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Beyond ESG: Connection Between the Corporate Net Impact and Financial Performance

Master's Thesis

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Abstract of master's thesis

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Abstract

This study examines the connection between corporate social responsibility (CSR) and corporate financial performance (CFP), with an introduction of new net impact measure for CSR. The thesis tests a novel net impact measure by Finnish startup Upright Oy measuring overall company net impact on society, knowledge, health, and environment dimensions. The empirical analysis focuses on public companies from Fortune 500 Global list from the year 2020, comprising companies globally and across industries. Three key research questions are empirically assessed, focusing on the connection between net impact and profitability, firm valuation and expected stock returns. The results of the study indicates weak negative connection between net impact and profitability. The connection between net impact and firm valuation is found to be tentatively positive, supporting underlying theory. Despite the higher valuations found for better net impact companies without being fundamentally driven by profitability, this study is not able to find significant evidence for hypothesized lower expected returns. This study brings valuable contribution into existing literature on the connection between CSR and CFP by introducing and testing a new measure of net impact with an aim to highlight the importance of measuring the actual impacts companies have on the surrounding world and gives strongly encourage to apply the metric in a wider scale in future academic research.

Keywords CSR, Impact Investing, Net Impact, ESG

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Tässä tutkimuksessa tarkastellaan yhteiskuntavastuun ja yritysten taloudellisen suorituskyvyn välistä yhteyttä, käyttämällä nettovaikuttavuutta uutena mittarina yhteiskuntavastuulle. Tutkimuksessa hyödynnetään suomalaisen startup-yrityksen Upright Oy:n kehittelemää uutta mittaria, jonka tavoitteena on mitata yritysten kokonaisvaikutusta ympäröivään maailmaan arvioiden tätä yhteiskunta-, tieto-, terveys- ja ympäristöulottuvuuksien kautta. Tutkimuksen empiirinen analyysi keskittyy vuoden 2020 Fortune 500 Global-listan julkisesti noteerattuihin yhtiöihin, sisältäen yhtiöitä ympäri maailmaa eri toimialoilta. Tutkimuksessa keskitytään kolmeen keskeiseen tutkimuskysymykseen, joiden kautta pyritään selvittämään yhtiön nettovaikuttavuuden yhteyttä kannattavuuteen, arvostukseen sekä odotettuihin tuottoihin. Tutkimuksen tulokset osoittavat heikon negatiivisen yhteyden nettovaikuttavuuden ja kannattavuuden välillä. Nettovaikuttavuuden ja yrityksen arvostuksen välillä löytyy alustava yhteys, tukien aikaisemmassa kirjallisuudessa esitettyjä teorioita. Huolimatta siitä, että paremman netto vaikutuksen yrityksille löytyi korkeampi arvostus ilman, että se olisi perustunut kannattavuuteen, tämä tutkimus ei kyennyt löytämään merkittäviä todisteita hypoteesin mukaisista matalammista odotetuista tuotoista. Tämä tutkimus tuo arvokkaan panoksen olemassa olevaan kirjallisuuteen yhteiskuntavastuun ja taloudellisen suorituskyvyn välisestä yhteydestä esittelemällä ja testaamalla uutta nettovaikuttavuuden mittaria, jonka tarkoituksena on korostaa yritysten todellisten vaikutusten mittaamisen tärkeyttä ympäröivään maailmaan. Lisäksi tutkimus rohkaisee uuden mittarin soveltamista laajemmin tulevaisuuden tutkimuksissa.

Avainsanat Yhteiskuntavastuu, vaikuttavuussijoittaminen, nettovaikuttavuus, ESG

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1. Introduction

Throughout the ongoing century, concerns about corporate social responsibility (CSR) have become increasingly hot topic in the global economy. Investors and other stakeholders have become more aware of companies' environmental, social and governance (ESG) actions which can be seen as increasing investment flows to sustainable investments[1]. This has also grown interest towards the academic research among this subject. Typically, the empirical studies have been examining companies' ESG-score or other corresponding measure for CSR in an endeavor to explain corporate financial performance (CFP). The past academic research has given somewhat mixed findings regarding the connection between CSR and CFP. Mostly, evidence have been found to present positive connection between CSR and firm valuations, and negative connection between CSR and expected stock returns, but some have also found empirical evidence for positive connection also in the latter. One key issue we have seen in this field of study, resulting in mixed evidence is the lack of comprehensive measure for the corporate social responsibility.

The interest toward companies' CSR performance stems from the external need for putting attention on how companies operate and impact the surrounding world. However, it has been discussed how well does the corporate ESG-scores, typically used in CSR studies, capture companies' actual impact, and that alternative measures are needed to further assess this topic. Introducing the corporate net impact, a new CSR metric, we argue a conceptual difference between ESG-investing and impact investing and propose more attention to be aimed towards the actual and measurable impact companies have in the world. Prior academic research considering impact investing is rather limited compared to research on ESG, mostly due to difficulty of measuring the actual corporate impact. The introduction of net impact adds an intriguing dimension to the academic discourse on corporate social responsibility.

