

Under the CSR umbrella – The effect of CSR performance and Human capital commitments on Corporate financial performance

A study of the Swedish market

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ABSTRACT

This study looks at the effect of corporate social responsibility (CSR) performance and human capital commitments on corporate financial performance for Swedish corporations between 2002 and 2015. While the general effect of CSR performance on corporate financial performance is well studied around the world, this study deep-dives into one factor under the CSR umbrella, human capital, which till this day is a sub-section of CSR that we know little about. A number of portfolios are constructed by ranking a selection of stocks on the Nasdaq Stockholm exchange based on their performance on scores related to CSR and human capital commitments. The returns of these portfolios are evaluated against the Carhart four-factor model and the portfolio analysis is complemented with an analysis of the return on equity and Tobin's Q of the firms included in the portfolios. Our overall findings indicate that there is no significant relationship between CSR performance/human capital commitments and corporate financial performance on the Swedish market. One exception is found when considering human capital commitments relating to training and development initiatives taken by firms in Sweden, where our findings indicate a negative relationship with long-run stock returns over the 14-year period considered in this study.

KEYWORDS: CSR, Human Capital, Corporate Financial Performance, Carhart four-factor model

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1. Introduction

The responsibility of a corporation towards stakeholders other than shareholders is a topic that for decades has divided the academic literature. Well renowned economist Milton Friedman (1970) argued that “There is one and only one social responsibility of business - to use its resources (...) to increase its profits (...)”. Friedman’s stand is rooted in a belief that human behaviour is driven by the maximization of self-interest, a theory that has seen increased resistance in later years. Economic theories of social norms brought forward by e.g. Romer (1984) and Akerlof (1980) show that disobeying social norms can be financially costly if it results in a loss of reputation. These considerations are all of importance when attempting to understand the effects of extending the responsibility of a corporation, to a degree beyond solely maximizing shareholder value.

This extended responsibility, today more widely known as corporate social responsibility (CSR), is an umbrella term capturing considerations towards everything from the environment to employee relations, also known as human capital commitments. To screen companies based on their CSR performance is a common phenomenon for investors world-wide, and the Swedish market is no exception. Research shows that one out of four investors on the Swedish market are invested in funds that screen companies’ CSR performance (Nordström, 2018). The supply of such funds is also substantial in Sweden, where 37% of the Swedish funds within the premium pension system are ethical funds, which screen companies CSR performance, compared to only 9% for non-Swedish funds in the system (Swesif, 2015).

While the general effect of CSR performance on corporate financial performance is well studied by renowned academics all around the world, the human capital specific aspects of CSR is till this day a sub-section of CSR that we know little about. Whether a corporation’s commitments towards its human capital is harmful or beneficial for firm value is a question worth asking, and there is today a great amount of theories addressing the effect of investing in human capital, though with predictions in stark contrast to each other.

1.1 The Study

This study looks at the effect of CSR performance and human capital commitments on corporate financial performance for Swedish corporations. The study is conducted over the 14-year period between 2002 and 2015. Our contributions are twofold. Firstly, by studying the relationship between CSR performance and corporate financial performance, we contribute to the broader array of research primarily conducted in the United States, though by looking at the Swedish market. Our findings can thus be compared to the previous findings in order to identify

differences and similarities between the effects found. Secondly, this study deep-dives into one factor under the CSR umbrella, human capital, in order to look at the relationship between a firm's commitments towards its human capital and corporate financial performance. Few previous studies have considered the human capital specific aspects of CSR, yet existing theories are in stark contrast to each other regarding the appropriate level of commitment towards a firm's human capital to maximize shareholder value.

When assessing corporate financial performance, this thesis will look at long-run stock returns, return on equity (ROE) and Tobin's Q. The purpose of this thesis is firstly to construct a number of stock portfolios based on CSR and human capital specific performance. Using Thomson Reuters Asset 4 database, we obtain scores on Swedish corporations' CSR performance and human capital commitments. Previous studies have shown that the Asset 4 database is a valuable stock selection factor, representing an overall measure of the quality of a company's business practices (Ribando and Bonne, 2010). There is one CSR specific score, based on which "CSR portfolios" will be constructed. For human capital commitments, there are two scores which will create "Employment Quality portfolios" and "Training/Development portfolios". From these three main portfolios, different versions of the respective portfolios will be created based on two different criteria and two different weighting schemes. The returns on these portfolios are evaluated against the Carhart four-factor model to determine if the portfolios realize any return different from the expected return. Portfolios are constructed January 1 every year, based on CSR performance and human capital commitment scores for the previous year, resulting in an ex-ante study.

Furthermore, we also analyse the ROE and Tobin's Q for all firms included in the above-mentioned portfolios by regressing these measures against CSR performance and human capital commitment scores on a firm-by-firm basis. To complement our stock return analysis with these measures is motivated with our aim to compare our results with previous studies which are conducted based on long-run stock returns as well as ROE and Tobin's Q. These regressions are also conducted ex-ante, in order to ensure that causality goes from CSR and human capital commitment scores to corporate financial performance and not vice versa.

1.2 Corporate Social Responsibility

In line with Servaes and Tamayo (2013), we rely on the definition of CSR by the World Business Council for Sustainable Development proposing that "CSR is the commitment of a business to contribute to sustainable economic development, working with employees, their

families, the local community and society at large to improve their quality of life” (WBCSD, 2004). This broad definition of CSR captures the width of the CSR umbrella, communicating the many different topics that fall under it. One of these topics is that of employee relations, which in this thesis is more broadly named “human capital commitments”, see subsection 1.3 *Human capital commitments* for a clarification.

Furthermore, while the purpose of this thesis is to assess if there is any relationship between CSR performance/human capital commitments and corporate financial performance, the portfolio construction conducted in this thesis is an investment strategy for individual investors that is closely related to the definition of socially responsible investing (SRI). The Forum for Sustainable and Responsible Investment define SRI as follows: “Sustainable, responsible and impact investing (SRI) is an investment discipline that considers environmental, social and corporate governance (ESG) criteria to generate long-term competitive financial returns and positive societal impact” (USSIF, 2018). The definition of SRI is closely connected to that of CSR, though from an investor’s perspective, rather than the perspective of a specific firm. Thus, this thesis provides insights for potential SRI strategies based on CSR performance or human capital commitments.

1.3 Human capital commitments

Human capital is one of the many factors that fall under the CSR umbrella described above. The term human capital commitments broadly refers to a corporation’s commitments toward providing high-quality employment benefits and job conditions and its effectiveness toward providing training and development for its workforce. Thomson Reuters provide two human capital specific scores, which together give an overall assessment of the human capital commitments of a corporation. The two scores are named “Employment Quality” and “Training/Development” and exact definitions of the respective scores are presented under section 4.3.1 *CSR and Human capital data*.

With regards to the reasons for studying human capital commitments, different theories yield fundamentally different predictions as to whether investments into the human capital of the firm increases or decreases shareholder value, see subsection 2.2 *Human capital and corporate financial performance* for an elaboration. There is not a lot of research on this specific sub-section of CSR in general, and there is, to the best of our knowledge, no previous study looking at the effect of human capital commitments on corporate financial performance in Sweden.

1.4 Corporate financial performance

In this thesis, the term corporate financial performance refers to both market- and accounting-based measures of performance, namely long-run stock returns, ROE and Tobin's Q. The previous literature considering the effect of CSR performance and human capital commitments on corporate financial performance has considered a variety of financial performance measures which have either been market-based measures such as long-run stock returns or accounting-based measures such as ROE (Ullman, 1985). While accounting-based measures such as ROE consider contemporaneous performance, market-based measures capture investors' expectations of a firm's future profitability. With this in mind, we consider the corporate financial performance measures used in this thesis, long-run stock returns, ROE and Tobin's Q to be complements rather than substitutes. These together allow us to get a broad understanding of the relationship between CSR performance/human capital commitments and corporate financial performance on the Swedish market.

1.5 Outline of thesis

The remainder of this thesis is organised as follows. Section two covers previous research on the effect of CSR performance on corporate financial performance, and of human capital commitments on corporate financial performance. In section three we develop the main hypothesis that we test and in section four we cover the methodology of this thesis and present summary statistics of our data. In section five, we present our empirical findings for the portfolios and the ROE/ Tobin's Q regressions and analyse our results. Section six covers a discussion of our findings, limitations of the study and suggestions for further research, while section seven concludes the paper.

2. Previous research

2.1 CSR performance and corporate financial performance

The extensive amount of previous studies looking at the relationship between CSR/SRI and corporate financial performance have found contradicting results, and the conclusion that can be drawn is that the literature is divided. A number of renowned authors within the field have found that there is no significant difference in the performance of socially screened assets compared to conventional assets. Hamilton et al (1993) compares the SRI mutual fund performance in the US with that of non-SRI mutual funds and finds no significant difference in financial performance. Kreander et al (2005) compare 60 ethical funds with 60 non-ethical, conventional funds from four European countries and find no significant difference in abnormal returns, defined as Jensen's alpha. Galema et al (2008) relate US portfolio returns to different dimensions of SRI and find that an SRI strategy does not generate any positive alpha. A study by Schröder (2004) analyses stock indices that represent SRI to compare performance with conventional benchmark indices. The SRI indices cover different international investment areas, where some have global investment universes and other indices contain stocks of single countries. Schröder finds no significant difference in performance between SRI and conventional investments.

Other authors have found that SRI portfolios underperform compared to conventional portfolios. Such an underperformance is found by Renneboog et al (2008) when they look at Asian and European SRI funds. The authors consider the Swedish market and not only find that the Swedish SRI funds underperform the domestic benchmark, but also that the Swedish SRI funds have statistically significant lower risk-adjusted returns than conventional funds. The authors explain their findings with the notion that SRI funds are overvalued, this as a consequence of investors' willingness to pay a premium for stocks that meet the criteria of an SRI fund. They also claim that there might be a difference in riskiness and 'style' between the SRI and non-SRI funds considered, and that the Carhart four-factor model used might not capture the SRI style well. The authors add an SRI/ethics factor to the model and hypothesize that such a factor would have a high factor loading, which is shown in the paper. Related studies by Hong and Kacperczyk (2009) report higher expected returns for stocks that are excluded from an SRI fund, such as gaming companies and tobacco producers, also known as sin-stocks.

In contrast, a meta-analysis of 251 studies on the empirical link between CSR performance and corporate financial performance, conducted by Margolis et al (2009), find that the effect of CSR performance on corporate financial performance is positive yet small.

Furthermore, Servaes and Tamayo (2013) criticize previous literature for a lack of understanding about the channels through which CSR affect firm value and find that CSR and firm value are positively related for firms with high customer awareness. Overall, all of these studies confirm the notion that the previous literature is indeed divided.

