



**LUND**  
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# Investing Responsibly

Benefits for the Ethical  
Investor

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## **Abstract**

**Title:** Investing Responsibly – Benefits for the Ethical Investor

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**Key words:** Finance, ESG, CSR, Emerging markets, Portfolio evaluation

**Purpose:** The purpose of this study is to examine whether investing responsibly, i.e. ethically, environmentally and socially aware, can be profitable for an investor.

**Methodology:** By creating a number of fictional portfolios, based on data provided by Nordea, we compare CSR-concentrated portfolios to non-CSR-concentrated portfolios and to the MSCI Emerging Market Index. Conclusions are drawn through different risk measures and portfolio performance.

**Theoretical perspectives:** Previous research discussing CSR is used as references in this thesis. The perspective of CSR affecting stock market performance, as conducted in this study, is a rather unexplored field of finance.

**Conclusions:** This study presents a positive correlation between CSR-concentrated portfolios and higher excess return, as well as with higher risk-reward. The differences between the CSR-concentrated and non-CSR-concentrated portfolios increase in the aftermath of the financial crisis in 2008.

## Summary

This thesis discusses whether Corporate Social Responsibility (CSR) can affect a company's, and consequently a portfolio's, stock market performance. The study presupposes the regular assumptions drawn from CAPM. By creating three different portfolios, consisting of companies with similar financial characteristics, but with different levels of CSR-involvement, we investigate how the CSR-factor may affect stock market performance. The data used in this study is based on a monthly basis over the last ten years. We perform statistical tests and calculate common risk measures for the portfolios, e.g. Sharpe ratio and Treynor's index. The results show that it can, in fact, be profitable for an investor to consider CSR-factors when making investment decisions.

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## Abbreviations

CSR = Corporate Social Responsibility

ESG = Environmental, Social, Governance

MSCI EM Index/MSCI Index = Morgan Stanley Emerging Markets Index (Large, Mid and Small Cap)

MV = Market value

NGO = Non-governmental organization

P = Price, defined as closing price for respective stock

UNPRI = United Nations Principles for Responsible Investment

## 1. Introduction

Throughout history, several paradigm shifts have occurred, changing the very fundamentals of the economic climate. One of these is the introduction of proprietorship that evolved in England during the 17<sup>th</sup> century and spread all across the globe, paving way for the transition from feudalism to contemporary capitalism.

Minor changes also affect the economy, for example the switch from one taxation policy to another. Bottom line, the economy in its personality is multifaceted and flexible in the way that it adjusts for the demands of people as well as its surrounding conditions.

### 1.1 The theory of Corporate Social Responsibility

To think that the idea of Corporate Social Responsibility, abbreviated CSR, is a new phenomenon in the atmosphere of corporate behavior would be a misconception. However this concept has gained a lot more attention in recent years, both in the academic world and on the highest possible political scene – the United Nations.

A report published by the Journal of Business Ethic offer a brief, but sufficient enough, summary of the historical legislative development, since early nineteenth century until today, regarding the mandates of corporations.

The present incorporation statute is standardized and everyone that files the correct paper work will be granted corporate standing. This was not always the case. In the early nineteenth century, anyone who wished to start a corporation had to file an individual petition to the legislatures in order to be granted corporate status. This approval was granted only if the corporation purpose would fulfill a public function, e.g. railroad construction and health care. There was a close link between corporate output and societal demand. During the industrialization the incorporation petitions increased dramatically which in turn lead to the first general legislative statute. This turned out to be a self-reinforcing mechanism which has led to that the requirement of incorporation is “any and all legal purposes” to describe the relationship between a corporation and society. I.e. the author argues that the universal approval process has led to the weakened link between society and corporations (Janine S. Hiller, 2012).

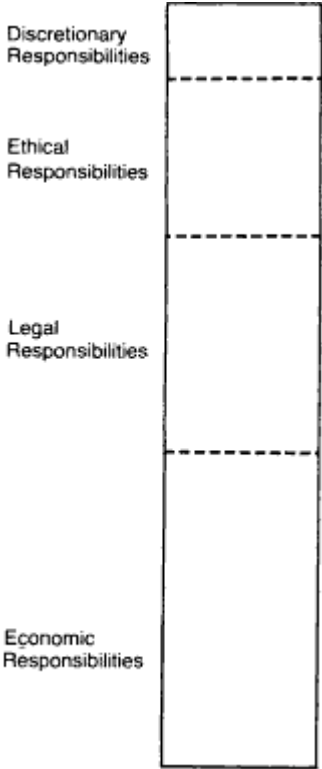
This “link” between corporations and society is something that companies are trying to renew today, and is recognized as CSR. The legitimacy and meaning of Corporate Social Responsibility has been a subject of intense discussion during the 20<sup>th</sup> century with many prominent economists sharing their opinions. One of the pioneers on this subject was Howard Bowen, who in his book from 1953, *Responsibilities of the Businessman*, highlights the perspective that large corporations have a substantial effect on the everyday lives of the people in its surroundings, because they play an important role in the decision making. Bowen claims that each company should act in a way that corresponds to the morals of the society as whole (Bowen, 1953).

Although Bowen was not the first person to draw attention to this kind of interaction between the relationships that society and companies share, his book was one of the first to treat this subject extensively and thus laid the foundations for the debate. This paradigm has received a lot of support, as well as critique, throughout the second half of the 20<sup>th</sup> century. In 1963 Joseph W. McGuire stated that the term Corporate Social Responsibility marked the effort that companies make to the benefit of society, without any direct economic gain (McGuire, 1963).

Corporate Social Responsibility, CSR, and its true meaning, i.e. what it interprets to in regard to actions was for long discussed even amongst CSR advocates. This can also be said to be true for today, but the discussion of today is more about to what *extent* companies should apply CSR-activities.

The most common way of describing the notion of CSR, on a theoretical level, is by using Archie B. Carroll’s CSR pyramid, which is considered to encapsulate the core meaning of CSR.

The most fundamental role that companies have in society “is economic in its nature”. Archie B. Carroll elaborates this by concluding that the main purpose of the company is to produce and sell goods to the public. By doing this they stimulate the economy by producing jobs and a market, which under this assumption is self-fulfilling. All other business responsibilities lie upon this, as this is the essence of the very existence of today’s economy. Following the legal responsibilities is seen as a “license to operate” – these legal responsibilities are embodied in the laws and regulations that society expects companies to obey. The ethical responsibilities are to some extent already implicitly followed as our laws are a product of our perception of what is and what is not ethical. What is further expected from companies



(Archie B. Carroll 1979)

from an ethical point of view is hard to define, because *ethic* is a very subjective concept. To exemplify the complexity with the ethical responsibilities one could ask themselves whether companies should be producing products that are made from scarce natural resources. This debate is still ongoing. At the top of the pyramid are the discretionary responsibilities (sometimes referred to as philanthropic responsibilities). These are the responsibilities that are up for each and one of us to determine whether they are critical in the interaction between the society and corporations. These responsibilities or expectations could, for example, be that a company decides to run a daycare center for the children of its employees (Carroll, 1979).

The idea of a corporation acting on incentives that do not have any apparent economic gain has not been entirely supported within the academic world. One of the major opponents to this idea was Milton Friedman.

In an article from 1970, Friedman argued that companies only have one role, which is to generate value to its shareholders. Friedman went as far as to claim that activities conducted to the benefit of society as whole were socialistic and directly antagonizing to the free market mechanisms. He claimed that the expenditures for actions that were not solely intended for profit maximization could be likened to government taxes and thus have a restraining function



on companies. Nevertheless, Friedman argued that CSR-activities are justified if they can generate more wealth to the shareholders. There is still a substantial distinction between Friedman's and Carroll's perceptions of the role companies play (or ought to play) in society. Milton Friedman did not consider the society's norms, except from the laws, as a necessity to be incorporated by companies, but rather as an ingredient to further enhance the performance of the companies, in terms of return to its shareholders, if required by the market. (Friedman, 1970). In contrast, Carroll recognized an extension of the responsibilities companies carry, on the basis of values that were not profit related (Carroll, 1979).

For illustrative purpose one could imagine Friedman's pyramid of CSR. This would consist of the bottom two boxes in Carroll's pyramid. What is essential to point out is that pro-CSR advocates remarked the civic responsibilities that companies ought to have.

## 1.2 Governments, organizations and corporations on CSR

The academic world has played a large part in introducing and developing the phenomena of CSR, but it has done so in symbiosis with the public and institutions such as Non-governmental organizations (NGOs), large corporations and governments.

Environmental, social and economic issues such as the global warming, labor exploitation and the financial crisis in 2007 have all contributed to more public awareness and thus demands towards corporate behavior (Lou X. and Bhattacharya CB, 2006). Some organizations and institutions have developed frameworks and guidelines for reporting and implementing corporate activities, in order for companies to become more transparent and accountable.

Four organizations distinguish themselves, given the importance that they have had and still have, with developing a platform under which CSR can become more mainstream.

The UN Global Compact, a United Nations organ, with more than 10,000 signatories, is the largest voluntary social responsibility initiative in the world. This organization has developed ten universally accepted principles in regard to human rights, environmental impact, labor and anti-corruption, which companies are following, although with different intensity (UNglobalcompact.com).

The NGOs have been part of the development towards a more responsible way of conducting business, by acting as indicators to companies in regard to public opinion. An example would

be the BP oil catastrophe in the Mexican gulf, which triggered big demonstrations around the globe, assembled by organizations such as Greenpeace. The NGOs certainly have an impact on a micro level, as well as on a macro level. In an article by from 2007, Edelman claims that the new generation of CEO's "... want advice on everything from Non-Governmental Organizations to employee engagement to public policy, in addition to our classic media relations skills" ,confirming the importance of NGOs.

The Global Reporting initiative, launched in 1997, is an organization that has developed a framework for reporting on the economic, social and environmental impact of a company. The reporting mechanism as well as the contents have been developed by representatives from all types of segments of society, from business to the civil society to governmental agencies in several countries. They recently launched their fourth generation of reporting framework, the G4 (Global Reporting Initiative 2010; G4 2013).

The International Organization of Standardization, ISO, published its ISO: 26000 document in 2010, which provides actual praxis guidelines for companies on how to implement certain aspects in their organizations in order to become more CSR-compliant. Similarly to the Global Reporting initiative, ISO 26000, has been developed by representatives from all segments, led by the Swedish and Brazilian normalization institutes ([www.iso.org](http://www.iso.org)).