We acknowledge that gaps in this field of mixed results have been tried to be filled by presenting new measures for CSR also before this study. However, we argue that in order to effectively capture the connection between corporate social responsibility and financial performance, one should shift focus from typically used ESG measures which are vulnerable for subjectivity, towards the actual, more objective impact companies have on the surrounding world. Thus, we aim to make a valuable

[1] According to *Global Sustainable Investment Review 2020* global sustainable assets reached AUM of 35.3 trillion USD, increasing 15% compared to 2018 (Global Sustainable Investment Alliance, 2020).

contribution to existing literature studying the connection between CSR and CFP by introducing this new measure of net impact, provided by Finnish startup company Upright Oy, into this discussion. In a quest to answer the challenge of lacking appropriate impact metric, Upright Oy, a Finnish startup established in 2017, developed a new model to measure corporate net impact on a comprehensive level, building the overall impact over four dimensions of *Society, Knowledge, Health,* and *Environment*. This new, artificial intelligence (AI) -based metric can be seen as a somewhat notable innovation in this field, proved by e.g., distribution of the net impact data in partnership with Nasdaq[2], the multinational financial service provider operating stock exchanges in United States and in Europe.

We argue this measure to be more precise measure in presenting what kind of impact, positive and negative, companies' CSR actions actually produce. We express this by detailly describing the nature of the introduced net impact measure, as well as testing the accuracy of the measure's *Environment* dimension against corresponding ESG pillar by Refinitiv, and emissions intensity by TruCost. By doing these, we arrive at a conclusion that net impact and ESG are fundamentally different, and net impact manages to capture the actual impacts companies create in their supply chains of operations better than ESG score, when this is measured as caused scope 1-3 emissions against Refinitiv ESG score. The net impact data has been publicly available only for limited sample of companies and so far, this very metric has not yet been studied in academic literature. Only the data provider Upright themselves have done some primitive tests regarding net impact and financial performance, where they suggest 0.23 positive correlation between profits and net impact (Upright Oy, 2021a). In order to introduce this new metric for academic literature on CSR-CFP connection we will make the most out of it in the scope of our study.

In this empirical study we examine how does this measure of corporate net impact effect financial performance. This connection is assessed through three key research questions considering the effect on profitability, valuation and expected stock returns. We hypothesize that the net impact would have neutral effect on firm profitability, but that better corporate net impact leads to higher stock valuation and lower expected returns, due to lower risk and increased investor demand good net impact companies enjoy.

Our hypothesis relies on the prevailing theory suggesting that higher CSR leads to higher valuation and lower expected returns as has been presented in studies, for example, by Heinkel et al. (2001),

[2] Upright starts global distribution of its net impact data in partnership with Nasdaq (Upright Oy, 2021c)

where they find investors refusing to invest in polluting companies results as a decrease in risk sharing, which increases the cost of capital for polluting firms and reduces their investment, and by Albuquerque et al. (2019), where they show how socially responsible investing can lead to increasing pricing power and higher valuation. Along these, we base our theory on a suggestion by Fama & French (2007), that preferences for green assets can have an impact on valuation, which is also agreed upon by Pástor, et al. (2021), who also find negative CAPM alphas for "green" stocks. We assume similarly to prevailing literature, that the positive connection between CSR and valuation is related to either lower risk or investor preferences, or both. Thus, we assume there exists a neutral connection between CSR and profitability due to trade-off equilibrium of costs and revenues resulting from CSR enhancing actions, as presented by McWilliams & Siegel (2001).

In this study, we base our reasoning and methodologies mostly on a paper by Pedersen et al. (2021), which extends existing frameworks to incorporate an ESG factor as a complementing criterion for portfolio selection. Whereas Baker et al. (2018) modeled two types of investors with mean-variance preferences (one also having taste for green assets) finding lower expected returns for greener assets and concentrated ownership, Pedersen et al. (2021) complement this by adding third type of investor unaware of ESG scores. The show how stocks with higher ESG-score enjoy higher valuations and lower expected returns when there are many ESG-motivated investors on the market. According to their theory each stock's ESG score plays two roles: first, it provides information about firm fundamentals and secondly, it affects investor preferences. We continue the assess our hypothesis among this theoretical framework, with a focus on net impact rather than ESG.

Due to the limited availability of the Upright Oy net impact data for public use, we focus our examination of the three research questions on the companies from Fortune 500 Global list of the year 2020. Fortune 500 Global is an annual list of the world's largest companies measured by total revenue. From the open-source data provided, we see this to be the most suiting group of companies which has an adequate amount of data available to conduct our empirical analysis. For this set of companies, we will use the corporate net impact data produced by Upright Oy and financial data sourced from Refinitiv in our empirical analysis. Overall, our dataset used to empirically test our hypotheses consists of 393 public companies from the biggest economies. These companies represent all 11 sectors of Global Industry Classification Standard (GICS) created by MSCI and Standard & Poor's. For the purpose of studying the effect of companies' impact on financial performance, we see this set of companies appropriate because of their undeniable impact on the global economy.