2.2 Human capital commitments and corporate financial performance

Whether a corporation's commitments towards its human capital is harmful or beneficial for firm value is a well debated topic. There is a great amount of theories addressing the effect of investing in human capital, and their predictions are in stark contrast to each other. Theories based on the typical firm from the 20th-century, where the physical capital generated a majority of firm value, tend to focus on cost efficiency and thus reduce employees to be nothing more than a production input (Taylor, 1911). These theories claim that investments into providing high quality employment benefits and training for the firms' human capital represents wasteful expenditure by management, something that ought to reduce firm value.

In contrast to these theories, theories from more recent days view employees as important assets driving a large part of the value in the modern organization. For example, Zingales (2000), argues that the changing nature of the modern organization emphasizes e.g. innovation, for which human capital is a more important input than physical capital. Zingales (2000) findings are in line with what is known as "human relation" theories from well-renowned authors such as Herzberg (1959) and Maslow (1943).

In an attempt to understand which of these theories that are born out in reality, Edmans (2011) analyse the relationship between employee satisfaction and long-run stock returns on the US market. Edmans constructs a value weighted portfolio of "the 100 best companies to work for in the US" and finds an annual alpha of 3.5% for the 25-year period between 1984 and 2009 against the Carhart four-factor model. His findings are in line with theories claiming that employee satisfaction benefits, rather than reduces, shareholder returns.

In contrast to Edmans (2011) findings, the aforementioned US study by Galema et al (2008), which considers employee relations as one of the factors under CSR, finds no significant abnormal return for an employee relation portfolio. The authors create a number of long-short portfolios, whereby one relates to employee relations. In a regression against the Carhart-four factor model, the portfolio does not generate any significant abnormal return.

Furthermore, in assessing the effect of human capital commitments on corporate financial performance, the equity markets ability to value these commitments, which are intangible by nature, is of relevance to study. Previous research on firms with high levels of intangible assets

such as advertising or R&D show that these firms earn superior returns in the long run (Chan, Lakonishok and Sougiannis, 2001). The findings are explained by the notion that equity markets tend to lack information about the value of such intangible assets, and thus misprice them to start with. Edmans (2011) study extends the research on the equity markets' incorporation of intangible assets to considering the incorporation of employee satisfaction in valuations. Edmans also aims to understand the causes of not incorporating the value of intangibles, beyond the explanation that information of their true value is not available to outside investors.

His findings show that markets fail to incorporate intangible assets fully into valuations. He finds that, despite the fact that information regarding the existence of these intangible assets is communicated, given that the list of "the 100 best companies to work for" is published in the reputable Forbes magazine annually, outside investors do not incorporate the true value of these assets in valuations. Thus, the notion that it would be lack of information regarding the value of these intangible assets that drives the superior long-run stock return is neglected.

The findings are in line with a mispricing hypothesis where high employee satisfaction does indeed benefit firm value, but where the market instead fails to incorporate this value. According to Edmans, under such a hypothesis the intangibles only affect the stock price when it subsequently manifests in tangible outcomes such as earnings announcements. Edmans show that companies listed on the "the 100 best companies to work for" list do exhibit significantly more positive stock price reactions to earnings announcements, in line with the hypothesis.

Elaborating on Edmans paper from 2011, Li, Zhang and Edmans (2017) consider the effect of institutional factors on the relationship between employee satisfaction and stock returns around the world. The authors look at labor market flexibility in 14 countries and, in line with Edmans (2011), find that employee satisfaction is associated with superior long-run stock returns in flexible labor markets (e.g. US), but not in rigid labor markets (e.g. Germany).

In Li and Zhang and Edmans (2017) study, Sweden is one of the countries in the sample and their findings regarding Sweden justifies a closer examination of the country. When controlling for the risk factors in the Carhart four-factor model, an equal weighted portfolio earns a positive alpha, significant at the 10% level. For a value weighted portfolio, the alpha is still positive, yet not significantly so. It is only when controlling for firm characteristics that the coefficient for Sweden is negative, though not significant at any level. These findings contradict a hypothesis based on the notion that Sweden, being a rather rigid labor market according to the authors and studies on labor market flexibility worldwide by e.g. Kahn (2011), should not yield superior long-run stock returns. With these findings in mind, a closer examination of the Swedish market, that this thesis intends to do, is motivated.

3. Hypothesis development

Building on the previous section covering research conducted to date, the purpose of this thesis is to investigate the effect of CSR performance and human capital commitments on corporate financial performance for Swedish corporations.

Based on the findings of Hamilton et al (1993), Kreander et al (2005) and Schröder (2004), there should be no difference in corporate financial performance between corporations that perform well in terms of CSR, compared to those that perform poorly. The same holds when considering the findings of Galema et al (2008) regarding both CSR performance related aspects and human capital specific aspects. These findings indicate that there should not exist any economic channel through which the CSR performance and human capital commitments of a corporation affect the financial performance of that corporation, and hence that no abnormal returns or significant relationships should be identified.

In contrast to the above, there is a broad array of research claiming that a relationship does exist, though with contradicting predictions of its direction. Margolis et al (2009) and Servaes and Tamayo's (2013) respective findings indicate that we should find a positive relationship between CSR performance and corporate financial performance. The same goes for the relationship between human capital commitments and corporate financial performance when considering the findings of Edmans (2011). The economic rationale behind a potential positive relationship is rooted in theories claiming that investments and commitments into CSR and human capital are value creating activities and hence that they should yield abnormal returns if outside investors have not incorporated this value in the first place, meaning the corporations are undervalued by the market.

The second group of research that claims that a relationship exists predict that the relationship is negative. The findings of Renneboog et al (2008) fall in this category. These authors explain the negative relationship identified with the notion that stocks of well-performing corporations in terms of CSR are overvalued by the market due to a high demand on these stocks. The rationale behind the negative relationship is that investors pay a premium for these stocks, resulting in a realized return below the expected return. A negative relationship is also predicted by Li, Zhang and Edmans (2017) when considering the institutional factors of Sweden, namely its labor market flexibility. The authors claim that a rigid labor market such as Sweden should not see any positive impact of human capital commitments on corporate financial performance. This is due to the fact that legislation already provides a minimum

standard for worker welfare, meaning investments into human capital commitments should see diminishing returns.

Given that the literature is divided and suggest positive, negative and no relationships between CSR performance/human capital commitments and corporate financial performance, we formulate our hypothesis in a way that captures this division. We run regressions on each of the portfolios constructed in this thesis separately, though we hypothesize the following with regards to the overall effect of CSR performance and human capital commitments on corporate financial performance in Sweden:

H₀: There is no relationship between corporate social responsibility performance/human capital commitments and corporate financial performance on the Swedish market

against the alternative hypothesis

H₁: There is a relationship between corporate social responsibility performance/human capital commitments and corporate financial performance on the Swedish market.

The empirical tests conducted in this thesis aim to test the above hypothesis. Each of the portfolios constructed are regressed against the Carhart four-factor model individually and for each of the three scores we consider both the entire sample, by comparing abnormal returns for scores above and below the median, and more extreme cases where we consider the top and bottom quartiles of the sample and compare these with each other. See an elaboration of our portfolio construction under section 4.2 *Portfolio construction*. A relationship is considered existing whenever we identify significant abnormal returns for portfolios based on a specific score (CSR, Employment Quality or Training/Development) in a certain direction, while at the same time finding a significant relationship between the score and ROE/Tobin's Q. In order to accept or reject the hypothesis for a specific score, we expect to find the same tendency for both the median and quartile portfolios for one specific score, while identifying the same tendency in the regressions for ROE and Tobin's Q. This decision rule is set up in order to assess the overall effect of CSR performance/human capital commitments on long-run stock returns, ROE and Tobin's Q, giving us a broad understanding of the effect on corporate financial performance, and thus sufficient support to either accept or reject the hypothesis.

4. Methodology

4.1 Demarcation of study

The study is limited to listed companies on the Nasdaq Stockholm exchange, primarily listed on the mid- and large-cap lists. The time horizon considered is January 2002 to December 2015. The availability of data related to CSR performance and human capital commitments of firms has dictated both the time horizon considered and the choice of companies included in the study, see Table A1 in section A of the appendix for a list of all companies considered in this study.

We look at the effect on long-run stock returns, ROE and Tobin's Q. The stock return data is considered on a portfolio basis while ROE and Tobin's Q are considered on a firm-by-firm basis, in line with previous research. For the stock return data, we construct portfolios which a theoretical investor is assumed to hold throughout the time horizon considered in the paper, see further details under section 4.2 *Portfolios construction* below.

To limit the paper to solely consider the Swedish market is motivated by our goal of comparing our results with results obtained by e.g. Edmans (2011), Galema et al (2008) Li, Zhang and Edmans (2017) and Renneboog et al (2008), who primarily focus on the US markets and whose papers are partially replicated in this study.

4.2 Portfolio construction

The analysis of stock returns is conducted on a portfolio level whereby we have constructed a number of portfolios used to assess the effect of CSR performance and human capital commitments on realized returns to shareholders. We have constructed portfolios based on different scores, criteria and weighting schemes.

The three scores that have been used are an aggregate CSR score and two human capital specific scores, Employment Quality and Training/Development. The Thomson Reuters Asset4 database scores companies' CSR activities and human capital commitments on a scale from 1-100 on an annual basis, meaning a company can obtain one score on the aggregate CSR dimension, a second score on Employment Quality and a third on Training/Development during one year.

For each of these scores, we have initially constructed two portfolios. Based on the first criterion, for all CSR scores we rank all stocks in the sample based on their CSR performance score and assign the companies above the median to one portfolio and all companies below the median to another. The portfolio of companies with scores above the median on that specific score, in this example the CSR score, is labelled the "strength portfolio" whereas the portfolio

of companies with scores below the median is labelled the “concern portfolio”, similar to the methodology used by Galema et al (2008). The same method has been used for all three scores, yielding six different portfolios.

Based on the second criterion, we have constructed two new portfolios for each score, though now by including the top and bottom quartiles in the strength and concern portfolio, respectively. This is done in order to isolate the most extreme companies in our sample and to see if these portfolios differ from the portfolios split at the median. This yield six new portfolios, meaning we have twelve portfolios in total in our main analysis. See Table 1 below.

Table 1. Portfolio construction

The table shows how the main portfolios in this thesis have been constructed. We assign stocks into portfolios based on the three scores (CSR, Employment Quality and Training/Development) and two criteria (scores above and below the median and in the top and bottom quartile). The “strength portfolio” column includes all portfolios with score above the median (portfolios 1-3) and all portfolios with scores in the top quartile of the sample (portfolios 4-6), for all three scores. The “concern portfolio” column includes all portfolios with scores below the median (portfolios 7-9) and all portfolios with scores in the bottom quartile of the sample (portfolios 10-12), for all three scores. This yields twelve equal weighted portfolios in total.