### 1.3 Finance sector and ESG<sup>1</sup> (Environmental, Social and Governance factors)

The traditional framework and guidelines do not fully apply to the financial sector given its more subtle form of participation within the realm of everyday business. An investment bank does not directly exploit children to work in a gold mine somewhere in Africa, however they may very well be a majority shareholder, and possibly even a board member, in such a company. Variables such as these should be taken into consideration in their reporting on CSR activities and a framework has been developed for this purpose by the UNPRI, United Nations Principles for Responsible Investing.

Starting in 2005, when Kofi Annan, the secretary-general at United Nations at the time, invited some of the largest institutional investors in the world to join a process to develop the so called "Principles for Responsible Investment". An Investor Group consisting of 20 people

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<sup>1</sup> "CSR" and "ESG" are used analogously in this study

from institutions in 12 different countries was supported by 70 experts from the investment industry, intergovernmental organizations and civil society. The Principles were launched in April 2006 at the New York Stock Exchange.

UNPRI issues the notion that variables such as climate change and human rights can affect the performance of investment portfolios, which is the foundation of the Principles. Therefore these factors should be taken into account alongside more traditional ones, if investors are committed to properly fulfill their fiduciary duty. “The Principles provide a voluntary framework by which all investors can incorporate ESG [(CSR)] issues into their decision-making and ownership practices and so better align their objectives with those of society at large.”(UNPRI.org). The PRI Initiative derived from the UN Global Compact<sup>2</sup> norms.

Although this is not the only way for companies within the finance industry to report on and implement ESG, the UNPRI initiative has had the most impact. It has obtained the largest number of signatories, which currently consists of 270 asset owners, 776 investment managers and 180 professional service partners (UNPRI.org).

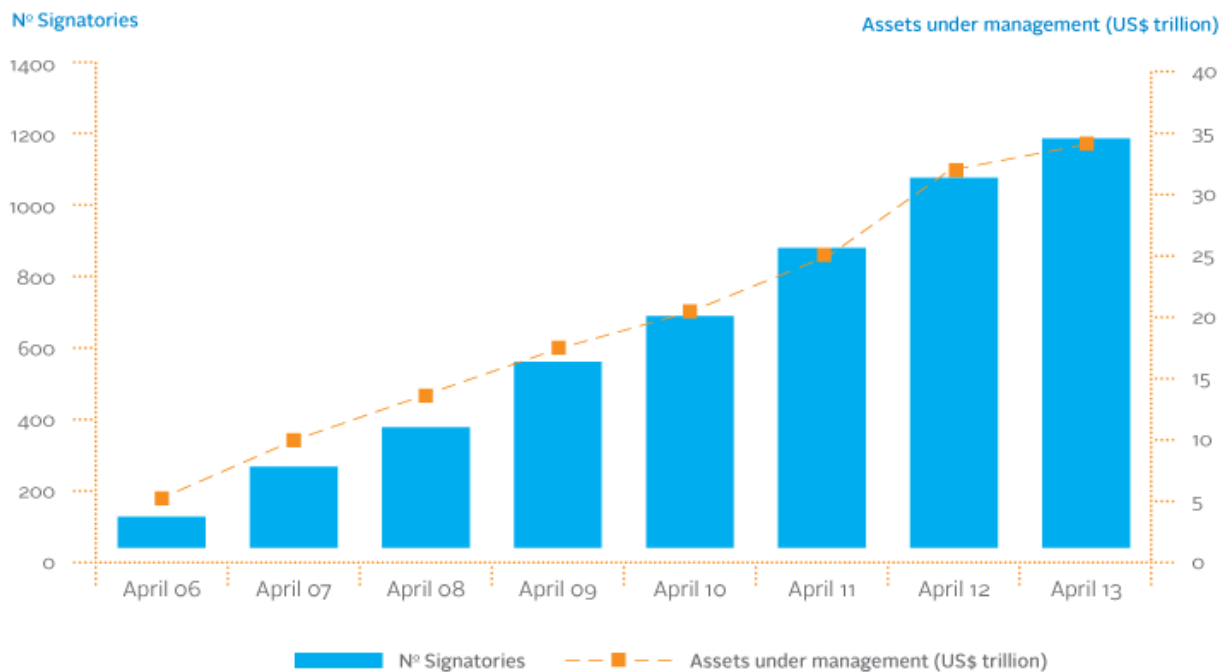
#### 1.4 The evolution of CSR

One way of pointing out the evolution of CSR is by looking at the UNPRI’s signatory list and how much of the total investable assets they manage. The table below shows the number of signatories and the total assets under management by the signatories since The Principles were launched the New York Stock Exchange.

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<sup>2</sup> The UN Global Compact is a strategic policy initiative for businesses that are committed to aligning their operations and strategies with [ten universally accepted principles](#) in the areas of [human rights](#), [labour](#), [environment](#) and [anti-corruption](#). This ever-increasing understanding is reflected in the Global Compact's rapid growth. With over 10,000 corporate participants and other stakeholders from over 130 countries, it is the largest voluntary corporate responsibility initiative in the world.([www.unglobalcompact.org](http://www.unglobalcompact.org))

Figure 1.1



Source: UNPRI.com

The UNPRI initiative is growing at a rapid pace. On its inception on April 2006 it represented \$4 US trillion of the total investable assets in the world, and six years later it composes \$34 US trillion, representing 15% of the world’s investable assets (UNPRI.org). Like the evident increase in assets under management the number of signatories has risen from 100 to 1226.

The PRI Initiative derived from the UN Global Compact norms, and together they form a partnership with UNEP FI<sup>3</sup>. It was created alongside the Principles to help put the framework into practice.

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<sup>3</sup> Founded in 1992 in the context of the Earth Summit in Rio, and based in Geneva, Switzerland, the United Nations Environment Programme Finance Initiative (UNEP FI) was established as a platform associating the [United Nations](#) and the financial sector globally. The need for this unique United Nations partnership arose from the growing recognition of the links between finance and Environmental, Social and Governance (ESG) challenges, and the role financial institutions could play for a more sustainable world. UNEP FI is continuously building its membership, and works closely with over [200 members](#), who have signed the [UNEP FI Statement of Commitment](#). The membership is made up of public and private financial institutions from around the world and is balanced between developed and developing countries. They recognize sustainability as part of a collective responsibility and support approaches to anticipate and prevent potential negative impacts on the environment and society. ([www.unepfi.org](http://www.unepfi.org))

A survey conducted by KPMG in 2013 that focuses on European responsible investing shows that the number of responsible investment (RI) funds<sup>4</sup> in Europe have increased by 217 since 2010, and today compose a total of 1775 RI funds. The survey also shows that the assets under management for RI funds increased by 19 % in Europe between 2010 and 2012. The Global Sustainable Investment Alliance, GSIA<sup>5</sup>, published a review in January 2013, regarding global sustainable assets. This review shows that the total estimated sustainable investments is at least \$13.6 US trillion as of December 31, 2011 in the covered regions<sup>6</sup>. The two reports have different terminology and a slightly different criteria when taking into account the ESG-compliance of funds. Worth mentioning is that in the report conducted by KPMG tried to converge its definition of ESG to the definition of GSIA<sup>7</sup>.

## 1.5 The economics of CSR

Before organizations such as those presented above, having developed these reporting frameworks and systems, companies could, in general, only be accounted for their financial results. The evolution of responsible investments is a result of companies that are voluntarily signing agreements that imply that they are anticipated to report on what their company specific activities induce, in terms of environmental, social and economic impact. This in turn is a consequence of the increasing demand on CSR-attributes on products/services by the public (Lou X. and Bhattacharya CB, 2006).

Neoclassical theory assumes that a company's main objective is to create profit to increase shareholder value. The shareholder in the neoclassical economic theory is the key agent for a company. A company behaves in a way that will enable it to maximize profits, subject to all relevant constraints, e.g. taxes. By profit-maximization, companies also create more jobs by stimulating supply and demand, which benefits society. As mentioned earlier, Milton Friedman, who was the most prominent contemporary neoclassical economist, pointed out the fact that engaging in CSR activities could provide yet another constraint to companies

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<sup>4</sup> Responsible/Sustainable investing is an investment method that includes environmental, social and governance (ESG) factors in the selection and management of investments. GSIA.

<sup>5</sup> The Global Sustainable Investment Alliance was launched in January 2013 and consist of the seven largest sustainable membership organizations in the world. [www.gsi-alliance.org](http://www.gsi-alliance.org)

<sup>6</sup> <http://gsiareview2012.gsi-alliance.org/#/12/> - Europe, Canada, United States, Asia (ex-Japan), Asia, Australia/NZ and Africa

<sup>7</sup> The definitions can be found in the reports.

because it represented a cost. This would in the long run limit a company to fully profit-maximize and thus decrease the value to its shareholders and to society (Friedman, 1970). This has also been the dominating paradigm within the management of business over the last two or three decades (Porter and Kramer, 2011).

The perception of a company that only focuses on making profit, and thus is creating value to the society as whole, is being challenged by the view that companies prosper at the expense of society (Porter and Kramer, 2011).

Much of the existing literature that focuses on CSR highlights the notion of the marketing advantages that are affiliated with CSR-activities.

Creyer (1997) show that products of companies perceived as ethical by consumers, are considered better than the products of its counterparts, and thus more purchasable.

Hopkins and Cowe (2004) show that 79 % of CEOs<sup>8</sup> think that CSR is necessary in the current business milieu in order to maintain a competitive advantage.

One way of explaining this is by considering the activities of a company that adopts and commits to the various CSR reporting and application frameworks produced by different institutions<sup>9</sup>. By engaging in these activities, for example investing in renewable energy that does not affect the environment as negative as existing technology, a company is not directly profit maximizing but it is sending a clear message to its community that it is in fact a part of the community and wants to be a benefactor. This automatically means that a company is communicating with a broader range of stakeholders than it is when it presents its financial quarterly or annual result to its shareholders.