To test our first hypothesis on the connection between corporate net impact and profitability we use Return on Assets (ROA) as the dependent variable. The connection is examined using variables for total impact, as well as variables for the impact each individual dimension. We run an aggregated regression with average values of the variables over the time period from 2015 to 2022 as well as separate annual cross-sectional regressions over this time period. With the aggregated data sample, we do not find statistically significant results for the connection between corporate net impact and firm profitability. However, by running the cross-sectional regressions for the separate observed years we find weak evidence of negative connection between corporate net impact and firm profitability. Additionally, we found that all other individual years suggest non-positive connection between net impact and profitability except 2021, where we find the connection to be positive. We theorize this finding to indicate about the lower risk-profile better net impact companies might have, which was realized during the Covid-19 crisis. Theses finding are not in line with either our hypothesis or the prevailing literature, where theory proposes neutral connection, as presented for example, by McWilliams & Siegel (2001). Nevertheless, we find this opposing moderate evidence also logical and make a tentative conclusion that achieving better net impact increases costs more than the topline benefits leading to lower profitability. We do not exclude the possibility that the potential topline benefits would be realized over longer time period, which might not be captured within our sample.

To assess our second research question and to test our hypothesis of positive connection between corporate net impact and valuation, we will use Tobin's Q as a dependent variable, as it has been commonly used measure for valuation in the relevant existing literature (e.g., Albuquerque et al., 2019; Pedersen et al., 2021). We run similar regressions than in our first hypothesis testing, by running first a regression with an aggregated sample followed by separate annual cross-sectional regressions. With the aggregated data sample, we are not able to find statistically significant results for the connection between corporate net impact and firm valuation. However, by running the cross-sectional regressions for the separate observed years we are able to find weak evidence of negative connection between corporate net impact and firm valuation. Our results suggest that the weak connection between net impact and valuation is especially driven by *Environment* dimension, which is highly in line with the results presented by Pedersen et al. (2021), who found positive connection between ESG, and firm valuation being especially driven by the environmental pillar. Overall, supported by this weak evidence and considering the tentative conclusion of negative connection between net impact and profitability, these results comply with our hypothesis and the prevailing

theory in the existing literature on this matter, suggesting investors to have a preference to invest in good net impact companies.

In the third part of our empirical analysis, we test our hypothesis of negative connection between corporate net impact and expected stock returns with a four-factor model (Carhart, 1997) developed to complement the three-factor model introduced by Fama & French (1992), which builds on their traditional capital asset pricing model (CAPM). Following methodology used by, for example, Borgers et al. (2013) we examine this effect as a portfolio study, computing returns for an investment strategy taking long position in the best impact-performing companies and short positions in the worst impact-performing companies after dividing our sample companies in three portfolios based on their net impact performance. Opposite to our hypothesis on the connection between net impact and expected stock returns, we do not find any statistically significant results, but when assessing the effect for equally weighted portfolios, we find the coefficients for total net impacts and all the dimensions to be negative and thus to point towards the direction of our hypothesis. This insignificance might be seen to be due to the limited sample used in our study. However, we found statistically significant negative connection between net impact and expected returns when we tested the same strategy by dividing companies into two groups, net positives, and net negatives. Even though our findings were not robust through different portfolio categorization methods, the results anyhow suggest the hypothesized negative connection to exist and highly encourage for further research with more comprehensive dataset considering the question if higher net impact could lead to lower expected returns. These results fall into the broad field of mixed results on the connection between CSR and stock returns accustomed in the existing literature.

Overall, our conclusions from the empirical analysis are giving moderately consistent evidence with the predetermined hypothesis, following the commonly shared view of practitioners on the field. With these findings we can make a tentative conclusion that investors' preference for better performing net impact companies is driven rather by non-pecuniary benefits, than lower risk profile of these companies. This conclusion is supported by the finding of a weak evidence of positive association between firm valuation and net impact, despite the weak evidence of negative association between firm profitability and net impact. However, it is possible that the lower risk profile also influences investor choices, as seen by the profitability results in 2021, which shows contradicting outcome compared to other years with statistically insignificant but positive association between firm profitability and net impact. We concluded this to be driven by the realization of the effects of Covid-

19 crisis. Nonetheless, our study's limitations, including the short time period and data sample, prevent us from determining the longer-term benefits of the lower risk profile. Finally, even though we didn't find robust statistically negative connection between net impact and expected returns, our results suggested some evidence of the existence of such a connection, which is also strongly suggested by our other findings.