Portfolio:	Strength portfolio		Concern portfolio	
Criterion:	Above median	Top quartile	Below median	Bottom quartile
CSR	Portfolio 1	Portfolio 4	Portfolio 7	Portfolio 10
EQ	Portfolio 2	Portfolio 5	Portfolio 8	Portfolio 11
TD	Portfolio 3	Portfolio 6	Portfolio 9	Portfolio 12

Notes. CSR = CSR score, EQ = Employment Quality score, TD = Training/Development score

The abovementioned portfolios are all equal weighted, meaning each company in each portfolio is given the same weight when calculating the portfolio return. We have also calculated portfolio returns using a different weighting scheme, namely value weighted portfolios. In this case, each company in a given portfolio is given its relative weight based on its market capitalization in the calculation of the portfolio return. Due to space constraints, the regressions based on value weighted portfolios will not be part of the body of this paper, but are presented separately in Table F1 (median) and F2 (quartile) in section F of the appendix.

All portfolios are constructed before the start of the trading day on January 1st each year, based on CSR/human capital scores from the previous year. This approach is used to ensure that causality goes from CSR/human capital scores to performance, and not vice versa. Each portfolio is rebalanced every twelve months and is held unchanged throughout the year. The rebalancing considers new scores on CSR performance and human capital commitments from

the trailing twelve months and once again splits the sample above and below the median and in the top and bottom quartiles.

Whenever a company has been delisted from the stock exchange during a year, the company is excluded from the portfolio that entire year. The number of companies in the different portfolios differ from year to year throughout the entire time horizon between 2002 and 2015 that we construct portfolios for. See section 4.3.4 *Summary statistics* for further information regarding the portfolios.

4.3 Data

4.3.1 CSR and human capital data

As previously stated, we obtain data on corporate social responsibility performance and human capital commitments from the Thomson Reuters Asset4 database. Thomson Reuters assess the CSR performance and human capital commitments of listed companies in Sweden over the time period between 2001 and 2014. Given that this is an ex-ante study, the data on CSR performance and human capital commitments span over the period 2001-2014, while the actual study considers corporate financial performance over the period 2002-2015. This is done in order to ensure that causality goes from CSR performance and human capital commitments to corporate financial performance and not vice versa.

The aggregate CSR score from Thomson Reuters has ten subordinate-scores relating to economic, environmental, social and corporate governance aspects of the firm, human capital commitments being one of them (Thomson Reuters, 2018). The human capital scores are thus subordinate-scores to the aggregated score related to CSR. We have considered both the aggregate CSR score and human capital commitment scores, two to be precise, in our study. Table 2 on the next page lists the scores used from Thomson Reuters, and clarifies the relationship between these scores.

Table 2. Description of CSR performance and Human capital commitment scores

The table shows information about the scores used to measure CSR performance and human capital commitments for the firms in our sample. The data is obtained from Thomson Reuters Asset4 database and contains scores over the period between 2001 and 2014. The human capital commitment scores are subordinate-scores to the aggregate score, measuring overall CSR performance.

Level	Name of Score	Description
Aggregate Asset4 score	CSR score	The Equal Weighted Rating reflects a balanced view of a company's performance in the four areas: economic, environmental, social and corporate governance
Sub-score	Employment Quality score	The workforce/employment quality category measures a company's management commitment and effectiveness towards providing high-quality employment benefits and job conditions. It reflects a company's capacity to increase its workforce loyalty and productivity by distributing rewarding and fair employment benefits, and by focusing on long-term employment growth and stability by promoting from within, avoiding lay-offs and maintaining relations with trade unions.
Sub-score	Training/Development score	The workforce Training/Development category measures a company's management commitment and effectiveness towards providing Training/Development (education) for its workforce. It reflects a company's capacity to increase its intellectual capital, workforce loyalty and productivity by developing the workforce's skills, competences, employability and careers.

Thomson Reuters monitors the companies on a rolling basis to consider information in financial reports, CSR reports, news and on NGO-websites and update scores thereafter. Every answer to every data point goes through a multi-step verification and quality control process (Thomson Reuters, 2012). The scores are updated on a bi-weekly basis, but all companies are later reviewed on an annual basis in order to set a final score on each dimension for a particular year, based on the scores set during the year (Thomson Reuters, 2018). These year-end scores are the once we have used in our study. The number of companies for which scores are available varies from year to year.

Since the scores are updated frequently, investors are assumed to have continuous access to the scores throughout a given year. With this in mind, when constructing our portfolios, we have assumed that if the stock market incorporates any effect from these scores into stock prices, this is done on a continuous basis and is not solely based on a specific score released on a specific date. Therefore, we have chosen January 1st as the date for portfolio construction and portfolio rebalancing in our study.

4.3.2 Corporate financial performance data

Thomson Reuters Datastream has been the primary source for stock return data and the Serrano Database, based on data from the Swedish Companies Registrations Office (Bolagsverket), has been the primary source of accounting data. The Serrano Database has been complemented with data from the Bloomberg database whenever data has been missing in Serrano. The databases indicate whenever a company is delisted from the stock exchange. When a company has been delisted in the last twelve months prior to January 1st a given year, that company is excluded from the portfolio entirely that year since the databases do not provide any information regarding the reasons for delisting.

Furthermore, whenever data have existed for both parent companies and the corresponding group, the data for the group has been included. For the stock return data, whenever multiple share classes have existed, the most liquid share class has been chosen. The returns of these shares have been calculated on a total return basis, see further explanation in section 4.4.1 *Stock returns* below. The returns on our portfolios have not been inflation adjusted and neither taxes nor transaction costs have been considered in our return calculations.

4.3.3 Carhart four-factor data

Data for the Carhart four-factor model calculated over every Swedish stock throughout the period 2002-2015 has been obtained from the Swedish House of Finance Research Data Center. The market risk premium is calculated over the OMXSPI, all share index. The risk-free rate used has been the 1-month Swedish Treasury bill, also obtained from the Swedish House of Finance Research Data Center.

4.3.4 Summary statistics

The following subsection covers summary statistics for our stock portfolios and for the data used in the ROE and Tobin's Q regressions in this study.

Table 3. Summary statistics - Stock portfolios

The table presents summary statistics for the stock portfolios over the studied period between 2002 and 2015. Panel A presents summary statistics for the median portfolios and Panel B for the quartile portfolios. The average number of companies in each portfolio is presented on an annual basis, since portfolios are rebalanced annually, while the mean return and standard deviation are presented on a monthly basis. The average portfolio score column indicates the average CSR score, Employment Quality score and Training/Development score that the companies in a given portfolio had over the entire 14-year period studied.

Panel A: Median portfolios								
	Strength portfolio				Concern portfolio			
	Avg. no of firms	Avg. score	Mean return (%)	SD (%)	Avg. no of firms	Avg. score	Mean return (%)	SD (%)
CSR	21	85	1,16	6,04	20	41	1,23	5,90
EQ	21	85	1,23	5,72	20	36	1,17	6,17
TD	21	86	1,15	6,08	20	48	1,25	5,82
Panel B: Quartile portfolios								
	Strength portfolio				Concern portfolio			
	Avg. no of firms	Avg. score	Mean return (%)	SD (%)	Avg. no of firms	Avg. score	Mean return (%)	SD (%)
CSR	11	92	1,13	6,23	10	27	1,26	6,02
EQ	11	93	1,24	6,84	10	21	1,29	6,43
TD	10	92	1,17	5,71	10	33	1,57	5,65
<i>Notes.</i> CSR = CSR score, EQ = Employment Quality score, TD = Training/Development score, SD = Standard Deviation								

Panel A in Table 3 presents summary statistics for the median portfolios. The number of companies in each portfolio has never exceeded 30 or fallen below 10 companies in a given year. For the aggregate CSR score and the human capital specific Training/Development score, the mean returns are higher for the concern portfolio, compared to their respective strength portfolios. The opposite holds for the Employment Quality portfolios.

In Panel B, we turn to the quartile portfolios. Naturally, the average number of companies in a portfolio is smaller when considering the quartile portfolios since only half of the sample

is considered. The mean returns are higher for all the concern portfolios compared to the strength portfolios.

Table 4. Summary statistics – ROE and Tobin’s Q

The table presents summary statistics for the data used in our ROE and Tobin’s Q regressions. The CSR, Employment Quality, and Training/Development scores are obtained from Thomson Reuters Asset4 database. The performance scores are on a scale from 1 to 100 and are given to each firm on an annual basis. Tobin’s Q is calculated as the market value of the firm in relation to the replacement value of its assets. ROE is calculated as net income divided by the book value of equity, and is expressed as a percentage. Total assets are expressed in MSEK. R&D intensity is calculated as R&D expenses divided by sales. The observations for Tobin’s Q, ROE, and R&D intensity are winsorized at the 5th and the 95th percentiles to avoid problems with outliers.

	Count	Mean	Median	Std. Dev.	Min	Max
CSR	630	63.66	74.64	28.37	3.38	97.53
EQ*	630	60.38	63.99	28.63	3.36	98.31
TD*	630	66.15	72.77	25.19	5.17	96.67
Tobin’s Q	630	2.00	1.46	1.44	0.48	4.87
ROE	630	19.20	19.20	14.39	-11.20	48.00
Total assets	630	205,978	20,694	774,766	0.50	6,378,411
R&D intensity	630	1.06	0.00	1.69	0.00	5.89

Notes. *: EQ = Employment Quality and TD = Training/Development

Table 4 present summary statistics for the CSR and human capital commitment scores and the performance metrics in our ROE and Tobin’s Q regressions. The table also includes total assets and R&D intensity, which are used as control variables to control for differences in firm size and investment levels that could otherwise affect the results. The motivation behind using these control variables is elaborated on in section 4.4.2 *ROE and Tobin’s Q data* below.

The average total assets of the firms studied amount to SEK 206 Bn, which is not surprising considering that our sample of firms are primarily listed on the mid- and large-cap lists of the Nasdaq Stockholm exchange. The Tobin’s Q figure indicate that the sample includes firms both under- and overvalued by the market, seen in relation to the replacement value of their assets, while the ROE figure indicates a substantial variation in profitability between the companies in the sample.

The variables used in the ROE and Tobin’s Q regressions have been tested for multicollinearity using the variance inflation factor (VIF), implying no problems with multicollinearity. A complementing correlation matrix of these variables also implies a low correlation between the independent variables. This matrix can be found in Table B1 in section B of the appendix.

4.4 Method

4.4.1 Stock returns

The regression technique developed by Jensen (1968) is applied in order to test whether the stock portfolios based on scores for CSR performance and human capital commitments generate any abnormal returns, and thereby test our hypothesis. The risk and return relationship is established using the Carhart four-factor model and is specified as follows:

$$R_{i,t} - Rf_t = a_i + \beta_i(RM_t - Rf_t) + s_iSMB_t + h_iHML_t + m_iMOM_t + \varepsilon_{i,t}$$

Where:

$R_{i,t} - Rf_t$ = the monthly excess return of each portfolio

$(RM_t - Rf_t)$ = the market risk premium

SMB_t = the size premium

HML_t = the value premium

MOM_t = the momentum premium

The intercept (a_i) captures the excess return of the portfolio that is not explained by the risk parameters in the Carhart four-factor model, given that the error term ($\varepsilon_{i,t}$) has an expected value of zero. As such, the intercept specifies the abnormal return of the portfolios. A more detailed description of the historical development behind the Carhart four-factor model, as well as the motivation behind using this asset pricing model over e.g. CAPM, is included in section C of the appendix.

