even studies revealing no significant relationship between ESG performance and risk-adjusted return (Halbritter & Dorfleitner 2015, p. 11). The background has illustrated the growth in emerging countries and successively that ESG performance accounts for trending risks in those markets. Thereby, this study investigates the relationship between ESG performance and risk adjusted return at the Indian stock marked during 2014.

1.2 Problem discussion
There is a great collection of research investigating the relationship between sustainable investment and returns on the financial market, both from an investing and a business perspective. A comprehensive review of 100 studies by Deutsche Bank (2012) reveals that sustainable investments are correlated with market-based outperformance, where focused use of ESG should capture the superior risk-adjusted returns (Deutsche Bank,
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2012, p. 5). However, studies of actual returns have shown that SRI fund managers historically have failed to capture superior risk-adjusted returns through the use of ESG screening (Deutsche Bank, 2012, p. 8).

A meta-study of 190 sources by the University of Oxford and Arabesque Partners (2014) demonstrates that superior stock performances are positively correlated with good sustainability practices (Clark et al., 2014. p. 44). Subsequently, it should be of interest for any institutional investor to include sustainability parameters in the investment process, to generate better return and simultaneously contribute to preserving the world wellness (Clark et al., 2014. p. 48). University of Oxford and Arabesque Partners (2014) also emphasises the current need of supplementary research to identify the most important sustainability parameters to generate better investment returns (Clark et al., 2014. p. 44).

Studies of the Indian market have increased in line with the increasing recognition of ESG factors. Chelawat, et al (2013) observed CNX Nifty 50 index and S&P ESG India Index from January 2008 to December 2012, where the comparison revealed that sustainable investment including ESG performance yields superior returns (Chelawat, 2013, p. 19). The S&P ESG India Index consistent outperformed CNX Nifty 50 and yielded returns of 61% compared to 17% by Nifty Index over the five-year period (Chelawat, 2013, p. 22).

ESG investments have increased rapidly in recent years. From a numerical aspect, a good example is the emergence of organisations as Principles for Responsible Investment (PRI), an international network of investors who works together to put responsible investment into practice (PRI, 2015). From their launch in 2006 to 2014, the numbers of signatories investing according to PRI have increased from approximately 150 to 1325 (PRI, 2014). Furthermore, assets management by PRI signatories has increased from the $4 trillion at the launch of 2006 to more than $45 trillion in 2014 (PRI, 2014). Nevertheless, Geoffrey Williams, chief executive at Kuala Lumpur-based OWW Consulting, presented results revealing that SRI investments in Asia are far lower then other global SRI investments (Röhrbein, 2011). Thus, he argues that investors do not care about ESG when investing in emerging countries in Asia.

According to Royal Bank of Canada, SRI has been practised for more than a century (2012, p. 1). In the post-war period, ESG factors such as employee rights were included in the business agenda, and movements in support of civil rights were highlighted during the 1960’s (Hoepner, 2013, p. 5). However, the question remains why investors in the past decade has increased their positive opinions towards ESG investments. Hoepner (2013) states a relevant question “Did all of these investors suddenly understand themselves as eco-pioneers or social campaigners?” (Hoepner, 2013, p. 6). This supports the possibility that ESG investments have a positive relation risk-adjusted return.

While there appears to be several reasons for implementing ESG into investor’s consideration, there are also some sceptics voting against it. Some are referring to the Efficient Market Hypothesis (EMH), and according to this hypothesis are available information reflected in security prices (Caplan et al., 2013, p. 3). The hypothesis describes that it should not be possible to earn an abnormal return based on available information. Thus, if ESG were of importance they would already have been integrated.
in the fundamental investment process and there would be no material advantage because of a good selection of companies with high ESG performance (Caplan et. al., 2013, p. 3). Therefore, if all investors’ use ESG in their investment model the benefits from it would disappear according to EMH. A study by Renneboog et. al. (2007, p. 27) found that SRI funds underperformed in relation to their comparable benchmarks. Investors pay a price for using screening through ESG, which is reflected in the share price since they are willing to pay a higher amount based on aversion to unethical corporate behaviour (Renneboog et. al., 2007, p. 28).

In connection with forecasts of high growth in emerging countries, India stands out as the most interesting market among many international investors, and the demand for ESG information from companies in emerging countries has increased rapidly (EIRIS, 2012, p. 2). In a study by EIRIS (2012), 78% of the respondents stated that the key challenge to invest in emerging countries is the lack of company ESG disclosure (EIRIS, 2012, p. 11). This is usually due to difficulties regarding different languages and how companies in emerging countries report their activities within the country and even operations in other countries (EIRIS, 2012, p. 11). Other issues are corporate culture and access to the local markets.

Previous studies have displayed different results. Where some argues that investors can generate superior returns by incorporating ESG into their investment process, while studies of actual returns displays that SRI fund managers historically have failed to generate superior risk-adjusted returns through the method. However, ESG highlight several of the substantial risks in emerging countries and because of forecasts of high development, international investors are increasing their exposure to the Indian market. In a volatile market like India where the risks are high, further research is needed to investigate recent periods of high growth and the relationship between ESG performance and risk-adjusted return. Subsequently, research is also needed to identify the most important ESG factors to generate better investment return in this area.

1.3 Research question

“Is there a relation between risk-adjusted return and ESG performance at the Indian stock market?”

1.4 Objective of the study

There are limited researches regarding the relationship between ESG performance and risk-adjusted return in India, and previous studies emphasises a need of identifying which sustainability factors that are most important in relation to investment returns. Thereby, the objectives of this study is to:

- Determine if there is a relationship between ESG performance and risk-adjusted return in India.

- Determine if there is a relationship between ESG performance and risk-adjusted return among companies with high ESG rating as well as for companies with low ESG rating.
1.5 Theoretical & practical contribution
The theoretical contribution of this study is mainly to improve knowledge of the relationship between ESG performance and risk-adjusted return. Since there are limited contemporary researches within this topic in India, the authors hope to increase the interest for further research by increasing empirical data within this area. The generalizability of this study is suitable for the measurement period 2014 for companies on the Indian stock market. Successively, this study aims to identify which sustainability factors that are most relevant for investment returns in India.

The practical contribution of this study is to clarify the value of using ESG information in the fundamental investments process. By creating a clearer understanding regarding the relationship between ESG performance and risk-adjusted return the authors have expectations of facilitate the investment process. In addition to this, the objective is to contribute to an increased awareness among companies for the significance of reporting on sustainability and to include it in their business model.

1.6 Delimitations
This study focuses on an individual country, which might reduces possible interferences that might affect the outcome, such as differences in regulatory backgrounds, macroeconomics tendencies and cultural factors (Renneboog et al, 2008, p. 1726-1728). In connection with predictions of high growth in emerging countries, India stands out as the most interesting market in Asia among several international investors (EIRIS, 2012, p. 2). Furthermore, this study investigates the Indian stock market in 2014 due to the high growth during the year, where S&P Bombay Stock Exchange Sensitive Index (S&P BSE Sensex) outperformed benchmark index and represented the best performance among the world's 10 largest stock markets (Financial Post, 2014). Due to time and budget limitations, this cross-sectional study has investigated the Indian stock market during 2014. Subsequently, this study will examine the Indian stock market as a whole, and will therefore not analyse different sectors within the market.

Since ESG data have been purchased from Sustainalytics, one of the world leading companies in responsible investment research, this study will be limited to the Indian companies that Sustainalytics has conducted and analysed. The authors have therefore not actively chosen the Indian companies. Nevertheless, the authors have received credible data that will be used in the study.

This study intends to investigate the relation between ESG performance and risk-adjusted return. Consequently, this study will not account for other factors that might affect the relationship between ESG and risk-adjusted return, as the authors’ aims to make the results as generalizable as possible. An example would be to account for company's size and its market capitalization value, in order to study whether it has any impact on the company's ESG performance.

1.7 Definitions

**ESG**
The term describes the environmental, social and corporate governance issues investors are considering in the setting of corporate behaviour. There is no definite definition of ESG, but typical characteristics usually included are: (i) issues that usually are considered non-financial or not material; (ii) a medium or long-term time horizon; (iii)
qualitative objectives that are not readily measurable in monetary terms; (iv) externalities not well captured by market mechanisms; (v) a shifting regulatory or policy framework; (vi) patterns occurring throughout a company’s supply chain; and (vii) a public-concern focus (Deutsche Bank, 2012, p. 19).

**ESG Performance**
A general description of how a company is performing in terms of ESG.

**ESG Rating**
Includes Total ESG rating as well as Environmental-, Social-, Governance- rating.

**ESG Factors**
The underlying factors that together form the ESG rating.

**Social Responsible Investment (SRI)**
An investment process aiming to accomplish social and environmental objectives along with financial objectives, utilizing both value-driven, and risk and return screening (Deutsche Bank, 2012, p. 19).

**Sustainable Investment**
The term includes all forms of Socially Responsible Investing and ESG-oriented investing. In its most developed form it uses ESG factors in comparable to the Responsible Investor definition (Deutsche Bank, 2012, p. 20).

**Emerging Countries**
“A country with low-to-middle per capita income as measured by the World bank” (HSBC, 2015).

**Risk-adjusted return**
The adjusted return for an asset towards the return of a benchmark index, Bombay Stock Exchange, where the risk for a specific time period has been accounted (Jensen, 1967, p. 393).
2. Theoretical Methodology

With a positivistic epistemology and objectivist ontology, this study is conducted with a quantitative research strategy and a deductive approach to answer the studies research question. A description of the literature search and the source-critical aspects taken into consideration summarizes this chapter.

2.1 Preconceptions

The authors are both students at Umeå School of Business and Economics with a specialisation in finance and have thus studied financial market and financial planning on intermediate level and also financial management on masters’ level. However, they are aware that if a different approach had been chosen before the degree project, they would possibly be able to implement additional knowledge that might have been of high relevance, which is currently because they have similar knowledge. Nevertheless, the authors believe that their current knowledge will be enough to analyse the data collected for the study.

Both authors have basic understandings within Sustainable investment and realize their knowledge effect the study from a positive and negative point of view. This is because even if they have basic understandings of the topic, there is a possibility that relevant information will be missed when reading previous studies or when analysing the data. However, the basic understandings can be positive and facilitate the process of finding relevant information and make significant analyses. Regarding the theoretical understandings of sustainable investments, the authors are also aware about the impact from social medias regarding this topic since ethics and community development are hot debates. Thus, social impacts should not be a problem in the study. In summary, the authors consider that their awareness of how preconceptions can affect this study will lead to a reduction of potential impacts and preservation of an objective and critical approach.

2.2 Epistemological and ontological issues

In a scientific research, there are different philosophical stands a researcher can chose from and those stands will represent the intuition of the research. In other words, depending on the researchers own philosophy towards scientific research work and what the researcher wants to investigate and how it will be done, there are different research strategies and methods to accomplish a scientific research work (Bryman & Bell, 2011, p. 7).

2.2.1 Epistemology

An epistemological issue concerns the problematical issues of acceptable knowledge in a research work and questions what is, or should be, regarded as acceptable knowledge (Quinlan, 2011, p. 13-14). In this context, researchers particularly questions whether the social world and natural science should be studied according to the same principles, procedures and ethics. Thus, the natural science epistemology is called positivism and the social science epistemology is named as interpretivism (Bryman & Bell, 2011, p. 15). Main differences between positivism and interpretivism are the research methods where positivism is based on numeric units and can be felt, observed and tested and the main purpose is to create comprehension (Bryman & Bell, 2011, p. 15). Interpretivism on the other hand share a view that the subject matters based on social sciences and
people and institutions are different from natural sciences. The main purpose is therefore to explain, which requires a different logic of research procedure to reflect the distinctiveness of humans as against natural order (Saunders et al., 2012, p. 132).

Subsequently, it would not be appropriate to use interpretivism in the authors study since they want to investigate the relation between ESG performance and risk-adjusted return. Additionally, this study wants to investigate the relationship between ESG performance and risk adjusted return. Positivism would therefore be suitable since epistemology is closest to both authors perception of knowledge and it reflects the choice of the research question. If the study instead intended to investigate how and why the ESG relates to each other it would have been appropriate to use interpretivism instead.

2.2.2 Ontology
Social ontology questions regard the nature of social objects. According to Quinlan (2011, p. 14) the ontological assumptions of social entities are either objective entities that have a reality external to social actors, or they are social constructions built from the perceptions and actions of social actions. Objectivism implies that the meanings of social phenomena have an existence independent of social actors and is beyond their reach or influence (Saunders et al., 2012, p. 131). Thus, reality exists regardless of social actors. A contrary alternative to objectivism is constructionism, which explains that social actors create reality social phenomena, where categories are not only produced by social communication but there is a need of constant revision and modification (Bryman & bell, 2011, p. 21).

The ontology most applicable in this study is objectivism, because the authors will analyse data in terms of actual returns and ESG performance of various firms gathered from various databases. Objectivism fits the purpose of this study better than constructionism; because they strive to generate evidence and generalizable principles, unaffected by context or observational environments. If they instead wanted to study, for example, how investors make their investment decisions in companies in India depending on its ESG ratings, their study would have used constructionism.

2.3 Scientific approach
When a research is conducted, an efficient and effective design is the key to success through the entire research process. According to Saunders et. al. (2012, p. 87), the theory used in a research depend on the researches intentions and understandings of the subject from the very beginning. Thus, theory used in the research cannot only reflect accuracy with its design.

A deductive approach basically means that a researcher starts with what is known and the theoretical considerations within this particular field, then derives one or several hypotheses that must be tested through empirical scrutiny (Bryman & Bell, 2011, p. 11). Contrary to a deductive approach is the inductive approach, which will not be used in this study since the authors will not implicate their finding for theories that prompted the whole exercise. This method is used to develop new theories from observations and is primarily used as new research topics are to be created (Saunders et al., 2012, p. 145). The deductive method is the most appropriate where historical data is used to test theoretical models and is therefore the most appropriate approach for this study. The deductive method is demonstrated in figure 1.
This study’s results are based on the amount of data collected about companies ESG ratings in India and how these ratings relate to their historical returns. In order to create a better understanding of knowledge within the area, a comprehensive literature review have been conducted to investigate previous studies and their conclusions, which have laid the foundation of the hypotheses. Subsequently, because the study uses a deductive approach it will connect empiricism and theory to analyse whether the empirical data differ from the audited theory and the conclusions will also be based on this foundation (Backman, 2008, p. 27).

2.4 Research strategy
Based on the statements above, a quantitative approach has been applied to the study. A quantitative method implies that the researcher systematically collects empirical and quantifiable data summarize these in a statistical form to analyse results based on testable hypotheses (Bryman & Bell, 2011, p. 151). Therefore, by using quantitative methods in this study it will give the authors an opportunity to collect empirical and quantifiable data, then process and analyse the results based on the selected hypotheses. A contradictory perspective to the quantitative approach, also called the traditional perspective, is the qualitative perspective (Mertens, 2005, p. 229). The main purpose of this approach is to analyse how individuals perceive and interpret the surrounding reality (Backman, 2008, p. 53). To do this study with a qualitative approach by using interviews would only make it more difficult for the authors to measure the relation between ESG performance and risk-adjusted return.

2.5 Perspective
The study will be designed from an investor’s perspective. The reason why perspective is good to clarify for the reader is according to Thurén (2011, p. 88-89) since it increases the ability to critically assess the study. Another reason why the authors present the perspective is because they want to increase the reader’s opportunity to treat the information in the way it is intended. The authors wish to increase the knowledge of how ESG may be used in the investment process. Therefore, investors in this study’s context are all kinds of investors, from fund managers to private investors.

2.6 Literature Search
After the authors had discussed the choice of subject for their thesis along with what they found to be of interest, they decided to immerse into ESG and risk-adjusted return. This was followed by a basic literature search through EBSCO and Umeå University Library's own search service. Before the decision to focus on emerging countries and specifically India the keywords were: “ESG”, “ESG factors”, “SRI” “Responsible Investment”, “Risk-adjusted return” and “ESG and risk-adjusted return”. Subsequently, the authors searched for previous university studies within the chosen subject to find some relevant inspiration regarding the structure. These studies were collected from Diva database.
After obtaining a deeper understanding of ESG and risk-adjusted return, the authors used other keywords to find the relevant information. By using the databases mentioned above, the authors searched for: "Efficient Market Hypothesis", "Adaptive Market Hypothesis", “Emerging Markets”, “India”, “Investments in India”, “India and ESG”, “CAPM” and “Pricing Models”. In some cases though, articles were not to be found in the used databases and it therefore lead the authors to use Google Scholar.

2.7 Source criticism
To critically examine the sources a researcher intends to use is extremely important, and Ejvegård (2008, p. 71 ff) emphasises three different parts to handle when the research sources are audited.

Authenticity requirement questions how real the sources a researcher intends to involve in a study are and if there are any counterfeits in the presentation (Saunders et al., 2012, p. 83). The theory that has made the foundation for the study is taken from the published scientific articles. Articles are retrieved from various databases, such as Umeå University library’s database and Google Scholar, and are widely peer reviewed. Meaning that other scientists have read and "approved" the articles, which strengthens the credibility. In cases where it is not clear whether the article is peer reviewed the credibility been tested in other ways, such as where it is published. Using only articles with high credibility also increases the reliability of this study.

Further, for a study to fulfil the independency requirements the researcher must be sure that the information is not influenced by interpretations (Ejvegård, 2008, p. 71). The authors have in the largest extent used original sources in their study with the exception of some sources inspired by other authors, which could decrease the credibility in this study. However, original sources have been used in the presentation of the study’s theoretical framework in order to avoid obstructive misinterpretation. Examples of original sources are Fama’s (1970) Efficient Market Hypothesis and Lo’s (2004) Adapting Market Hypothesis, which will serve as a great foundation for the study’s analysis. Additionally, the connection to the ESG information only comes from original sources.

Along with the requirements above, there is also a requirements regarding how actual the information is, assuming that it is generally better use a newer source than an older (Ejvegård, 2008, p. 72). The usage of ESG issues in business models is a relatively new topic; the study has therefore used the most current sources as possible. Similarly, information concerning developments in emerging markets has been kept as relevant as possible. Some of the articles though, especially about EMH, can be considered as old. However, these sources are still considered as relevant, but in order to increase their credibility they have been compared with recent research to increase the credibility to the these older theories.

2.8 Ethical Issues
In research, there are four ethical standards that should be met: lack of informed consent, no harm to participants, invasion of privacy and deception. This means that the respondents should be aware of what the study intends to investigate, that their participation is voluntary, that personal data and other sensitive information is treated

~ Theoretical Methodology ~
with high confidentiality and that the information collected from respondents are only used as research (Bryman & Bell, 2011, p. 128 ff).

The authors will collect the data for from Sustainalytics, a global leader in sustainability research and analysis. Therefore, a requirement from the authors’ side was to sign a confidentiality agreement where the authors agree not to share the data. Therefore, this study is also influenced by some legal and ethical considerations. The reason why it is important that the ESG data is not disseminated is that it is used for commercial purposes by Sustainalytics. Since the data do not contain any personal information, some significant social aspects do not affect this study.
3. Theoretical Framework

The theoretical chapter begins with a detailed explanation of ESG and how it is used by what is called positive and negative screening. Subsequently, there is a presentation and description of the Capital Asset Pricing Model (CAPM) and how the model will be used in this study. Further, to give the reader a good understanding of what the Adaptive Market Hypothesis (AMH) is, the study firstly describes Efficient Market Hypothesis (EMH). Finally, a description of the model that represents the theoretical framework that underlies the study's analysis and conclusion is made.