With this study, we bring forth new contribution to the existing academic literature on CSR-CFP connection. Our main contribution stems from introducing a new, to extent of our knowledge the most comprehensive, company-level impact metric into the field of corporate social responsibility research on connections to financial performance. To our acknowledge, so far this measure has only been studied by the Upright Oy themselves, in a fairly primitive manner, but not yet been introduced in relevant academic literature. By not only studying the overall effect of company impact on financial performance, we also further examine the connection of each impact dimension, namely *Society*, *Knowledge*, *Health*, and *Environment*, to profitability, firm valuation and expected stock returns separately, extending our contribution to the exiting literature.

By this introduction of a new metric into the CSR-CFP discussion, we also make our contribution to the wider debate on what is the role of businesses in tackling the major issues societies are facing. With this study, we hope to encourage academicians to further examine this measure of company net impact in their endeavors regarding the studies in this field of academia. In addition, our contribution on testing the usability of Upright Oy's net impact metric in its connection to other CSR metrics and to financial performance, we bring valuable insights for the investor use of net impact metrics as well. Valuably, we present evidence increasing the motivation for the usage of net impact data in future research as well, as we study the correlations between environmental aspects of net impact and ESG, and emission intensities, which imply superiority of net impact over ESG in this matter.

The rest of this paper is arranged as follows. *Section 2* provides a thorough view of the relevant existing literature regarding the CSR and the connection to CFP as a background for our research questions and provided contribution. *Sections 3* and *4* describe the used data and methods, including a detailed description of the introduced metric of net impact. Finally, *Section 5* provides the results of the empirical analysis accompanied with thorough discussion of these results, and testing the robustness of our results. Finally, *Section 6* concludes the study.

2. Prior literature and theoretical framework

2.1. Corporate social responsibility

Traditional view of corporation's existence is based on Milton Friedman's *Shareholder Theory*. Friedman's theory argues that the only purpose of corporation is to maximize the profits for its shareholders (Friedman, 1970). This view sees the decision of buying company's stocks as sole act of maximizing the expected monetary value for their invested capital. Friedman argues that the idea of corporate social responsibility is misguided, as it makes an assumption that businesses can act as moral agents and ignores the fact of businesses being owned by shareholders who have a right to expect a return on their investment. Later, this rather unambiguous view has been opposed, for example, by Edward Freeman with his publication *Stakeholder Theory*, where he introduces idea of how corporations should create value for all its stakeholders, such as customers, employees, and communities – not only for the shareholders of the company (Freeman, 1984). The logic presented by Freeman argues that the stakeholder approach can benefit companies ultimately, as it can lead to better stakeholder-relations, increased stakeholder-loyalty, and improved long-term performance.

In more recent academic literature on the matter, Hart & Zingales (2017) agree with Friedman's original *Shareholder Theory* on the aspect that many of the public companies should make shareholder welfare their main objective in their paper *Companies Should Maximize Shareholder Welfare Not Market Value.* On the other hand, as the title of the paper unveils, the authors argue that shareholder welfare should not be measured as market value of company (and thus the monetary gains), since shareholders have also social and ethical concerns related to their investments along with obvious monetary aspirations. Whereas Friedman's logic relies on separability of profitability from ethical and social issues, the authors object this point of view. As Hart and Zingales make a case for broadening the meaning of shareholder welfare from only monetary perspective to include other aspects, it can be seen accommodating views introduced in Freeman's *Stakeholder Theory*.

What remains the main difference in the standpoints of these two opposing views originally introduced decades ago, is the definition of roles; should the broader scope of social and environmental issues be addressed on company- or government-level. The view of companies aspiring to create value for broader group of stakeholders rather than only the shareholders of the company is evidently supported by the increasing demand for social responsibility in investing (e.g., Białkowski et al., 2016).

The actions companies make in the fields of societal issues are usually considered to be a part of corporate social responsibility (CSR). There exist several definitions for CSR, but most of them agree on it to refer on voluntary set of actions companies make to undertake for example social and environmental issues. For example, McWilliams & Siegel (2001) define CSR as "actions that appear to further some social good, beyond the interests of the firm and that which is required by law". This view emphasizes the difference between obeying the law and acting socially responsibly. For example, if company avoids discriminating some groups of people, it is not engaging in a socially responsible action, only obeying the law.

2.2. Corporate social responsibility and financial performance

Over the past few decades, there has been an increasing interest in socially responsible investing (SRI), motivating researchers to assess the relationship between corporate social responsibility (CSR) and corporate financial performance (CFP). Great number of studies have been conducted in a hope to find a consensus on whether CSR positively or negatively affects CFP. However, despite the efforts to analyze this relationship, the results have been somewhat mixed. Mostly, academic studies have found there to be positive connection between CSR and firm valuation, and negative connection between CSR and expected stock returns. However, there have also been some evidence of the connection with expected returns to be positive, resulting in somewhat ununiform consensus on that matter.