The MRP factor (Market Risk Premium) measures systematic risk and is calculated as the return of the market in excess of the risk-free rate. The SMB factor (Small Minus Big) measures the size premium and is defined as the return of small firms subtracted by the return of large firms, based on market capitalization. The HML factor (High Minus Low) measures the value premium. The factor is calculated by subtracting the return of firms with high book-to-market ratios (value stocks) with the return of firms with low book-to-market ratios (growth stocks). Lastly, the MOM factor (Momentum) measures the difference in returns between stocks that have previously performed well (winners) and stocks that have previously performed poorly (losers). This is calculated by subtracting the average return of the stocks with the highest past performance with the average return of the stocks with lowest past performance. Summary

statistics for the Carhart factors between 2002 and 2015 that have been used in this study can be found in Table D1 in section D of the appendix.

The actual returns for the stocks in our portfolios are calculated using a total return index from Datastream by Thomson Reuters. The index measures the theoretical return for each company under the assumption that dividends are reinvested on the ex-dividend date and is calculated as:

$$RI_t = RI_{t-1} * \frac{P_t}{P_{t-1}}$$

except when t = ex-dividend date, then:

$$RI_t = RI_{t-1} * \frac{P_t + D_t}{P_{t-1}}$$

Where:

RI_t = return index on day t

P_t = adjusted closing prices at day t

P_{t-1} = adjusted closing prices at day $t-1$

D_t = dividend payment associated with the ex-dividend date

We test our hypothesis by regressing the portfolio returns for the CSR portfolios, the Employment Quality portfolios and the Training/Development portfolios against the four-factor model to see if any of the portfolios generate any abnormal returns. The analysis of abnormal returns is conducted on a score-by-score basis. We thus consider all of the portfolios for one specific score, e.g. CSR, to see if the results point in the same direction or not. As previously stated, should we find any significant abnormal returns for e.g. the strength portfolios based on scores above the median and in the top quartile, while at the same time not finding any significant abnormal return for the respective concern portfolios, this would indicate support for rejecting the null-hypothesis for that specific score.

4.4.2 ROE and Tobin's Q data

To further measure the impact of CSR performance and human capital commitments on corporate financial performance, we consider the effect on ROE and Tobin's Q. We consider ROE a profitability measure and Tobin's Q a value measure. In order to find more support for either accepting or rejecting our hypothesis, the results from the ROE and Tobin's Q regressions complement our portfolio regressions when we analyse the results and draw conclusions.

The ROE measure is used to evaluate if there is a direct relationship between how well a company performs on scores related to CSR/human capital commitments and its actual profitability. It is calculated by dividing net income by the book value (BV) of equity as follows:

$$ROE_t = \frac{Net\ Income_t}{BV\ of\ Equity_{t-1}}$$

While ROE measures short-term profitability, the metric is considered a good complement to Tobin's Q to evaluate the relationship between CSR performance/human capital commitments and corporate financial performance. A significant positive or negative relationship between CSR performance or human capital commitment scores and ROE is interpreted as support to reject the null-hypothesis, while giving further insights into the profitability of the firms in question.

Tobin's Q measures the market value (MV) of the firm in relation to the replacement value of its assets. The metric is calculated as:

$$Tobin's\ Q_t = \frac{(BV\ of\ assets_t - BV\ of\ equity_t - deferred\ taxes_t + MV\ of\ equity_t)}{BV\ of\ assets_t}$$

The metric is based on a firm's market value and is considered as it is a better measure of long-term performance compared to profitability. A significant and positive or negative relationship between CSR performance/human capital commitment scores and Tobin's Q is interpreted as support to reject the null-hypothesis, while giving further insights into the long-term valuation of the firms in question.

In order to test these relationships empirically, we estimate regressions using ordinary least squares (OLS):

$$ROE_{i,t} = \beta_1 + \beta_2 Score_{i,t} + \beta_3 LogAssets_{i,t} + \beta_4 RDintensity_{i,t} + \varepsilon_{i,t}$$

and:

$$TobinsQ_{i,t} = \beta_1 + \beta_2 Score_{i,t} + \beta_3 LogAssets_{i,t} + \beta_4 RDintensity_{i,t} + \varepsilon_{i,t}$$

Where:

β_1 = the intercept

$Score_{i,t}$ = the aggregate CSR or human capital commitment specific score

$LogAssets_{i,t}$ = the logarithm of total firm assets (control variable)

$RDintensity_{i,t}$ = the R&D intensity of the firm (control variable)

$\varepsilon_{i,t}$ = the error term, with an expected value of zero

The *Score* variable is the main explanatory variable in the regressions and is either the aggregate CSR score, or one of the human capital specific scores, Employment Quality or Training/Development for company *i* in time period *t*. In line with Servaes and Tamayo (2013), the regressions include two control variables: firm size and R&D intensity. Controlling for size is motivated by the fact that larger firms also tend to be older, which implies less investments and hence a lower Tobin's Q. Treacy (1980) also supports a relationship between firm size and profitability. The size variable, *LogAssets*, is calculated by taking the logarithm of the total book value of assets for firm *i* in time period *t*.

R&D expenses is expected to have a positive impact on firm value and may, as a consequence, lead to a higher Tobin's Q in the long run. However, a varying amount of R&D expenses between firms can also have an impact on the achieved profitability in the short run. This motivates the inclusion of this control variable in our model. The variable *RDintensity* is calculated by dividing research and development expenses with sales for firm *i* in time period *t*. Whenever a firm in the sample does not report any values for this measure, it is assumed not to have any R&D expenses for that year and the observation is set to zero. The variables for Tobin's Q, ROE and R&D expenses are winsorized at the 5th and 95th percentile in order to avoid problems with outliers.

5. Results

The following section presents the main results of this paper. First, the results from our stock portfolio regressions are presented for the median and quartile portfolios, respectively. Thereafter, the main results from our ROE and Tobin's Q regressions are presented. The section concludes with an analysis of the results based on our hypothesis.

5.1 Stock portfolio results – Median portfolios

Table 5. Risk-adjusted returns - Median portfolios

The table shows the regressions of monthly returns for the median portfolios against the Carhart four-factor model. The dependent variables are the returns for either the CSR portfolio, Employment Quality portfolio or the Training/Development portfolio. The independent variables are the Carhart factors, MRP, SMB, HML, and MOM. Panel A shows strength portfolio returns while Panel B shows concern portfolio returns, using an equal weighted weighting scheme. All regressions are tested and corrected for heteroscedasticity, using robust standard errors.

	CSR	Employment Quality	Training/Development
Panel A: Strength			
β_{MRP}	1.031*** (0.0367)	0.967*** (0.0380)	1.033*** (0.0330)
β_{SMB}	-0.0383 (0.0297)	-0.0433 (0.0322)	-0.0272 (0.0315)
β_{HML}	0.198*** (0.0505)	0.180*** (0.0469)	0.156*** (0.0487)
β_{MOM}	-0.0146 (0.0422)	-0.00840 (0.0379)	-0.0441 (0.0478)
α	0.00178 (0.00158)	0.00304* (0.00159)	0.00198 (0.00153)
Observations	168	168	168
R ²	0.889	0.870	0.895
Panel B: Concern			
β_{MRP}	0.941*** (0.0491)	1.010*** (0.0478)	0.940*** (0.0522)
β_{SMB}	-0.0289 (0.0466)	-0.0224 (0.0464)	-0.0363 (0.0459)
β_{HML}	0.0779 (0.0717)	0.108 (0.0735)	0.138* (0.0731)
β_{MOM}	-0.0793 (0.0489)	-0.0784 (0.0495)	-0.0498 (0.0496)
α	0.00385* (0.00197)	0.00270 (0.00189)	0.00369* (0.00197)
Observations	168	168	168
R ²	0.813	0.850	0.817

Notes. Robust standard errors are shown in the parentheses. ***: Significant at the 1 percent level ($p < 0.01$), **: Significant at the 5 percent level ($p < 0.05$), *: Significant at the 10 percent level ($p < 0.10$)

Table 5 present the main regression results for our six median portfolios. The monthly excess return of the strength portfolios (Panel A) and the concern portfolios (Panel B) are regressed against the Carhart four-factor model, where the intercept (alpha) measures abnormal returns. When looking at the aggregate CSR score, the concern portfolio generates a monthly abnormal return of 0.39%, which is statistically significant at the 10% level. This is higher than the abnormal return of 0.18% for the strength portfolio, which is not statistically significant.

The strength portfolio for Employment Quality outperforms the concern portfolio, as the former generates a statistically significant monthly alpha of 0.30% while the latter generates an insignificant monthly alpha of 0.27%. On the contrary, the abnormal returns of the portfolios based on Training/Development show the opposite pattern. The concern portfolio result in a monthly abnormal return of 0.37%, significant at the 10% level, compared to strength portfolio with an insignificant abnormal return of 0.20% per month.

Regarding the factor coefficients for the strength portfolios, the MRP and the HML coefficients are significant at the 1% level while the remaining coefficients are generally insignificant. For the concern portfolios, it is only the MRP coefficient that with significance explain a part of the excess monthly returns. Though, we conduct an F-test which indicates that the overall regression is statistically significant. The adjusted coefficient of determination shows that the Carhart four-factor model on average explains approximately 88% of the variation in portfolio returns for the strength portfolio and circa 83% for the concern portfolio.

Lastly, we conduct alternative regressions, adding one of the Carhart factors at a time to the model. This is done to consider how the models adjusted coefficient of determination and the significance levels of all factors changes. The alternative regressions indicate that the explained variation in realized portfolio returns increases only marginally when more factors than the MRP factor are added. An overview can be found in Table E of section E in the appendix.

5.2 Stock portfolio results – Quartile portfolios

Table 6. Risk-adjusted returns - Quartile portfolios

The table shows the regressions of monthly returns for the quartile portfolios against the Carhart four-factor model. The dependent variables are the returns for either the CSR portfolio, Employment Quality portfolio or the Training/Development portfolio. The independent variables are the Carhart factors, MRP, SMB, HML, and MOM. Panel A shows strength portfolio returns while Panel B shows concern portfolio returns, using an equal weighted weighting scheme. All regressions are tested and corrected for heteroscedasticity, using robust standard errors.