3.1 Environmental, Social and Governance (ESG)

3.1.1 Sustainable investing

A broad description of sustainable investment is a long-term model that invests efficiently and fairly (Towers, 2011, p. 2). During recent years sustainable investing has been under constant development and in line with this, numerous new concepts in the field have emerged. Because the definitions sometimes differ or are being used in different situations, there is a potential chance for confusion when looking at this sector (Deutsche Bank, p. 18. 2012). A fundamental concept in the area is Socially Responsible Investing (SRI). According to Deutsche Bank (2012), SRI aims to achieve environmental and social objectives in correspondence with financial performance by utilizing both value-driven, and positive screening in the investment process (Deutsche Bank, 2012, p. 19).

In 1998 Moskowitz published his classic analysis of the "100 Best Companies to Work For" which was a contributing factor to why academics and investors began to put increasing emphasis on good corporate governance in a company's risk and return profile (Deutsche Bank, p. 20. 2012). Subsequently, in the early 2000s a renewed interest emerged, to include corporate governance in addition to financial, social and environmental factors into SRI, and thereby create a more concrete definition of the sector (Deutsche Bank, p. 20. 2012).

In order to formulate the concept of ESG, UNEP Finance Initiative (UNEP FI) formed an asset management-working group, where on project was to investigate the financial materiality of Environmental, Social and Governance (ESG) factors (Deutsche Bank, p. 20. 2012). The most important result of this investigation was that ESG factors affect long-term market value (Deutsche Bank, p. 20. 2012). The principles of PRI was presented in 2006 by UN Secretary General Kofi Annan, who also emphasised the concept of Responsible Investing (RI) as an integrated part of SRI, meaning those investments who incorporate ESG into their investment process (Deutsche Bank, p. 20. 2012). The fundamental objective of RI is to promote sustainable investment through a long-term investment strategy that promotes short-term performance without risking future performance, i.e. to produce a higher return, both in present and in the future (Towers, 2011, p. 2).

3.1.2 Environmental, Social and Governance (ESG) issues

The world of investing is changing: critical questions concerning climate change, social change and corporate governance have become an integrated part of the financial world. Subsequently, the concept of SRI have become more relevant than ever as it aims to
create long-term value for both investors and society as a whole. From a business point of view, many are recognizing both the tangible and intangible value of incorporating these issues into the corporate activities (Koehler, Park C. 2013). Forbes (2013) defines SRI as “Sustainable, Socially conscious, mission, green or ethical investing”. Social responsible investors are attempting to streamline their investments, by including ESG information in addition to the conventional financial criteria in their fundamental investment strategy (Bourghelle, Jemel, & Louche, 2009, p.3). Since ESG is a subjective and non-financial measure, investors need to investigate the business to understand the main critical standards matching their own values.

The fundamental issue is to find valuation effects to estimate the balance between financial and sustainability performance, which is achieved by surveying the specific sustainability issues most important in the respective markets and industry (Clark et al, 2014, p. 10). New research by Deloitte shows the materiality of ESG data should be correlated to valuation effects, like materiality for any input in investment decision-making (Clark et al, 2014, p. 10). University of Oxford and Arabesque Partners (2014) have summarised some of the relevant ESG issues that could effect valuation depending on the specific markets or industry, which could be seen in table 1.

### Table 1. Selection of Material ESG factors (Clark et al, 2014, p. 10)

<table>
<thead>
<tr>
<th>Environmental (&quot;E&quot;)</th>
<th>Social (&quot;S&quot;)</th>
<th>Governance (&quot;G&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiversity/land use</td>
<td>Community relations</td>
<td>Accountability</td>
</tr>
<tr>
<td>Carbon emissions</td>
<td>Controversial business</td>
<td>Anti-takeover measures</td>
</tr>
<tr>
<td>Climate change risks</td>
<td>Customer relations/product</td>
<td>Board structure/size</td>
</tr>
<tr>
<td>Energy usage</td>
<td>Diversity issues</td>
<td>Bribery and corruption</td>
</tr>
<tr>
<td>Raw material sourcing</td>
<td>Employee relations</td>
<td>CEO duality</td>
</tr>
<tr>
<td>Regulatory/legal risks</td>
<td>Health and safety</td>
<td>Executive compensation schemes</td>
</tr>
<tr>
<td>Supply chain management</td>
<td>Human capital management</td>
<td>Ownership structure</td>
</tr>
<tr>
<td>Waste and recycling</td>
<td>Human rights</td>
<td>Shareholder rights</td>
</tr>
<tr>
<td>Water management</td>
<td>Responsible marketing and R&amp;D</td>
<td>Transparency</td>
</tr>
<tr>
<td>Weather events</td>
<td>Union relationships</td>
<td>Voting procedures</td>
</tr>
</tbody>
</table>

#### 3.1.2.1 Environmental
Almost every aspect of business has an impact on land, water or air, which ultimately may change our climate. The sensitivity of potential consequences caused by climate change is having an increasing interest within the financial world (CFA, 2008, p. 1). Scientific research reveals that the earth is experiencing a global climate change and the financial markets have also accepted this by expanding the relevance of environmental factor in the financial analysis (CFA, 2008, p. 4). Subsequently, companies have started to strategically position themselves to deal with this climate change. Climate change affects all companies and provides a systematic risk. Although, long-term effects are
discussed and may affect companies because of regulations, resource constraints, cost of emissions and waste management (Collin, 2009, p. 12). The majority of governments worldwide have responded to the climate change, and carbon-based energy sources have been or are waiting to be exposed to either higher taxes or/and increased regulation (CFA, 2008. p. 4). Conclusively, enterprises will need to adapt to the new corporate landscape that addresses climate change (CFA, 2008. p. 4).

Although climate change might be the one attracting most attention, there are more environmental issues affecting businesses. In order to understand the opportunities and risks companies are facing, investors and analysts also need to understand environmental issues such as pollution, waste management, ecosystem change, resource consumption, use of toxic chemicals, licensing costs, among many others (CFA, 2008. p. 4).

Furthermore, carbon-intensive industries are the main objective of many laws and restrictions that have been added, implemented or are under investigation (CFA, 2008. p. 4). Future uncertainty from the impact of these laws and restrictions in the firms is a major concern, which in turn becomes a challenge for investors. But even the outside carbon intensive industries are likely to be affected by rules and regulations in carbon-intensive industries. Subsequently, it is important that companies develop technology and approaches that offer a lower risk profile and improve the ability to manage the changes that have been and is to be expected in a carbon-constrained world (CFA, 2008. p. 4).

A problem for analysts is the lack of appropriate data and metrics to accurately judge the environmental risks the company is exposed to (CFA, 2008. p. 4). Because of this it is usually not any information about theses risks in companies balance sheets and income statements. For this reason, ESG have emerged as an important tool to calculate the risks. Organizations such as Global Reporting Initiative have emerged in order to quantify some environmental measures in order to make meaningful comparisons between companies and industries (GRI, 2013. p. 5). The GRI G4 Sustainable Reporting Guidelines suggests standard disclosures and reporting principles, with a description on how it should be implemented in order to report sustainability issues (GRI, 2013. p. 5).

3.1.2.2 Social

The social issues directly affect the firms’ operational performance. Social factors are primarily related to the company’s business relationships and play an increasingly important role in the public perception of listed companies, strongly associated with its brand integrity and reputation (CFA, 2008. p. 5). Some commonly mentioned social factors are: human rights, worker rights, safety, labor relations, child labor, community relations/development, and indigenous rights (CFA, 2008. p. 5). However, companies have much to gain by managing the social practices and stakeholder relationships, as it could lead to an increased loyalty among employees and customers, to thereby decrease the potential risks of expenses that are related to strikes and boycotts (Collin, 2009, p. 12). Subsequently, a negative reputation may affect the general perception of the company's financial situation and prompting for new regulatory burdens, ultimately affecting the market value (CFA, 2008. p. 5). In line with communication technology developments in recent decades, the information flow have increased significantly and global investors can take part of the company's social behaviour shortly after an event or breaking news story (CFA, 2008. p. 5). This means that social factors are increasingly
important to manage public perception of the company. High profile brands with business or manufacturing in Asia is particular exposed; young workers have gained more knowledge of their rights at work and have demonstrated a keen sense for the leverage they hold over the reputation of global companies (Lee, 2011). It is important that investors understand the advantages of investing in companies with strong stakeholder relationships and better social corporate practices, and thereby reduces social risks threatening the company they invest in (CFA, 2008, p. 5).

3.1.2.3 Governance
During the financial crisis the banking sector was close to collapse partly as a consequence of the corporate governance in the sector, today it is generally accepted that poor corporate governance could lead to serious consequences. The way a business is governed can affect its financial performance and should be of great concern for all shareowners (Collin, 2009, p. 11). Awareness among investors and research on governance practices and corporate performance has been increasing in recent years, as a consequence, supervisory focus on transparency and disclosure in governance issues has sharpened (CFA, 2008. p. 4). Some events that have illustrated the importance of corporate governance issues to investors are the scandals concerning companies as Enron Corporation, WorldCom, and Parmalat, who reconstructed its financial data and concealed corporate governance issues for the public (CFA, 2008. p. 3). In accordance with the attention to risks associated with governance factors it has become increasingly included in the investment decision-making processes (CFA, 2008. p. 3). As a result, several private governance ratings agencies have emerged to meet the demand for information on governance risks (CFA, 2008. p. 3).

Furthermore, as awareness has increased, investor’s propensity to influence governance changes in the companies has become more apparent. Activist shareholders have begun to a greater extent involve themselves in governance issues and often criticize the failure to care finances, missed investment opportunities, erroneous strategic corporate vision and the management’s unwillingness to invest in future growth (CFA, 2008. p. 3). As a consequence among investors and the public, a need for standardized guidelines for companies concerning governance issues have emerged. Subsequently, investor-led organization of governance professionals as International Corporate Governance Network (ICGN) and Global Corporate Governance Forum has emerged with the objectives to provide inspiration and promote corporate governance (ICGN, 2015) (IFC, 2015).

3.1.3 Screening
As the desire for sustainable investments has arisen, techniques in order to achieve this have also been developed. Today sustainable investment implies integrating decisions with concerns for the environment and society, which means to responsibly manage financial resources in a way that maximizes financial return while being environmentally and socially sustainable. Although interest in sustainable investments has increased the debate surrounding whether how the criteria for environmental and social values should be integrated is an on-going debate (Chelawat, 2013, p. 16).

ESG criteria are not used in traditional investment methods, which instead base their decisions exclusively on risk-adjusted return. Subsequently, a common way to meet requirements for sustainable investment is screening, usually referred as ethical screening (Deutsche Bank, p. 20. 2012). Although many different criteria have been
used in the process, ESG criteria have emerged as the most accepted between SRI fund managers (Chelawat, 2013, p. 16). One reason for this is UN Environment Programme Finance Initiative (UNEPFI) encouragement of using ESG criteria in the screening process for all investment portfolios (Chelawat, 2013, p. 16). The screening process is designed to select companies that meet ESG criteria and is broken down into two different methods, positive and negative screening.

### 3.1.3.1 Negative screening

Negative screening is the oldest and most basic SRI screening strategy (Renneboog et al., 2008, s. 1728). The strategy intends to exclude companies that do not meet the requirements of the process. In most cases it is simply to apply a “yes” or “no” analysis. The criteria in negative SRI screening may include ESG rating and can be applied to an initial asset pool such as a stock index. Usually this implies that specified sectors and industries such as military weapon, tobacco manufactures, companies with poor performance in labour relations or environmental protection are excluded from the portfolio (Deutsche Bank, p. 29. 2012). Other approaches in negative screening may account for responsible operations are pornography, labour rights, the violation of human rights and animal testing (Renneboog et al., 2008, s. 1728).

### 3.1.3.2 Positive screening

The other option is to apply positive screening. This approach filters out shares that do not meet the determined superior standards. Commonly, companies are ranked based on the criteria within each industry or market, which ultimately means that only those companies that performed best against the criteria, will be selected (Renneboog et. al., 2008, s. 1728). Positive screening is a more preventive approach than negative screening, and a method that is becoming increasingly common among investors. Negative screening focuses on the exclusion of companies that are considered as "sin stocks", i.e. companies with offensive products or activities. Through positive screening investors support those companies that are at the front edge of social and sustainable operations (Renneboog et. al., 2008, s. 1728). Conclusively, positive screening requires a larger analysis of complex issues and using of ESG rating is one way to manage this.

### 3.1.4 Why do not all investors use ESG screening?

Although the numbers of investment processes including ESG rating have increased in recent years only a small part of the investors applies the method. Instead most investors still use traditional investment methods, basing their decisions exclusively on a risk-adjusted return (Chelawat, 2013, p. 16). It may seem paradoxical that not more investors use ESG when comprehensive studies by Deutsche Bank (2012) and the University of Oxford and Arabesque Partners (2014) reveals that the use of ESG factors are correlated with superior performance in the markets. Simultaneously, there are also ethical advantages using the ESG factors as it contributes to preserve world wellness (Clark G et al, 2014. p. 48). The method is not performed to the same extent as some research suggesting it should, comparatively due to major challenges, and studies of actual returns show that SRI fund managers historically have failed to capture superior returns through the use of ESG screening (Deutsche Bank, 2012, p. 8).

Subsequently, ESG screening implies challenges since it is a subjective and non-financial measure; as a consequence investors need to investigate the business to understand the standards matching their own values. This problem is particularly critical in emerging countries where corporate culture does not promote reporting activities, and
business generally have less transparency than companies in developed countries (EIRIS, 2012, p. 11). In a survey made of international investors by EIRIS (2012), 78% of the respondents stated that the key challenge to invest in emerging countries is the lack of company ESG disclosure (EIRIS, 2012, p. 11). Additionally, investors perceive ESG risks to be higher in emerging countries compared to the developed countries making the lack of information particularly severe (van Dijk et al., 2012, p. 3).

Geoffrey Williams, chief executive at Kuala Lumpur-based OWW Consulting, presented figures displaying that only $60bn was invested in Asian Equity SRI funds by 2011 (Röhrbein, 2011). Information from the UN Principles for Responsible Investment (PRI) disclosed that the equivalent amount of $9trn was invested in global SRI funds, demonstrating that investors overlook international guidelines in Asia and do not care about ESG issues (Röhrbein, 2011). An important reason for this is investor’s disappointment towards Asian governments ability to create an environment that supports sustainable companies (Röhrbein, 2011).

Although some of today’s research indicates that ESG performance is correlated with superior returns, contemporary studies emphasises that further research is needed to find the specific sustainability issues that are important in relation to superior returns (Clark et al, 2014, p. 10). The screening method is to some extent questioned and there are no distinct research regarding the financial value of using ESG information in the investment process. Which is the fundamental reason why not all investors use ESG screening.

3.2 Capital Asset Pricing Model (CAPM)
The Capital Asset Pricing Model (henceforward denoted as CAPM) is used to determine the expected return-risk relationship and is helpful when analysing portfolios with different risks and returns. CAPM implies that expected return on a portfolio should be equal to the risk-free rate plus a risk premium. Hence, CAPM have been used as a variable in the formula to calculate risk-adjusted return, which is further explained in the next chapter.

It was Markowitz (1952) who developed the modern portfolio theory where he emphasised the importance of portfolios and risks, and the correlation between assets and diversification (Markowitz, 1952, p. 89). Markowitz (1952) clarified that prior to his theories investor’s focuses were placed on single assets without the consideration of the effect of portfolios (Markowitz, 1952, p. 92).

The creation of Markowitz (1952) modern portfolio theory would William Sharpe (1964), John Lintner (1965) and Jan Mossin (1966) take into consideration when they developed the Capital Asset Pricing Model (CAPM). CAPM is used to determine the expected return-risk relationship and is helpful when analysing portfolios with different risks and returns and that assets are price commensurate with a trade-off between diversifiable risk and expectations of return (Perold, 2004, p. 9; Dempsey, 2013, p. 7). Thus CAPM implies that the expected return on a portfolio should be equal to the risk-free rate plus a risk premium and that there is a connection between expected return and systematic risk, which are measured as the beta $\beta$ (Perold, 2004, p. 14). What the beta value actually indicates is assets volatility relative to the market as a whole and the market risk is not possible to diversify the beta value reflecting the expected return on a market in equilibrium (Bodie et al, 2011, p. 282). Investors, according to CAPM, are
supposed to hold well-diversified portfolios and therefore eliminate all the unsystematic risk. Hence it implies that the beta value only reflects the systematic risk.

CAPM is based on five different assumptions that must be met for the model to work (Blitz et al, 2013, p. 3):

i) There are no constraints, e.g. on leverage and short selling.
ii) Investors are risk averse and only care about the mean and variance of return.
iii) There is only one period.
iv) Information is complete and rationally processed.
v) Markets are perfect and there are therefore no transaction costs and no taxes.

These assumptions reflect a simplified and idealized world, but as with many other theories, these assumptions are needed to obtain CAPM in a basic more understandable form (Perold, 2004, p. 16). Nevertheless, through these implications the financial industries come to rely on CAPM when determining the discount rate for valuing investments within a company and additionally made these companies to value their own firm (Dempsey, 2013, p. 7).

According to Bodie et al. (2011, p. 281-282), there are also some additional mathematical assumptions to calculate CAPM:

i) All investors will hold a market portfolio hence a portfolio consisting of all traded risky assets. Therefore the proportion of each stock is calculated as:

\[
\frac{\text{Price per share} \times \text{Number of shares outstanding}}{\text{Total market value of all stocks}} = \text{Proportion of each stock}
\]

ii) The portfolio tangent the Capital Allocation Line (CAL).

iii) The risk premium on the market portfolio will be proportional to its own risk degree, investors can borrow and lend at the risk-free rate.

iv) Risk premium on individual assets will be proportional to the risk premium on the market portfolio.

Based on the assumptions above, the formula for CAPM is designed as followed: (Bodie et al, 2011, p. 293):

\[
E(r_i) = r_f + \beta_i [E(r_m) - r_f]
\]

\(E(r_i)\) = Expected return on asset i
\(r_f\) = Risk free rate
\(\beta_i\) = Beta coefficient for asset i
\(E(r_m)\) = Expected market return
\([E(r_m) - r_f]\) = Market risk premium
The risk-free rate plus a share risk premium therefore obtain the expected return. The risk premium is the shares beta value multiplied by the return on the market minus the risk-free rate (Bodie et al, 2011, p. 293).

Some early supporters to CAPM were Black et al. (1972) and Fama & MacBeth (1973). Their evidence supports beta as a risk measurement, as their results demonstrated a positive relationship between realized return and risk for all their countries in the different studies (Black et. al., 1972, p. 42; Fama & Macbeth, 1973, p. 624). Another early supporter to CAPM were Friend et al. (1978, p. 903) and they aimed to find empirical evidence for CAPM due to several critics to the model. These authors summarized some advantages with the model (Black et. al., 1972, p. 42; Fama & Macbeth, 1973, p. 624; Friend et. al., 1978, p. 917).

- CAPM only considers systematic risk, which is reflected in reality where many investors have diversified portfolios and hence eliminate unsystematic risk.
- It generates a theoretically relationship between required return and systematic risk.

Brown & Walter (2013, p. 44) wrote in their paper that even though CAPM is a predicting model, it still is a relevant model that should not be rejected. They are claiming that previous studies arguing against CAPM are using problematic arguments (Brown & Walter, 2013, p. 44). Critics to CAPM are using invalid historical evidences as required efficient benchmarks are needed, and they are claiming that investors do not expect to be compensated for unavoidable risks. As a matter of fact, Brown & Walter (2013, p. 48-49) state some practical evidence of CAPM’s relevance.