The importance of identifying and engaging with multiple stakeholders in order to gain greater knowledge about respective stakeholder's needs and demands to be able to address them is emphasized by Eccles, Ioannou and Serafeim (2013). They elaborate this by asserting that stakeholder engagement is enhancing the creation of intangible assets such as long-term customer relationships which can create a competitive advantage. This statement is supported by Sen, S, Gürhan-Canlitz. Z and Morwitz. V (2001), when concluding that by ignoring the

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<sup>8</sup> A survey which was conducted in 2004 with CEOs.

<sup>9</sup> See Paragraph 1.X

interests of other stakeholders, shareholder value creation can be impeded due to consumer boycotts.

Eccles, Ioannou and Serafeim (2013) argue that High Sustainability<sup>10</sup> companies outperform Low Sustainability companies that operate in the business to consumer industry [B2C], firms that are sensitive to brand management and firms that capitalize on natural resources, in terms of various accounting performance measures such as return on equity, return on assets etc.

Considering the risk associated with CSR, Oikonomou, Brooks and Pavelin (2012) show that firms with CSR-problems are exposed to higher systematic risk. A working paper from Albuquerque, Durnev and Koskinen (2013) show that companies with greater customer loyalty are also less affected by aggregate economic shocks.

There is a clear link between the need of engaging in CSR activities and the type of industry a specific company is exposed to. Porter and Kramer elaborate this by arguing that this need has been caused by the companies themselves due to the obsolete approach to value creation and assert the issue as “They [the companies] continue to view value creation narrowly, optimizing short-term financial performance in a bubble while missing the most important customer needs and ignoring the broader influences that determine their longer-term success”. (Porter and Kramer, 2011, p. 4).

Another dimension that further allows us to understand the implications of CSR through the perspective of companies, is that CSR policies make the pool of attractive employees more available to companies that have such policies. A primitive and generalized explanation to this is that company image has a lot to do in the decision making when searching for the most competent people Fombrun (1996) and Greening and Turban (2000).

By engaging in and incorporating CSR-activities companies can get a whole new dimension of marketing. That is expanding their product attributes further so that it appeals to customers on more levels than the “functional” one (Wang and Bansal, 2012).

Another interpretation of CSR, which is challenging to the definition we have provided so far, is the one presented by Christian Aid. In a report from 2004, they argue that CSR is a way for

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<sup>10</sup> High Sustainability is the term used in the working paper to denote firms that “voluntarily adopted sustainability policies by 1993”. This is the equivalent to the companies that are CSR-active.

large multi-national companies to improve their public image and do not do anything substantial except for greenwashing<sup>11</sup> (Christian Aid, 2004).

An interesting aspect to point out is that the signatories in the UNPRI initiative continued to grow during the financial crisis of 2008.

## 1.6 Purpose and disposition

This study makes an attempt to determine whether it can, in fact, be beneficial for an investor to consider ESG-factors when making investment decisions. We execute this by creating a number of portfolios, which we then compare to each other and a benchmark. These comparisons are conducted by computing various measures for each portfolio and the benchmark. Conclusions are drawn from the results obtained by the analysis of the data and the theoretical background.

The primary question raised in order to fulfill the purpose of this thesis:

- Can an investor benefit from considering ESG-factors when making investment decisions?

Secondly, we also aim to find out:

- What are the reasons underlying the superior/inferior performance of an ESG-concentrated portfolio, relative a benchmark or non-ESG-concentrated portfolio?
- How does business cycles affect ESG-portfolios versus non-ESG-portfolios?

Chapter 1 provides a theoretical background of the subject matter for this thesis, as well as purpose and problem formulation.

Chapter 2 will give an account for how the portfolios are created and what risk measures and performance indicators we use when analyzing these portfolios. In Chapter 3 we present the results retrieved from our calculations conducted in Chapter 2. Chapter 4 provides an analysis of the results presented in Chapter 3. Chapter 5 summarizes the thesis' conclusions and make suggestions for further studies.

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<sup>11</sup> For definition of "greenwashing" see <http://www.investopedia.com/terms/g/greenwashing.asp>



## 2. Methodology and theoretical background

### 2.1 CAPM

Capital Asset Pricing Model, CAPM, is a model that describes the risk-return relationship and is used when calculating prices for risky assets. According to CAPM, investors need to be compensated for the time value of money and for undertaking risk. The expected return of a portfolio should at least equal the risk-free rate plus a risk premium. If this criteria is not fulfilled, the investment should not be undertaken. The expected return according to CAPM is calculated as the risk-free interest rate plus beta times market premium

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

where  $E(R_i)$  is the expected portfolio return,  $R_f$  is the risk-free interest rate,  $\beta_i$  is the portfolio beta and  $E(R_m)$  is expected market return.

CAPM includes a number of assumptions that we apply to our study:

- Investors will choose to hold a portfolio in which each stock represents a weight that is proportional to its value, i.e. a portfolio that is capitalization-weighted. Consequently, the portfolios we create are weighted accordingly.
- The so-called risk premium for the market portfolio will be proportional to its risk and level of risk aversion of the representative investor. Mathematically,

$$E(r_M) - r_f = \bar{A}\sigma_M^2$$

where  $\sigma_M^2$  is the variance of the market portfolio and  $\bar{A}$  is the average degree of risk aversion across investors. Note that because  $M$  is the optimal portfolio, which is efficiently diversified across all stocks,  $\sigma_M^2$  is the systematic risk of this universe.

- The risk premium of the portfolio constituents will be proportional to the risk premium on the market portfolio, and the beta coefficient of the stock relative to the market portfolio. Beta measures the systematic risk of a security or portfolio in comparison to the market. Beta is calculated as

$$\beta_i = \frac{Cov(r_i, r_M)}{\sigma_M^2}$$

and the risk premium on individual securities calculated as

$$E(r_i) - r_f = \frac{Cov(r_i, r_M)}{\sigma_M^2} [E(r_M) - r_f] = \beta_i [E(r_M) - r_f].$$

(Bodie, Kane, Marcus, 2007).

## 2.2 Data

The majority of the data used in this study is based on data provided by Nordea.

The data provided by Nordea consist of 388 companies<sup>12</sup> that were analyzed during the selection process in the development of Nordea Emerging Stars Equity Fund. The names, ISIN and Nordea's ESG-rating<sup>13</sup> for each constituent are declared. Since these companies are analyzed in the context of a fund investing in emerging markets, we decide to continue in this direction, choosing MSCI Emerging Markets Index as our benchmark for this study. The different portfolios are constructed with regards to the respective ESG-rating for each company, allowing us to isolate the ESG-factor of the portfolios and thus attribute any differences in performance to this.

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<sup>12</sup> For complete list of companies, see table A.4-6 in Appendix

<sup>13</sup> <http://esg.nordea.com/>

The portfolios are constructed in the following manner:

- We include all of the 388 companies in our **Portfolio ABC** (A-, B- and C-rated). Inception date at 2003-11-01, and end date at 2013-11-01. We calculate the return of the portfolio on a monthly basis.
- **Portfolio AB** comprise only the A- and B-rated companies (237 companies). Inception date at 2003-11-01, and end date at 2013-11-01. Return is calculated in the same way as the former portfolio.
- The third portfolio, **Portfolio C**, includes only the C-rated companies (151 companies) with inception date at 2003-01-11, and end date at 2013-11-01 with returns calculated on monthly.

The 388 companies are selected by Nordea Investment Management. The first stage includes 1000 companies, which are analyzed based on their financial aspects. 388 companies of the 1000 are declared sufficiently stable from a financial stand point and these are then further analyzed from the ESG-perspective by the RIG-team in Nordea Asset Management<sup>14</sup>. These are later categorized into three sub-categories depending on their ESG-status. The A and B rated companies are ESG-approved and thus further analyzed for the selection of Nordea Emerging Stars Equity Fund whereas the C rated were eliminated from the selection process (Antti Savilaakso, 2013).

For analytical purposes we will not only consider the entire 10-year holding period, but also divide it into three equal sub-periods of 40 months each. This allows us to analyze our portfolios under different macro-economic phases, considering the financial crisis' outburst in 2008. The periods are divided accordingly:

- Period 1: 2003-11-01 – 2007-03-01
- Period 2: 2007-03-01 – 2010-07-01
- Period 3: 2010-07-01 – 2013-11-01

All of the portfolios above are capitalization-weighted, which means that each company affects the portfolio proportionally to its market value relative to the total composition of all constituents in respective portfolio. Prices and market values are transformed into US

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<sup>14</sup> Responsible Investments and Governance team.

Dollars. We choose US Dollars since it is a commonly used currency in the financial world, and in our attempt to create fictitious portfolio that are diversified among sectors and regions, we believe this is the best way to go.

Using Datastream we extract additional data that we need;

- Market value(MV) in local currency for each company
- Closing price(P) in local currency for each company
- FX rates for US Dollars

Using this data we calculate MV and P in USD for each company, creating a total market value for each portfolio, respectively.

Market value, expressed in USD, is calculated as MV in local currency divided by the respective FX rate for USD

$$MV_i \text{ in US Dollars} = \frac{MV_i \text{ in local currency}}{FX \text{ rate } USD_i}$$

Closing price for each company, expressed in USD, is calculated as P in local currency divided by the respective FX rate for USD.

The portfolios are rebalanced each period, i.e. monthly respectively weekly. This is done in order to

$$Price_i \text{ in US Dollars} = \frac{Price_i \text{ in local currency}}{FX \text{ rate } USD_i}$$

Return for each constituent is calculated as the percental change in price between observation date i and i-1 divided by the price at observation i-1

$$Return_i = \frac{(Price_i - Price_{i-1})}{Price_{i-1}}$$

The total MV for respective portfolio is calculated as the sum of MV for each constituent

$$\text{Total market value} = \sum_{i=1}^n MV_i$$

Since our portfolios are capitalization-weighted, the weight for each constituent in respective portfolio is calculated as MV for each company divided by total market capitalization

$$\text{Weight}_i = \frac{MV \text{ company}_i}{\text{Total MV for portfolio}}$$

To investigate what effect each constituent have on the respective portfolio, performance contribution for each constituent is calculated as weight multiplied by return

$$\text{Performance contribution}_i = \text{Return}_i * \text{Weight}_i$$

For measuring the portfolio risk we use the excel function STDEV.P, which calculates standard deviation as following

$$\text{Standard deviation, } \sigma = \sqrt{\frac{\sum(x - \bar{x})^2}{n}}$$

where  $\bar{x}$  is the sample mean AVERAGE(number1,number2,...) and n is the sample size.