	CSR	Employment Quality	Training/Development
Panel A: Strength			
β_{MRP}	1.039*** (0.0408)	1.058*** (0.0663)	0.983*** (0.0446)
β_{SMB}	-0.0600 (0.0402)	-0.0883 (0.0537)	0.0245 (0.0498)
β_{HML}	0.140*** (0.0492)	0.211* (0.113)	0.171** (0.0681)
β_{MOM}	-0.0379 (0.0772)	-0.126 (0.0832)	0.0690 (0.0488)
α	0.00167 (0.00187)	0.00274 (0.00221)	0.00218 (0.00184)
Observations	168	168	168
R ²	0.862	0.811	0.831
Panel B: Concern			
β_{MRP}	0.953*** (0.0629)	0.951*** (0.0665)	0.888*** (0.0468)
β_{SMB}	-0.0205 (0.0445)	-0.0172 (0.0696)	-0.0419 (0.0380)
β_{HML}	0.0437 (0.0710)	0.0290 (0.0707)	0.0341 (0.0662)
β_{MOM}	0.0138 (0.0448)	-0.149** (0.0594)	0.00546 (0.0432)
α	0.00380 (0.00238)	0.00486* (0.00254)	0.00747*** (0.00228)
Observations	168	168	168
R ²	0.733	0.749	0.728
<i>Notes.</i> Robust standard errors are shown in the parentheses. ***: Significant at the 1 percent level ($p < 0.01$), **: Significant at the 5 percent level ($p < 0.05$), *: Significant at the 10 percent level ($p < 0.10$)			

In Table 6 above, the regressions for the quartile portfolios are presented. Neither the strength nor concern portfolio for the aggregate CSR score generate any abnormal return that is statistically different from zero. However, the coefficients are still positive and indicate a similar pattern to the results obtained for the median portfolios.

In contrast to the median portfolios, the results of the quartile portfolios for the human capital specific scores, Employment Quality and Training/Development, now point in the same

direction. The concern portfolios based on Employment Quality and Training/Development yield abnormal returns of 0.49% and 0.75%, respectively, and are significant at the 10% and 1% level. These are notably higher than the abnormal returns for the corresponding strength portfolios, which are not statistically significant.

The MRP and HML coefficients are once again the only statistically significant factor coefficients for the strength portfolios. For the concern portfolios, it is mainly the MRP coefficient that is significant. An F-test indicates that the overall regression is statistically significant. The adjusted coefficient of determination is on average 83 % for the strength portfolios and 74% for the concern portfolios, which is somewhat lower compared to the median portfolios. Once again, we conduct alternative regressions adding one factor at a time to the model, which show that the explained variation in realized portfolio returns increases only marginally when more factors than the MRP factor are added to the model. See Table E in section E of the appendix.

5.3 ROE and Tobin's Q regression results

In Table 7 on the next page, the results of the regressions based on ROE are presented. In column (1) to (3), the regressions are conducted with year dummies to control for the influence of aggregate trends during the studied period that could otherwise drive the result. In the regressions presented in column (4) to (6), we have included firm fixed effects in order to control for time-invariant firm characteristics that could affect the findings.

The regression in column (1) indicates that there is a positive and statistically significant relationship between overall CSR performance, and ROE. An economic interpretation tells us that when the CSR score increase by one percentage point, ROE increase by 0.107 percentage points. For the regressions based on human capital commitment scores and ROE, the regression coefficients are also positive, yet small and insignificant. This implies no direct relationship between human capital commitments and profitability. Furthermore, the low adjusted coefficient of determination for the regressions indicate that the model explains a small amount of the variation in ROE.

When also controlling for firm fixed effects, the relationship between profitability and overall CSR performance still holds, although the significance level and the coefficient become marginally lower. However, to control for firm fixed effects does not seem to impact the relationship between human capital commitments and profitability, as the coefficients in column (5) and (6) are still insignificant and small. The coefficient for Training/Development

is even slightly negative, indicating a negative, rather than positive, relationship between human capital commitments and profitability. Lastly, the adjusted coefficient of determination increases substantially when controlling for both year dummies and firm fixed effects. As such, the models in column (4) to (6) better explains the variation in ROE.

Table 7. Panel regression of ROE as a function of CSR and Human capital

The table presents the main results of the panel regressions estimated using OLS, where the dependent variable is ROE on a firm-by-firm basis. The main independent variable is either the CSR, Employment Quality, or Training/Development score. The logarithm of total book value of assets (Log assets) and R&D Intensity are used as control variables. The regressions in column (1)-(3) includes year dummies, while column (4)-(6) are also controlled for firm fixed effects. All regressions are tested and corrected for heteroscedasticity, and for the lack of independence of observations for the same firm, using robust standard errors clustered by firm. The VIF (variance inflation factor) indicate no problems with multicollinearity. The observations for ROE and R&D intensity are winsorized at the 5th and the 95th percentile to avoid problems with outliers.

	Year dummies			Year dummies & firm fixed effects		
	(1)	(2)	(3)	(4)	(5)	(6)
CSR	0.107*** (0.0384)			0.0935** (0.0416)		
EQ [†]		0.0299 (0.0289)			0.00192 (0.0331)	
TD [†]			0.0179 (0.0371)			-0.00256 (0.0366)
Log assets	-0.706 (0.592)	-0.214 (0.566)	-0.133 (0.603)	-4.109** (2.046)	-3.158 (2.014)	-3.140 (1.967)
R&D intensity	-0.223 (0.710)	0.0157 (0.680)	-0.0290 (0.710)	-2.656** (1.162)	-2.878** (1.392)	-2.876** (1.430)
Constant	14.64** (6.193)	12.84* (6.538)	12.80** (6.371)	51.11** (19.46)	46.02** (19.19)	46.11** (18.99)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	No	Yes	Yes	Yes
Observations	630	630	630	630	630	630
R ²	0.104	0.073	0.071	0.527	0.518	0.518

Notes. Robust standard errors are shown in the parentheses. ***, Significant at the 1 percent level ($p < 0.01$), **, Significant at the 5 percent level ($p < 0.05$), *, Significant at the 10 percent level ($p < 0.10$) [†]: EQ = Employment Quality and TD = Training/Development

The results of the estimated regressions for Tobin's Q are reported in Table 8 on the next page. As in the previous table, the regressions in column (1) to (3) are conducted with year dummies, whereas the regressions in column (4) to (6) are conducted with both year dummies and firm fixed effects.

Table 8. Panel regressions of Tobin's Q as a function of CSR and human capital

The table presents the main results of the panel regressions estimated using OLS, where the dependent variable is Tobin's Q on a firm-by-firm basis. The main independent variable is either the CSR, Employment Quality, or Training/Development score. The logarithm of total book value of assets (Log assets) and R&D Intensity are used as control variables. The regressions in column (1)-(3) includes year dummies, while column (4)-(6) are also controlled for firm fixed effects. All regressions are tested and corrected for heteroscedasticity, and for the lack of independence of observations for the same firm, using robust standard errors clustered by firm. The VIF (variance inflation factor) indicate no problems with multicollinearity. The observations for Tobin's Q and R&D intensity are winsorized at the 5th and the 95th percentile to avoid problems with outliers.

	Year dummies			Year dummies & firm fixed effects		
	(1)	(2)	(3)	(4)	(5)	(6)
CSR	0.00881** (0.00438)			0.00806*** (0.00242)		
EQ [†]		0.00296 (0.00458)			0.00343** (0.00167)	
TD [†]			0.00217 (0.00632)			0.00128 (0.00191)
Log assets	-0.363*** (0.0800)	-0.325*** (0.0799)	-0.318*** (0.0856)	-0.416*** (0.128)	-0.340** (0.129)	-0.341** (0.131)
R&D intensity	-0.0437 (0.0806)	-0.0238 (0.0803)	-0.0287 (0.0814)	-0.00835 (0.127)	-0.0191 (0.139)	-0.0312 (0.148)
Constant	5.364*** (0.784)	5.205*** (0.816)	5.185*** (0.781)	5.528*** (1.236)	4.946*** (1.216)	5.090*** (1.265)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	No	Yes	Yes	Yes
Observations	630	630	630	630	630	630
R ²	0.200	0.180	0.178	0.881	0.877	0.875

Notes. Robust standard errors are shown in the parentheses. ***: Significant at the 1 percent level ($p < 0.01$), **: Significant at the 5 percent level ($p < 0.05$), *: Significant at the 10 percent level ($p < 0.10$) [†]: EQ = Employment Quality and TD = Training/Development

The results indicate a positive relationship between Tobin's Q and overall CSR performance, which is significant at the 5% level when year dummies are included in the model. While this implies a direct relation between CSR performance and firm value, the coefficient is rather small. An economic interpretation tells us that when the CSR score increase by one percentage point, Tobin's Q increase by 0.09 percentage points. In column (2) and (3), none of the regressions based on human capital commitment scores yield any significant coefficients, meaning we cannot claim that any relationship exists between human capital commitments and Tobin's Q when only including year dummies in the model.

When controlling for both year dummies and firm fixed effects in the regressions, the relationship between the CSR score and Tobin's Q still holds, now at the 1% significance level. This suggests that the relation between overall CSR performance and firm value holds even when unobservable firm characteristics are accounted for. For the human capital commitment

scores, the coefficient for the Training/Development score is still insignificant and small. However, the coefficient for Employment Quality in column (5) yields a different outcome, as we now observe a significant coefficient for the Employment Quality score. The coefficient is small, indicating a negligible relationship since an economic interpretation tells us that when the Employment Quality score increase by one percentage point, Tobin's Q increase by only 0.03 percentage points. Finally, the adjusted coefficient of determination increases from approximately 18% to 88% when the firm fixed effects are adjusted for, meaning that there is a considerable increase in the model's explanatory power.

5.4 Analysis of CSR performance and corporate financial performance

The median portfolios based on CSR scores yielded a positive and significant abnormal return for the concern portfolio, but not for the strength portfolio. When turning to the quartile portfolios, we do not find any significant abnormal returns, for either of the two CSR portfolios. If the significant abnormal return identified for the median concern portfolio is a consequence of poor CSR performance, one would expect this relationship to continue to hold for the quartile portfolios. This is not the case, meaning these findings imply that there is no significant relationship between CSR performance and corporate financial performance for Swedish corporations, and thereby indicating that we cannot reject the null-hypothesis. Given that we do find an abnormal return for the median portfolios, but not for the quartile portfolios, one interpretation could be that the abnormal return identified might be due to some unidentified factor other than CSR performance.

These findings are in line with the findings of Hamilton et al (1993), Kreander et al (2005), Schröder (2004) and Galema et al (2008), claiming that there is no significant difference in corporate financial performance between companies performing well in terms of CSR, and companies performing poorly.