- Corporations use CAPM in Capital budgeting.
- Regulatory agencies use CAPM in price setting.
- Fama’s (1970) market efficiency use same criterions.
- Academics use CAPM when teaching corporate finance.

Additionally, Smith & Walsh (2012, p. 73) suggest that CAPM is only “half right” as it is the most common asset pricing model, but only when it works 100% of the time. Thus, they argue that one should not discard CAPM because it is only “half right”, in favour of an unspecified alternative that tells nothing at all (Smith & Walsh, 2012, p. 78).

One of the very early critics to CAPM is Roll (1972) who claims that it is not possible to create a truly diversified portfolio. Roll (1972, p. 130-131) states some major problems with the model: (i) There is only a single testable hypothesis associated with the generalized two-parameter asset pricing model, (ii) The theory is not testable unless all individual assets are included in the sample, (iii) In any sample of observations on individual returns, regardless of the generating process, there will always be an infinite number of ex-post mean variance efficient portfolios, (iv) CAPM relies on the assumption about markets being efficient, where there is a linear relation between beta and the expected return. This relation is not independent since it has to rely on another assumption, namely the efficiency of the market portfolio (Roll, 1972, p. 131).

Conclusively, CAPM is mentioned in the theoretical framework to clarify the logic behind CAPM to facilitate the understandings for the reader of what happens when risk-
adjusted return is tested. CAPM is considered to be of great importance for this study because it will be used to calculate the return on each company and also because it has lain ground for other mathematical models, which will be mentioned in the practical method.

3.3 Efficient Market Hypothesis

Market efficiency is one of the cornerstones of the modern financial circuits and there have been several studies and discussions regarding how reliable it is in reality. Market efficiency is an essential theory in this study, because if markets were fully efficient would good selections by investors of companies with high ESG characteristics already have been integrated into investor’s fundamental process (Caplan et. al., 2013, p. 3).

Nevertheless, a market is supposed to be efficient with respect to information set if the price fully reflects that information (Fama, 1970, p. 383). Lo (2004, p. 2) describes market efficiency, which makes this condition easy to understand, through an old saying:

“There is an old joke, widely told among economists, about an economist strolling down the street with a companion. They come upon a $100 bill lying on the ground, and as the companion reaches down to pick it up, the economist says, “Don’t bother—if it were a genuine $100 bill, someone would have already picked it up”

Malkiel (2003) explains it further through a statement that by enlightening the information set to all market participants it would lead to efficient markets where asset prices reflect information based on historical prices (Malkiel, 2003, p. 60). The study associated market efficiency with the “Random Walk Model”, which is a conventional term in financial literature and it is used to describe price series where all subsequent price fluctuations signify random partings from previous prices (Malkiel, 2003, p. 60). The result of a random walk model is that prices fully reflect all historical information, meaning that it does not matter if people are experts in speculating stock prices, they will obtain a rate of return equal to an uninformed investors portfolio (Malkiel, 2003, p. 60).

It is said that Eugene Fama (1970) was the former of the Efficient Market Hypothesis (EMH) and according to his work; a capital market is efficient when prices always fully reflect the information available (Fama, 1970, p. 383). Nevertheless, if a market should be efficient, there are some market conditions that have to be fulfilled. The first criterion implies no transactions costs in trading securities (Fama, 1970, p. 387). Secondly, all available information should be cost free to all participants in the market (Fama, 1970, p. 387). The third and final criterion explains an equal evaluation amongst the participants in the market about the current information for the price and distributions of future prices of each security (Fama, 1970, p. 387). According to Fama (1970), if all these criterions are fulfilled then the current price of a security should fully reflect all available information. Nevertheless, these conditions are sufficient for market efficiency, but not necessary (Fama, 1970, p 387). All participants in the market do not have to evaluate information equally, as long as there are some participants who systematically evaluate all information (Fama, 1970, p. 387). Timmermann & Granger (2004) states in their study about EMH from the perspective of a modern forecasting approach, that these criterions are still relevant when applying EMH into a study (Timmermann & Granger, 2004, p. 16).
EMH divides the market into three different categories based on the efficiency of each category. These categories are called weak form, semi-strong form and strong form (Fama, 1970, p. 389).

In markets weak form efficiency, current prices fully reflect all information based on historical prices of an asset and traders cannot develop a trading rule to identify miss-priced assets (Rakesh & Parikshit, 2007, p. 59). Thus, an investor would not be able to have an information advantage over another actor by technical analysis of historical data. This restrains operators to integrate abnormal risk-adjusted returns over the market (Rakesh & Parikshit, 2007, p. 59).

Fama (1970) tested a market’s semi-strong efficiency. Several models in this test were constructed to analyse whether current price fully reflect all obvious public available information (Fama, 1970, p. 404). Rabbani et al (2013) explains semi-strong efficiency as the share price adjustment whenever new information is publically available and adjustment occurs almost instantaneously and without any bias (Rabbani et al, 2013, p. 136). Thus trading on the publically available information would not earn any abnormal return. Tests of different occurrences that might drive a share price in different directions could be useful to study whether semi-strong form exists and hence results shows how the market interprets the information of the event (Lakshami & Roy, 2013, p. 2).

Strong form tests of the efficient markets model are according to Fama (1970) analyses whether all available information, thus including weak and semi-strong form, is fully reflected in current prices (Fama, 1970, p. 409). Thus, strong form efficiency proposes that security prices reflect all available information, even private information. Insiders profit from trading on information not already incorporated into prices for example, an upward or downward trend of prices in a particular period of time for the concerned firm (Gilani et al, 2015, p. 28). Hence the strong form does not hold in a world with an uneven playing field (Rakesh & Parikshit, 2007, p. 59).

This study focuses on weak and semi-strong form efficiency since the study will only observe public information and historical results within our chosen companies. Lakshami & Roy (2013) examined the validity of semi strong efficiency by testing the relationship between price-to earnings ratio (P/E) and equity returns in Indian stock market (Lakshami & Roy, 2013, p. 1). Their study was based on monthly stock returns of 90 companies during 2006 and 2012 and companies were conducted into different portfolios depending on each company’s P/E ratio. Subsequently, the results demonstrated increasing average annual returns in the portfolio with low P/E ratio compared with the portfolio with high P/E ratio (Lakshami & Roy, 2013, p. 6). Furthermore, Gilani et al (2015) made a study of the Islamabad stock market testing weak form efficiency. They observed companies on the Islamabad stock exchange during the year of 2013 and their hypothesis was whether the Islamabad stock exchange is weak form efficient or not (Gilani et al, 2015, p. 31). Results of the study displayed market efficiency when using weak form information according to Augmented Dickey-Fuller (ADF) statistical tests (Gilani et al, 2015, p. 35).

Conclusively, whether Efficient Market Hypothesis is efficient in the long run or not is not possible to state based on empirical evidence (Alajberg et al, 2011, p 67). Therefore,
it is necessary for more additional theoretical framing regarding structures to information and learning environments. Malkiel (2003) also states with the passage of time and more sophisticated technologies, speculators will work against market efficiency and develop further patterns into the stock market (Malkiel, 2003, p. 80).

This study will investigate the efficient market hypothesis by studying the relationship between ESG performance and risk-adjusted return in the investment process. It will therefore lead the authors to mainly questioning the weak and semi-strong efficiency. The authors will question the semi-strong efficiency by investigate stocks with high ESG ratings. If the outcome leads to a positive relationship between high ESG ratings and risk-adjusted return, it will be evidence against semi-strong efficiency. It will automatically lead the authors to challenge the weak form efficiency because it therefore becomes possible to observe how companies with high ESG ratings have performed historically. Same tests will also be implemented on companies with low ESG rating to see the relationship with risk-adjusted return.

3.4 Adaptive Market Hypothesis

3.4.1 The Development of Adaptive Market Hypothesis

As mentioned earlier, EMH is one of the cornerstones within the financial circuits. Hence, despite a large body of research on EMH of over four decades, the answer of whether markets are efficient or not remains to be elusive. Nonetheless, there has been a lack of strong alternative theoretical explanations towards EMH. It was Lo (2004) who made a proposed complementary approach towards EMH, announced as the Adaptive Market Hypothesis (AMH), which can coexist with the EMH in an intellectually manner (Lo, 2004, p. 21).

Lo (2004) was driven by the fact that behavioural economics and finance have under significantly amounts of time tried to challenge EMH by arguing that markets are not rational, but they are driven by fear and greed instead (Lo, 2004, p. 1). In his paper, he clarifies the critiques to rational markets and the random walk theory, where these implications have been tested by critiques over the years. He is mentioning that these critiques of the EMH are arguing that investors are often, if not always, irrational in their financial behaviour (Lo, 2004, p. 5). Furthermore, experimental economists are mentioned in his paper where all have documented a number of contradictory statements towards EMH in form of specific behavioural biases that are pervasive to decision making under uncertainty (Lo, 2004, p. 4). These behavioural biases are, amongst others, overconfidence, overreaction, loss aversion, herding, psychological accounting, miscalibration of probabilities, hyperbolic discounting and regret, all of which are contradictory towards EMH and expected utility theory (Lo, 2004, p.4-5).

As a matter of fact, Lo (2004) argue that efficient markets with perfect information are impossible. Because if there were perfect efficient markets, there would be no profit in gathering information about the markets and hence it would be a very minor reason to trade and markets would eventually collapse (Lo, 2004, p. 6). Defenders of EMH are although, according to Lo (2004), responding to the challenges of EMH admitting that behavioural biases and inefficiencies do exist, even though their impact and spread is limited since opponents are already doing their best to exploit such opportunities (Lo, 2004, p. 6). Nevertheless, such arguments from the defenders of EMH cannot be settled
theoretically because careful measurements and statistical analysis have to be tested, which are very challenging (Lo, 2004, p. 7).

From a behavioural perspective, Lo (2004) propositions, as mentioned earlier, an alternative theory to EMH, where markets are adaptable and switch between efficiency and in-efficiency at different points of time (Hiremath & Kumari, 2014, p. 1). In his more updated version about AMH, Lo (2005) states that because of limited computational liabilities amongst humans, optimization is more costly and humans are adapting choices that are satisfying, which is an alternative to optimization (Lo, 2005, p. 30). These satisfying options will make choices that are only satisfying, although not necessarily optimal. Thus humans make their choices depending on experience and they learn what might be optimal estimations by receiving positive or negative reinforcement from the outcomes (Lo, 2005, p. 30-31). Although on the contrary, if there are changes in the environment, then it is obvious that old experiences might not be suitable when estimating optimal choices, which is what Lo (2005) proposed as behavioural biases (Lo, 2005, p. 31). Behavioural biases in this sentence stand for bad advised actions based on how humans observe them.

3.4.2 AMH implications

The hypothesis of an adaptive market implicates a variety of differences towards the classic EMH (Lo, 2004, p. 21-24):

1) A relation between risk and reward exists and it is unlikely to be stable over time.
2) Arbitrage opportunities do exist from time to time.
3) Investment strategies may differ depending on the environment, where they will perform well in some environments and poor in others.
4) Innovation is the key to survival.
5) Survival is the only objective that matters

The first implication is determined by preferences from market aspects, such as market ecology, as well as regulatory environments and different laws. In such cases, where there are shifts over time, any potential loss or reward is much likely to be affected (Lo, 2004, p. 21). Lo (2004) exemplifies this implication with the technology bubble in the beginning of the 21st century; those investors who made substantial losses during this period are more likely to have exited market and hence leaving the market to a different population of investors in the year of 2004 (Lo, 2004, p. 21).

Furthermore, the second implication is determined by arbitrage opportunities because without such opportunities, investors would have no incentives to gather any information and hence the price-discovery aspect of financial markets would fall (Lo, 2004, p. 22). Arbitrage opportunities may occur since AMH implies more complex market dynamics, such as cycles, trends, bubbles and crashes.

AMH also implies that investment strategies may decline for a certain time and then may return to a profitable strategy when environmental conditions becomes more suitable for those kinds of investments (Lo, 2004, p. 22). Subsequently, the importance of innovation is a key for survival. EMH states that some certain levels of expected returns may be achieved by taking a sufficient level of risk. AMH on the other hand
suggest that investors should adapt to changes in market conditions and thus the risk and reward relation varies over time (Lo, 2004, p. 23).

Finally, survival is of great importance for all financial market participants. Lo (2004) explains it as while profit maximization, utility maximization and equilibrium are of importance: the main principle in evolution of markets and financial technology is to survive (Lo, 2004, p. 24).

3.4.3 Adapting AMH
Ever since Lo (2004) presented the AMH to the financial market, it has been tested in various studies. Hiremath & Kumari (2014) is an example and they studied if it is possible that AMH provides a better description of the behaviour of Indian stock market instead of EMH. On the grounds that the Indian stock market has the largest number of listed companies on its exchanges and has a growing market capitalization to the GDP, it would therefore be reasonable that the Indian stock market exhibit different characteristics compared to underdeveloped stock markets (Hiremath & Kumari, 2004, p. 2). Both linear and nonlinear methods were employed to evaluate the hypothesis empirically and the linear tests showed results indicated a switch between periods of efficiency and inefficiency while the nonlinear tests shows a strong evidence of nonlinearity in returns throughout the sample period (Hiremath & Kumari, 2004, p. 6 ff). Findings of the study suggest that Indian stock market is moving towards efficiency (Hiremath & Kumari, 2004, p. 11-12).

Ghazani & Araghi (2014) made a study evaluating the existence of AMH by applying daily returns in the Tehran stock exchange. Duration of data of daily returns were from 1999 to 2013 and both linear and nonlinear tests have been used to study adaptive behaviour of returns (Ghazani & Araghi, 2014, p. 53-54). Results from all of the different tests strongly suggest that the market condition is consistent with the implication of the AMH (Ghazani & Araghi, 2014, p. 58).

Conclusively, the Adaptive Market Hypothesis might be a better hypothesis in this study since it takes finance behavioural into account. As mentioned earlier, investors seems to be more risk averse towards investments in emerging countries mainly because of the lack of transparency, culture differences and business regulations (van Dijk et al, 2012, p. 5). Therefore, if there are several companies with high ESG ratings in India, it might reduce investors view towards risk in emerging countries.

3.5 Theoretical Part of Departure
All Indian companies in the study have been evaluated and received a comprehensive ESG rating. This study assumes that ESG rating and risk-adjusted returns can generate two outcomes; a relationship or no relationship, where a relationship on the other hand can generate two outcomes; positive or negative relationship. Nevertheless, whether there is a relationship or not, it will be affected by pricing model, screening and individual ESG factors. Conclusively, this process is demonstrated in figure 2.
Figure 2 - Theoretical Part of Departure

Figure 2 illustrates two different parts of a company that will help this study to answer its research question. Part one demonstrates a company's financial performance, which consists of the return a company generates adjusted for its risk. Risk-adjusted return can be calculated in different ways through different pricing models depending on what the study aims to investigate. Thus, there are different variables in these pricing models where CAPM is a relevant model because, as mentioned before, it takes systematic risk into account.
The other part in figure 2 is a subjective measure, called ESG, which may help investors to identify companies with superior business models. A company with a superior business model gets a high ESG rating and a company with a non-superior business model gets a low ESG rating. However, ESG ratings may be influenced by investor’s own preferences through observations of the individual factors within ESG. In this way, individual factors within ESG also affect the investment process. Another way to implement ESG is through screening; where investors usually select a handful of companies with the highest ESG rating, alternatively deselect companies with the worst ESG rating.

The objective for this study is subsequently to combine the two parts and hence generate a relation or no relation between risk-adjusted return and ESG performance. If the outcome is that it is no relationship it can be explained by EMH. As mentioned earlier, EMH states that it does not matter if a company have a high ESG rating. If ESG issues were of importance it would have been integrated into investors fundamental process (Caplan et. al., p. 3). Thus, if a no relationship between ESG performance and risk-adjusted return occurs, the market could be considered as efficient.

However, if the outcome leads to a relationship between ESG performance and risk-adjusted return, then relation are either positive or negative. In this study means a positive relationship that a high ESG rating generates higher risk-adjusted return. Thus, a negative relationship indicates that a high ESG rating generates lower risk-adjusted return. It is not obvious that there will be a positive or negative relationship but these possibilities gives incentives for AMH. AMH disputes that investment strategies, in this study ESG performance, may decline for a certain time to eventually return to a profitable strategy when right conditions appear (Lo, 2004, p. 22).
4. Previous Studies

In this chapter a detailed description will be made of some of the most cited studies within the field of ESG, value of ESG performance, and ESG performance in emerging markets. These previous studies have had a tremendous significant role in this study design and have provided inspiration for various practical approaches and theoretical starting points.

Deutsche Bank (2012) claimed in their meta-study, with over 100 academic studies of sustainable investing around the world, to be the most comprehensive review of the literature ever conducted (Deutsche Bank, 2012, p. 5). Results revealed clear evidence that sustainable investments can be a distinct advantage for investors (Deutsche Bank, 2012, p. 5). Companies with high ESG ratings have a lower cost of capital in terms of debt and equity, for this reason these companies are considered to be at lower risk by the market who reward them accordingly (Deutsche Bank, 2012, p. 8). The compilation of the studies also reveals that 89% claim that high ratings are correlated with market-based outperformance both over the medium and long term (Deutsche Bank, 2012, p. 5).

Additionally, Deutsche Bank (2012) declares that the ESG analysis should be incorporated by serious fund managers in the investment process, and in any corporate strategy that cares about shareholder value (Deutsche Bank, 2012, p. 5). Focused use of ESG criteria should capture the superior risk-adjusted returns if well executed as evidence illustrates that strong ESG performance are correlated with certified financial planers outperformance of the market (Deutsche Bank, 2012, p. 8). However, studies of actual returns have shown that several SRI fund managers historically have failed to capture superior risk-adjusted returns through the use of screening with ESG rating (Deutsche Bank, 2012, p. 8).

In a meta-study by the University of Oxford and Arabesque Partners (2014) where more than 190 different sources have been compiled, results demonstrate a remarkable correlation between economic performance and sustainable business practices (Clark et. al., 2014, p. 6). This suggests that responsibility and profitability are not inconsistent, but should be considered as a combined unit (Clark, et. al., 2014, p. 6). In 90% of the studies are sound ESG standards related to a lower cost of capital, and 88% of the studies demonstrates that sound ESG practices results in better operational performance (Clark et. al., 2014, p. 44).

The most relevant result from this study is that 80% of the studies show that stock price performances are positively correlated with good sustainability practices (Clark et. al., 2014, p. 44). Thereby, it should be of interest for any institutional investor and trustees to incorporate sustainability factors in the investment process to generate better return and contribute to preserving the world wellness (Clark et. al., 2014, p. 48). Even if there are results of economic performance and sustainable business practices, University of Oxford and Arabesque Partners report emphasises the current need of further research to identify the sustainability factors that are most important in relation to investment returns (Clark et. al., 2014, p. 44).
Previous Studies

A study by van Duurem et al (2015) investigated how conventional asset managers’ accounts for environmental, social and governance factors in their investment process. Their findings reveal that several of the managers in the study do consider and integrate responsible investing in their investment process (van Dureem et. al., 2015, p. 4). They also found that several asset managers preferred governance factors to environmental and social factors. Although, retail investors consider environmental and social factors to be more dominate factors in the investment process (van Dureem et. al., 2015, p. 8).