### 2.3 Risk-adjusted performance measures

To help us evaluate the results from our study we use several risk measures, which allow us to quantify the results – an essential prerequisite for conducting our analysis.

The risk measures we use are the following:

### 2.3.1 Sharpe Ratio

The Sharpe ratio is calculated by dividing the average portfolio excess return over the sample period by the standard deviation of returns over that period. It measures the reward-to-(total) volatility and tells us whether a portfolio's return is the result of smart investment decisions or due to excess risk.

$$\text{Sharpe's ratio, } sr_i = \frac{(\bar{r}_p - \bar{r}_f)}{\sigma_p}$$

where  $\bar{r}_p$  is the expected portfolio return,  $\bar{r}_f$  is the risk-free return and  $\sigma_p$  is the portfolio standard deviation.

### 2.3.2 Treynor's Index

Treynor's index measures a portfolio's excess return per unit of risk, using beta as risk measure. It is calculated by dividing the average portfolio excess return over the sample period by the systematic risk.

$$\text{Treynor's index, } tr_i = \frac{(\bar{r}_p - \bar{r}_f)}{\beta_p}$$

where  $\bar{r}_p$  is the expected portfolio return,  $\bar{r}_f$  is the risk-free return and  $\beta_p$  is the portfolio beta. Beta value is calculated for each company during every period, respectively.

### 2.3.3 Jensen's measure (Jensen's alpha)

Jensen's measure is the average return on the portfolio over and above that predicted by the CAPM, given the portfolio's beta and the average market return. Jensen's measure is the portfolio's alpha value, and is therefore sometimes referred to as "Jensen's alpha".

$$\text{Jensen's alpha, } \alpha_p = \bar{r}_p - [\bar{r}_f + \beta_p(\bar{r}_M - \bar{r}_f)]$$

where  $\bar{r}_p$  is the expected portfolio return,  $\bar{r}_f$  is the risk-free return,  $\beta_p$  is the portfolio beta and  $\bar{r}_M$  is the expected market return.

## 2.4 Statistical testing

To determine whether our Sharpe ratios and Treynor's index-values are significant, we perform hypothesis tests.

### 2.4.1 Sharpe Ratio

A Sharpe ratio significantly different from zero tells us that there is a systematic reward taking on additional risk, given the holding period and portfolio composition. This is tested by a hypothesis test, where under  $H_0$ :  $sr_i = 0$  we have

$$\widehat{sr}_i \sim N \left( 0, \frac{1 + \frac{1}{2} \widehat{sr}_i^2}{T} \right)$$

where  $\frac{1 + \frac{1}{2} \widehat{sr}_i^2}{T}$  is the variance,  $\sigma^2$ , of  $\widehat{sr}_i$ . The Z-value is then calculated by dividing the Sharpe ratio by the standard deviation divided by the square root of the number of observations

$$Z_{obs} = \frac{\widehat{sr}_i}{\sigma / \sqrt{n}}$$

To determine whether the Sharpe ratios differs significantly among the portfolios' respective values, we perform an equality hypothesis test between two Sharpe ratios, where we have  $H_0$ :  $sr_{ij} = sr_i - sr_j = 0$ . This difference can be transformed:

$$\widehat{sr}_{ij} = \widehat{sr}_i - \widehat{sr}_j = s_i * m_j - s_j * m_i$$

where

$$m_i = \frac{1}{T} \sum_{t=1}^T d_{it}$$

$$s_i = \sqrt{\frac{1}{T} \sum_{t=1}^T (d_{it} - m_i)^2}$$

and

$$d_{it} = (R_{it} - R_{bt}).$$

The asymptotic distribution of the transformed difference is normal with mean equal to  $sr_{ij}$  and variance given by:

$$\theta = \frac{1}{T} \left[ 2s_i^2 s_j^2 - 2s_i s_j s_{ij} + \frac{1}{2} m_i^2 s_j^2 + \frac{1}{2} m_j^2 s_i^2 - \frac{m_i m_j}{2s_i s_j} [s_{ij}^2 + s_i^2 s_j^2] \right]$$

where  $T$  is the number of observations and  $s_{ij}$  is the estimated covariance between excess returns of portfolio  $i$  and  $j$ , calculated as

$$s_{ij} = \frac{\sum (r_{it} - \bar{r}_i)(r_{jt} - \bar{r}_j)}{T}$$

The test statistic is:

$$z(sr_{ij}) = \frac{\widehat{sr}_{ij}}{\sqrt{\theta}} \sim N(0,1)$$



### 2.4.2 Treynor's Index

To determine whether the Treynor's index values differ significantly among the portfolios' respective values, we perform an equality hypothesis test between two Treynor's index values, where we have  $H_0: tr_{ij} = tr_i - tr_j = 0$ . We use the transformed difference:

$$\widehat{tr}_{ij} = \widehat{tr}_i - \widehat{tr}_j = \frac{m_i s_m^2}{s_{im}} - \frac{m_j s_m^2}{s_{jm}}$$

where  $m_i$  is the mean excess return of portfolio i,  $s_m^2$  is the market variance and  $s_{im}$  is the covariance between portfolio i and the market portfolio, in our case MSCI EM Index.

The asymptotic distribution of the transformed difference is normal with mean equal to  $tr_{ij}$  and variance given by:

$$\begin{aligned} \phi = & \frac{1}{T} [s_i^2 s_{jm}^2 + s_j^2 s_{im}^2 - 2s_{im} s_{jm} s_{ij} + m_i^2 (s_j^2 s_m^2 - s_{jm}^2)] \\ & + \frac{1}{T} [m_j^2 (s_i^2 s_m^2 - s_{im}^2) - 2m_i m_j (s_{ij} s_m^2 - s_{im} s_{jm})] \end{aligned}$$

The test statistic is:

$$z(tr_{ij}) = \frac{\widehat{tr}_{ij}}{\sqrt{\phi}} \sim N(0,1)$$

(Jobson and Korkie, 1981)

### 2.4.3 Jensen's Alpha

The Alpha value of respective portfolio is calculated using the Excel LINEST function. It calculates the statistics using the "least squares" method.

## 3. Results

### 3.1 Descriptive statistics

We start by presenting some descriptive statistics, such as sector allocation, portfolio performance and risk measures.

#### 3.1.1 Sector allocation

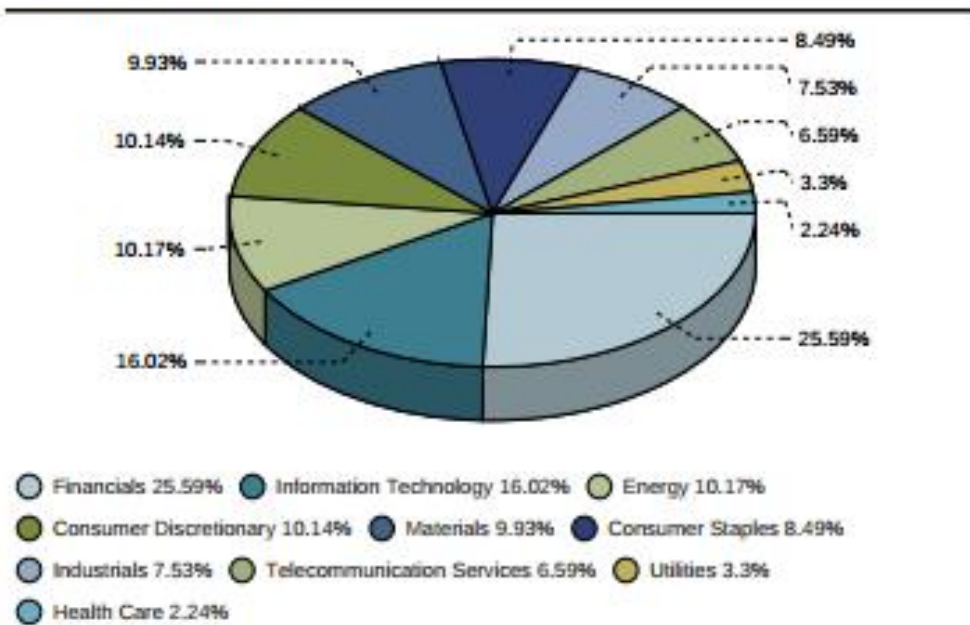
The industry allocation between the MSCI Emerging Markets Index and the portfolios we construct is similar. The charts<sup>15</sup> below show the distribution among 10 industries.

We can see that the sector weights correspond to each other very well, with mostly minor deviations. The “Financials” sector is the dominating in both MSCI EM and the ABC portfolio, representing 25.59 % and 21.75 %, respectively. We find the largest difference between the portfolios in the “(Information) Technology” sector, with weights of 16.02 % and 5.04 %, respectively, and a deviation of approximately 11 percentage points. Health care accounts for the smallest portion with 2.24 % of the total in the MSCI index, while telecom is the smallest in our ABC portfolio, with 2.92 %.

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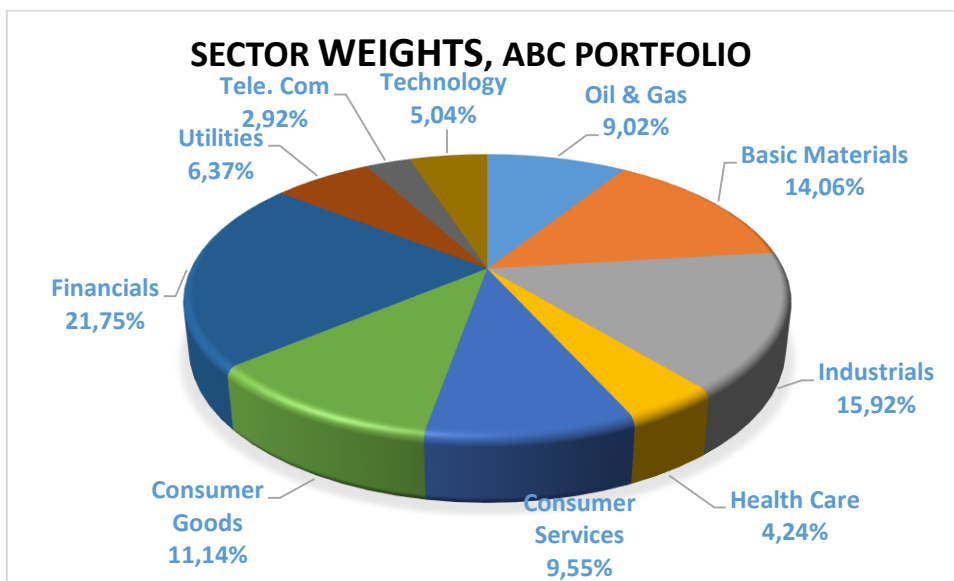
<sup>15</sup> The MSCI EM sectors are classified according to GICS, while the portfolios that we construct are classified according to ICB. By merging Consumer Discretionary and Consumer Staples in the MSCI EM chart we obtain a sector that is equivalent of merged sector in portfolio ABC consisting of subsectors Consumer Goods and Consumer Services. The differences are negligible – for classifications see <http://www.msci.com/products/indices/sector/gics/> & <http://www.icbenchmark.com/>.