When considering the relationship between CSR performance and ROE on a firm-by-firm basis, a positive and significant relationship is found when controlling for both year dummies and firm fixed effects. The same holds when looking at the relationship between Tobin's Q and the aggregate CSR score, meaning that companies with a high CSR performance score tend to be valued higher by the market seen in relation to the replacement value of their assets, compared to companies with a lower CSR performance score. Overall, the ROE and Tobin's Q regressions indicate support to reject the null-hypothesis and are in line with the findings of Margolis et al (2009) and Servaes and Tamayo (2013), claiming that there is a positive relationship between CSR performance and corporate financial performance.

The overall conclusion regarding the relationship between CSR performance and corporate financial performance when considering both the stock returns and the ROE and Tobin's Q regressions does not provide enough support to reject the null-hypothesis. Our findings thus support the previous literature claiming that there is no significant relationship between CSR performance and corporate financial performance. We discuss alternative explanations based on previous literature for the phenomenon identified, where there is a positive relationship between CSR performance and ROE/Tobin's Q but no abnormal long-run stock return, under section 6.1 *Mispricing of CSR performance*.

5.5 Analysis of human capital commitments and corporate financial performance

The analysis of the relationship between human capital commitments and corporate financial performance considers the Employment Quality portfolios and the Training/Development portfolios separately. The strategy based on Employment Quality scores split at the median yielded a significant abnormal return for the strength portfolio, but not for the concern portfolio. When turning to the quartile portfolios, the opposite holds. That is, we find a positive and significant abnormal return for the concern portfolio but not for the strength portfolio. These mixed findings provide little, if any, evidence of a significant relationship between Employment Quality performance and long-run stock returns. One interpretation is that the abnormal returns identified may not be a consequence of the Employment Quality performance, but rather a consequence of some other factor given that the results point in opposite directions. Overall, these findings indicate that there is no significant relationship between human capital commitments and corporate financial performance in Sweden, which in turn implies that our null-hypothesis cannot be rejected, in line with the findings for CSR performance.

Furthermore, the ROE and Tobin's Q regressions did not yield any significant results for the effect of Employment Quality on either of the measures when including year dummies to the model. When firm fixed effects are controlled for, the regression for Tobin's Q and Employment Quality is positive and significant, though with a very small coefficient, indicating a weak relationship. This is in line with the result obtained for the stock portfolios by further indicating no significant relationship between human capital commitments and corporate financial performance in Sweden, and by supporting the notion that our null-hypothesis cannot be rejected.

When considering the Training/Development portfolios, a clear relationship between human capital initiatives related to providing training and development opportunities and long-

run stock returns is found. For the median portfolios we find a positive abnormal return for the concern portfolio, significant at the 10% level, but not for the strength portfolio. When turning to the quartile portfolio, the same is found for the concern portfolio, with a monthly abnormal return of 0.75%, significant at the 1% level. These findings imply that there is a significant negative relationship between human capital commitments and corporate financial performance for Swedish firms, which thereby indicate support to reject the null-hypothesis. The negative relationship identified contrasts the findings of Edmans (2011), who finds a positive relationship between employee satisfaction and long-run stock returns on the US market, but are in line with the theoretical arguments brought forward by Li, Zhang and Edmans (2017).

The result of the ROE and Tobin's Q regressions cannot fully confirm the findings based on long-run stock returns. While the coefficient for ROE on Training/Development is negative, the effect of Training/Development on both ROE and Tobin's Q are insignificant both with and without controls for firm fixed effects. This indicates no significant relationship between human capital commitments and corporate financial performance and therefore provides no further support to reject the null-hypothesis.

The overall conclusion regarding the relationship between human capital commitments and corporate financial performance is that there is not enough evidence to reject the null-hypothesis, when taking both the portfolio stock returns and the ROE and Tobin's Q regressions into account. While the portfolio analysis did indicate support to reject our null-hypothesis for the Training/Development portfolio, this was not confirmed when considering ROE and Tobin's Q, meaning the null-hypothesis cannot be rejected according to our decision rule established under section 3. *Hypothesis development.*

This conclusion is in line with the conclusion that could be drawn for CSR performance. However, the findings related to human capital commitments imply that there might be a difference between the effect of employment quality commitments and training/development initiatives taken by firms in Sweden. More precisely, our findings indicate that the relationship between training and development initiatives and corporate financial performance could be negative, given the consistent findings for both the median and quartile concern portfolios for Training/Development. Alternative explanations for our findings related to human capital commitments are elaborated on when considering institutional factors that might be of relevance under section 6.2 *Institutional factors and Human capital commitments.*

6. Discussions and Limitations of study

The overall findings of this paper do not support rejecting the null-hypothesis, that there is no relationship between CSR performance/human capital commitments and corporate financial performance on the Swedish market, with one exception relating to training and development initiatives where our findings suggest that the relationship could be negative.

Our findings give rise to a number of questions. Firstly, why do we not identify any significant relationship between CSR performance and our portfolio returns, but a positive relationship between CSR performance and ROE/Tobin's Q? Secondly, why is the relationship between training and development initiatives and long-run stock returns negative in our study? And lastly, what effect may the Carhart four-factor model chosen have on the findings of this study?

In an attempt to address these questions, we consider alternative explanations to our findings based on previous research. We ask whether a mispricing story, as discussed by both Renneboog et al (2008) and Edmans (2011), could answer our first question relating to the CSR portfolios. We consider institutional factors, and consider if these might explain the negative relationship between training and development initiatives and corporate financial performance, in line with Li, Zhang and Edmans (2017) theories. Lastly, we assess the loadings of the four-factor model used to regress our portfolio returns against, to better understand our portfolio results.

6.1 Mispricing of CSR performance

Renneboog et al (2008) claim that SRI stocks tend to be overvalued by the stock market as a consequence of investors' willingness to pay a premium for stocks that meet certain SRI/CSR criteria. This premium, the authors claim, result in lower realized returns for the stocks. Edmans (2011) also bring forward a mispricing theory when considering the equity markets' incorporation of employee satisfaction into valuations, claiming that these stocks tend to be undervalued by the market, thus yielding positive abnormal returns.

The findings of this study related to the CSR portfolios could potentially be explained by Renneboog et al's (2008) claims of an overvaluation of stocks performing well in terms of CSR. We find a positive relationship between CSR scores and ROE, yet no positive and significant abnormal return for the portfolios holding stocks with high CSR scores. In line with Renneboog et al (2008), this could be explained with the notion that, despite the fact that the CSR stocks tend to be correlated with a high ROE, the equity market already pays a premium for these

stocks, resulting in no abnormal return on the stocks. Further proof for such a notion is found when considering the fact that companies with a high CSR performance score tend to have a high Tobin's Q, and thus be valued higher by the market, compared to companies with a low CSR performance score.

The fact that one out of four investors on the Swedish market are invested in funds that screen companies CSR performance indicates a strong demand for socially screened assets among Swedish investors, as presented in the introductory paragraph of this thesis (Nordström, 2018). Also, the substantial supply of ethical funds that buy stocks performing well in terms of CSR on the Swedish market further confirms this notion of a strong demand (Swesif, 2015). Together, these factors could be drivers of a potential mispricing, in line with Renneboog et al (2008). Although this study has not explicitly tested such a mispricing theory, the theory could potentially explain parts of the findings related to CSR performance and corporate financial performance and serves as an alternative explanation of our findings.

6.2 Institutional factors and Human capital commitments

Li, Zhang and Edmans (2017) argue that institutional factors, namely the labor market flexibility of a country, impacts the degree to which employee satisfaction affects long-run stock returns. The authors argue that employee satisfaction is associated with superior long-run stock returns in flexible labor markets, but not in rigid labor markets. The channel through which the labor market flexibility affects the relationship between human capital commitments and corporate financial performance is claimed to be the legislation of a specific country. In a rigid labor market, legislation already provides a minimum standard for worker welfare, meaning additional expenditures should exhibit diminishing returns according to Li, Zhang and Edmans (2017). The Swedish market is considered being a rigid labor market in an international comparison, both by the authors Li, Zhang and Edmans (2017) and in a number of other studies comparing labor market flexibility around the world, see e.g. Kahn (2011). Similar conclusions, regarding the effect of legal origins on CSR, are also drawn by Liang and Renneboog (2017).

The argument that corporations in a rigid labor market, such as the Swedish market, should exhibit diminishing returns on investments into human capital could be one potential explanation to the negative relationship identified between the sub-score of human capital commitments, training/development, and long-run stock returns in our study. Albeit the findings based on our portfolios are in line with the theories related to labor market flexibility, this is not the case when considering the ROE and Tobin's Q regressions presented. One could

expect to see a significant negative relationship between training/development initiatives and ROE and the Tobin's Q based on the presented theory. We have not found any significant proof of this being the case, meaning the theories related to labor market flexibility are restricted to potentially explaining the long-run stock returns in this thesis.

6.3 Stock portfolio loadings on the Carhart factors

While the portfolio regressions in this study are statistically significant overall, the regressions generally resulted in low factor loadings on the Carhart four-factor model used. For example, for the strength and concern portfolios split at the median, only the MRP factor is significant and yield relatively high coefficients, taking on values between 0.97 and 1.03 for the three strength portfolios and between 0.94 and 1.01 for the three concern portfolios. Furthermore, the HML coefficient is significant but relatively small for the strength portfolios, while the remaining factors are generally insignificant and small for all portfolios. A similar pattern can be seen for the quartile portfolios.

In their paper, Renneboog et al (2008) extend the Carhart four-factor model by introducing a new SRI factor to the model with the purpose to investigate if this extended model could better explain their portfolio returns. As claimed in section 2.1 *Previous research*, the authors argue that there might be a difference in riskiness and 'style' for companies in portfolios based on an SRI strategy, seen in relation to the original benchmark, and hypothesise that the new factor thus should have a high factor loading, which is shown in their paper. The introduction of a factor similar to Renneboog et al (2008), in our case related to CSR performance and human capital commitments, could potentially improve the asset pricing model used in this study and thus affect our estimated abnormal returns. As such, there is a possibility that the relationship between CSR performance/human capital commitments and corporate financial performance in Sweden could be better explained by an extended model. An introduction of a new factor, similar to that introduced by Renneboog et al (2008) would be appropriate to test, yet is found to be outside the scope of this thesis.

6.4 Implications of findings

While the findings of this paper have implications for a number of stakeholders, investors and corporate managers are specifically addressed. For investors, since our findings do not allow us to reject the null-hypothesis with regards to either CSR or human capital commitments, SRI-strategies based on overall CSR performance or human capital commitments on the Swedish

market should neither improve nor worsen investment performance. While our overall regressions support this notion, some of our findings indicate that human capital commitments related to training and development initiatives reduces shareholder value, something investors ought to bear in mind.

For corporate managers on the Swedish market, the effect of training and development initiatives on corporate financial performance is the most pertinent outcome in this thesis. The negative relationship with long-run stock returns identified creates implications for corporate managers when determining the degree to which it should invest in increasing its intellectual capital, workforce loyalty and productivity by developing, among other things, the workforce's competences and skills going forward.