Hoepner (2013) made a study about ESG data and if it could enhance returns and reduces risks. The study, which observes the 100 most global sustainable companies compared to its market benchmark, made four brief observations where the first one concludes that implementing ESG have increased significantly the last decade (Hoepner, p. 8). Also, companies have realized that a good environment makes employees happy, societal concerns about climate changes leads more government policies towards business, and a better corporate governance gives managers less tools to make decisions without investors considerations (Hoepner, 2013, p. 8). Another observations from the study was that using ESG datasets might be a useful investment opportunity since it is not currently covered in many professional finance degrees (Hoepner, 2013, p. 8). A third observation found those portfolios of assets with abnormal ESG ratings outperforms their benchmarks (Hoepner, 2013, p. 9). A final observation of the study was that firms with better ESG ratings experience higher credit ratings and lower cost of capital (Hoepner, 2013, p. 11).

Subsequently, Derwall et. al. (2005) were early making a study if SRI leads to an inferior or superior portfolio performance. Main focus of the study was the economic value a company creates relative to its waste it generates (Derwall et. al., 2005, p. 51). Two equity portfolios were constructed, evaluated and differed in eco-efficiency consisting of large cap companies in United States during the period of 1995-2003. They presents contradictory evidence, which typical recommends investors to be cautious about adopting SRI, and that a stock portfolio consisting of large-cap companies that are most eco-efficiency outperformed a less eco-efficient over the observed period (Derwall et. al., 2005, p. 61). Thus the author’s suggests that benefits of considering environmental criteria in the investment process can be substantial (Derwall et. al., 2005, p. 61).

A study of the Indian stock market was made by Goyal & Aggrawal (2014) and examined whether ESG stocks in the portfolio represented by the S&P ESG India Index outperforms the market portfolio in the Indian stock market. Calculations were made by using the absolute rate of return and the risk-adjusted measurements like Sharpe ratio, Treynor ratio, Jensen ratio and CAPM, during the period of 2008-2013 (Goyal & Aggrawal, 2014, p. 93-94). The authors found that ESG stock portfolios had outperformed the market portfolios. The absolute return, monthly mean return and the risk-adjusted measurements were all higher for the ESG portfolio compared to the market portfolio (Goyal & Aggrawal, 2014, p. 95). Their conclusions state that those empirical findings have important implications for the investors who are socially responsible (Goyal & Aggrawal, 2014, p. 96).

Another study of Indian companies was made by Vasal (2009). He used data for the S&P ESG India Index and the market index, S&P 500 index, during the period of 2005-2008; to examine the performance of the portfolio of socially screened stocks in the
Indian capital market. A finding from the study infers signals of positive excess return of the S&P ESG India Index compared to market index (Vasal, 2009, p. 384). In other words does not the portfolio of stocks of socially responsible companies underperform the market (Vasal, 2009, p. 384).

Nevertheless, there are also some researchers stating that there is no significance relationship between ESG performance and abnormal returns at all. Halbritter & Dorfleitner (2015, p. 11) finds in their study that there is no significant return differences between companies with high and low ESG performance. The sample included ESG data and companies return for the U.S stock market from 1991-2012, where they used Carhart (1997) four-factor model as well as Fama and MacBeth (1973) cross-sectional regressions. The authors do find a significance influence of some of the ESG variables with the cross-sectional regression (Halbritter & Dorfleitner, 2015, p. 8). However, the authors are doubtful that investors will exploit this influence and they therefore conclude that investors should not expect any abnormal returns by considering high or low ESG ratings in the portfolio (Halbritter & Dorfleitner, 2015, p. 11).

Furthermore, Van Dijk et al (2012) made a study about risks of ESG in emerging markets and how they relate the overall performance of a company, where the main focus were lying on the BRIC countries. Their motivation for the study was the significant increase in emerging market investments and investors remains cautious due to factors such as the limited corporate transparency, corporate cultures differences and business legislation differences (Van Dijk et. al., 2012, p. 5). The study concludes several characteristics that pose significant challenges for responsible investors, such as corruption, reputational risks, transparency and lower levels of scrutiny by governments (Van Dijk et. al., 2012 p. 28). The author’s recommend investors, amongst others, to invest into more research in emerging countries, join forces with local investors and be aware of cultural differences (Van Dijk et. al., 2012 p. 28).

Additionally, a study written by Maˇnescu (2011), states that ESG factors do not have any major impact on a company's share price and therefore cannot generate abnormal returns. The study was conducted on public US companies during the period 1992-2008. The term ESG were divided into different parts to measure each party separately and then calculate an aggregating ESG (Maˇnescu, 2011, p. 104). Some of the parts, amongst others, were Community Relations, Employee Relations, Human Rights and Product Safety. During the period July 1992-June 2008, only community relations had a positive effect on stock returns, even though it could have been due to mispricing (Maˇnescu, 2011, p. 111). Thus the implications are sometime that ESG factors might have a relevant value but they are not efficiently implemented into stock prices (Maˇnescu, 2011, p. 112).

Subsequently, Aggarwal (2013) also made a study of whether sustainable companies are more profitable than non-sustainable companies. The study was made on listed Indian companies and the results reveals that corporate sustainability, as a whole has no significant influence on financial performance. However some financial performance measures such as return on assets (ROA) was influenced by corporate sustainability, while measurements like return on equity (ROE) and return on common equity (ROCE) was not influenced by corporate sustainability (Aggarwal, 2013, p. 8). By dividing corporate sustainability into smaller factors it was possible to discern that factors like...
governance and community had positive influence, while employees and environment dimensions had negative influence on financial performance (Aggarwal, 2013, p. 9).

In summary, the studies show that some results indicate a positive connection, while others suggest a non-existent or negative relationship between ESG performance and risk-adjusted returns. These surveys will constitute a basis for analysis where different results will be compared with the studies above.
5. Practical Method

In the practical method the author’s describes why a cross-sectional study is the most relevant choice based on the objective for this study. A description of the sample is thereafter presented where a convenience sample is chosen for collecting the data. Additionally, a description of all the parameters has been made to be able to calculate risk-adjusted return for every company. The chapter thereafter describes the study’s hypotheses and how they will be tested through different regressions. Conclusively, this chapter ends with different truth criterions.

5.1 Cross-sectional analysis

This study aims to contribute with theoretical insights by investigating the relationship between risk-adjusted return and ESG performance at the Indian Stock Market in 2014. A cross-sectional analysis is observational and implies the gathering of data on more then one case at a single point in time or within a short time frame to create an overview of relevant variables in order detect patterns of association (Bryman & Bell, 2011, s. 53). This study is examining the relationship between variables and is not focusing on changes over time; thereby it can be defined as a cross-sectional analysis.

When the study is designed of data from a particular point in time one must be careful in drawing conclusions saying something about the development over time (Johannesen & Tufte, 2010, p. 50). To examine changes over time a study with repeated measurements must be constructed. The longitudinal design is a clearly defined design category implying observations of several individuals for a time period and making repeated measurements on the same individuals (Bryman & Bell, 2011, p. 58). There are different types of longitudinal design and the most suitable within this category would be a panel study, which is based on making an observation usually representative for a specific area (Bryman & Bell, 2011, p. 58). The structure of a panel study assumes the data for at least two variables are collected and at least on two occasions from the object to be studied, it is more informative than the cross-sectional method since it reduces the possible effects of timing errors that can affect the outcome. (Bryman & Bell, 2011, p. 58).

Although longitudinal research is vital, limitations due to time and budget impose the need of cross sectional studies (Cooper, 2010, p. 142) and these limitations have also influenced the approach for this study. Furthermore, the longitudinal design objective is to highlight the changes and causal forms of impact over time (Bryman & Bell, 2011, p. 658), which is not the purpose of this study. Cross sectional studies also captures some of the benefits of a longitudinal design by competent questioning history, expectations and past attitudes even though this responses must be interpreted with great caution (Cooper, 2010, p. 142). As this study investigates the relationship between risk-adjusted return and ESG performance at the Indian Stock Market in 2014 a cross sectional method have been conducted.

5.2 Sampling

There are fundamental benefits of sampling in a study, by selecting particular elements in a population one may draw conclusions about the whole area (Cooper, 2010, p. 364). Reasons for sampling are furthermore that it lowers the cost, allows greater accuracy of
results, greater speed and because of the availability of elements (Cooper, 2010, p. 363). A good sample represents the population it intends to represent and in measurements terms the sample must be valid (Cooper, 2010, p. 364). Subsequently, the chosen companies in this study are selected through nonprobability sampling instead of probability sampling (Cooper, 2010, p. 384). Usually probability samplings are considered to be the more superior as it reduces the chance of sampling error (Cooper, 2010, p. 3684). However, the benefits from using a nonprobability sample are mainly practical, which also is the main reason for the sample in this study where nonprobability sampling is the only feasible alternative due to the availability of ESG ratings (Cooper, 2010, p. 384).

Furthermore, the Indian companies are selected through a convenience sample, which is the least reliable design since it has no control over the precision of the sample but can be of great value in exploratory research (Cooper, 2010, p. 385). Due to limitations in taking part of ESG data a convenience sample has been the most reasonable choice in combination with time and expense factors. All companies in this study are listed on the Bombay Stock Exchange and are selected by Sustainalytics as a part of the Sustainalytics Emerging Markets Universe. This universe is a combination of standard indices as Morgan Stanley Capital International (MSCI), All Country World Index (ACWI) in combination of client specific coverage requests (Mail). Overall the sample consists of 126 Indian companies and represents a significant portion of the Indian market.

5.3 Calculating risk-adjusted return

From an economic perspective, a good investment generates high returns in relation to risk, i.e. a high risk-adjusted return. This means that the higher risk-adjusted returns an investment generates the better it is. Thus, two aspects are of interest when an investment is evaluated: return and risk, which must be studied in the evaluation of an investment. In this study, a variety of calculations are conducted and the calculations have been performed in the programs Microsoft Office Excel and the statistical program Stata. The formulas for the different calculations included in the study are those that follow in this section (5.3). To calculate the risk-adjusted returns, there are a handful of popular approaches and those methods are Alpha, Treynor ratio, Fama & French three-factor model, Carhart 4-factor model and Sharpe ratio. All methods have their unique calculations of risk while all methods also require different kinds of collections of data. In this study alpha is selected and will be explained in more detail later in this section.

5.3.1 Actual Return

Initially, the daily-adjusted closing price (adjusted closing price accounting for stock splits, dividends and right offerings) in 2014 for every company at the Bombay Stock Exchange (BSE). Those closing prices will be gathered from the Thomson Reuters’ DataStream, a well-known database contained with macro and cross asset financial databases. Thus, by using the daily-adjusted closing price is it possible to calculate the actual return for every asset. The formula is:

\[ R_t = \frac{P_{i,t}}{P_{i,t-1}} - 1 \]  

(2)
\[ R_i = \text{Actual return for stock } i \]
\[ P_{i,t} = \text{Closing price for stock } i \text{ at time } t \]
\[ P_{i,t-1} = \text{Closing price for stock } i \text{ at time } t - 1 \]

As mentioned earlier, to calculate the actual return the daily-adjusted closing price is used in the formula. The reason why daily return is calculated is to get an accurate actual return as possible and therefore increase the credibility of the study's empirical results.

5.3.2 Beta
To be able to calculate CAPM for every company in this study, the company’s Beta (\( \beta \)) must first be calculated. Beta measures the systematic risk for an asset according to Pennman (2013, p. 107) and depends on the covariance \( \text{cov}(r_i, r_m) \), between the return on the asset and the return on the market and the market variance \( \sigma_m^2 \).

\[ \beta_i = \frac{\text{cov}(r_i, r_m)}{\sigma_m^2} \] (3)

Furthermore, the daily return for every company and BSE index can be calculated and thus the information to calculate Beta for every company and BSE index are available. In addition, to facilitate the process and save time, an option would be to collect every company beta from Yahoo Finance or a similar browser. However, there are opportunities to obtain a misleading Beta as the study intends to investigate the year 2014 and the information available is from 2015 and it is therefore more credible to calculate beta by hand, despite the longer process.

Additional options to beta for explaining variations in return for shares would have been to use the Fama and French's (1992) three-factor model and Carhart's (1997) four-factor model. Fama & French (1992) suggested that beta value alone did not have a degree of explanation for returns that researchers previously thought, and the two factors beyond the beta value that explained the price of an asset were factors related to company size and the book-to-market ratio. Carhart (1997) developed subsequently Fama & French's (1992) model with an additional factor termed momentum factor. However, finding these factors for the Indian companies in this study is difficult because of the lack of transparency and is also extremely time consuming. Beta can be considered as an accepted measure and it will therefore be used for the study.

5.3.3 Risk-free rate
Another factor used in the calculations of each company’s expected return is the risk-free rate. As previously mentioned, the risk-free rate is the rate an investor would receive if he invested in a risk-free asset during a given period. In a survey by PWC (2013, p. 6) made on asset managers, fund managers and stockbrokers, were 64% indicating they are using the 10-year government bond interest rate as a basis for the risk free rate when determining the rate of return on shares. Thus, the risk-free interest rate used in this study is the 10-year Indian government bond. In order to obtain an average risk-free interest rate during the year 2014, the estimated mean of percentages was calculated during the dates of 2014-01-01, 2014-04-30, 2014-08-31 and 2014-12-
31. The average of the percentages resulted in a risk-free interest rate of 8.5% (Investing, 2015).

**5.3.4 Risk-premium**

The last significant factor in CAPM model is the market risk premium \((R_m - R_f)\). Market risk premium explains the difference between the expected return on a market portfolio and the risk-free rate. According to EY, a global leading accounting company (2014, p. 10), the estimated market risk premium at the beginning of 2014, 8.3%, which will be used in this study.

**5.3.5 Jensen’s Alpha**

The original CAPM is used to calculate expected returns and historical rates is used in this study. Therefore, in this study, a reformulation of CAPM called Jensen’s Alpha (1967) will be used. Since CAPM is mainly used to calculate the expected return, Jensen (1967) created a different approach to use CAPM to adjust returns for risk. He states in his study that the only variable needed to explain the price of an asset is the systematic risk and his measurements estimates a financial asset’s deviation from equilibrium, which is the Jensen’s Alpha (Jensen, 1967, p. 390). Therefore, if CAPM is a functioning model, then alpha should be equal to zero. The formula to estimate Jensen’s Alpha is (Jensen, 1967, p. 393):

\[
\alpha_i = R_i - [R_f + \beta_i (R_m - R_f)]
\]  

\(\alpha_i = \text{Alpha}\)  
\(R_i = \text{Actual Return on asset } i\)  
\(R_f = \text{Risk-free rate}\)  
\(\beta_i = \text{Beta coefficient for asset } i\)  
\(R_m - R_f = \text{Market risk premium}\)

Conclusively, a positive alpha indicates that a company’s risk-adjusted return is superior towards the return of a benchmark index, in this study the BSE index. A negative alpha indicates that the company’s risk-adjusted return is not superior towards the return of BSE index.

**5.3.6 Market Index**

In order to calculate any risk-adjusted return among the companies, a market index will first be selected. According to Strong (1992, p. 539) is it possible for a market index to differ depending on the number of securities, how the various securities are weighted and even how security prices are averaged to form the index. It is therefore extremely important for this study to use an index that reflects reality in order to avoid results that are misleading for the study. The index chosen for this study is the BSE index during the period from 2014, which is demonstrated in Figure 3.
Using the BSE index as a benchmark index can be considered as given since all companies in the study are listed on the BSE index and it therefore increases the credibility of the study’s results. The use of another index could, as previously mentioned, lead to misleading results because the calculations of Beta and Alpha for each company would have been different.

5.4 Data

5.4.1 Secondary data
This study uses historical data available to acquire through various institutions and databases, and is described as secondary data (Björklund & Paulsson, 2003, p. 67-68). In a study with secondary data, analysis is completed of already collected data, which will be the historical return, risk-free interest rate, risk premium and ESG rating for this study. According to Bryman (2008, p. 303), some advantages of using secondary data are; data tend to be of good quality, and that the data is easily accessible and leaves more room for analysis. These factors appeal for this study and are reflected in the study's analysis. There are good arguments that the study’s data will be of good quality since the historical performance of the companies have been taken from the Thomson Datastream and corporate ESG ratings have been purchased from Sustainalytics, a well-known company in the global responsible investment research. On the contrary, it is difficult to argue that data for the companies ESG ratings would be easily accessible since it is not public data.

Subsequently, conducting secondary analyses in a study might also lead to some problems, such as; that the data is too complex, the lack of familiarity with what the material is really saying, or that the underlying variables may be missing (Bryman, 2008, p. 304-305). However, downloading and using historical adjusted close prices for different securities to calculate average returns, is something that the authors are familiar with during their time at the School of Umeå University. Also, handling market risk premium and risk-free interest rate in order to calculate CAPM and Alpha is also something that the authors are comfortable with. However, one might discuss the complexity of the data for each company's ESG rating. Data obtained from Sustainalytics involves 170 different ESG factors and it requires a careful review of
each factor to create an understanding of the data and therefore avoid erroneous analysis.

**5.4.2 Collecting and processing historical stock data**
For the collection of the historical stock data, Thomson’s Datastream has been used, a database with a large amount of financial information. The data that has been collected from Datastream is the adjusted close prices for each Indian companies included in the study sample in the year 2014. Subsequently, the closing prices have been processed in Microsoft Excel by first calculating the daily returns for 2014 for each company to eventually add up to the actual return over the period. In order to calculate beta for each company, the study used BSE benchmark index and therefore also closing price of the index taken from Datastream to calculate daily actual return. Finally, CAPM was calculated for each company and each company's alpha for the study of companies that have generated a superior risk-adjusted return.

When alpha has been calculated for each company, it has subsequently been possible to identify which companies in the study’s sample that generated a positive alpha, and therefore caused a superior risk-adjusted return. Companies that have a negative alpha and not achieved a superior risk-adjusted return will also be taken into consideration in the study.

Furthermore, by filtering historical stock data, the study only chose to include companies that were active during the entire fiscal year 2014. This is to be able to perform a credible study as possible, since these companies would not have been reliable to perform the study on, given the selected measurement period. As previously mentioned, Indian companies selected for the data have been obtained from Sustainalytics. The total number of companies included in the data was 126, all listed on the Bombay Stock Exchange. Therefore, other companies also listed on the BSE have not been analysed since there are no data about these companies' ESG ratings.

**5.4.3 Collecting and processing ESG data**
In collection of ESG data, the authors have contacted a company named Sustainalytics. As previously mentioned, Sustainalytics is a well-known company within the global responsible investment research area. Data was sent to the authors as an excel document and have therefore been processed in Microsoft Office Excel. The collected data for ESG ratings are combined ratings for the Indian companies during the year 2014. The data set contains information on, among other things, the names of the companies in India, companies Total ESG rating, Environmental, Social and Governance rating, and also ratings for each factor within the ESG and all this data has been thoroughly reviewed by the authors. Conclusively, total data for each company consists of 170 different factors distributed over ESG.

**5.4.4 Shortfall**
There are companies listed on the Bombay Stock Exchange, which has not been analysed by Sustainalytics in 2014 and they will therefore not be analysed in this study because the data for the study has been purchased from Sustainalytics.