Figure 3.1



Source: MSCI.com

Figure 3.2



Similarly, we see that the allocation among sectors between portfolio AB and C correspond well to each other. The “Financials” sector is the dominating in both portfolios, representing 22.84 % and 20.00 %, respectively. The largest observed difference between the portfolios is in the “Basic Materials” sector, with weights of 12.07 % and 17.24 %, respectively, a deviation of approximately 5 percentage points. Worth mentioning is that the sector weights deviate less from each other between AB and C than between MSCI EM and ABC.

Figure 3.3

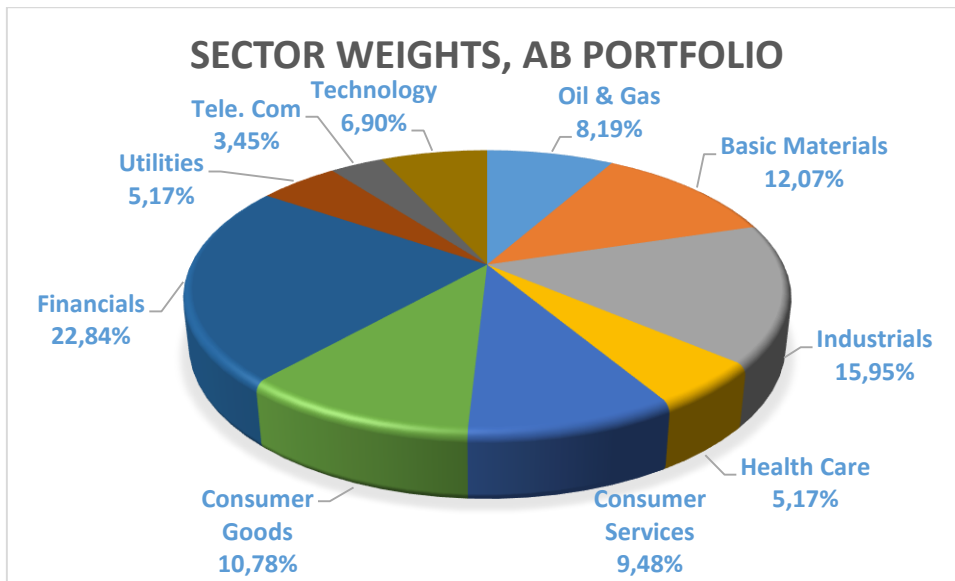
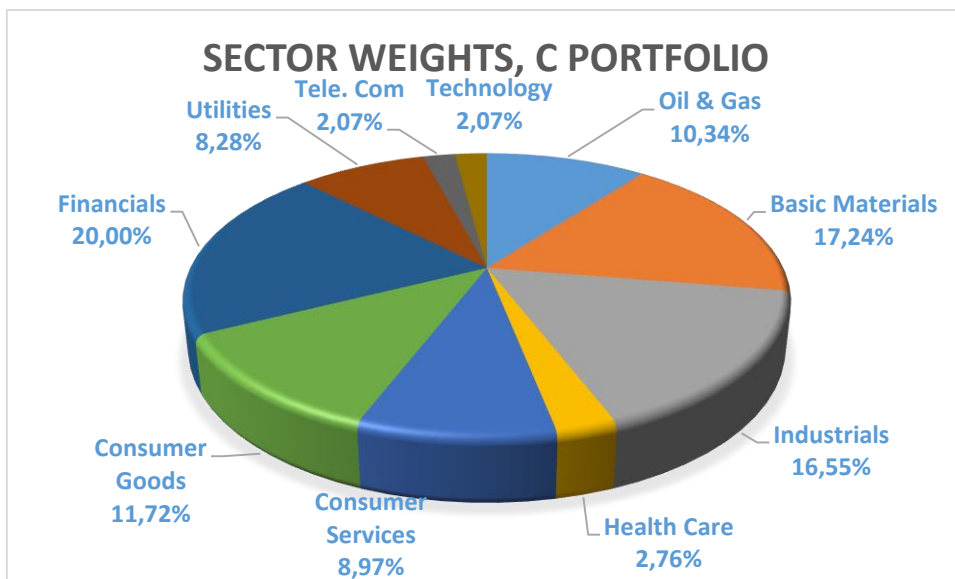


Figure 3.4

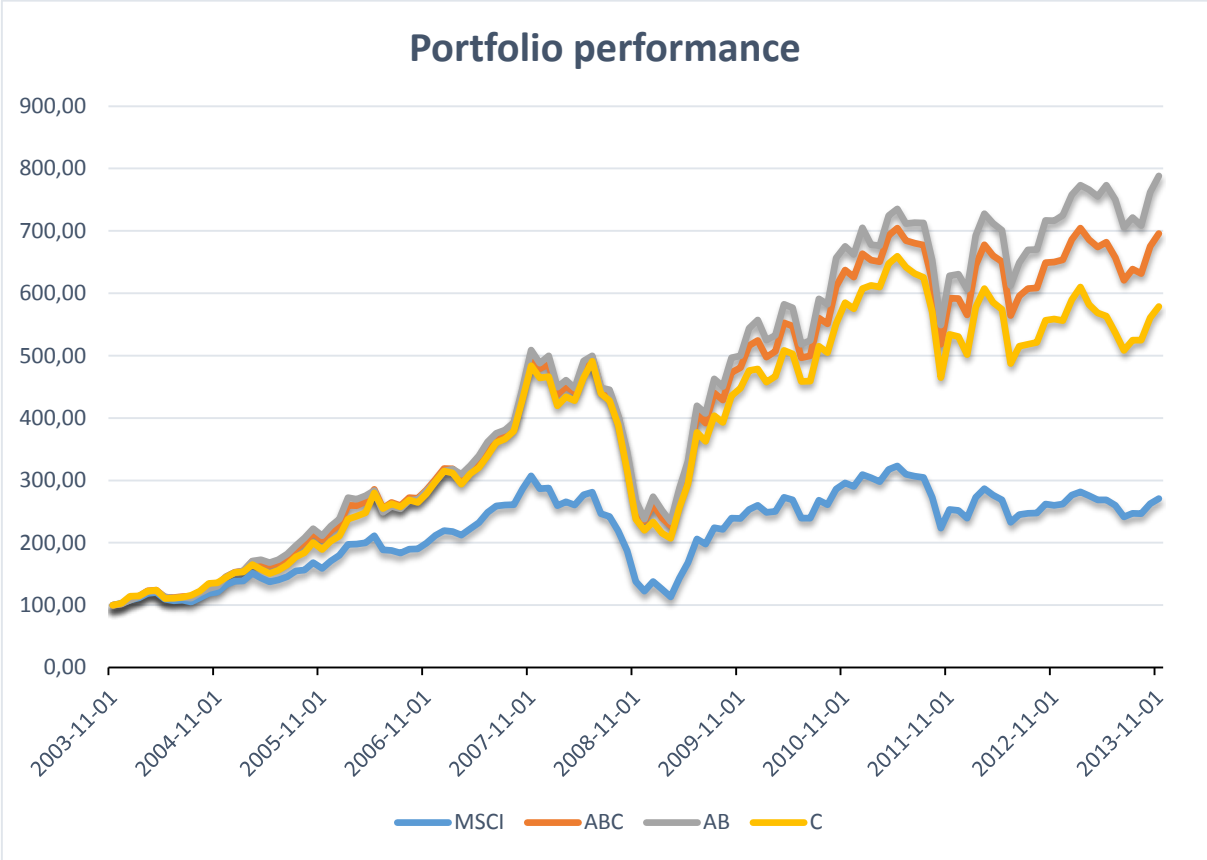


### 3.1.2 Portfolio performance

All of the portfolios we construct outperform the MSCI Emerging Markets IMI Index over the ten year period. The top performer of over the time horizon is the AB portfolio which gained almost 700 % in return. This is equivalent of an annual return of approximately 32 %. The C portfolio exhibits the worst performance of the three constructed portfolios, although beating the MSCI EM convincingly every year over the holding period. Another interesting fact to

point out is that portfolio AB actually outperforms portfolio C on a yearly basis in 7 out of the 10 years (). The time period between 2003-11-01 and 2013-11-01 is particularly interesting because of the eventful characteristics. During this period we experience growth from the inception date up to the beginning of the financial crisis of 2008. The recession lasts for about a year before all of the portfolios start to, fairly quickly, recover and reach levels that are actually higher than before the crisis. Between 2011 and end date, we confirm a growth, although in a more volatile environment than before the crisis<sup>16</sup>.

Figure 3.5



All of the portfolios and MSCI EM behave in a similar way over the holding period, which is confirmed by the correlation matrix. Portfolio AB and C are close to perfectly correlated with the MSCI EM index.

<sup>16</sup> See Table A.1 in Appendix for performance values

Table 3. 1

Correlation 10 years, 2003-12-01 - 2013-11-01			
	MSCI	AB	C
MSCI	1,00		
AB	0,98	1,00	
C	0,96	0,95	1,00

### 3.1.3 Risk measurements

When adjusting for risk we get the following results: The risk measurements indicate the same characteristics as the portfolio performance, i.e. portfolio AB is superior to MSCI EM and the other portfolios. The Sharpe ratios and Treynor's index measurements for portfolio AB consistently show the highest risk-reward. We can also assert that the financial crisis, which occurs during period 2, decreases the Sharpe ratios considerably, and during period 3 still have not recovered to their levels prior to the crisis. The same pattern is evident for the Treynor's index values, however not as aggressively. This is due to the respective risk measure used when computing the values; portfolio risk for Sharpe ratio and Beta value for Treynor's index.