Measures for corporate social responsibility (CSR)

Corporate social responsibility (CSR) is a broad concept that encompasses a wide range of aspects, and therefore can be measured in various ways. In empirical studies on the matter CSR has been measured, for example, as the amount of CO2 emissions, as the industry company operates in ("sin" or "non-sin"), as accounting information on governance (Pedersen et al., 2021), as employee satisfaction (Edmans, 2011), and as quality of stakeholder relations (Borgers et al., 2013). However, the most commonly used proxy tends to be ESG-ratings and -scores, due to the perceived holistic approach including environmental, social and governance aspects, and the fact that they are produced by a third-party assessment firm.

However, also among the ESG-ratings, the different measuring approach made by various service providers creates difficulties. Berg et al. (2021) explain the widely found mixed returns in standard regression estimates on CSR-CFP connection with attenuation bias, due to noisy ESG variables. In their study, they assess ESG-ratings provided by ISS, Moody's, Refinitiv, RepRisk, Sustainalytics, S&P Global and TruValue Labs – thus covering many of the most popular metrics in the field. As ESG ratings from different providers are based on varying methodologies in choosing, measuring, and aggregating ESG attributes, they find only 0.2 average pairwise correlation of the ESG ratings in their sample of over 1,100 companies from the Eurozone, U.K., U.S., and Japan. This is found regardless of the later discussed choice of ex-ante or ex-poste -perspective of returns. In a previous study of the same group of academicians they argue that the main reason for the disagreement in the ESG ratings is this difference of used methodologies and conclude this means that the attributes for ESG are measured imperfectly (Berg et al., 2019). This conclusion motivates our approach to emphasize the net impact measurement in the CSR-CFP discussion, instead of the noisy ESG ratings.

Studied connection between corporate social responsibility (CSR) and corporate financial performance (CFP)

As mentioned, the existing literature has not been able to produce full consensus on how CSR actions affect financial performance. As the connection has been widely studied, also the measures used for CFP have been diverse. In a meta-study from early 21st century, Orlitzky et al. (2003) find difference in the results of CSR-CFP connection depending on the chosen variables for indicating CFP. Similarly, this can be noticed in many of the recent papers studying CSR-CFP relationship; to represent financial performance, some studies focus on market-based measures, such as stock returns or Tobin's Q (e.g., Bolton & Kacperczyk, 2021; Pedersen et al., 2021) and some on accounting-based measures, such as Returns on Net Operating Assets (RNOA) or Return on Equity (ROE) (e.g., Hong & Kacperczyk, 2009; Pedersen et al., 2021).

Within the scope of this empirical study, we focus on financial performance measured as profitability, firm valuation and expected stock returns. The existing literature among these subjects is rather extensive, with most of the obscurity arising from the studies examining the connection between CSR and stock returns. Academic literature mostly agrees on a positive connection to exist between the existing CSR measures and firm valuations. The background for this research stems from the desire to understand the factors that influence the value of a firm, such as investors preferences.

In previous research, academicians have studied asset pricing models that consider investors taste for CSR increasing firm value and lowering cost of capital. Heinkel et al. (2001) developed and equilibrium model to show how exclusionary ethical investing can affect a firm's investment. They looked at two different types of investors, one of whom would not back polluting companies. As a result, risk sharing declines, which raises the cost of finance for polluting firms and lowers their investment. According to a model developed by Albuquerque et al. (2019), a company's investments in socially conscious causes a rise in consumer loyalty and increases pricing power. Because of this, the company is less risky and hence more valuable. Pastor et al. (2021) also model investing related to ESG criteria, but they argue the reason for holding green assets is simply in the taste preferences, finding corresponding evidence for better CSR assets connection to higher prices and lower expected returns. El Ghoul et al. (2011) complies with the logic of good CSR companies experiencing lower expected returns and lower cost of capital, leading to higher valuation. In other related literature, the relationship between good CSR and higher firm valuation has been argued to stem from improved relationships with stakeholders (e.g., Clarkson, 1995) and created competitive advantage (e.g., Porter & Kramer, 2006), for example.

As an early introducers of investor taste preferences, Fama & French (2007) proposed a model examining the impact of differing opinions and preferences on asset pricing. The authors consider the standard asset pricing model assumptions of common agreement about future asset payoffs and sole concern about these payoffs to be highly unrealistic. They argue that the differences in investor preferences can indeed affect asset prices, and empirically analyzing this they find significant results for this effect. Thus, Fama and French introduce a new view on the factors driving asset prices, where they emphasize the importance of considering the impact of different opinions and preferences investors have.

Later on, Baker et al. (2018) follow similar theoretical reasoning, arguing that green bonds have lower expected returns than ordinary bonds, which they assess with a framework that considers investors with non-pecuniary utility in addition to mean-variance of standard portfolio. They find that green bonds are traded at a premium even after controlling various fixed and time-varying factors. They conclude that the natural explanation for this premium is the willingness of investors to sacrifice returns to hold green bonds.