Furthermore, as mentioned earlier, historical stock data for every company is retrieved from the Thomson Datastream. In contrast, of the 126 Indian companies included in the sample, 12 of the companies were not to be found in Datastream. According to Johannessen & Tufte (2002, p. 136): the smaller the loss, the less uncertainty arises
when the author will generalize the results of the sample. For example, a shortfall of about 5-10% relatively has little impact on the result and it is therefore possible to generalize the results with fairly high confidence. A shortfall of 12 companies out of 126 total in this study involves a loss of about 9.5%, which falls within the possibility where it is still possible to generalize the results. To complement the loss of these companies, an attempt was made to find the companies through Yahoo Finance, which also contains of historical financial data. Unfortunately, it was not possible to receive any historical stock data on companies via Yahoo Finance either. Conclusively, the shortfall resulted in 114 Indian companies, which will be included in the sample for this study.

There have also been some losses of data that has been purchased from Sustainalytics. As previously mentioned, there are 170 different factors within ES
g but only 24 factors had a full score of each company in the sample. The other 146 factors had some variables where the information was not available and they were therefore not selected. Selecting factors with a full score for each company increases the credibility for the study since it will not be any misunderstandings of the data because every factor has a number that can be analysed.

5.5 Definition of hypotheses
This study will test the relationship between risk-adjusted return and ESG performance of Indian companies listed on BSE. These tests will contribute to the discussion of whether high or low ESG ratings for a company have a positive or negative relationship to risk-adjusted return, where risk-adjusted return will be measured through alpha. In obedience with previous studies and their disclosure of a positive correlation between ESG performance and superior risk-adjusted return on the markets, this study will analyse whether their findings are applicable on BSE (University of Oxford and Arabesque Partners, 2014; Deutsche Bank, 2012; Clark et. al., 2014; Hoepner, 2013). Thus, the first hypothesis will be as follows:

\[ H_{1,0} = \text{There is no significant relationship between the companies' Total ESG rating and risk-adjusted return.} \]

\[ H_{1,a} = \text{There is a significant relationship between the companies' Total ESG rating and risk-adjusted return.} \]

Subsequently, the study will also investigate whether there are any differences between Environmental, Social and Governance ratings and their relationship towards risk adjusted return. According to van Duuren et. al. (2015, p. 8), professional asset managers prefer governance factors to social and environmental and it will therefore be of interest for this study to test if there are any of these factors generating a relationship, both positive and negative, towards risk-adjusted return.

\[ H_{2,0} = \text{There is no significant relationship between the companies' Environmental, Social or Governance rating and risk-adjusted return.} \]

\[ H_{2,a} = \text{At least one of the companies Environmental, Social or Governance rating has a significant relationship to risk-adjusted return.} \]
Conclusively, there are limited researches regarding which ESG factors that are most important to investment returns. Additionally, previous studies emphasise a need of further investigations within this area. Ma’nescu (2011) mentions in a study that specific ESG factors do not have any specific impact on a company’s share price and cannot generate abnormal returns. It would therefore be of interest to test if there are any of the samples factors within ESG that could show a significant relationship to superior risk-adjusted return.

\[ H_{3,0} = \text{There is no significant relationship between the companies ESG factors and risk-adjusted return.} \]

\[ H_{3,a} = \text{At least one of the companies ESG has a significant relationship to risk-adjusted return.} \]

### 5.5.1 Type 1 and 2 errors

To accomplish several hypotheses a study might include several risks, where wrong decision taking is one of them. Within statistics, these decision takings are named Type I and Type II errors (Andersson et. al., 2007, p. 340-342). Type I one errors occurs when the authors rejects \( H_0 \) when it is true and can be delimited through a correct representable sample or by decreasing the probability rate from 0.05 to 0.01 for example. This study investigates 114 Indian companies listed on BSE and they represent a big part of the major companies in India. Furthermore, a type II error contains of accepting \( H_0 \) when it is false, and these kinds of errors increase when the researcher attempts to decrease the risk for type I errors (Andersson et. al., 2007, p. 341). Conclusively, since there are a lot of risks when doing statistical tests should the researcher be very observant if she decides to accept the null hypothesis, \( H_0 \) (Andersson et. al., 2007, p. 342).

### 5.6 Regression analysis

To analyse if there is any correlation between risk-adjusted return and ESG ratings for the various Indian companies, three different regressions have been conducted and will oblige as the study's empirical part. Performing a regression makes it possible to find out how a response variable, dependent variable, will be affected by changes in the explanatory variable, independent variable, (Moore, 2010, p. 100). In this study, the average alpha for each company is the dependent variable and its change will be explained by the independent variable ESG rating. The independent variable, ESG rating, has been designed in different ways depending on the hypothesis being tested. The type of regressions that has been conducted are linear regressions and this is because it is possible to form a linear connection between the variables and therefore is the linear regression most feasible. In every linear regression, the parameters for the independent variables have been studied since those parameters explain how an eventual relationship is exhibited. A positive parameter means that the independent variable has a positive effect on the dependent variable, in the sense that the dependent variable increases in value. A negative parameter has the opposite effect on the dependent variable (Andersson et. al., 2007, p. 50).

As mentioned earlier, this study will consist of three different regressions where the first will be a simple regression. This first regression will test whether the total average ESG
rating of all companies have a positive or negative impact on risk-adjusted return, and its formula can be observed in equation 5.

\[ \alpha_i = \beta_1 + \beta_2 \text{TotESG}_i + \varepsilon_i \]

\( \alpha_i \) = Average alpha for all Indian companies
\( \beta_1 \) = A constant intercept of the expected mean value of \( \alpha \) when all independent variable = 0.
\( \beta_2 \) = Exposure value against the average ESG rating
\( \text{TotESG} \) = Average total ESG rating for all Indian companies
\( \varepsilon_i \) = Stochastic error term that does not correlate with any of the independent variables.

Subsequently, for the other two regressions multiple independent variables will be in the equation and a multiple regression line will therefore be performed. A multiple regression analysis makes it able for the researcher to analyse the relationship between a single-dependent variable and several independent variables. According to (Andersson et. al., 2007, p. 110) occurs a risk when using multiple regression analysis with independent variables. For example, two of the independent variables could have a high correlation, which might create uncertain results when trying to analyse how well the individual independent variables contribute to an understanding of the dependent variable (Andersson et. al., 2007, p. 110). This phenomenon is called multicollinearity.

Moreover, for the first multiple regression the independent variables will consist of the average environmental, social and governance ratings to see if the three factors have any positive or negative correlation with the average alpha. The variables for the first multiple regression compiles in equation 6.

\[ \alpha_i = \beta_1 + \beta_2 \text{TotEnvironmental}_i + \beta_3 \text{TotalSocial}_i + \beta_4 \text{TotalGovernace}_i + \varepsilon_i \]

In the final multiple regressions the independent variables will consist of all the 24 factors that are included in E, S and G to see if any of these factors that explains a positive or negative effect on the average alpha for all the Indian companies.

\[ \alpha_i = \beta_1 + \beta_2 \text{EnvironmentalPolicy}_i + \beta_3 \text{Envmansys} + \cdots + \beta_{29} \text{Govincidents} + \varepsilon_i \]

5.7 Truth Criteria

5.7.1 Measurement
A good measurement tool is an accurate counter or indicator of what the study aims to measure, meaning that classes should be fit for scientific purposes (Ejvegård (2009, p. 46). Furthermore, measurement tools should also be easy and efficient to use (Cooper, 2012, p. 280). It is important that parameters, instruments, testing and investigation
methods are valid and reliable, and if these requirements are not fulfilled the research has no scientific value (Ejvegård, 2009, p. 77). Measurement tools can be evaluated by two main criteria: validity, reliability error (Cooper, 2012, p. 280). Both reliability and validity are ultimately related to how reliable and accurate the measurements are, which is particularly important in quantitative research (Bryman, 2013, p. 65).

5.7.2 Validity
The concept of validity means that the study measures what it actually intends to measure, and to avoid problems, clear metrics and measurement methods are required (Ejvegård (2009, p. 80). There are two different types of validity: external and internal validity (Cooper, 2012, p. 280). External validity criterion concerns how well results can be generalized across individuals, settings and time periods (Cooper, 2012, p. 280). In order to analyse how well the sample is representative for the population, researchers must evaluate which impact shortfalls has for the survey, a large loss is a major threat to the external validity and impairs the generalizability of the study (Johannesen & Tufte, 2010, p. 240). This study represents the Indian stock market and consists of 114 companies listed on the Bombay Stock Exchange, with twelve shortfalls this is considered as a representative sample for the market. Nevertheless, a larger sample of Indian companies might increase the chances of finding significant results. Additionally, another important issue is the extent to which the survey can be transmitted within time and space; a way to control this is by conducting the same survey in new contexts and at other times periods (Johannesen & Tufte, 2010, p. 241). Thus, conventional methods and historical data retrieved from reliable sources described in the practical method have been used to meet this criterion. Attributed this, practices in the financial frequently criticised and the authors of this study are aware of the risks involved in the use of these. Beta are one of those, which is an estimated variable making it a potential subject to errors and bias, while it is not possible to predict it is constant over time (Easley, 2002, p. 2213).

Furthermore, internal validity illustrate how well the research are measuring what it actually intends to measure (Cooper, 2012, p. 280). Making it important that the researcher can demonstrate how the instrument actually measures what it says it does. The sample consists of companies in different industries and with varying company size, both in terms of globalisation and market capitalization, which increases the generalization for the Indian stock market.

Ultimately, validity consists of three main forms: content validity, criterion related validity and construct validity (Cooper, 2012, p. 280). The concept of content validity demonstrates how well a measuring instrument can generate adequate coverage of all relevant items under the study, for this criterion to be contented the sample must therefore be representative for the selected group to be studied (Cooper, 2012, p. 281). Criterion related validity denotes the level of proficiency in capturing the most important aspects in the study, which is essential for predicting an outcome or existence of a behaviour error (Cooper, 2012, p. 281). Furthermore, construct validity attempts to evaluate and identify the underlying causes measured, and determine how well the research represents the population (Cooper, 2012, p. 282). The selected companies in this study are chosen for various reasons, e.g. indices and investor requests, but are all part of the Bombay Stock Exchange and represents such a large sample that content validity are justified. Although the validity is separated into these three different forms, they are interdepended and together constitute the ultimate validity of a survey.
5.7.3 Reliability
Reliability measures the degree of consistent results over time and concerns the degree to which a measurement is free of random or unstable error (Cooper, 2012, p. 283). The question is if there are several random or temporary conditions that could reflect the conclusion of the study and is particularly important to consider when a quantitative study has been realized (Bryman & Bell, 2005, p. 48). According to Ejvegård (2009, p. 78) one should be observant with the reliability of measurement instruments in all different kinds of sciences, particularly since it is usually the researcher himself who designs the measuring instrument which ultimately affects the reliability. Historical data of stock prices have been gathered from Thomson Datastream, which is considered as a reliable source of historical stock prices and any manual mismanagement of these data has been reduced. Hence, stock prices would be the same and not affected by randomness or other temporary conditions. Furthermore, since the study is constructed of ESG data that is a subjective measure, this is an area of particular importance. ESG data of Indian companies have been purchased from Sustainalytics, a world leader in ESG research and considered as a reliable source of historical ESG information. With this, generalizability is increased because their measurement is well established.

Reliability is strongly associated to replicability. Usually there are incentives to repeat a study and analyse the previous results, there are several reasons for this but usually the researcher has the feeling that the previous results are not consistent with those from other studies (Bryman, 2013, p. 63). To make the replicability possible a detailed description must be made of how the original study is conducted (Bryman, 2013, p. 63). The procedure of this study is well documented in the practical method, and constructed by conventional methods, which strengthens the replicability for the study.

From a scientific perspective the measurement must be trustworthy and valid. However, it is important that the method is practical can be defined as economical, convenient and the possibility to understand the result (Cooper, 2012, p. 285). From an economic perspective, one must consider the budget since data are not free even if additional data provide a higher reliability (Cooper, 2012, p. 285). In addition to budgetary restrictions, researchers often need a quick and economical scorings due to time limitations (Cooper, 2012, p. 285). Furthermore, data should be easy to administer, thereby detailed and clear instructions of the measurements should be construed while the study design and layout and also can support the convenience (Cooper, 2012, p. 285). These criterions are predominantly related to the cost and management of ESG data from Sustainalytics. First, the use of ESG data usually involves a fee since the development of data requires significant expertise. Hence, it is important to manage ESG data in a proper way. Thereby, administrations of the data are realized in consultation and guidance from Sustainalytics to reduce potential biases and retain continuity.

5.8 Practical Approach
All Indian companies in the study have been evaluated and received a comprehensive ESG rating. Subsequently, companies will be divided into two groups, representing those with high rating and those with low rating through a screening process. The screening process in this study differs from the traditional positive and negative screening process and can be observed in figure 2. Where positive screening filters out shares that do not meet the determined superior standards, negative screening intends to exclude companies that do not meet the requirements of the process (Renneboog et al., 2008, p. 1728). These approaches focus on selecting the best companies or deselect the
worst, meaning that companies between the criteria are not represented in any of the categories. In this study, companies will instead be divided into two equal groups; the reason is that we want to make the results representative for the whole sample (figure 2).

After the screening process all companies’ risk-adjusted return are calculated through CAPM and Jensen’s Alpha. To determine the value of the company's risk-adjusted return in 2014 it is compared with BSE index, representative of the Indian market, where returns higher than BSE index are classified as superior and returns below are classified as non-superior.

Through this process, an overview of the Indian companies risk-adjusted return in relation to their performance in terms of ESG rating is created, while a direct comparison between the companies performance in those terms also can be achieved. Finally, companies within the two groups will be examined to identify which ESG factors most important in relation to risk-adjusted return.

Figure 4. Practical Approach
6. Empirical Findings and Analysis

A brief presentation of the study’s empirical findings will be demonstrated followed by some analysis in this chapter. The authors have divided the chapter into four different parts depending on the objectives. The analysis will connect the theories, which have laid the foundation for the study and the empirical findings. A discussion where the authors include their own thoughts will end the chapter.

6.1 Presentation of results

Results of this study will primarily be presented in graphs where the regression line represents the trending risk-adjusted return (Alpha) in relation to the company’s ESG rating. A negative Alpha represents a non-superior risk-adjusted return and a positive-Alpha represents a superior risk-adjusted return. The highest ESG rating a company can receive is hundred and the lowest is zero.

Furthermore, the comprehensive rating categories are Total ESG-, Environment-, Social- and Governance- rating. Each empirical finding will firstly be presented for the overall group, where Total ESG rating will be presented followed by Environment-, Social- and Governance- rating separately. Subsequently, all companies are divided into two groups by screening, where companies with ESG rating over 57.38 (median), form a sustainable group and companies with ESG rating below 57.38, form the less sustainable group. Additionally, a similar presentation of empirical findings will be constructed for the two groups, where Total ESG rating will be presented followed by Environment-, Social- and Governance- rating separately.

The same hypotheses have been used for all ESG ratings. Where he null hypothesis is that there is no relation between risk-adjusted return and ESG ratings/factors. The alternative hypothesis is consequently that there is a relation between risk-adjusted returns and the ESG ratings/factors. This is a simple summary of the hypothesis:

\[ H_0 = \text{There is no significant relationship between a company’s ESG rating/factors and risk-adjusted return.} \]

\[ H_a = \text{There is a significant relationship between a company’s ESG rating/factors and risk-adjusted return.} \]

All ESG ratings that have been analysed obtain a graph illustrating its relation to Alpha. The relationships between the factors that constitutes ESG ratings and alpha have also been analysed and is presented at the end of the empirical data. When results are statistical significant the null hypothesis is rejected. The significance level is usually tested with p-values of <0.01, <0.05 or <0.10. The significance level 0.10 is selected due to previous studies difficulties of finding statistical significance relationships. For example, Mañescu (2011) performed similar tests but had difficulty finding significant results, with p-values <0.01 and <0.05.

Descriptive statistic of Alpha and ESG ratings are presented in Table 2. First, it demonstrates that average Alpha is 0.2215 in the less sustainable group, while the
average Alpha in the sustainable group is 0.1174. This result indicates that Indian companies with a lower Total ESG rating have received a higher risk-adjusted return compared to Indian companies with higher Total ESG rating. Table 2 also presents ESG ratings for the overall group where average Social rating is 68.50, which can be compared the average Governance rating that is 53.00. Standard deviation, how much total ESG rating deviates from its mean, is 3.69 in the less sustainable group, which can be compared to the sustainable group with a standard deviation of 8.77. Ultimately, the average Total ESG rating is 67.29 in the sustainable group and 51.02 in the less sustainable group.

<table>
<thead>
<tr>
<th>Alpha</th>
<th>Average</th>
<th>Std. Dev</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Alpha, Overall</td>
<td>0.1614</td>
<td>0.3643</td>
<td>0.1996</td>
</tr>
<tr>
<td>Total Alpha, Sustainable Group</td>
<td>0.1174</td>
<td>0.2861</td>
<td>0.1155</td>
</tr>
<tr>
<td>Total Alpha, Less Sustainable Group</td>
<td>0.2215</td>
<td>0.3884</td>
<td>0.2651</td>
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<table>
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<th>ESG Rating, Overall Group</th>
<th>Average</th>
<th>Std. Dev</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>59.28</td>
<td>10.58</td>
<td>57.38</td>
</tr>
<tr>
<td>Environment</td>
<td>56.35</td>
<td>14.39</td>
<td>54.69</td>
</tr>
<tr>
<td>Social</td>
<td>68.50</td>
<td>8.87</td>
<td>65.63</td>
</tr>
<tr>
<td>Governance</td>
<td>53.00</td>
<td>14.79</td>
<td>50.31</td>
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<th>Std. Dev</th>
<th>Median</th>
</tr>
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<tbody>
<tr>
<td>Total</td>
<td>67.29</td>
<td>8.77</td>
<td>63.94</td>
</tr>
<tr>
<td>Environment</td>
<td>65.79</td>
<td>12.87</td>
<td>64.38</td>
</tr>
<tr>
<td>Social</td>
<td>73.35</td>
<td>9.59</td>
<td>71.88</td>
</tr>
<tr>
<td>Governance</td>
<td>62.73</td>
<td>13.05</td>
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<table>
<thead>
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<th>ESG Rating, Less Sustainable Group</th>
<th>Average</th>
<th>Std. Dev</th>
<th>Median</th>
</tr>
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<tbody>
<tr>
<td>Total</td>
<td>51.02</td>
<td>3.69</td>
<td>51.04</td>
</tr>
<tr>
<td>Environment</td>
<td>46.60</td>
<td>7.93</td>
<td>45.00</td>
</tr>
<tr>
<td>Social</td>
<td>63.50</td>
<td>3.97</td>
<td>62.50</td>
</tr>
<tr>
<td>Governance</td>
<td>42.95</td>
<td>8.35</td>
<td>43.69</td>
</tr>
</tbody>
</table>
6.2 Overall Group

Figure 5 demonstrates a negative correlation between Alpha and Total ESG rating illustrated in the weak sloping regression line (-0.0042493). This result is however not statistically significant at a conventional level, with a p-value of 0.169. The overall group receives an average Total ESG rating of 59.28 and average Alpha of 0.1614 (table 2), indicating that a majority of the study’s Indian companies in this study have generated a superior risk-adjusted return in 2014.

![Figure 5 - Alpha & Total ESG rating Overall Group](image)

Furthermore, Environmental, Social, and Government rating in the overall group have been examined individually. The Indian companies’ Environmental rating have a negative correlation to Alpha illustrated with the sloping regression line (-0.0010647) in figure 6. However, this result is not statistically significant at a conventional level since it has a p-value of 0.640. The overall group average Environmental rating is 56.35 (table 2).