6.5 Suggestions for further research

In an attempt to explain our findings, we have turned to theories regarding mispricing, labor market flexibility and factor loadings, all of which have been discussed in previous research on the topic. Due to the limited scope of this thesis, a deeper study of the reasons behind our findings have not been possible to conduct. For instance, we identify a significant negative relationship between training and development initiatives and long-run stock returns, but not for ROE and Tobin's Q, and leave the reasons for this identified phenomenon unanswered in our thesis. The exploration of these questions are, nonetheless, relevant for many stakeholders and could be a potential topic for further research within the field.

To date, research on the effect of human capital commitments on corporate financial performance has been limited and most of the existing studies have been conducted in a US context. This thesis contributes to this field of research by studying the effect on Swedish corporations. However, to the best of our knowledge, the topic is still not thoroughly studied. We therefore encourage further research considering the human capital specific aspects of CSR in different countries and on different industries, as this could provide further and possibly more far-reaching conclusions regarding the relationship between human capital commitments and corporate financial performance.

6.6 Limitations of data

This study uses data for firms listed on the Nasdaq Stockholm exchange, primarily on the mid- and large-cap lists. Given this fact, the relationships identified in this study are restricted to large and listed firms, and may not apply for smaller and private firms in the same way. When

considering the number of firms for which we have had CSR performance and human capital commitment data on an annual basis, this number has increased over time between 2001 and 2014. This implies that the degree to which smaller firms are represented in our data sample has increased over time, mitigating the aforementioned issue.

In this study, we have excluded companies that have been delisted in the last twelve months prior to January 1st in a given year. This may increase the risk of survivorship bias, yet has found to be appropriate since the databases used do not provide any insights into the reasons for delisting the companies. By excluding the mentioned companies, we believe that the regressions in our study better estimates the true relationships between CSR performance/human capital commitments and corporate financial performance, without the interference of factors causing the delisting of the companies.

Lastly, with regards to the proxy used for human capital commitments, the Employment Quality score and the Training/Development score, the selection of these scores are a result of the data that Thomson Reuters has provided. The degree to which this captures the total human capital commitments of a corporation cannot be certain, though we argue that this is a good enough proxy since it covers a variety of commitments by a firm and since it is easily comparable between firms.

6.7 Critique of method

The aim of this study has been to investigate if there is any causal effect of CSR performance and human capital commitments on corporate financial performance, and not vice versa. For the corporate financial performance metric ROE, one could argue that it is a good corporate financial performance, a good ROE, that enables good CSR performance and human capital commitments. We have addressed this by conducting an ex-ante study, considering the effect of scores from one year on financial performance on the next. By doing so, we have not completely eliminated the risk of reverse causality, but have nonetheless addressed the issue.

The portfolio returns of this study have not been adjusted for inflation, taxation or any transaction costs that a theoretical investor might be subject to. While these conditions may be unrealistic, they have been necessary given the limited scope of this thesis. This might impact the level of relevance of our findings in a real-world context.

Lastly, for the ROE and Tobin's Q regressions, we have used two control variables, R&D intensity and the logarithm of assets, in line with similar previous studies. The use of control variables affects the results, and there is no certainty that the model used captures all relevant

differences between the firms in the sample that might impact the results. While this is the case, we argue that R&D intensity and the logarithm of assets captures some of the most essential differences between firms that might impact ROE and Tobin's Q, something that previous studies have confirmed by using these control variables.

7. Conclusions

This thesis considers the effect of CSR performance and human capital commitments on corporate financial performance for Swedish corporations between 2002 and 2015. Portfolios are constructed by ranking a selection of stocks on the Nasdaq Stockholm exchange based on their performance on three scores, one CSR specific score and two human capital commitment related scores. We assign different stocks into different portfolios based on the score (CSR, Employment Quality or Training/Development) and two different criteria (scores above and below the median and in the top and bottom quartile, respectively), resulting in twelve portfolios in our main analysis. The respective portfolios' excess returns are regressed against the Carhart four-factor model in order to investigate if any portfolio yields abnormal returns. The portfolio analysis is complemented with an analysis of a profitability measure, ROE, and a valuation measure, Tobin's Q, on a firm-by-firm basis.

The results of this study do not support rejecting the null-hypothesis, that there is no relationship between CSR performance/human capital commitments and corporate financial performance on the Swedish market, with one exception relating to Training/Development where our findings suggest that the relationship could be negative. In an attempt to better understand our findings, we consider three alternative explanations based on previous literature.

Firstly, a mispricing theory could potentially explain the findings of our CSR portfolios, where no significant relationship is found for the stock portfolios, yet a positive relationship is found with ROE and Tobin's Q. We consider the possibility that the stock market pays a premium for stocks performing well in terms of CSR, yielding lower realized returns compared to the expected return for such stocks.

Secondly, institutional factors relating to the labor market flexibility of Sweden could help explain the findings for our Training/Development portfolios in this study. The underlying argument is that Sweden, being a rigid labor market, should see diminishing returns on additional expenditures towards human capital commitments, given that legislation already provides a minimum standard for worker welfare.

Lastly, we assess the loadings of the four-factor model used to regress our portfolio returns against, and discuss if the introduction of a new factor in line with previous research could improve the asset pricing model used in this study and thus affect our estimated abnormal returns. An alternative model including an additional factor could potentially better explain the cross-sectional variation in average stock returns for our portfolios.

The overall findings of this thesis have implications for a number of stakeholders, in particular investors and corporate managers on the Swedish market.

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Appendix

Section A: List of companies included in the study

Table A1. Companies included in the study

This table presents a list of the companies that have been part of the different portfolios and part of the ROE and Tobin's Q regressions at some point during the period 2002 to 2015.

ALFA LAVAL AB	ASSA ABLOY AB	ATLAS COPCO AB
AXFOOD AB	BEIJER REF AB	BILLERUD AB*
BILLERUDKORSNÄS AB	BOLIDEN AB	CAPIO AB
CASTELLUM AB	CTT SYSTEMS AB	ELECTROLUX AB
ELEKTA AB	ENIRO AB	FABEGE AB
FINGERPRINT CARDS AB	FÖRENINGSSPARBANKEN AB	GAMBRO AB
GETINGE AB	GUNNEBO AB	HENNES & MAURITZ AB
HEXAGON AB	HEXPOL AB	HOLMEN AB
HUFVUDSTADEN AB	HUSQVARNA AB	HÖGANÄS AB
ICA GRUPPEN AB	INDUSTRIVÄRDEN AB	INTRUM JUSTITIA AB
INVESTMENT AB KINNEVIK	INVESTOR AB	JM AB
KUNGSLEDEN AB	L E LUNDBERGFÖRETAGEN AB	LAGRUMMET AUGUSTI NR 52 AB
LINDAB INTERNATIONAL AB	LUNDIN PETROLEUM AB	MEDA AB

MODERN TIMES GROUP MTG AB	NCC AB	NEDERMAN HOLDING AB
NIBE INDUSTRIER AB	NOBIA AB	NOLATO AB
NORDEA BANK AB	OMX AB	PREVAS AKTIEBOLAG
SAAB AB	SANDVIK AB	SAS AB
SCANIA AB	SECURITAS AB	SKANDINAVISKA ENSKILDA BANKEN AB
SKANSKA AB	SKF AB	SWEDBANK AB
SVEDBERGS I DALSTORP AB	SWEDISH MATCH AB	SWEDISH ORPHAN BIOVITRUM AB
SVENSKA CELLULOSA SCA AB	SVENSKA HANDELSBANKEN AB	TELE2 AB
TELEFONAKTIEBOLAGET L M ERICSSON AB	TELELOGIC AB	TELIASONERA AB
TRELLEBORG AB	VBG GROUP AB	VOLVO AB
WIHLBORGS FASTIGHETER AB	WM-DATA AKTIEBOLAG	
*Merged with Korsnäs AB in 2012		

Section B: Correlation matrix of ROE and Tobin's Q data

Table B1. Correlation matrix

The table presents a correlation matrix of all variables considered in our ROE and Tobin's Q regressions. The observations of Tobin's Q, ROE, and R&D intensity are winsorized at the 5th and the 95th percentile to avoid problems with outliers.

	CSR	EQ	T&D	Tobin's Q	ROE	Total assets	R&D intensity
CSR	1.00						
EQ*	0.487	1.00					
TD*	0.626	0.375	1.00				
Tobin's Q	-0.047	-0.048	-0.059	1.00			
ROE	0.164	0.063	0.014	0.265	1.00		
Total Assets	0.204	0.179	0.138	-0.171	0.038	1.00	
R&D intensity	0.143	-0.034	0.100	-0.051	-0.08	-0.122	1.00

Notes. *: EQ = Employment Quality and TD = Training/Development

Table B1 above shows a correlation matrix of the dependent and the explanatory variables in our regressions. As expected, the correlation between the CSR and human capital measures as well as the correlation between the performance measures are relatively high. None of the other correlations between variables are substantial.

Section C: Previous literature on asset pricing models

C1. CAPM

In this thesis, the Carhart four-factor model is used to measure the relationship between risk and expected returns of different stock portfolios. This model is an extension of the Capital Asset Pricing Model (CAPM), which was introduced by Sharpe (1964) and expanded by Lintner (1965) and Black (1972). The CAPM builds on the notion of an efficient market and implies that an investor is only compensated for the time value of money (the risk-free rate) and for systematic risk. The expected return in excess of the risk-free rate is thus dependent on the volatility of a particular security or portfolio, measured by beta (β), and the market risk premium, which is measured as the difference between the excess return of the market and the risk-free rate. Therefore, the model implies that abnormal returns which are not explained by any of these risk factors should not occur. The formal CAPM-equation is defined as follows:

$$R_{i,t} - Rf_t = \beta_i (RM_t - Rf_t) + \varepsilon_{i,t}$$

Where:

$R_{i,t} - Rf_t$ = The excess return over the risk free rate

β_i = Beta value

$(RM_t - Rf_t)$ = The market risk premium

$\varepsilon_{i,t}$ = Error term

However, several studies have found empirical evidence of particular cases where realized returns do not match the expected returns predicted by CAPM. In his paper, Banz (1981) finds that firms with a low market equity achieves higher average risk-adjusted returns than firms with a high market equity. The authors thus suggest that this size effect must be accounted for and that the CAPM is misspecified. Many researchers have also found evidence of a value effect in asset pricing. Basu (1977), for example, finds a significant relationship between price-earnings ratios and stock returns for firms traded on the NYSE (New York Stock Exchange) during the years 1957 to 1971. His result implies that firms with low price-earnings ratios tend to achieve higher risk-adjusted returns than firms with high price-earnings ratios. A similar conclusion is drawn by Stattman (1980), who finds a positive relation between high book-to-market ratios and average stock returns for U.S. firms.