Table 3. 2

Sharpe Ratios				
	10 years	Period 1	Period 2	Period 3
MSCI	0,1493	0,4217	0,0801	0,0806
ABC	0,2591	0,5982	0,1746	0,1647
AB	0,2690	0,5995	0,1809	0,1939
C	0,2309	0,5322	0,1621	0,1208

Table 3. 3

Treynor Index				
	10 years	Period 1	Period 2	Period 3
ABC	0,01970	0,02990	0,01794	0,01059
AB	0,02055	0,03070	0,01858	0,01256
C	0,01790	0,02802	0,01691	0,00784

Jensen's alpha for the portfolios show that portfolio AB has the highest monthly excess return relative MSCI EM, i.e. alpha value, consistently, throughout the 10-year period<sup>17</sup>.

Table 3.4

Jensen's Alpha				
	10 years	Period 1	Period 2	Period 3
ABC	0,0082	0,0096	0,0094	0,0053
AB	0,0092	0,0103	0,0103	0,0072
C	0,0067	0,0081	0,0085	0,0028

The beta coefficients for respective portfolio show that they carry risk levels similar to the systematic risk level. Portfolio C is the only one that exceeds the market volatility.

Table 3.5

Beta coefficients, 2003.11.01 - 2013.11.01		
ABC	AB	C
0,97	0,97	1,03

## 3.2 Statistical testing

### 3.2.1 Sharpe Ratio

It turns out that all Sharpe ratios are significantly different from zero, except for MSCI EM during period 2 and 3<sup>18</sup>. The highest value we receive from portfolio AB, in every period. Moreover, we want to determine whether the respective Sharpe ratio for each period and portfolio differs from one another. From Table 3.5 we deduce that, considering table 3.2,

<sup>17</sup> For all Jensen's Alpha and regression values, see Table A.3 in Appendix

<sup>18</sup> See Table A.2 in Appendix for complete results

portfolio AB consistently shows statistically significant higher risk-reward than portfolio C, hence, higher than MSCI EM as well.

Table 3. 6

<b>Sharpe equality test</b>		
	<b>MSCI - ABC</b>	<b>AB - C</b>
<b>2003-12-01 - 2013-11-01</b>		
<b>Z<sub>obs</sub></b>	5,6773	5,7167
<b>P-value</b>	<0,0001	<0,0001
<b>Significance</b>	***	***
<b>2003-12-01 - 2007-03-01</b>		
<b>Z<sub>obs</sub></b>	3,3183	1,1585
<b>P-value</b>	<0,0001	>0,05
<b>Significance</b>	***	No
<b>2007-04-01 - 2010-07-01</b>		
<b>Z<sub>obs</sub></b>	3,1735	0,5316
<b>P-value</b>	<0,0001	>0,05
<b>Significance</b>	***	No
<b>2010-08-01 - 2013-11-01</b>		
<b>Z<sub>obs</sub></b>	4,3968	1,7791
<b>P-value</b>	<0,0001	>0,05
<b>Significance</b>	***	No

### 3.2.2 Treynor's Index

The Treynor's index values in table 3.3 showed that portfolio AB has the highest value, consistently through the 10 year-period and all of the sub-periods. Testing for equality between the values of portfolio AB and C, we can deduce AB carries a significantly higher value for all periods.



Table 3.7

<b>Treynor equality test AB - C</b>	
<b>2003-12-01 - 2013-11-01</b>	
Z <sub>obs</sub>	4,970720378
P-value	<0,0001
Significance	***
<b>2003-12-01 - 2007-03-01</b>	
Z <sub>obs</sub>	221,9695478
P-value	<0,0001
Significance	***
<b>2007-04-01 - 2010-07-01</b>	
Z <sub>obs</sub>	35,95871722
P-value	<0,0001
Significance	***
<b>2010-08-01 - 2013-11-01</b>	
Z <sub>obs</sub>	440,0017182
P-value	<0,0001
Significance	***

### 3.2.3 Jensen's Alpha

Jensen's alpha value for portfolio AB and portfolio C indicate that portfolio AB has a higher excess return relative the MSCI EM Index, than portfolio C's respective excess return.

Table 3.8

<b>Jensen's alpha, 2003-12-01 - 2013-11-01</b>			
<b>MSCI - AB</b>			
Beta	0,979641	0,009222	Alpha
SE(Beta)	0,02002	0,001509	SE(Alpha)
R <sup>2</sup>	0,953033	0,016353	se(y)
F	2394,377	118	Df
SS Reg	0,64028	0,031554	SS Resid
<b>MSCI - C</b>			
Beta	0,987069	0,006682	Alpha
SE(Beta)	0,025912	0,001954	SE(Alpha)
R <sup>2</sup>	0,924796	0,021165	se(y)
F	1451,073	118	Df
SS Reg	0,650026	0,05286	SS Resid

## 4. Analysis

Given the premises that the companies we analyze exhibited the same financial characteristics when analyzed by Nordea Investment Management, the sector similarity among the portfolios and the identical portfolio construction, we obtain two highly comparable financial assets – if we consider the portfolios (AB and C) as equity funds, for example.

The correlation coefficients between portfolio AB and C are high (0.95)<sup>19</sup>, which means that they are nearly perfectly correlated. We accomplish this because of the fact that our portfolios are relatively large and, thus, well diversified. Usually, an investor can presume that the vast majority of the non-systematic risk is diversified away when including at least 30 constituents in a portfolio (in our portfolios we use 237 and 151 for portfolios AB and C, respectively). However, the correlation coefficient does not tell us *how much* the stock prices move in the same direction.

From the fact that the portfolios react in almost the same way to changes in macro-economic fundamentals (high correlation), we obtain an even greater level of conviction that the financial foundations for the two portfolios are at par, and thus there must be something else that is differentiating the portfolios, which generates the superior returns for portfolio AB.

We also recognize that there are other factors that contribute to portfolio performance. One of these factors could be the size of a company. If a small company is successful, this generally means higher returns in the first phases of its lifetime, until the market eventually recognizes its true value. Since we have not done the financial analysis of each company we cannot assert these types of issues given the time span and the limits of this thesis. Although, given the character of the companies we analyze, we see that the vast majority of them are large multinational companies. Taking this into account we argue that we have succeeded further in isolating the financial conditions of the portfolios, making the portfolios as similar as possible. Similarly, we apply the same approach to other variables that might affect characteristics of firms and affect the long term performance. In short, we argue that by having the amounts of companies (237 in portfolio AB and 151 in portfolio C) in respective portfolio, we diversify away such biases. The substantial differences between the return of the

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<sup>19</sup> See table 3.1

portfolios and the return of the MSCI EM index indicate that CAPM does not seem to apply in this case. Otherwise, we would have obtained similar returns for the portfolios and the benchmark, since beta values close to 1 mean that almost all non-systematic risk is diversified away. Thus, we assume for further analysis that the overwhelming difference between the portfolios is the CSR factor.

Considering that the majority of our companies have some dependence (which all companies, in fact, have) on brand management and image building it is safe to say that CSR engagement could explain some of the difference in performance. This is also supported by Eccles, Ioannou and Serafeim in 2013, when concluding that *High Sustainability* companies outperform *Low Sustainability* companies in industries where brand management is important. Our study shows the same pattern, where the ESG-approved portfolio outperforms the non-approved ESG-portfolio.

The Treynor's index that shows the risk adjusted return is higher for portfolio AB than C, which is in line with the conclusions of Oikonomou et al. (2012) about systematic risk. During the sub-period between 2007.04.01 – 2010.08.01, i.e. the period of the financial crisis, the Treynor's index and relative performance is superior for portfolio AB than that of portfolio C. Thereby it is legitimate to say that the observations of Koskinen et al. (2013) regarding the impacts from economic shocks are less hard on companies that are CSR engaged.

The Sharpe ratios in Table 3.2 show that portfolio AB has a greater risk-reward the entire 10-year period, including every sub-period, than the MSCI EM index and the other portfolios. An interesting fact to point out, though, is that all portfolios and the MSCI EM index have substantially higher Sharpe ratio for period 1 than for period 2 and 3. If we take a look at Figure 3.5, which shows the returns over the 10-year period, we see that all portfolios and the MSCI EM index experience growth from inception date up to mid-2008, when the financial crisis occurs. The crisis causes a significant recession that affects all constituents, but at the end of 2009, the levels are back to about the same as just before the crisis. The recovery then turns into growth, and at the end date in November 2013 we see that all portfolios have risen to levels above those before the crisis, the MSCI EM index being at about the same as pre-crisis. We conclude through Figure 3.5 that it is only after the financial crisis that the portfolios really start to grow apart from each other, being rather similar as of before mid-

2008. Portfolio AB really starts to grow apart from portfolio C at the end of 2009, ending at an index-value of approximately 800 and 600, respectively. The Sharpe ratio values for period 3 are noteworthy because of the considerably lower levels than those of period 1, this being despite the evident recovery made by both portfolios, as shown by the returns, ending in 2013 at index levels well above those at the end of period 1. This means that the risk-reward for period 1 is much greater than for period 3, despite the all-time high levels shown in Figure 3.5, possibly indicating a more volatile environment.

When we consider the risk-adjusted return measures such as the Sharpe ratio and Treynor's index, where portfolio AB is statistically superior to portfolio C in most cases during the whole 10 year period, we conclude that this could be attributed to the different levels of CSR engagement between the portfolios. As stated earlier in the introduction, companies that are CSR-orientated respond better to comprehensive economic shocks and are thus less risky.

Jensen's alpha for portfolio AB is also higher than for portfolio C, which is in line with the discussion above. The most significant difference between the portfolios is observed during period 3, after the financial crisis, with 0,072 % for portfolio AB and 0,028 % for portfolio C. However, portfolio AB beats portfolio C every period, including the 10-year period. This means that excess return over the market is higher for portfolio AB. Again, we attribute this result to the level of CSR engagement exercised by respective portfolio.