More recently, Pedersen et al. (2021) build upon this logic with their theory of ESG-efficient frontier. They present a framework based on modern portfolio theory, but further extend it by including ESG factor as an additional criterion for the portfolio selection. In their theory, they consider three investor types; investors unaware of ESG-scores and only seeking to maximize their mean-variance utility (Type-U investors), investors aware of ESG-scores and incorporating the information to their views of risk and expected returns (Type-A investors), and investors with motivation towards high ESG-scores (Type-M investors). The authors show how Type-M investors quest to optimize the trade-off between high expected return, low risk, and high ESG-score. This can be simplified to a trade-off between ESG and Sharpe Ratio. This way, in a market where there are many Type-M investors, the stocks with higher ESG-score deliver low expected returns due to their willingness to accept lower returns in change to "doing good". The theory presented suggests that the ESG scores of assets serve a dual role in assessing the expected stock returns. They argue that the score provides information about the company fundamentals, and the score affects investor preferences.

As presented, the prior literature on CSR-CFP relationship explains the positive connection for example by lower risk profile and investors having preferences towards better CSR assets. In relation to this, McWilliams & Siegel (2001) provides theory on why CSR and profitability has neutral connection and thus does not affect this equation. In their paper. They explain how it can be shown that firm investing in better CSR attribute and a firm producing no CSR attributes will be both in equilibrium, equally profitable. This is explained by a trade-off: while increasing CSR level could increase revenues, it also increases costs. Similarly, without investments in CSR the revenues would be lower, as would the costs. As we aim to study whether similar positive connection exists between net impact and firm valuations without profitability driving this, we have formulated our first two research questions around this relationship, as will be presented in *Section 2.4*.

Closely related to profitability and firm valuations, stock returns have been widely studied indicator of financial performance in studies examining the relationship with CSR. Our third hypothesis presented in *Section 2.4* is one assessing this connection, drawing connections from insights of the first two research questions. In the past research, some have found higher stock returns for well ESG performing companies, while others have found the effect to exist in converse manner. For example, there has been provided empirical evidence on how investment strategy taking long positions in carbon-efficient stocks and short positions in carbon-inefficient stock earn positive abnormal returns over a time period from 2010 to 2015 with a sample of U.S. stocks (In et al., 2019) and that employee satisfaction (regarded as a part of CSR) is correlated with shareholder returns (Edmans, 2011).

However, there are several studies showing that better responsibility leads to lower expected returns, which connects to the theories of positive connection between CSR and firm valuations. Hong & Kacperczyk (2009) exhibit how so-called "sin" stocks (stock of companies in somewhat dubious industries of e.g., alcohol, tobacco, and gaming) having higher expected returns than comparable stocks since the "sin" stocks are being avoided by many investors and are exposed to more risk. Similarly, companies with higher carbon emissions have been found earning higher stock returns, robust in North America, Europe, and Asia (Bolton & Kacperczyk, 2021b). Pástor et al. (2021) propose a theoretical model whereby dividing stocks into ESG-positive and ESG-negative they find in equilibrium the ESG-positive assets should have lower expected returns when measured with CAPM alphas. This is explained with investor preferences towards these stocks, and because they find these stock hedging against future risks. Similar effects have been exhibited in venture capital universe, where funds aiming for social impact earn lower expected returns than other funds (Barber et al., 2021). This is explained by investors gaining non-pecuniary utility from investing to funds with positive social impact.

When assessing the studies examining stock returns, differences occur also in the perspective of returns. Some studies focus on expected future returns, as does for example, Baker et al. (2018) and Zerbib (2019) in bond market and El Ghoul et al. (2011) and Chava (2014) in stock markets. On the other hand, some studies have been conducted focusing on realized returns, as seen for example in studies on stock universe by In et al. (2019), Bolton & Kacperczyk (2021), and Görgen et al. (2010). Studying both realized and expected returns, van der Beck (2021) argues that the realized outperformance experienced with high CSR stocks is based on investment flows, and thus does not mean that the expected returns for these stocks should be higher. For this reason, in this study we will focus on the expected returns when assessing this aspect of financial performance.

In summary, the existing literature on the connection between corporate social responsibility (CSR) and financial performance is extensive, but not entirely consistent. Academic literature agrees on the positive relationship between CSR measures and firm valuations. This is attributed to several factors, including investor preference for CSR assets, improved relationships with stakeholders, and created competitive advantage. Deriving from this, theoretical consensus expects lower expected returns for better CSR companies. However, here results have been mixed. Keeping in mind the findings of exiting literature and relying on prevailing financial theory on CSR-CFP connection, this study examines the connection between net impact and profitability, firm valuations, and expected returns.

2.3. Impact investing

As can be concluded from the increasing number of ESG-aspects incorporated into business operations of companies[3], the importance of corporate social responsibility is increasing. Correspondingly, the similar effect can be noticed at investor level, as the demand for socially responsible investment (SRI) funds have been increasing (Białkowski et al., 2016). This is implied to be a result of investors having grown non-pecuniary considerations into their investment decision process. As investors seem to take CSR into account increasingly in their investment decisions, it is worth to ponder how is this responsibility measured. Considering this increasing interest, it can be concluded that investors are looking for investments generating positive impact on the world. Most commonly in these discussions, the metrics used in evaluating companies' level of CSR have been some kind of ESG-scores or ratings. We argue, that ESG ratings do not provide appropriate metric for measuring what kind of impact companies actually have as we argue in *Section 2.4*. Therefore, we want to shift the focus from ESG towards impact in the context of investing.