![Figure 6 - Alpha & Environment Rating Overall Group](image)

Furthermore, when observing the relation between Social rating and Alpha, a negative regression (-0.0020168) is illustrated in figure 7. This result is not statistically significant at a conventional level since it has a p-value of 0.585.
Worth noting is that a majority of companies have a Social rating between 60 and 80 and the average rating is 68.50 (table 2).

Figure 7 - Alpha & Social Rating Overall Group

Figure 8, presents a negative regression (-0.0047933) between Governance rating and Alpha in the overall group. This test is statistical significant at a conventional level with a p-value 0.029, indicating that Indian companies with a lower Governance rating in general receives a higher risk adjusted return than those with higher Governance rating. Furthermore, the average Governance rating in the overall group is 53.00 (table 2).

Figure 8 - Alpha & Governance Rating Overall Group

6.2.1 Analyse Overall Group

After observing the overall group empirical findings, the intuitive perception is a negative relationship between Total ESG rating and risk-adjusted return, see figure 5. However, as the result is not statistically significant at a conventional level this relationship cannot be determined. This implies there is no correlation between companies’ Total ESG rating and risk-adjusted returns in the Indian market during 2014, which is consistent with Fama’s (1970, p. 383) EMH and the semi-strong form of efficiency. The process of this finding can be obtained in figure 2. Thereby, if Total ESG rating were of importance it is already integrated into the markets fundamental
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investment process, and there is no material advantage of selecting companies with extraordinary Total ESG rating. Furthermore, this result contradicts to a variety of earlier studies that found a positive relationship between ESG performance and risk-adjusted return (Hoepner, 2013; Derwall, 2005; van Dijk et. al., 2012; Duurem et. al., 2015; Clark et. al., 2014; Deutsche Bank, 2012).

Deutsche Bank (2012, p. 5) mentions in their report that high ratings of ESG are positively correlated with market-based outperformance both over medium and long term. Since this study has been conducted during of 2014, is it difficult to discuss how the outcome would have been if carried out over a longer period. On a medium and short-term period though, it is noteworthy that results from the overall group contradicts with Deutsche Banks (2012) report. Furthermore, Clark et. al. (2014, p. 48) states that there should be of interest for any institutional investor to incorporate sustainability factors to the investment process to generate a better return and to be a part of the worlds better wellness. However, the results from the overall group demonstrates an absent of connection between companies’ Total ESG rating and risk-adjusted return. And investors will not generate a better return by investing in companies in India with higher Total ESG rating.

A more specific comparison can be made with another study of the Indian stock market. Goyal & Aggrawal (2014) found that ESG stock portfolios had outperformed the market portfolios in the Indian stock market. Where the absolute return, monthly mean return and the risk-adjusted measurements were all higher for the ESG portfolio compared to the market portfolio (Goyal & Aggrawal, 2014, p. 95). Goyal & Agrawal (2014) examined the Indian market in an earlier period than this study and found contradictory results. Although the study’s approach differs from this to a certain extent, this finding strengthens the theory of AMH suggesting that investors adapt to changes in market conditions and the risk and reward relation varies over time (Lo, 2004, p. 23).

Although this results contradicts to a lot of previous studies are there some studies empirical findings similar to this study. Like the result from the overall group, Ma’nescu (2011) results also state that ESG factors do not have a major impact on a company’s financial return. Thus, even though ESG factors might have a relevant value, they are still not efficiently implemented into stock prices. Additionally, when comparing the relationship between ESG ratings and risk-adjusted return, only Governance had a statistical significance to Alpha. The result from the overall group also strengthens Halbritter & Dorflleitner’s (2015, p. 11) findings to a certain extent, as they state there is no significant relationship between return and companies with high and low ESG ratings. Furthermore, Environmental, Social, and Government rating in the overall group have been examined individually. The result indicates a negative relationship between the three rating categories and risk-adjusted return. Simultaneously, this is not statistically significant for Environmental and Social rating. Implying there is no correlation between companies’ Environmental and Social rating and risk-adjusted return, which is consistent with EMH (Fama, 1970, p. 383) and the semi-strong form of efficiency. The process is described in figure 2. In a financial world where sustainability is a major trend, this might seem surprising. Organizations like GRI are trying to make meaningful comparisons between companies and industries through environmental measures in order to generate more investments in companies with high Environmental ratings (GRI, 2013, p. 5).
Results from the overall group demonstrates a negative relationship between Governance rating and risk-adjusted return. This relationship also applies on a conventional level since it is statistically significant. According to AMH could this negative relation occur due to greedy investors who do not care about corporate governance as long as the company generates high profits (Lo, 2004, p. 4-5), suggesting that investors adapt to changing market conditions to generate abnormal returns (Lo, 2004, p. 23). The process is illustrated in figure 2. This finding also contradicts with van Dureem's et. al. (2015, p. 8) statement that financial asset managers considers Governance ratings to be of more importance then Environmental and Social ratings. Additionally, the importance of corporate governance issues has increased due to several major scandals (CFA, 2008. p. 3). And as a consequence supervisory focus on transparency and disclosure in governance issues has sharpened (CFA, 2008. p. 4). This makes the finding is particularly interesting, since result indicates that the Indian stock market do not follow the suggesting trend as Governance rating and risk-adjusted returns have a negative relationship.

### 6.3 Sustainable group

The sustainable group consists of Indian companies which have obtained a total ESG rating that is above the overall group median of 57.38 (table 2). Within the sustainable group, figure 9 illustrates a positive relation (0.0011325) between Total ESG rating and Alpha. This result is not statistically significant at a conventional level, with a p-value of 0.785. Indian companies in the sustainable group also received an average Alpha of 0.1174 and the average Total ESG rating is 67.29 (table 2).

![Figure 9 - Alpha & Total ESG Rating Sustainable Group](image)

As previous approach, Environmental, Social, and Government rating in the sustainable group are also examined individually. Figure 10 demonstrates a positive correlation between Environment rating and Alpha illustrated in the upward sloping regression line (0.0021791). However, this result is not statistically significant at a conventional level with a p-value of 0.780. The average Environment rating in the sustainable group is 65.79 (table 2).
Furthermore, figure 11 displays a positive sloping regression line \((0.0006073)\) describing the relation between Social rating and Alpha in the sustainable group. Yet, this result is not statistically significant at a conventional level with a \(p\)-value of 0.873. The average Social rating is 73.35 (table 2), which is the highest obtained average in terms of rating within this study.

Figure 12 illustrates a negative relationship between Governance rating and Alpha illustrated in the weak the sloping \((-0.0009160)\) regression line. Again, this result is not statistically significant at a conventional level, with a \(p\)-value of 0.743. The average Governance rating within the sustainable group is 62.73 (table 2).
6.3.1 Analyse Sustainable Group

For companies in the sustainable group, the intuition is that Total ESG ratings have a positive correlation to risk-adjusted return, meaning that investors should generate a better risk-adjusted return if investing in companies with the highest Total ESG rating. However, this finding was not statistically significant and investors should therefore not relate their investments into this finding. The results from the sustainable group’s Total ESG rating corresponds to Fama’s (1970) EMH. EMH claims that available information should be fully reflected into the price of an asset (Fama, 1970, p. 383). Thus, information of a company with high Total ESG rating should already have been reflected into its share price and investors are not able to earn abnormal risk-adjusted return based on available information (Caplan et. al., 2013, p. 3). This connection between the no relationship and market efficiency corresponds to this study’s theoretical part of departure and can be observed in figure 2.

Additionally, same findings obtain for the sustainable group’s Environmental, Social and Governance rating. None of the three factors had a significant relationship to risk-adjusted return, even though the intuition is a positive relation when only observing the figures. This is an interesting finding because in the overall group was Governance rating statistically significant with a negative relationship, but that is not the case for the sustainable group. Thus, it appears to be a stronger connection to market efficiency for the sustainable group than for the overall group. Further, it also corresponds to the connection between a no relationship and EMH, which is illustrated in this study’s theoretical part of departure, figure 2.

This finding of a no relationship contradicts to an amount of previous studies (Deutsche Bank, 2012; Derwall et. al., 2005; Hoepner, 2013; van Dijk, 2012; Clark et. al., 2014). They all found either a positive or a negative relationship between ESG performance and risk-adjusted return. As a matter of fact, Vasal (2009) and Goyal & Aggrawal (2014) found a positive relationship between Indian companies ESG performance and risk-adjusted return. Thus, AMH could be a relevant theory to apply for the contradictory results from the sustainable group Goyal & Aggrawal (2014). AMH suggests that investors should adapt to changes in market conditions and thus the risk and reward relation varies over time (Lo, 2004, p. 23).
However, results from the sustainable group correspond to some other previous studies (Aggarwal, 2013; Halbritter & Dorfleitner, 2015; Ma’nescu, 2011). Halbritter & Dorfleitner (2015, p. 11) state that there is no relationship between ESG factors and risk-adjusted return and investors should not expect any abnormal risk-adjusted return by considering high or low ESG ratings in the investment portfolio. Ma’nescu (2011, p. 104) concludes that ESG factors do not have any major impact on a company’s share price and cannot generate any abnormal return. Both Halbritter & Dorfleitner (2015) and Ma’nescu (2011) made their study on U.S companies between 1990-2010 and are therefore complicated to apply to the sustainable group in this study. Still, Aggarwal’s (2013, p. 9) study also investigated Indian listed companies and revealed a no significant influence for corporate sustainability as a whole on financial performance. Aggarwal’s (2013, p. 9) study found though contradicting result compared to this study. By dividing corporate sustainability into smaller factors it was possible to discern factors like governance and community had positive influence, while employees and environment had a negative influence on financial performance.

Furthermore, this study’s screening approach contradicts to Chelawat’s (2013, p. 16) screening process where he encourage all investment portfolios to use ESG criteria and that the screening process is designed to select those companies that meet the ESG criteria’s. The screening process in this study is made by calculating the median of all the companies ESG rating and subsequently divide them into two groups, where one is the less sustainable group and the other is a group of more sustainable companies. From a perspective where only return matters, the sustainable group implies that it does not matter whether an investor makes a screening of companies based on ESG criteria, because there are no relationship between ESG performance and risk-adjusted return for the sustainable group in this study. However, Deutsche Bank (2012, p. 8) presents evidence of SRI fund managers who historically have failed to generate abnormal returns through the use of ESG screening. Thus, this study’s empirical findings correspond to Deutsche Bank (2012), as this study illustrates no relation between risk-adjusted return and ESG rating through screening. Also, as this study cannot claim that results are statistically significant and could therefore correspond to Deutsche Bank’s (2012, p. 8) statement that screening is not performed to the same extent as some research suggesting it should, due to major challenges.

Conclusively, van Dijk et. al. (2012) claims that there is a need of more research in emerging countries, especially the BRIC-countries where investors should be aware of cultural differences. As cultural differences are subjective variables and difficult to measure, they might effect this study’s results explaining why the empirical findings for the sustainable group are not statistical significant on a conventional level.

6.4 Less Sustainable Group

As a counterpoint to the sustainable group, the less sustainable group consists of Indian companies which obtained a Total ESG rating below the overall group median of 57.38 (table 2). In the less sustainable group, figure 13 illustrates negative correlation between Alpha and Total ESG rating illustrated in the sloping regression line (-0.0171354). Still, this result is not conventional with a p-value of 0.206. The average Alpha in the less sustainable group is 0.2215 (table 2), which significantly higher than in the sustainable group, indicating that a majority of companies in this group have generated a high risk-adjusted return in 2014.
In the less sustainable group, Environmental, Social, and Government ratings are also examined individually. Hence, Environmental rating relation to Alpha is illustrated in figure 14, where the regression line has a positive slope (0.0007522). Nevertheless, this test is not statistically significant at a conventional level as it received a p-value of 0.906. The average Environmental rating is 46.60 in the less sustainable group (table 2).

Figure 14 demonstrates the relation between Social rating and Alpha, illustrating a positive sloping regression line (0.0006860). As previously, this result are not statistical significant since it received a p-value of 0.957. The statistics reveals an average Social rating of 63.50 (table 2) in the less sustainable group. Worth noting is that several companies receives a Social rating between 60 and 65.
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Figure 15 - Alpha & Social Rating Less Sustainable Group

Figure 15, illustrates a negative relationship between Governance rating and Alpha, this correlation is illustrated in form of the downward sloping (-0.0156180) regression line. Furthermore, this result is statistically significant at a conventional level with a p-value of 0.076, demonstrating that Indian companies with a low Governance rating in general receives a higher risk adjusted return than companies with a greater Governance rating. The average Governance rating within the less sustainable group is 42.95 (table 2).

Figure 16 - Alpha & Governance Rating Less Sustainable Group

6.4.1 Analyse Less Sustainable Group

After the screening process, Indian companies with a total ESG rating underneath 57.38 constructed the less sustainable group. Empirical data of the less sustainable group illustrates a negative relationship between total ESG rating and risk-adjusted return. However, the relationship cannot be determined as the result is not statistically significant at a conventional level. As for previous findings of the overall and sustainable group, results for the less sustainable group also implies there is no relation between companies’ total ESG rating and risk-adjusted return. This finding for the less sustainable group is also consistent with Fama’s (1970, p. 383) EMH and semi-strong
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form of efficiency and can be obtained in figure 2. The hypothesis that markets are efficient on the Indian stock market is still supported after dividing companies in the sample into two different groups. Thus, information about companies with extraordinary ESG rating would not generate any material advantages.

However, results from the less sustainable group demonstrates a negative relationship between Governance rating and risk-adjusted return. This relationship is statistically significant on a conventional level and makes it possible to question whether markets for the Indian companies are fully efficient. It appears to be a weaker relation to market efficiency for the less sustainable group then for the sustainable group. As for the overall group, this finding contradicts with Dureem’s et. al. (2015, p. 8) statements that financial assets managers considers Governance factors to be of more importance then environmental and social factors. It seems like companies listed on the Bombay stock exchange with lower ESG rating do not follow suggesting trends of the importance of corporate governance as Governance rating and risk-adjusted return have a negative relationship (CFA, 2008, p. 4). Collin (2009, p. 11) declares that the way a business is governed can affect its financial performance and should be of great concern for all shareholder.

Furthermore, this result contradicts to a variety of earlier studies that found a positive relationship between ESG performance and risk-adjusted return (Hoepner, 2013; Derwall, 2005; van Dijk et. al., 2012; Clark et. al., 2014; Deutsche Bank, 2012). As mentioned earlier, these studies obtained a positive relation between ESG performance and risk-adjusted return.

Hoepner (2013) wrote in his study of the 100 most global sustainable companies compared to its market benchmark, that the implementation of ESG factors into the investments process have increased significantly the last decade (Hoepner, 2013, p. 8). Another observations from the study was that using ESG datasets might be a useful investment opportunity since it is not currently covered in many professional finance degrees. Also, portfolios of assets with abnormal ESG ratings outperform their benchmarks (Hoepner, 2013, p. 9). Nevertheless, his findings contradict with the less sustainable group in this study. This study implies that ESG datasets have been covered in many professional finance degrees and it is already implemented into companies share prices.

ESG are positively correlated with market-based outperformance both over medium and long term, according to Deutsche Bank (2012, p. 5). This study has been conducted during a one-year period, 2014, and it is therefore difficult to discuss whether the results had been different over a longer period through a longitudinal study. Van Dijk et. al. (2012, p. 5) declares a significant increase in emerging market investments and that investors remains cautious due to factors such as transparency amongst others. They recommend investors to invest into more research in emerging countries before any investment decisions (van Dijk et. al., 2012, p. 28). At the same time, EIRIS (2012, p. 11) state that the key challenge to invest in emerging countries is because of unavailable information, due to lack of company ESG disclosure. However, this study implies that there is no relationship between Total ESG ratings and risk-adjusted return for the less sustainable group. Thus, the outcome would either be that more research not necessary, as it would not generate abnormal risk-adjusted return, or the insignificant results are due to company ESG disclosure meaning that information about companies are not
available for investors. Conclusively, this does not apply to the Governance factor as it is statistically significant.

Subsequently, there are studies in line with the empirical findings in the less sustainable group, including Halbritter & Dorfleitner's (2015, p. 11) study that emphasises there is no significant correlation between returns and companies with high or low ESG performance. Furthermore, Manescu (2011, p. 112) clarifies that ESG performance do not have a relevant impact on a company's share price and cannot be used to generate superior risk-adjusted returns. Their result is straightened by this study, since p-values do not meet the conventional requirements, except for Governance.

Whether efficient market hypothesis is efficient is not possible to state based on shifting empirical evidence from previous studies (Alajberg et al, 2011, p 67), and is supported through the results in the less sustainable group. Nevertheless, while the need of sophisticated technologies working against EMH increases (Malkiel, 2003, p. 80), the usefulness of ESG rating are still considered to be an interesting tool based on the results in the less sustainable group. These possibilities gives incentive for adaptive market hypothesis disputing that investment strategies, in this case using ESG rating, may decline for a certain time and then may return to a profitable strategy when right conditions appear (Lo, 2004, p. 22).

6.5 Individual Factors

As a last part of the study's practical approach, an observation of the different groups is made to observe if any individual factors within ESG has a significant relation to risk-adjusted return. A total of 24 different ESG factors are observed for both the sustainable and less sustainable group. In the sustainable group there are 12 factors with positive relation and 11 factors with negative relation to risk-adjusted return, see table 3. However, none of the relations is statistically significant at a conventional level since p-values do not meet the established criteria.

One factor, environmental supply chain incidents, has been omitted from STATA since all companies received the same rating. Although no factors relation to Alpha is statistically significant, the strongest positive correlation is product and service incidents with a coefficient of 0.006. Customer incident is the factor with strongest negative correlation with a coefficient of 0.0044.

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<th>Coefficient</th>
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Empirical Findings and Analysis

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Within the less sustainable group each factor was examined to find out if there was any significant relation to Alpha. Overall, the result reveals that 9 variables had a positive relation and 15 variables had a negative correlation to Alpha, see table 4. Just as in the sustainable group, none of the relations is statistically significant since p-values do not meet the defined criteria. Environmental supply chain incidents have also been omitted from STATA in the less sustainable group since all companies obtained the same rating.

Even if no factor displays a significant relationship to Alpha, Environmental Management System stands out from the group with a relatively low p-value of 0.114, which is close to meeting the statistical requirement. It is also noteworthy that Governance Incidents have a positive correlation to alpha of 0.4000085.

Table 4 - Individual Factors, Less Sustainable Group

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Empirical Findings and Analysis

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6.5.1 Analyse All Factors

University of Oxford and Arabesque Partners emphasises the lack of previous research in order to identify which sustainability variables that are most important in relation to investment returns (Clark et. al., 2014, p. 44). This makes it difficult to compare results to prior research since comparable research is missing. Additionally, ESG information is a subjective and non-financial measure without recognised standards making it further difficult to compare results from other research.

In the analysis of each variable individually, results displays no significant relation between the variables and risk-adjusted return, see table 3 and 4. This applies both in the sustainable and less sustainable group and strengthens Halbritter & Dorfleitner's (2015, p. 11) previous research; emphasising there is no significant correlation between risk adjusted returns and companies ESG ratings. These findings also imply there is no relation between ESG factors and risk-adjusted returns in the Indian market and corresponds with EMH (Fama, 1970, p. 383) and the semi-strong form of efficiency. See figure 2 for description to this finding. This suggests that the market has already absorbed possible benefits from using ESG factors in the fundamental investment process.