## 5. Conclusions and further studies

In summary, we establish that the results of this study tell us that the level of CSR engagement exercised by a portfolio can, in fact, affect its performance on the stock market. Higher level of engagement in CSR activities correlates positively with higher return and risk-reward. The emerging markets have shown aggressive recovery after the financial crisis, and the fact that the group of companies with higher levels of CSR engagement outperform the ones that do not focus on CSR as much, is an indicator that CSR really does affect the performance of a company and this is a justification when we derive the superior performance, to some extent, to CSR variables.

Our standpoint, that CSR is actually something that contribute to performance, can be opposed considering that we have not been able quantify the magnitude of the CSR-effects to portfolio performance. However, this is an assignment outside the scope of our thesis. The discussion and results above are enough to stipulate a CSR dependence on performance, although the “how much”- aspect remains somewhat unanswered.

Further extending this study in the future, it would be interesting to examine whether similar results can be found when investing in the global market, instead of focusing on emerging markets. A possible bias in our study may occur, since the focus on emerging markets may not show exactly the same characteristics as the entire global market; emerging markets is per definition markets that show some of the characteristics of a developed market, but not all of them.

Another dimension that would be interesting, is to quantify the CSR-effect on portfolio performance. This is something that has been tried but not generated any successful output. One way to do this would possibly be to quantify the material that is reported on, based on the reporting mechanisms provided by different institutions, such as the ones presented in this thesis. The results could be set in relation between different companies to see to what extent a company is involved with CSR. This could then be set in relation to company performance, something like the Treynor’s index and Sharpe ratio.

## Appendix

Table A.1

Annual portfolio performance 2003.11.01 - 2013.11.01				
Date	MSCI	ABC	AB	C
2005-01-01	29,52%	40,34%	42,71%	34,71%
2006-01-01	33,63%	54,30%	60,85%	42,49%
2007-01-01	27,53%	45,31%	38,27%	56,07%
2008-01-01	36,22%	58,24%	64,67%	53,70%
2009-01-01	-51,54%	-45,69%	-44,61%	-49,44%
2010-01-01	88,38%	100,85%	103,50%	105,18%
2011-01-01	19,10%	26,68%	26,66%	27,07%
2012-01-01	-22,46%	-14,77%	-13,99%	-17,40%
2013-01-01	15,49%	21,41%	25,04%	17,58%
2013-11-01	-2,11%	1,44%	4,07%	-1,83%

Table A.2

Variables	MSCI	ABC	AB	CM
<b>Sharpe test 10 years, 2003-12-01 - 2013-11-01</b>				
Var	0,0084	0,0086	0,0086	0,0086
Z <sub>obs</sub>	17,8187	30,5843	31,7136	27,3464
P-value	<0,00005	<0,00005	<0,00005	<0,00005
Significance	***	***	***	***
<b>Sharpe test 40 months, 2003-11-01 - 2007-03-01</b>				
Var	0,0272	0,0295	0,0295	0,0285
Z <sub>obs</sub>	16,1656	22,0366	22,0767	19,9225
P-value	<0,00005	<0,00005	<0,00005	<0,00005
Significance	***	***	***	***
<b>Sharpe test 40 months, 2007-04-01 - 2010-07-01</b>				
Var	0,0251	0,0254	0,0254	0,0253
Z <sub>obs</sub>	3,1987	6,9322	7,1780	6,4407
P-value	>0,05	<0,00005	<0,00005	<0,0005
Significance		***	***	***
<b>Sharpe test 40 months, 2010-08-01 - 2013-11-01</b>				
Var	0,0251	0,0253	0,0255	0,0252
Z <sub>obs</sub>	3,2202	6,5426	7,6823	4,8164
P-value	>0,05	<0,00005	<0,00005	<0,01
Significance		***	***	***

\*P-values are displayed as percentages

Table A. 3

Jensen's alpha, 2003-12-01 - 2007-03-01				Jensen's alpha 2007-04-01 - 2010-07-01				Jensen's alpha, 2010-08-01 - 2013-11-01			
MSCI - AB				MSCI - AB				MSCI - AB			
Beta	0,974728	0,010269	Alpha	Beta	0,981674	0,010309	Alpha	Beta	0,973066228	0,007205	Alpha
SE(Beta)	0,060683	0,00314873	SE(Alpha)	SE(Beta)	0,030503	0,003087	SE(Alpha)	SE(Beta)	0,025691419	0,001649	SE(Alpha)
R <sup>2</sup>	0,871627	0,01834934	se(y)	R <sup>2</sup>	0,964609	0,019461	se(y)	R <sup>2</sup>	0,974194016	0,010393	se(y)
F	258,0117	38	Df	F	1035,713	38	Df	F	1434,526671	38	Df
SS Reg	0,086872	0,01279453	SS Resid	SS Reg	0,392255	0,014392	SS Resid	SS Reg	0,154937862	0,004104	SS Resid
MSCI - C				MSCI - C				MSCI - C			
Beta	1,026335	0,00806491	Alpha	Beta	0,957348	0,008451	Alpha	Beta	1,029993529	0,002758	Alpha
SE(Beta)	0,076827	0,00398647	SE(Alpha)	SE(Beta)	0,040941	0,004143	SE(Alpha)	SE(Beta)	0,027761701	0,001781	SE(Alpha)
R <sup>2</sup>	0,82445	0,02323126	se(y)	R <sup>2</sup>	0,93502	0,02612	se(y)	R <sup>2</sup>	0,973135422	0,01123	se(y)
F	178,4621	38	Df	F	546,792	38	Df	F	1376,502031	38	Df
SS Reg	0,096314	0,02050828	SS Resid	SS Reg	0,373055	0,025926	SS Resid	SS Reg	0,173596815	0,004792	SS Resid

Table A.4

Company List 1/3		
TULLOW OIL PLC	ORASCOM CONSTRUCTION INDS	PBG SA
ANGLOGOLD ASHANTI LTD	ORASCOM TELECOM HOLDING	ALLIANCE OIL CO
AVENG LTD	ANGLO AMERICAN PLC	EURASIA DRILLIN-GDR REGS
RandGold resources	ABSA GROUP LTD	LUKOIL OAO-CLS
SASOL LTD	AFRICAN RAINBOW MINERALS LTD	NOVATEK OAO-SPONS GDR REG S
3SBIO INC-ADR	ANGLO PLATINUM LTD	Phosagro
ALIBABA.COM LTD	ASPEN PHARMACARE HOLDINGS LT	SBERBANK-CLS
ANGANG STEEL CO LTD-H	CLICKS GROUP LTD	TATNEFT-CLS
ANTA SPORTS PRODUCTS LTD	DISCOVERY HOLDINGS LTD	AKBANK T.A.S.
ASIAN CITRUS HOLDINGS LTD	FIRSTRAND LTD	COCA-COLA ICECEK AS
BAIDU INC - SPON ADR	GOLD FIELDS LTD	ENKA INSAAT VE SANAYI AS
BANK OF CHINA LTD-H	IMPALA PLATINUM HOLDINGS LTD	TAV HAVALIMANLARI HOLDING AS
BOSIDENG INTL HLDGS LTD	IMPERIAL HOLDINGS	TURKIYE HALK BANKASI
CC LAND	KUMBA IRON ORE LTD	YAPI VE KREDI BANKASI
CHINA BLUECHEMICAL LTD - H	MTN GROUP LTD	ALL AMERICA LATINA LOGISTICA
CHINA COAL ENERGY CO-H	NASPERS LTD-N SHS	AMIL PARTICIPACOES SA
CHINA COMMUNICATIONS CONST-H	PSG GROUP HOLDINGS	ANHANGUERA EDUCACIONAL PART
CHINA CONSTRUCTION BANK-H	REUNERT LTD	B2W COM GLOBAL DO VAREJO
CHINA DONGXIANG GROUP CO	SANLAM LTD	BANCO BRADESCO SA-PREF
CHINA HIGH SPEED TRANSMISSIO	STANDARD BANK GROUP LTD	BANCO SANTANDER (BRASIL) SA
CHINA LILANG LTD	THE FOSCHINI GROUP LTD	BANCO SANTANDER BRASIL-ADS
CHINA MENGNIU DAIRY CO	WOOLWORTHS HOLDINGS	BM&FBOVESPA SA
CHINA MODERN DAIRY HOLDINGS	AAC Technology Holdings	BR MALLS PARTICIPACOES SA
CHINA OVERSEAS LAND & INVEST	ALUMINUM CORP OF CHINA LTD-H	BR PROPERTIES SA
CHINA PETROLEUM & CHEMICAL-H	ASIAINFO HOLDINGS INC	CIA BRASILEIRA DE DIS-SP PRF
CHINA RESOURCES ENTERPRISE	ASM PACIFIC TECHNOLOGY	CIA DE BEBIDAS DAS AME-PREF
CHINA RESOURCES POWER HOLDIN	BEIJING ENTERPRISES HLDGS	CIA ENERGETICA DE SP-PREF B
CHINA SHENHUA ENERGY CO - H	BYD CO LTD-H	CIA ENERGETICA MINAS GER-PRF
CHINA TAIPING INSURANCE HOLD	CHINA AGRI-INDUSTRIES HLDGS	CIA HERING
CHINA UNICOM HONG KONG LTD	CHINA MERCHANTS BANK-H	CIA SANEAMENTO BASICO DE SP
CNOOC LTD	CHINA MINSHENG BANKING-H	CIA SIDERURGICA NACIONAL SA
DATANG INTL POWER GEN CO-H	CHINA MOBILE LTD	CPFL ENERGIA SA
DONGFANG ELECTRIC CORP LTD-H	CTRIIP.COM INTERNATIONAL-ADR	DIAGNOSTICOS DA AMERICA SA
EVERGRANDE REAL ESTATE GROUP	DENWAY MOTORS LTD	DROGASIL SA
HUABAO INTERNATIONAL HOLDING	E-HOUSE CHINA HOLDINGS-ADS	PT Surya Citra Media
KWG PROPERTY HOLDING LTD	ENN ENERGY HOLDINGS LTD	Ayala Corp
LI NING CO LTD	FRANSHION PROPERTIES	Grupo Televisa
PETROCHINA CO LTD-H	GREEN DRAGON GAS LTD	NATURA COSMETICOS SA
POLY HONG KONG INVESTMENTS	GUANGDONG INVESTMENT LTD	NET SERVICOS DE COMUNI-PREF
REXLOT HOLDINGS LTD	HANG LUNG PROPERTIES LTD	OGX PETROLEO E GAS PARTICIPA
RUINIAN INTERNATIONAL LTD	HOLLYSYS AUTOMATION TECHNOLO	PETROBRAS - PETROLEO BRAS
SHANGHAI ELECTRIC GRP CO L-H	HYSAN DEVELOPMENT CO	PETROBRAS - PETROLEO BRAS-PR
SHANGHAI INDUSTRIAL HLDG LTD	IND & COMM BK OF CHINA-H	TELECOMUNICACOES DE SAO-PREF
SHIMAO PROPERTY HOLDINGS LTD	KUNLUN ENERGY CO LTD	TIM PARTICIPACOES SA-PREF
SINOTRUK HONG KONG LTD	LEE & MAN PAPER MANUFACTURIN	EMPRESA NACIONAL DE ELECTRIC
SJM HOLDINGS LTD	LONGFOR PROPERTIES	SOC QUIMICA Y MINERA CHILE-B
SOHO CHINA LTD	LONGTOP FINANCIAL-SPON ADR	ALFA S.A.B.-A
THE UNITED LABORATORIES INTE	MINDRAY MEDICAL INTL LTD-ADR	ALSEA SA
WYNN MACAU LTD	NEW ORIENTAL EDUCATIO-SP ADR	BANCO COMPARTAMOS SA
YANLORD LAND GROUP LTD	NINE DRAGONS PAPER HOLDINGS	Banorte