Defining impact investing

Originally, the idea of socially responsible investing (SRI) was to avoid investments perceived as harmful in some way. As a broadly discussed topic, the specific definitions tend to vary depending on the source, but typically, SRIs have meant avoiding investments in companies operating industries such as tobacco, alcohol, and weapons, to name a few. We consider impact investing to belong under the broader scope of responsible investing. Impact investments, in contrast to other SRIs, have a distinctive feature. While socially responsible investments strive to minimize negative consequences, impact investments prioritize generating beneficial social or environmental benefits (Donohoe & Bugg-levine, 2010). This simple definition of impact investing as comprising the aim of financial return and environmental or social impact is widely agreed on (Clarkin & Cangioni, 2016; Combs, 2014; Hebb, 2013).

According to Global Impact Investing Network (GIIN), impact investing is a form of investing, where the intention is to "generate positive, measurable social and environmental impact alongside a financial return". Agreeing with this, Bugg-Levine & Emerson (2011) introduce a term "blended

[3] According to McKinsey, more than 90% of S&P 500 companies publish ESG reports in some form (Perez et al., 2022)

value" when referring to the dual-agenda of financial profit and environmental and/or social impact. In a paper on differences between ESG and impact investing (Foroughi, 2022) follows and complements this impact investing definition with three principles defining impact investing; expectation of financial return in addition to social or environmental impact, sought change typically among environmental or social issues, and the attempt to measure the change. Important note both articles make is the intentionality of impact.

GIIN estimates that the market size of impact investments in 2022 was 1.164 trillion USD and is constantly growing (Hand et al., 2022). Thus, it seems that importance of making impact in investors thoughts is increasing. However, measuring corporate impact is difficult and there has not been universal measure available that indicates impact of corporate operations on the surrounding world, which has led current literature on impact investing using for example fund characteristics as a proxy for impact investing (Barber et al., 2021). Sometimes the different concepts of CSR seem to mix, as impact investing and ESG investing are intermingled. We argue there to be conceptual difference between the two, which will be described more in more detail later in this section.

Difference between impact and ESG

As proved in the preceding literature review, interest towards environmental, social and governance issues have been increasing among investors. In the economic and financial contexts, the terms of impact and ESG may easily be intermingled, even among academicians and professionals. This is human, since in the vague, bigger picture the two terms both refer to the action companies do to avoid harmful actions for the society and the planet. Both impact and ESG management aim to help investors as well as other stakeholders of companies, also in financial terms (Vahouny, 2022). However, the two terms being closely related, we argue there to be also a clear distinction between them, similar to Busch et al. (2021), Foroughi (2022), and Vahouny (2022) The key differences between impact and ESG in investing context are presented in *Table 1*.

Impact investing has dual agenda of comprising both positive financial returns and positive social or environmental impact. Thus, impact investing can be regarded as an investment style or strategy which aims to generate financial profit along with measurable positive impact on the world. ESG investing on the other hand refers to a more of a screening of set standards when making investment decisions – sort of a framework of criteria (Foroughi, 2022): ESG framework helps investors to understand how the risks are mitigated under each predetermined ESG pillars and their subsections.

Table 1: Key differences between Impact and ESG in investing context

Impact	ESG
Investment strategy	*Investment framework*
Forward-looking	*Backward-looking*
Impact of products/services observable outside	*Actions reported by the company themselves*
Includes external factors	*Focus on internal operations*
Used directly to advance the mission	*Used to gain resources to advance the mission*
Answers the question: What?	*Answers the question: How?*

Usually, ESG-measure tend to be backward-looking by nature (Foroughi, 2022), trying to explain how the company has considered the different aspect of ESG in their operations. Impact on the other hand aims to quantify and describe what kind of consequences the company creates through their services or products. This intentionality is in the very core of impact investing, as stands out from the GIIN description. In ESG, this usually means describing how the company has mitigated risks, while impact refers to e.g., how a company providing educational services creates impact in the future due to that education. Similar to this, impact measures are usually observable from outsider's point of view, whereas in many cases ESG ratings commonly rely on the information companies publish themselves on the matter. For example, company might have good ESG rating due to transparent reporting and ambitious targets for cutting emissions, but this does yet mean that the company's actions have any actual impact for the environment. This way, in ESG reporting so-called "green-washing" (or here rather, "impact-washing") is possible. Impact on the other hand can be measured more easily from outside (Vahouny, 2022) for example by assessing the impact oil drilling has on natural resources.