C2. Fama French three-factor model

In their paper from 1992, Fama and French introduce their three-factor model by extending the CAPM with a size and a value factor (Fama and French, 1992). They measure the size factor in terms of market capitalization and the value factor in terms of the book-to-market ratio. Their results show that average stock returns cannot solely be explained as a linear function of the market beta that measures systematic risk, but that the returns are also captured by a value and a size premium. This three-factor model, they argue, also incorporates the effect of leverage and price-earnings, which have been found to have an effect on stock returns by scholars such as Bhandari (1988) and Basu (1977). As a consequence, the Fama-French three-factor model is expected to explain approximately 90% of the cross-sectional variation in average returns. The formal equation behind the Fama-French three-factor model is defined as:

$$R_{i,t} - R_{f_t} = \alpha_i + \beta_i (RM_t - R_{f_t}) + s_i SMB_t + h_i HML_t + \varepsilon_{i,t}$$

Where:

$R_{i,t} - R_{f_t}$ = The excess return over the risk-free rate

β_i = Beta value of Asset i

$(RM_t - R_{f_t})$ = The market risk premium

s_i = Sensitivity of Asset i to the size premium

SMB_t = Fama and French Small minus Big portfolio return in Sweden in month t

h_i = Sensitivity of Asset i to the value premium

HML_t = Fama and French High minus Low portfolio return in Sweden in month t

$\varepsilon_{i,t}$ = Error term

C3. The Carhart four-factor model

In contrast to the findings by Fama and French (1992), Jegadeesh and Titman (1993) successfully develop a trading strategy based on stock momentum. This momentum strategy is carried out by buying portfolios of stocks that have achieved high returns during the past 3-12 months and selling portfolios of stocks that have achieved poor returns during the same time period. The authors find empirical evidence that this strategy is profitable, as their portfolios earned a monthly return of 0, 95% during the 20-year period between 1965 and 1985.

Carhart (1997) elaborates on the findings by Jegadeesh and Titman (1993) by adding a momentum factor to the Fama-French three-factor model when assessing the performance of mutual funds. The momentum factor captures the tendency for a well-performing stock to

continue to increase in value and for a poor-performing stock to continue to decline in value. He finds that the four-factor model largely reduces the pricing errors compared to both CAPM and the three-factor model. As consequence, the Carhart four-factor model should be a better model for explaining the cross-sectional variation in average stock returns. The Carhart four-factor model is presented under section *4.4.1 Stock returns*.

Section D: Summary statistics for the Carhart factors

Table D1. Summary statistics - Carhart factors

The table shows summary statistics for the factors in the Carhart four-factor model used to regress excess returns against in this study. The mean returns, standard deviations, minimum and maximum monthly returns are presented for the Swedish market during the time horizon considered in this paper, 2002-2015

	Obs.	Mean	Std. Dev	Min	Max
MRP	168	0,72 %	5,45 %	-18,15 %	21,64 %
SMB	168	-0,19 %	5,64 %	-43,90 %	23,85 %
HML	168	0,37 %	3,51 %	-15,88 %	12,46 %
MOM	168	0,38 %	5,65 %	-30,21 %	16,40 %

Notes. MRP = Market risk premium-factor, SMB = Small minus big-factor, HML = High minus low-factor, MOM = Momentum-factor

In Table D1, the mean monthly factor return on MRP is positive, which is in line with what follows from CAPM. The low monthly mean factor return on SMB indicates that the average return on small and big companies, measured by their market capitalizations, did not differ substantially during the studied period. The positive mean monthly factor return for HML indicate that companies with high book-to-market ratios earned higher returns on average compared to companies with low book-to-market ratios. Similarly, the positive mean monthly factor return on MOM indicates that companies with a positive trailing twelve-month average return outperform companies with a negative trailing twelve-month average return during the studied period.

Section E: Factor test of the empirical model

Table E1. Test of the Carhart four-factor model

The table shows the result of regressions of monthly returns for the median CSR portfolio against the Carhart four-factor model, where each factor are added one by one in order to test the model's explanatory power. The independent variables are the Carhart factors, MRP, SMB, HML, and MOM. Panel A shows strength portfolio returns while Panel B shows concern portfolio returns, based on an equal weighted weighting scheme. All regressions are tested and corrected for heteroscedasticity, using robust standard errors.

	(1)	(2)	(3)	(4)	(5)
Panel A: Strength					
α	0.00998** (0.00468)	0.00245 (0.00169)	0.00235 (0.00167)	0.00169 (0.00157)	0.00178 (0.00158)
β_{MRP}		1.041*** (0.0468)	1.037*** (0.0443)	1.038*** (0.0374)	1.031*** (0.0367)
β_{SMB}			-0.0713** (0.0304)	-0.0346 (0.0277)	-0.0383 (0.0297)
β_{HML}				0.197*** (0.0504)	0.198*** (0.0505)
β_{MOM}					-0.0146 (0.0422)
Observations	168	168	168	168	168
R ²	0.000	0.873	0.877	0.889	0.889
Panel B: Concern					
α	0.0107** (0.00457)	0.00362* (0.00196)	0.00359* (0.00196)	0.00334* (0.00194)	0.00385* (0.00197)
β_{MRP}		0.978*** (0.0571)	0.976*** (0.0563)	0.977*** (0.0541)	0.941*** (0.0491)
β_{SMB}			-0.0226 (0.0333)	-0.00883 (0.0339)	-0.0289 (0.0466)
β_{HML}				0.0737 (0.0746)	0.0779 (0.0717)
β_{MOM}					-0.0793 (0.0489)
Observations	168	168	168	168	168
R ²	0.000	0.806	0.807	0.809	0.813
<i>Notes.</i> Robust standard errors are shown in the parentheses. ***: Significant at the 1 percent level ($p < 0.01$), **: Significant at the 5 percent level ($p < 0.05$), *: Significant at the 10 percent level ($p < 0.10$)					

In Table E1 above, returns of the equal weighted CSR portfolio based on median scores are regressed against the Carhart four-factor model, by adding one variable at the time. This is done in order to test the explanatory power of the empirical model in this study. The coefficient of determination in the regressions indicate that the explained variation in realized portfolio returns increases marginally when more factors are added. Similar regressions have been conducted for all different portfolios considered in this study, all of which yield similar conclusions.

Section F: Regression results for value weighted stock portfolios

Table F1. Risk-adjusted returns – Value weighted median portfolios

This table shows the result of regressions of monthly returns for the median portfolios against the Carhart four-factor model. The dependent variables are the returns for either the CSR portfolio, Employment Quality portfolio or the Training/Development portfolio. The independent variables are the Carhart factors, MRP, SMB, HML, and MOM. Panel A shows strength portfolio returns while Panel B shows concern portfolio returns, based on a value weighted weighting scheme. All regressions are tested and corrected for heteroscedasticity, using robust standard errors.

	CSR	Employment Quality	Training/Development
Panel A: Strength			
β_{MRP}	0.913*** (0.0304)	0.881*** (0.0288)	0.943*** (0.0299)
β_{SMB}	-0.0879*** (0.0332)	-0.104*** (0.0307)	-0.0943*** (0.0294)
β_{HML}	-0.0316 (0.0592)	0.0150 (0.0465)	-0.0586 (0.0575)
β_{MOM}	-0.0646 (0.0428)	-0.0463 (0.0325)	-0.0790** (0.0355)
α	-0.00153 (0.00152)	-0.00135 (0.00147)	-0.00123 (0.00143)
Obs.	168	168	168
R ²	0.897	0.891	0.904
Panel B: Concern			
β_{MRP}	0.972*** (0.0375)	1.044*** (0.0500)	0.977*** (0.0451)
β_{SMB}	-0.0223 (0.0336)	-0.0237 (0.0387)	-0.0241 (0.0358)
β_{HML}	-0.0188 (0.0538)	-0.0532 (0.0683)	0.0791 (0.0683)
β_{MOM}	-0.0107 (0.0320)	-0.00495 (0.0388)	-0.0170 (0.0372)
α	-0.000162 (0.00192)	-0.00221 (0.00193)	-0.00169 (0.00198)
Obs.	168	168	168
R ²	0.820	0.854	0.831
<i>Notes.</i> Robust standard errors are shown in the parentheses. ***: Significant at the 1 percent level ($p < 0.01$), **: Significant at the 5 percent level ($p < 0.05$), *: Significant at the 10 percent level ($p < 0.10$)			

The results for our value weighed median portfolios are presented in Table F1 above. The regressions do not yield any significant abnormal returns, for any of the score, and thus do not provide any further insights into the relationship between CSR performance/human capital commitments and corporate financial performance on the Swedish market.

Table F2. Risk-adjusted returns – Value weighted quartile portfolios

This table shows the result of regressions of monthly returns for the quartile portfolios against the Carhart four-factor model. The dependent variables are the returns for either the CSR portfolio, Employment Quality portfolio or the Training/Development portfolio. The independent variables are the Carhart (1997) factors, MRP, SMB, HML, and MOM. Panel A shows strength portfolio returns while Panel B shows concern portfolio returns, based on a value weighted weighting scheme. All regressions are tested and corrected for heteroscedasticity, using robust standard errors.

	CSR	Employment Quality	Training/Development
Panel A: Strength			
β_{MRP}	0.894*** (0.0518)	0.951*** (0.0579)	1.012*** (0.0395)
β_{SMB}	-0.185*** (0.0602)	-0.183*** (0.0520)	-0.0467 (0.0469)
β_{HML}	-0.0614 (0.0987)	-0.145* (0.0772)	0.0588 (0.0507)
β_{MOM}	-0.219*** (0.0706)	-0.192*** (0.0557)	0.0836*** (0.0308)
α	-0.00133 (0.00212)	-0.00286 (0.00231)	-0.000302 (0.00191)
Obs.	168	168	168
R ²	0.860	0.844	0.826
Panel B: Concern			
β_{MRP}	1.117*** (0.0509)	1.094*** (0.0599)	1.040*** (0.0459)
β_{SMB}	-0.00500 (0.0435)	0.0252 (0.0555)	-0.0457 (0.0405)
β_{HML}	0.0737 (0.0529)	0.0417 (0.0588)	0.0405 (0.0777)
β_{MOM}	0.0688** (0.0323)	0.00549 (0.0355)	-0.00673 (0.0385)
α	-0.00252 (0.00227)	0.00264 (0.00251)	0.00102 (0.00235)
Obs.	168	168	168
R ²	0.810	0.777	0.790
Notes. Robust standard errors are shown in the parentheses. ***: Significant at the 1 percent level ($p < 0.01$), **: Significant at the 5 percent level ($p < 0.05$), *: Significant at the 10 percent level ($p < 0.10$)			

The results for our value weighed quartile portfolios are presented in Table F2 above. The regressions do not yield any significant abnormal returns, for any of the score, and thus do not provide any further insights into the relationship between CSR performance/human capital commitments and corporate financial performance on the Swedish market.