Table A.5

Company List 2/3		
YANZHOU COAL MINING CO-H	PING AN INSURANCE GROUP CO-H	GENOMMA LAB INTERNACIONAL-B
ADANI ENTERPRISES LTD	SHANDONG WEIGAO GP MEDICAL-H	GRUPO MODELO S.A.B.-SER C
AXIS BANK LTD	SINA	ANTOFAGASTA PLC
DR. REDDY'S LABORATORIES	SINFERT HOLDINGS LTD	Banco de Credito del Peru
IRB INFRASTRUCTURE DEVELOPER	SINOPHARM GROUP CO-H	Credicorp
IVRCL INFRASTRUCTURES & PROJ	SINOVAC BIOTECH LTD	HIKMA PHARMACEUTICALS PLC
JET AIRWAYS INDIA LTD	SUN HUNG KAI PROPERTIES	SAUDI BASIC INDUSTRIES CORP
MUNDRA PORT AND SEZ LTD	TENCENT HOLDINGS LTD	Emlak konut GYO
LARSEN & TOURBO	TINGYI (CAYMAN ISLN) HLDG CO	Talwalkers Better Value Fitness
NTPC LTD	TRINA SOLAR LTD-SPON ADR	Tower Bersama Infrastructure
OIL & NATURAL GAS CORP LTD	WANT WANT CHINA HOLDINGS LTD	LLX
PUNJAB NATIONAL BANK	WHARF HOLDINGS LTD	Qihoo
RELIANCE INDUSTRIES LTD	XINGDA INT'L HOLDINGS	AIA
TATA TEA LTD	YINGDE GASES	China Everbright
TITAN INDUSTRIES LTD	ZHUZHOU CSR TIMES ELECTRIC-H	Urbi Desarrollos Urbanos
UNITECH LTD	CHINA MEDICAL SYSTEMS HOLDING	OTP
UNITED SPIRITS LTD	ZTE	Beijing Enterprises Water group
ADARO ENERGY TBK PT	ABB LTD	Desarrolladora Homex SAB
INDOFOOD SUKSES MAKMUR TBK P	BHARAT HEAVY ELECTRICALS	Minor International
Perusahaan Gas Negara	BHARTI AIRTEL LTD	Advanced Info Services
TAMBANG BATUBARA BUKIT ASAM	BLUE STAR LTD	Jaya Real
UNITED TRACTORS TBK PT	CAIRN INDIA LTD	Universal Robina
GS ENGINEERING & CONSTRUCT	CROMPTON GREAVES LTD	PT Media Nusantara
HYUNDAI ENGINEERING & CONST	DABUR INDIA LTD	Giant Manufacturing
HYUNDAI MOTOR CO	DISH TV INDIA LTD	EQUINOX MINERALS LTD-CDI
LS CORP	DLF LTD	LYNAS CORP LTD
SAMSUNG ENGINEERING CO LTD	EDUCOMP SOLUTIONS LTD	NewCrest
SEOBU TRUCK TERMINAL CO LTD	GAIL INDIA LTD	OIL SEARCH LTD
SHINHAN FINANCIAL GROUP LTD	Hero motor	PANAUST LTD
CIMB GROUP HOLDINGS BHD	HINDUSTAN UNILEVER LTD	SM INVESTMENTS CORP
SIME DARBY BERHAD	HOUSING DEVELOPMENT & INFRAS	ACER INC
TENAGA NASIONAL BHD	HOUSING DEVELOPMENT FINANCE	ADVANCED SEMICONDUCTOR ENGR
NOBLE GROUP LTD	ICICI BANK LTD	ASUSTEK COMPUTER
SOUTHGOBI RESOURCES LTD	INFO EDGE INDIA LTD	CHINA STEEL CORP
ALLIANCE GLOBAL GROUP INC	INFOSYS TECHNOLOGIES LTD	CHROMA ATE INC
CATHAY FINANCIAL HOLDING CO	ITC LTD	CHUNGHWA TELECOM CO LTD
CHINATRUST	JAIN IRRIGATION SYSTEMS LTD	DELTA ELECTRONICS INC
FAR EASTERN NEW CENTURY CORP	JINDAL STEEL & POWER LTD	FUBON FINANCIAL HOLDING CO
FORMOSA CHEMICALS & FIBRE	JSW STEEL LTD	LARGAN PRECISION CO LTD
FORMOSA PETROCHEMICAL CORP	LANCO INFRATECH LTD	MEDIATEK INC
FORMOSA PLASTICS CORP	LUPIN LTD	TAIWAN GLASS IND CORP
HON HAI PRECISION INDUSTRY	MAHINDRA & MAHINDRA	TAIWAN SEMICONDUCTOR MANUFAC
HTC CORP	MAHINDRA & MAHINDRA FIN SECS	UNIMICRON TECHNOLOGY CORP
NAN YA PLASTICS CORP	ONMOBILE GLOBAL LTD	BANGKOK BANK PUBLIC CO LTD
CP AII	PANTALOON RETAIL INDIA LTD	KASIKORNBANK PCL
PTT PCL	PETRONET LNG LTD	PTT EXPLOR & PROD PUBLIC CO
SIAM COMMERCIAL BANK PUB CO	Phoenix Mills	SIAM CEMENT PUBLIC CO LTD
CEZ AS	SHRIRAM TRANSPORT FINANCE	RANDON PARTICIPACOES SA-PREF
PKO BANK POLSKI SA	SIEMENS INDIA LTD	SLC AGRICOLA SA
FEDERAL GRID CO UNIFIED-CLS	Sobha Developers	VALE SA

Table A.6

Company List 3/3		
FEDERAL HYDROGENERATING CO	STATE BANK OF INDIA	VALE SA-PREF A
GAZPROM OAO-MSE	SUN PHARMACEUTICAL INDUS	VIVO PARTICIPACOES SA-PREF
INTEGRA GROUP HOLD-REG S GDR	SUZLON ENERGY LTD	ENERSIS SA
KAZAKHMYS PLC	TATA MOTORS LTD	ECOPETROL SA
MAGNIT-CLS	Tata Steel	CEMEX SAB-CPO
MECHEL-CLS	UNITED PHOSPHORUS LTD	COCA-COLA FEMSA SAB-SP ADR
MMC NORILSK NICKEL-CLS	ZEE Entertainment	CONSORCIO ARA S.A.B.
MOBILE TELESYSTEMS-SP ADR	ASTRA INTERNATIONAL TBK PT	GRUPO MEXICO SAB DE CV-SER B
O'KEY GROUP-GDR REGS	BANK MANDIRI TBK	WALMART DE MEXICO-SER V
PHARMSTANDARD-REG S GDR	BANK RAKYAT INDONESIA PERSER	CIA DE MINAS BUENAVENTUR-ADR
POLYUS GOLD-CLS	INDOCEMENT TUNGGAL PRAKARSA	Comba Telecom Systems
ROSNEFT OIL COMPANY-STD	KALBE FARMA PT	CITIC SECURITIES CO LTD.
SEVERSTAL-CLS	MITRA ADIPERKASA	Wuxi
SURGUTNEFTEGAS-CLS	TELEKOMUNIKASI INDONESIA TBK	Jardine Strategic
TNK-BP HOLDING-CLS	DOOSAN HEAVY INDUSTRIES	FIBRIA CELULOSE SA
URALKALI-CLS	DOOSAN INFRACORE CO LTD	ITAU UNIBANCO HOLDING SA
VTB BANK OJSC	HYUNDAI HEAVY INDUSTRIES	ITAUSA-INVESTIMENTOS ITAU-PR
X 5 RETAIL GROUP NV-REGS GDR	HYUNDAI MOBIS	LOCALIZA RENT A CAR
BIM BIRLESIK MAGAZALAR AS	KB FINANCIAL GROUP INC	LOJAS RENNER S.A.
TEKFEN HOLDING AS	KOREA ELECTRIC POWER CORP	MULTIPLAN EMPREENDIMENTOS
TURKCELL ILETISIM HIZMET AS	KOREA PLANT SERVICE & ENG	EMPRESA BRAS DE AERONAUTICA
TURKIYE GARANTI BANKASI	LG CHEM LTD	GERDAU SA-PREF
TURKIYE IS BANKASI-C	LG CORP	HYPERMARCAS SA
BANCO DO BRASIL SA	LG DISPLAY CO LTD	LOJAS AMERICANAS SA-PREF
CENTRAIS ELETRICAS BRASILIER	LG ELECTRONICS INC	PDG Realty
CENTRAIS ELETRICAS BRAS-PR B	POSCO	PORTO SEGURO SA
COSAN SA INDUSTRIA COMERCIO	SAMSUNG ELECTRONICS CO LTD	S-OIL CORPORATION
CYRELA BRAZIL REALTY SA EMP	SAMSUNG FIRE & MARINE INS	GAMUDA BHD
SK ENERGY CO LTD	SAMSUNG HEAVY INDUSTRIES	
MMC CORP BHD	IJM CORP BHD	

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