Just like other results coherent to EMH, the individual examination of ESG factors also support Maˇnescu (2011) previous findings that ESG factors do not have a major impact on a company’s financial return. Furthermore, the results are consistent to Hiremath & Kumari (2014) previous study, stating that companies on the Indian stock market are moving towards more efficiency. However, there might also be alternative reasons for the findings of no correlation between ESG factors and risk adjusted return. van Dijk et. al., (2015, p. 3-5) suggest that a positive effect of using ESG factors might be omitted due to lack of transparency in Indian companies since investors simply do not have the knowledge of how sustainable a company really is. It should also be noted that van Dijk
et. al., (2015, p. 3-5) research proposes a positive relationship between ESG rating and a risk-adjusted return. If any of the statements apply to the situation in the Indian market is difficult to determine. Regarding van Dijk et. al., (2015) statement, its basically a question of wait and see if the market support the statement in the future.

The investigations of individual ESG factors are also contradictory to previous research that found a positive relationship between ESG factors and risk-adjusted return (Hoepner, 2013; Derwall, 2005; Duurem et. al., 2015; Clark et. al., 2014; Deutsche Bank, 2012). This also applies when comparing other studies of the Indian stock market, where Goyal & Aggrawal (2014) found that ESG stock portfolios outperformed Indian market portfolios (Goyal & Aggrawal, 2014, p. 95). The reason for this contradictory result may be due to different periods of investigation. Meaning that AMH who suggests that investors adapt to changes in market conditions and the risk and reward relation varies over time, still can explain the Indian market over a long-term period of time.

6.6 Discussion

The study's empirical results generally demonstrate high p-values, meaning that few observations relation to risk-adjusted return are statistically significant at a conventional level. This outcome corresponds to several previous studies illustrating that it is difficult to find statistically significant relationships between these variables (Halbritter & Dorfleitner, 2015, p. 11; Mañescu, 2011, p. 111). From a rational investor's perspective this outcome not surprising, because if there were an opportunity to outperform the market through public information, investors would already have absorb the information and eliminated this possibility through the fundamental investment process (Caplan et al, 2013, p. 3). However, what initially speaks for the use of ESG is that it is a subjective measure that usually only larger investment institutions have access to. Additionally, there is a lack of transparency and reporting on ESG issues in developing countries, which could be beneficial for some investors (EIRIS, 2012, p. 11).

A statistically significant result in this study is the negative correlation between Governance rating and risk-adjusted return, table 2. The statistically significant results are found both in the overall group and in the less sustainable the group, see figure 8 and 16. As a consequence of large scandals, research on governance practices and corporate performance has increased and supervisory focus on transparency and disclosure in governance issues has sharpened (CFA, 2008, p. 4). Subsequently, several private governance ratings agencies have emerged, and governance factors have become increasingly included in the investment decision-making processes (CFA, 2008. p. 3). Also, van Duurem et. al (2015) study illustrates that conventional asset managers accounts for environmental, social and governance factors in their investment process, where several prefer governance factors to environmental and social factors (van Dureem et. al., 2015, p. 4).

The result from this study displays that Indian companies with lower Governance rating obtains a higher risk-adjusted return then companies with higher Governance rating. Conclusively, this suggests that investors do not value that transparency and disclosure in Governance issues to the same extent as some organizations and researchers suggests. Another reason may be that in a period where the demands for sustainable investment increases, emerging markets gives an opportunity to perform unethical investment as
corporate culture does not promote reporting activities, and business generally have less transparency than companies in developed countries (EIRIS, 2012, p. 11).

Furthermore, the finding of this relationship in the overall and less sustainable group but not in the sustainable group are worth noting and raises some questions regarding market efficiency. According the result the market is efficient on a semi strong level in the sustainable Group. However, the findings in the overall and less sustainable group are not consistent with the theory when examining Environmental, Social and Governance rating individually. This Implies that the market has absorbed the public information among companies that obtained a higher ESG rating and constitutes sustainable group, on the contrary this does not apply for the less sustainable group. The result may be due to various reasons, but a thoughtful suggestion is that sustainable investors have rivalled each other by making similar investments. Conclusively, this process has not been made between companies with lower ESG rating.

When choosing the subject for the thesis, a main reason to explore the relationship between sustainability and risk adjusted return in emerging countries was because of the idea that foreign investors ignore sustainability factors in these markets. This was further strengthened by (Röhrbein, 2011), arguing that investors in Asia are abandoning international guidelines for sustainable investments and adopting their own. Subsequently, a reason why investors do not care about sustainability in India may be that a key challenge to make sustainable investments in emerging countries is the lack of company ESG disclosure (EIRIS, 2012, p. 11). In relation to this, large organization that produces ESG data usually keeps their methods confidential making it difficult to fully compare all ESG factors between companies in emerging countries. Conclusively, this might be the reason why the market is not perfectly efficient in this study, as it only applies to the sustainable group. If ESG data were not confidential and available for all investors, the market might adjust for this information as EMH advocates. Thereby, it might be perfectly efficient, leaving no significant relationships between ESG performance and risk-adjusted return.

Furthermore, due to time and budget limitations this cross-sectional study is constructed on information from 2014, a research design not proper to make conclusions regarding development. Previous studies regarding ESG and risk-adjusted return are mainly conducted over longer time periods; thereby one has to be cautious when comparing results from this study with other research. One disadvantage with making a cross sectional study is that the researchers cannot ignore the fact that results might depend on coincidences. This implies that when results are coherent with EMH, it is still not possible to exclude AMH where markets can vary in efficiency over time.

The sample of this study contains of 114 Indian companies and can partly be questioned. Several previous studies have greater samples and were also able to establish significant results, while this study had difficult to displaying significant relationships.
7. Conclusion

This chapter begins with conclusions that have been based on empirical data that have been collected and interpreted based on the theoretical basis and research question for this study. Subsequently, theoretical and practical contributions will be presented followed by suggestions for further studies. The chapter ends with some societal and ethical issues.

The main objective for this study was to examine the relationship between ESG rating and risk-adjusted return for companies on the Bombay stock exchange, where another objective was to divide companies in this study into two different groups through screening. A final objective was to examine individual factors within ESG and their relationship to risk-adjusted return. Through a cross-sectional study has 114 companies been examined and 21,420 variables been observed. Thereby, the research question was; *is there a relation between risk-adjusted return and ESG performance at the Indian stock market?*

7.1 Overall Group

The overall group’s Total ESG rating was not statistically significant, indicating there is no relation between Total ESG rating and risk-adjusted return for companies in India. Therefore, results for the overall group’s Total ESG rating answer the study's research question, that there is generally no connection between risk-adjusted return and ESG performance at the Bombay Stock Exchange. Hence, this study cannot fully reject EMH as results indicate that the Indian stock market is efficient and it is therefore no material advantage because of a good selection of companies with high ESG characteristics (Caplan et. Al., 2013, p. 3). Average Alpha for this group was 0.1614, indicating that a majority of companies in this study have generate a superior risk-adjusted return for the year 2014.

However, Governance rating for the overall group demonstrated a significant negative relationship to risk-adjusted return and contradicts to Duurem et. al. (2015) who argue that asset managers prefer to invest in companies with high Governance rating. Market efficiency can therefore be questioned for Governance rating, as the semi-strong form of market efficiency indicates that public available information should not be able to overcome the market (Fama, 1970, p. 383). Thus, results demonstrate that the semi-strong form of market efficiency is not entirely for filled on the Bombay Stock Exchange in the year 2014. Investors aiming for high risk-adjusted return might therefore be able to implement low Governance ratings into their investment model.

7.1.1 Sustainable and Less Sustainable Group

One of the study's objectives was to divide the Indian companies into two equally large groups through screening. Where companies with high Total ESG rating formed the sustainable group and companies with lower Total ESG rating formed the less sustainable group. Results revealed that the average Alpha was 0.1174 in the sustainable group and 0.2215 in the less sustainable group. However, when investigating the relationship between Total ESG rating and risk adjusted return there was no significant results.
The investigation of Environmental, Social and Governance ratings did not reveal any significant correlation to risk-adjusted return in the sustainable group. In the less sustainable group however, Governance rating had a significant negative relation to risk-adjusted return. Thereby, the result indicates that the semi-strong form of market efficiency is not fully fulfilled in the Indian stock market during the measurement period.

### 7.1.2 Individual Factors

Another objective was to investigate whether ESG factors had a significant relation to risk-adjusted return in both the sustainable group and in the less sustainable group. However, none of the factors had a significant relation to risk-adjusted return, which responds to the study's research question. Thus it demonstrates similar results as previous studies, according Halbritter & Dorfleitner (2015) it is not possible to find any relationship between ESG factors and risk-adjusted return. Conclusively, there is a need for more research on what specific ESG factors are influencing risk-adjusted return as van Dijk (2012) proposes.

### 7.2 Theoretical and Practical Contributions

The study has expanded the empirical evidence of the relationship between ESG performance and risk adjusted return on the Indian market stock market. Results from this study demonstrate no significant relation between Total ESG ratings and risk adjusted return within Indian companies during 2014. Additionally, this study is able to theoretically contribute with the fact that the efficient market hypothesis cannot be rejected on a semi-strong level. This study has theoretically contributed with the fact there is no significant relationship between specific ESG factors and risk-adjusted return.

This finding constructs the practical contribution that investors (both private and financial asset managers) cannot generate a superior risk-adjusted return by using Total ESG rating of the Indian market in the fundamental investment process. However, an empirical finding illustrates a negative relation between government rating and risk adjusted return, where results indicates that the market is not effective in the semi-strong form.

### 7.3 Suggestions For Further Studies

This study analysed the relationship between risk-adjusted return and ESG performance within the Indian stock market in 2014. Furthermore, this study investigated whether any individual ESG factors have a significant relationship with risk-adjusted return. Based on the results, following research suggested for the future.

In this study, relationships between risk-adjusted return and ESG performance during 2014 has been analysed in a cross sectional study, a research design inappropriate for the determination of development. As India is one of the most interesting markets for international investors, a longitudinal research design investigating the Indian stock market over a longer period of time is necessary to determine its development regarding ESG issues. Also, as mentioned throughout this study there is a need for more research on what specific ESG factors are influencing risk-adjusted return.
~Conclusion~

The results also displayed that governance rating to some extent are negatively correlated with risk-adjusted return. Subsequently, additional research is needed to either contradict or develop this finding.

This study has examined the linear relationship between ESG performance and risk-adjusted return. Although it was not significant, Indian companies with Total ESG rating around average was the one with lowest risk-adjusted returns in 2014. The results suggest that the relationship between ESG performance and risk-adjusted return might not be linear. Thereby, non-linear investigations are needed to further examine the relation.

One problem with this study was the relatively small sample, both in terms of Indian companies and number of ESG factors. For that reason a study of the Indian stock market with a greater sample is required, which also would increase the probability of finding significant results.

7.4 Societal and ethical issues
The community has over the past decade begun to understand that transparency of companies in emerging countries is of great importance in order for companies to not have a detrimental effect on investors and on society as a whole. Even though the process is getting better, there are still several countries that need to do more and for instance adopt laws and regulations for companies to become more transparent. This is especially important for countries like India that has become much more integrated into the global economy. Companies like Sustainalytics therefore creates a useful exercise for society and investors as they can create ESG ratings for companies in countries like India.

Research can be difficult to keep objective (Arbnor & Bjerke, 1994, p. 264 ff). When interpreting data, there were opportunities for misunderstandings because it is easy to misinterpret regression lines, alpha values and ESG rating, amongst others. The ability to remain objective is based on preconceptions that exist within the topic for the authors. Personal opinions should not affect interpretations because the authors do not hold a broader understanding of the subject than can be expected of a business student. Therefore, interpretations of empirical data should be relatively objective.
Reference List


OECD. (2013). Emerging Asian economies expected to remain resilient but structural reform critical, says new Economic Outlook for Southeast Asia, China and India.


Retrieved: 30-3-2015


Appendix

Appendix 1 – Summarising Table

<table>
<thead>
<tr>
<th>ESG Rating</th>
<th>P-Value</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0.169</td>
<td>-0.0042493</td>
</tr>
<tr>
<td>Environment</td>
<td>0.640</td>
<td>-0.0010647</td>
</tr>
<tr>
<td>Social</td>
<td>0.585</td>
<td>-0.0020168</td>
</tr>
<tr>
<td>Governance</td>
<td>0.029</td>
<td>-0.0047933</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ESG Rating, Sustainable Group</th>
<th>P-Value</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0.785</td>
<td>0.0011325</td>
</tr>
<tr>
<td>Environment</td>
<td>0.780</td>
<td>0.0021791</td>
</tr>
<tr>
<td>Social</td>
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<td>0.0006073</td>
</tr>
<tr>
<td>Governance</td>
<td>0.743</td>
<td>-0.0009160</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>ESG Rating, Less Sustainable Group</th>
<th>P-Value</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0.206</td>
<td>-0.0171354</td>
</tr>
<tr>
<td>Environment</td>
<td>0.906</td>
<td>0.0007522</td>
</tr>
<tr>
<td>Social</td>
<td>0.957</td>
<td>-0.0006860</td>
</tr>
<tr>
<td>Governance</td>
<td>0.076</td>
<td>-0.0156180</td>
</tr>
</tbody>
</table>
Appendix 2. Regression Analysis – Overall Group

Regression Alpha – Total ESG Rating

Number of obs = 126  
R-squared = 0.0152  
Adj R-squared = 0.0073

| Alpha       | Coef.    | Std. Err. | t     | P>|t| |
|-------------|----------|-----------|-------|-----|
| Total ESG Rating | -0.0042493 | 0.003068 | -1.39 | 0.169 |

Regression Alpha – Environment Rating

Number of obs = 126  
R-squared = 0.0018  
Adj R-squared = -0.0063

| Alpha             | Coef.     | Std. Err. | t     | P>|t| |
|-------------------|-----------|-----------|-------|-----|
| Environment Rating | -0.0010647 | 0.0022707 | -0.47 | 0.640 |

Regression Alpha – Social Rating

Number of obs = 126  
R-squared = 0.0024  
Adj R-squared = -0.0056

| Alpha      | Coef.     | Std. Err. | t     | P>|t| |
|------------|-----------|-----------|-------|-----|
| Social Rating | -0.0020168 | 0.003682 | -0.55 | 0.585 |

Regression Alpha - Governance Rating

Number of obs = 126  
R-squared = 0.0379  
Adj R-squared = 0.0301

| Alpha         | Coef.     | Std. Err. | t     | P>|t| |
|---------------|-----------|-----------|-------|-----|
| Governance Rating | -0.0047933 | 0.0021703 | -2.21 | 0.029 |
Appendix 3. Regression Analysis – Sustainable Group

Regression Alpha – Total ESG Rating

Number of obs = 64
R-squared = 0.0012
Adj R-squared = -0.0149

| Alpha | Coef.   | Std. Err. | t     | P>|t| |
|-------|---------|-----------|-------|-----|
| Total ESG Rating | 0.011325 | 0.0041424 | 0.27  | 0.785 |

Regression Alpha – Environment Rating

Number of obs = 64
R-squared = 0.0096
Adj R-squared = -0.0064

| Alpha | Coef.   | Std. Err. | t     | P>|t| |
|-------|---------|-----------|-------|-----|
| Environment Rating | 0.0021791 | 0.0028092 | 0.78  | 0.441 |

Regression Alpha – Social Rating

Number of obs = 64
R-squared = 0.0004
Adj R-squared = -0.0157

| Alpha | Coef.   | Std. Err. | t     | P>|t| |
|-------|---------|-----------|-------|-----|
| Social Rating | 0.0006073 | 0.0037865 | 0.16  | 0.873 |

Regression Alpha – Governance Rating

Number of obs = 64
R-squared = 0.0017
Adj R-squared = -0.0144

| Alpha | Coef.   | Std. Err. | t     | P>|t| |
|-------|---------|-----------|-------|-----|
| Governance Rating | -0.000916 | 0.0027831 | -0.33 | 0.743 |
Appendix 4. Regression Analysis – Less Sustainable Group

Regression Alpha – Total ESG Rating

Number of obs = 62  
R-squared = 0.0265  
Adj R-squared = 0.0103

| Alpha         | Coef.  | Std. Err. | t     | P>|t| |
|---------------|--------|-----------|-------|-----|
| Total ESG Rating | -0.0171354 | 0.0134075 | -1.28 | 0.206 |

Regression Alpha - Environment Rating

Number of obs = 62  
R-squared = 0.0002  
Adj R-squared = -0.0164

| Alpha         | Coef.  | Std. Err. | t     | P>|t| |
|---------------|--------|-----------|-------|-----|
| Environment Rating | 0.0007522 | 0.0063253 | 0.12  | 0.906 |

Regression Alpha – Social Rating

Number of obs = 62  
R-squared = 0.0000  
Adj R-squared = -0.0166

| Alpha         | Coef.  | Std. Err. | t     | P>|t| |
|---------------|--------|-----------|-------|-----|
| Social Rating | -0.000686 | 0.0126344 | -0.05 | 0.957 |

Regression Alpha - Governance Rating

Number of obs = 62  
R-squared = 0.0516  
Adj R-squared = 0.0358

| Alpha         | Coef.  | Std. Err. | t     | P>|t| |
|---------------|--------|-----------|-------|-----|
| Governance Rating | -0.0105618 | 0.0058482 | -1.81 | 0.076 |
Appendix 5. Multiregression analysis- Sustainable Group

Regression Alpha -

- (E1) Environmental Policy – (E2) Environmental Management System – (E3) CDP Participation – (E4) GHG Reduction Programmes – (E5) Operations Incidents – (E6) Green Procurement Policy – (E7) Environmental Supply Chain Incidents - (E8) Product Service Incidents

(S1) Discrimination Policy - (S2) Diversity Programmes – (S3) Employee Incidents – (S4) Scope of Social Supplier Standards – (S5) Social Supply Chain Incidents – (S6) Customer Incidents – (S7) Activities in Sensitive Countries – (S8) Society Community Incidents

(G1) Bribery Corruption Policy – (G2) Whistleblower Programmes – (G3) Global Compact Signatory - (G4) Business Ethics Incidents – (G5) ESG Reporting Standards – (G6) Separation of Chair CEO (G7) Board Independence – (G8) Governance Incidents

Note: E7 Environmental Supply Chain Incidents omitted because of collinearity

Number of obs = 63
R-squared = 0.2571
Adj R-squared = -0.1701

| Alpha                              | Coef.    | Std. Err. | t     | P>|t| |
|------------------------------------|----------|-----------|-------|-----|
| E1 Environmental Policy            | -.0000104| .0019137  | -0.01 | 0.996|
| E2 Environmental Management System | .0006771 | .0014361  | 0.47  | 0.640|
| E3 CDP Participation               | .000749  | .0014803  | 0.51  | 0.616|
| E4 GHG Reduction Programmes        | -.0003159| .0013778  | -0.23 | 0.820|
| E5 Operations Incidents            | .0017111 | .0043181  | 0.40  | 0.694|
| E6 Green Procurement Policy        | .000471  | .0021329  | 0.22  | 0.826|
| E7 Environmental Supply Chain Incidents | -    | -         | -     | -   |
| E8 Product Service Incidents       | .0065972 | .0188824  | 0.35  | 0.729|
| S1 Discrimination Policy           | .0002174 | .0019617  | 0.11  | 0.912|
| S2 Diversity Programmes            | .0016435 | .0019887  | 0.83  | 0.413|
| S3 Global Compact                  | -.0011492| .0032167  | -0.36 | 0.723|
### Appendix 6. Multiregression analysis - Sustainable Group

Regression Alpha -

- (E1) Environmental Policy – (E2) Environmental Management System – (E3) CDP Participation – (E4) GHG Reduction Programmes – (E5) Operations Incidents – (E6) Green Procurement Policy – (E7) Environmental Supply Chain Incidents - (E8) Product Service Incidents

- (S1) Discrimination Policy - (S2) Diversity Programmes – (S3) Employee Incidents – (S4) Scope of Social Supplier Stanards – (S5) Social Supply Chain Incidents – (S6) Customer Incidents – (S7) Activities in Sensitive Countries – (S8) Society Community Incidents

- (G1) Bribery Corruption Policy – (G2) Whistleblower Programmes – (G3) Global Compact Signatory - (G4) Business Ethics Incidents – (G5) ESG Reporting Standards – (G6) Separation of Chair CEO (G7) Board Independence – (G8) Governance Incidents

Note: E7 Environmental Supply Chain Incidents omitted because of collinearity
Number of obs = 63  
R-squared = 0.3015  
Adj R-squared = -0.1213

<p>| Alpha                               | Coef.     | Std. Err. | t     | P&gt;|t| |
|-------------------------------------|-----------|-----------|-------|------|
| E1 Environmental Policy             | -.0030604 | .0026683  | -1.15 | 0.259 |
| E2 Environmental Management System  | .0036116  | .0022299  | 1.62  | 0.114 |
| E3 CDP Participation               | .0023469  | .00344    | 0.68  | 0.499 |
| E4 GHG Reduction Programmes        | -.0042614 | .0059068  | -0.72 | 0.475 |
| E5 Operations Incidents            | -.005907  | .0035272  | -1.67 | 0.102 |
| E6 Green Procurement Policy        | -.0089007 | .0067619  | -1.32 | 0.196 |
| E7 Environmental Supply Chain Incidents | -     | -         | -     | -   |
| E8 Product Service Incidents       | -.0080927 | .0111642  | -0.72 | 0.473 |
| S1 Discrimination Policy           | -.0008393 | .0034257  | -0.25 | 0.808 |
| S2 Diversity Programmes            | .0028883  | .0081599  | 0.35  | 0.725 |
| S3 Global Compact Signatory        | -.0032575 | .0073365  | -0.44 | 0.660 |
| S4 Scope of Social Supplier Standards | -.0007795 | .0131894  | -0.06 | 0.953 |
| S5 Social Supply Chain Incidents   | -.0107561 | .0181718  | -0.59 | 0.557 |
| S6 Customer Incidents              | .0007782  | .0090223  | 0.09  | 0.932 |
| S7 Activities in Sensitive Countries | -.0046985 | .013957   | -0.34 | 0.738 |
| S8 Society Community Incidents     | .003402   | .0042289  | 0.80  | 0.426 |
| G1 Bribery Corruption Policy       | .0006975  | .0025006  | 0.28  | 0.782 |
| G2 Whistleblower Programmes        | -.0026756 | .002959   | -0.90 | 0.372 |
| G3 Global Compact Signatory        | -.0024131 | .003092   | -0.78 | 0.440 |
| G4 Business Ethics                 | -.000211  | .0042381  | -0.05 | 0.961 |</p>
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<thead>
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<th>Incidents</th>
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<th>0.31</th>
<th>0.762</th>
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<td>.0019646</td>
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<td><strong>G6 Separation of Chair CEO</strong></td>
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<td>.0012262</td>
<td>-0.22</td>
<td>0.830</td>
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<tr>
<td><strong>G7 Board Independence</strong></td>
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<td><strong>G8 Governance Incidents</strong></td>
<td>4000085</td>
<td>.4360458</td>
<td>0.92</td>
<td>0.365</td>
</tr>
</tbody>
</table>
Appendix 7 - Companies in the study

<table>
<thead>
<tr>
<th>Company</th>
<th>Return 2014</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ABB India Ltd.</td>
<td>71.78%</td>
<td>0.50</td>
</tr>
<tr>
<td>2. ACC Ltd.</td>
<td>40.31%</td>
<td>0.22</td>
</tr>
<tr>
<td>3. Adani Enterprises Ltd.</td>
<td>80.57%</td>
<td>0.56</td>
</tr>
<tr>
<td>4. Adani Ports and Special Economic Zone Ltd.</td>
<td>89.30%</td>
<td>0.73</td>
</tr>
<tr>
<td>5. Adani Power Ltd.</td>
<td>29.56%</td>
<td>0.06</td>
</tr>
<tr>
<td>6. Aditya Birla Nuvo Ltd.</td>
<td>44.63%</td>
<td>0.27</td>
</tr>
<tr>
<td>7. Ambuja Cements Ltd.</td>
<td>39.30%</td>
<td>0.23</td>
</tr>
<tr>
<td>8. Apollo Hospitals Enterprise Ltd.</td>
<td>19.23%</td>
<td>0.10</td>
</tr>
<tr>
<td>9. Ashok Leyland Ltd.</td>
<td>113.53%</td>
<td>0.90</td>
</tr>
<tr>
<td>10. Asian Paints Ltd.</td>
<td>46.76%</td>
<td>0.32</td>
</tr>
<tr>
<td>11. AXIS Bank Ltd.</td>
<td>-82.70%</td>
<td>-1.09</td>
</tr>
<tr>
<td>12. Bajaj Auto Ltd.</td>
<td>25.94%</td>
<td>0.10</td>
</tr>
<tr>
<td>13. Bajaj Holdings &amp; Investment Ltd.</td>
<td>43.30%</td>
<td>0.27</td>
</tr>
<tr>
<td>14. Bank of Baroda</td>
<td>-90.54%</td>
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<td>15. Bank of India</td>
<td>82.28%</td>
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</tr>
<tr>
<td>16. Bharat Electronics Ltd.</td>
<td>114.51%</td>
<td>0.98</td>
</tr>
<tr>
<td>17. Bharat Forge Ltd.</td>
<td>107.32%</td>
<td>0.99</td>
</tr>
<tr>
<td>18. Bharat Heavy Electricals Ltd.</td>
<td>50.47%</td>
<td>0.29</td>
</tr>
<tr>
<td>19. Bharat Petroleum Corp. Ltd.</td>
<td>63.83%</td>
<td>0.54</td>
</tr>
<tr>
<td>20. Bharti Airtel Ltd.</td>
<td>5.34%</td>
<td>-0.10</td>
</tr>
<tr>
<td>21. Bharti Infratel Ltd.</td>
<td>71.14%</td>
<td>0.61</td>
</tr>
<tr>
<td>22. Cadila Healthcare Ltd.</td>
<td>70.10%</td>
<td>0.60</td>
</tr>
<tr>
<td>23. Cairn India Ltd.</td>
<td>-26.24%</td>
<td>-0.38</td>
</tr>
<tr>
<td>24. Canara Bank Ltd.</td>
<td>48.80%</td>
<td>0.24</td>
</tr>
<tr>
<td>25. Castrol India Ltd.</td>
<td>49.57%</td>
<td>0.35</td>
</tr>
<tr>
<td>26. Cipla Ltd.</td>
<td>44.82%</td>
<td>0.32</td>
</tr>
<tr>
<td>27. Coal India Ltd.</td>
<td>37.43%</td>
<td>0.22</td>
</tr>
<tr>
<td>28. Colgate-Palmolive India Ltd.</td>
<td>28.75%</td>
<td>0.18</td>
</tr>
<tr>
<td>29. Container Corporation of India Ltd.</td>
<td>63.01%</td>
<td>0.48</td>
</tr>
<tr>
<td>30. Corporation Bank Ltd.</td>
<td>35.22%</td>
<td>0.23</td>
</tr>
<tr>
<td>31. Crompton Greaves Ltd.</td>
<td>37.68%</td>
<td>0.19</td>
</tr>
<tr>
<td>32. Cummins India Ltd.</td>
<td>37.92%</td>
<td>0.22</td>
</tr>
<tr>
<td>33. Dabur India Ltd.</td>
<td>31.72%</td>
<td>0.20</td>
</tr>
<tr>
<td>34. DIVI'S Laboratories Ltd.</td>
<td>35.03%</td>
<td>0.27</td>
</tr>
<tr>
<td>35. DLF Limited</td>
<td>-20.66%</td>
<td>-0.47</td>
</tr>
<tr>
<td>Rank</td>
<td>Company Name</td>
<td>Share Price</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>36.</td>
<td>Dr. Reddy's Laboratories Ltd.</td>
<td>25.33%</td>
</tr>
<tr>
<td>37.</td>
<td>Essar Oil Ltd.</td>
<td>67.32%</td>
</tr>
<tr>
<td>38.</td>
<td>Exide Industries Ltd.</td>
<td>38.60%</td>
</tr>
<tr>
<td>39.</td>
<td>Gail India Ltd.</td>
<td>28.62%</td>
</tr>
<tr>
<td>40.</td>
<td>GlaxoSmithKline Consumer Healthcare Ltd.</td>
<td>30.16%</td>
</tr>
<tr>
<td>41.</td>
<td>GlaxoSmithKline Pharmaceuticals Ltd.</td>
<td>8.60%</td>
</tr>
<tr>
<td>42.</td>
<td>Glenmark Pharmaceuticals Ltd.</td>
<td>37.75%</td>
</tr>
<tr>
<td>43.</td>
<td>GMR Infrastructure Ltd.</td>
<td>-36.95%</td>
</tr>
<tr>
<td>44.</td>
<td>Godrej Consumer Products Ltd.</td>
<td>14.13%</td>
</tr>
<tr>
<td>45.</td>
<td>Godrej Industries Ltd.</td>
<td>5.34%</td>
</tr>
<tr>
<td>46.</td>
<td>Grasim Industries Ltd.</td>
<td>22.96%</td>
</tr>
<tr>
<td>47.</td>
<td>Great Eastern Shipping Company Ltd</td>
<td>16.12%</td>
</tr>
<tr>
<td>48.</td>
<td>HCL Technologies Ltd.</td>
<td>25.70%</td>
</tr>
<tr>
<td>49.</td>
<td>HDFC Bank Ltd.</td>
<td>36.71%</td>
</tr>
<tr>
<td>50.</td>
<td>Hero MotoCorp Limited</td>
<td>43.34%</td>
</tr>
<tr>
<td>51.</td>
<td>Hindalco Industries Ltd.</td>
<td>26.34%</td>
</tr>
<tr>
<td>52.</td>
<td>Hindustan Petroleum Corp. Ltd.</td>
<td>86.52%</td>
</tr>
<tr>
<td>53.</td>
<td>Hindustan Unilever Ltd.</td>
<td>N/A</td>
</tr>
<tr>
<td>54.</td>
<td>Hindustan Zinc Ltd.</td>
<td>28.19%</td>
</tr>
<tr>
<td>55.</td>
<td>Housing Development Finance Corp. Ltd.</td>
<td>37.27%</td>
</tr>
<tr>
<td>56.</td>
<td>ICICI Bank Ltd.</td>
<td>63.89%</td>
</tr>
<tr>
<td>57.</td>
<td>IDBI Bank Ltd.</td>
<td>9.59%</td>
</tr>
<tr>
<td>58.</td>
<td>Idea Cellular Ltd.</td>
<td>-8.65%</td>
</tr>
<tr>
<td>59.</td>
<td>IDFC Ltd.</td>
<td>37.79%</td>
</tr>
<tr>
<td>60.</td>
<td>Indiabulls Financial Services Ltd.</td>
<td>N/A</td>
</tr>
<tr>
<td>61.</td>
<td>Indian Oil Corp. Ltd.</td>
<td>49.03%</td>
</tr>
<tr>
<td>62.</td>
<td>IndusInd Bank Ltd</td>
<td>64.51%</td>
</tr>
<tr>
<td>63.</td>
<td>Infosys Ltd.</td>
<td>17.16%</td>
</tr>
<tr>
<td>64.</td>
<td>ITC Ltd.</td>
<td>15.23%</td>
</tr>
<tr>
<td>65.</td>
<td>Jaiprakash Associates Ltd.</td>
<td>-79.35%</td>
</tr>
<tr>
<td>66.</td>
<td>Jindal Steel &amp; Power Ltd.</td>
<td>N/A</td>
</tr>
<tr>
<td>67.</td>
<td>JSW Energy Ltd.</td>
<td>62.26%</td>
</tr>
<tr>
<td>68.</td>
<td>JSW Steel Ltd.</td>
<td>4.01%</td>
</tr>
<tr>
<td>69.</td>
<td>Kotak Mahindra Bank Ltd.</td>
<td>55.87%</td>
</tr>
<tr>
<td>70.</td>
<td>Larsen &amp; Toubro Ltd.</td>
<td>34.61%</td>
</tr>
<tr>
<td>71.</td>
<td>LIC Housing Finance Ltd.</td>
<td>70.45%</td>
</tr>
<tr>
<td>72.</td>
<td>Lupin Ltd.</td>
<td>44.91%</td>
</tr>
<tr>
<td>73.</td>
<td>Mahindra &amp; Mahindra Financial Services Ltd.</td>
<td>22.82%</td>
</tr>
<tr>
<td>Rank</td>
<td>Company Name</td>
<td>Ownership %</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>74.</td>
<td>Mahindra &amp; Mahindra Ltd.</td>
<td>22.82%</td>
</tr>
<tr>
<td>75.</td>
<td>Mahindra Lifespace Developers Ltd.</td>
<td>17.89%</td>
</tr>
<tr>
<td>76.</td>
<td>Mangalore Refinery and Petrochemicals Ltd.</td>
<td>7.82%</td>
</tr>
<tr>
<td>77.</td>
<td>Maruti Suzuki India Ltd.</td>
<td>63.96%</td>
</tr>
<tr>
<td>78.</td>
<td>Mother Suni Systems Ltd.</td>
<td>87.27%</td>
</tr>
<tr>
<td>79.</td>
<td>Mphasis Limited</td>
<td>-7.49%</td>
</tr>
<tr>
<td>80.</td>
<td>Nestle India Ltd.</td>
<td>19.31%</td>
</tr>
<tr>
<td>81.</td>
<td>NHPC Ltd.</td>
<td>-2.33%</td>
</tr>
<tr>
<td>82.</td>
<td>NMDC Ltd.</td>
<td>7.32%</td>
</tr>
<tr>
<td>83.</td>
<td>NITPC Ltd.</td>
<td>8.76%</td>
</tr>
<tr>
<td>84.</td>
<td>Oil and Natural Gas Corp. Ltd.</td>
<td>19.76%</td>
</tr>
<tr>
<td>85.</td>
<td>Oil India Ltd.</td>
<td>21.74%</td>
</tr>
<tr>
<td>86.</td>
<td>Oracle Financial Services Software Ltd.</td>
<td>15.40%</td>
</tr>
<tr>
<td>87.</td>
<td>Oriental Bank of Commerce Ltd.</td>
<td>42.04%</td>
</tr>
<tr>
<td>88.</td>
<td>Piramal Enterprises Ltd.</td>
<td>57.24%</td>
</tr>
<tr>
<td>89.</td>
<td>Power Finance Corporation Ltd.</td>
<td>65.18%</td>
</tr>
<tr>
<td>90.</td>
<td>PowerGrid Corporation of India Ltd.</td>
<td>35.30%</td>
</tr>
<tr>
<td>91.</td>
<td>Punjab National Bank Ltd.</td>
<td>63.89%</td>
</tr>
<tr>
<td>92.</td>
<td>Ranbaxy Laboratories Ltd.</td>
<td>55.65%</td>
</tr>
<tr>
<td>93.</td>
<td>Reliance Capital Ltd.</td>
<td>77.60%</td>
</tr>
<tr>
<td>94.</td>
<td>Reliance Communications Ltd.</td>
<td>-54.61%</td>
</tr>
<tr>
<td>95.</td>
<td>Reliance Industries Ltd.</td>
<td>1.17%</td>
</tr>
<tr>
<td>96.</td>
<td>Reliance Infrastructure Ltd.</td>
<td>17.62%</td>
</tr>
<tr>
<td>97.</td>
<td>Reliance Power Ltd.</td>
<td>-18.43%</td>
</tr>
<tr>
<td>98.</td>
<td>Rural Electrification Corporation Ltd.</td>
<td>47.21%</td>
</tr>
<tr>
<td>99.</td>
<td>Sesa Sterlite Ltd.</td>
<td>7.12%</td>
</tr>
<tr>
<td>100.</td>
<td>Shree Cement Ltd.</td>
<td>78.01%</td>
</tr>
<tr>
<td>101.</td>
<td>Shriram Transport Finance Co. Ltd.</td>
<td>50.95%</td>
</tr>
<tr>
<td>102.</td>
<td>Siemens Ltd.</td>
<td>32.03%</td>
</tr>
<tr>
<td>103.</td>
<td>State Bank of India Ltd.</td>
<td>72.11%</td>
</tr>
<tr>
<td>104.</td>
<td>Steel Authority of India Ltd.</td>
<td>15.96%</td>
</tr>
<tr>
<td>105.</td>
<td>Sun Pharmaceutical Industries Ltd.</td>
<td>36.87%</td>
</tr>
<tr>
<td>106.</td>
<td>Sun TV Network Ltd.</td>
<td>1.32%</td>
</tr>
<tr>
<td>107.</td>
<td>Suzlon Energy Ltd.</td>
<td>25.86%</td>
</tr>
<tr>
<td>108.</td>
<td>Tata Chemicals Ltd.</td>
<td>47.80%</td>
</tr>
<tr>
<td>109.</td>
<td>Tata Communications Ltd.</td>
<td>36.28%</td>
</tr>
<tr>
<td>110.</td>
<td>Tata Consultancy Services Ltd.</td>
<td>18.60%</td>
</tr>
<tr>
<td>111.</td>
<td>Tata Motors Ltd.</td>
<td>56.22%</td>
</tr>
<tr>
<td>No.</td>
<td>Company Name</td>
<td>Change</td>
</tr>
<tr>
<td>------</td>
<td>---------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>112.</td>
<td>Tata Power Co. Ltd.</td>
<td>-4,41%</td>
</tr>
<tr>
<td>113.</td>
<td>Tata Steel Ltd.</td>
<td>-4,74%</td>
</tr>
<tr>
<td>114.</td>
<td>Tech Mahindra Ltd.</td>
<td>35,87%</td>
</tr>
<tr>
<td>115.</td>
<td>Titan Company Ltd.</td>
<td>50,85%</td>
</tr>
<tr>
<td>116.</td>
<td>Torrent Power Ltd.</td>
<td>29,77%</td>
</tr>
<tr>
<td>117.</td>
<td>UltraTech Cement Ltd.</td>
<td>41,75%</td>
</tr>
<tr>
<td>118.</td>
<td>Union Bank of India Ltd.</td>
<td>62,93%</td>
</tr>
<tr>
<td>119.</td>
<td>Unitech Ltd.</td>
<td>5,26%</td>
</tr>
<tr>
<td>120.</td>
<td>United Breweries Ltd.</td>
<td>8,56%</td>
</tr>
<tr>
<td>121.</td>
<td>United Spirits Ltd.</td>
<td>6,43%</td>
</tr>
<tr>
<td>122.</td>
<td>UPL Ltd.</td>
<td>57,13%</td>
</tr>
<tr>
<td>123.</td>
<td>Wipro Ltd.</td>
<td>2,57%</td>
</tr>
<tr>
<td>124.</td>
<td>Wockhardt Ltd.</td>
<td>N/A</td>
</tr>
<tr>
<td>125.</td>
<td>YES BANK Ltd.</td>
<td>73,87%</td>
</tr>
<tr>
<td>126.</td>
<td>Zee Entertainment Enterprises Ltd.</td>
<td>32,51%</td>
</tr>
</tbody>
</table>