To continue to emphasize the difference, impact scores consider the externalities the company's products or services has on the surrounding world (Foroughi, 2022; Gray & Mcguckin, 2022; Vahouny, 2022), which ESG sometimes disregards if not reported by the company. For example, impact figures take into account how the steel from steel manufacturer is used later in the supply chain, whereas ESG only accounts for the immediate effect the manufacturing and other operations have from the manufacturers point of view. Lastly, whereas impact investing aims to directly support the company mission related to social or environmental impact, ESG investing aims to make additional resources available to advance the mission by better financial performance (Caplan et al., 2013).

To conclude, where ESG-scores tells *how* certain companies operate from environmental, social and governance perspective, corporate impact tells *what* companies do and what is the impact of their operations on the surrounding world. This sums up the conceptual difference distinguishing the two terms from each other. Usually, impact investing is also ESG investing, but ESG investing is not necessarily impact investing.

2.4. Research question

Presenting how the connection between CSR and CFP has been studied before and what kind of evidence these studies have provided, as well as highlighting the difference of ESG and impact, we want to shift the focus from ESG related studies towards impact. In this study we examine whether the prevailing theories on CSR-CFP connection presented before applies with a new CSR measure of net impact, which, to extent of our knowledge, has not yet been studied in this context.

One might argue, that as a new measure that has not yet been studied it similarly would not be yet integrated into decision making of investors. However, we argue that the actual impact companies have on the different net impact aspects of *Society, Knowledge, Health,* and *Environment* are observable from outside to some extent even without the acknowledgement of this specific metric. Thus, we assume that investors can include this into their decision-making regardless of the novelty of this specific measure. In this paper we are willing to answer to the question *"Does corporate net impact have a connection with firm financial performance?"* which we are going to examine through three key research questions described below.

Pedersen et al. (2021) suggest that ESG score plays two roles, of which the first one is providing information about company fundamentals. We are willing to find out if the net impact acts in a similar way by testing if there is a connection between net impact and firm profitability. Thus, our first research question seizes into this:

Q1: Does corporate net impact affect firm profitability?

By examining this research question, we are willing to find out if corporate net impact has an actual effect on corporate fundamentals such as profitability, which we can later leverage in the assessment of our further research questions.

We assume that companies striving to enhance their net impact incur higher costs. For example, employing renewable energy across the supply chain, which positively affects the Environment dimension through lower greenhouse gas emissions, is typically costlier than the cheapest available option. Also, using ethical workforce instead of e.g., child labor or other unethical cheap labor increases the cost base but also increases the net impact in the *Society* dimension. Thus, it could be argued that there is a trade-off between the net impact attributes and corporate costs. However, we also assume that net impact improving attributes could improve the topline, in other words increase the revenue. As presented in prior literature better CSR performing companies have been argued to have competitive advantage for example due to better relationship with the employees and better reputation in the eyes of the customers, which eventually lead to higher customer demand and better product price elasticity (Gregory et al., 2014; Pedersen et al., 2021). The relationship between the corporate net impact and company's profitability is a complex and dependent on the context. Thus, we assume that in general these two factors presented above trades off each other leading eventually to neutral effect on profitability as also suggested by McWilliams & Siegel (2001). However, we don't exclude the possibility of positive or negative effect to be found. Our hypothesis for the first research question is as follows:

H1: Corporate net impact has a neutral effect on firm profitability

The second role of ESG suggested by Pedersen et al. (2021) is that the score gives information about the investor's preference. We are willing to find out if the company net impact acts in a similar role. Our second research question is as follows:

Q2: Does corporate net impact affect firm valuation?

By examining this research question, we aim to find out if corporate net impact has an actual effect on firm valuation level. We assume that increasing valuation level could indicate that investors have preference to invest in better net impact companies, that the better net impact companies are having lower risk profile or both. Together with the results of *Q1* we are able to analyze these factors within the prevailing theoretical framework suggested by for example Pedersen et al. (2021).

Previous academic literature it has demonstrated that investors have a preference to invest in better CSR performing companies (e.g., Pastor et al. 2021; Baker et al., 2018; Fama & French, 2007). The preference is explained to be due to the companies having lower risk profile or investors' altruistic motives to invest in companies with better CSR performance, in other words "doing good" with their investments. We hypothesize that investors should have similar preference regarding the net impact of the company as they evidently have regarding ESG meaning that investors have a preference to invest in companies that are having larger positive net impact in the surrounding world over those with a large negative net impact. This preference is expected to affect the firm valuation in two ways that are connected to each other. Firstly, by increasing the stock demand and creating a price pressure on the stock that raises the company valuation and secondly, by lowering the cost of capital as investors are willing to accept lower required rate of return in turn of lower risk profile companies are carrying due to better net impact, which again results in increase in the stock valuation. Thus, our hypothesis for the second research question is as follows:

H2: Higher corporate net impact leads to higher firm valuation

Following the two first research questions presented above we are going to finally examine if the net impact could function as a predictor for future expected returns. Our third research question is as follows:

Q3: Does corporate net impact affect expected returns?

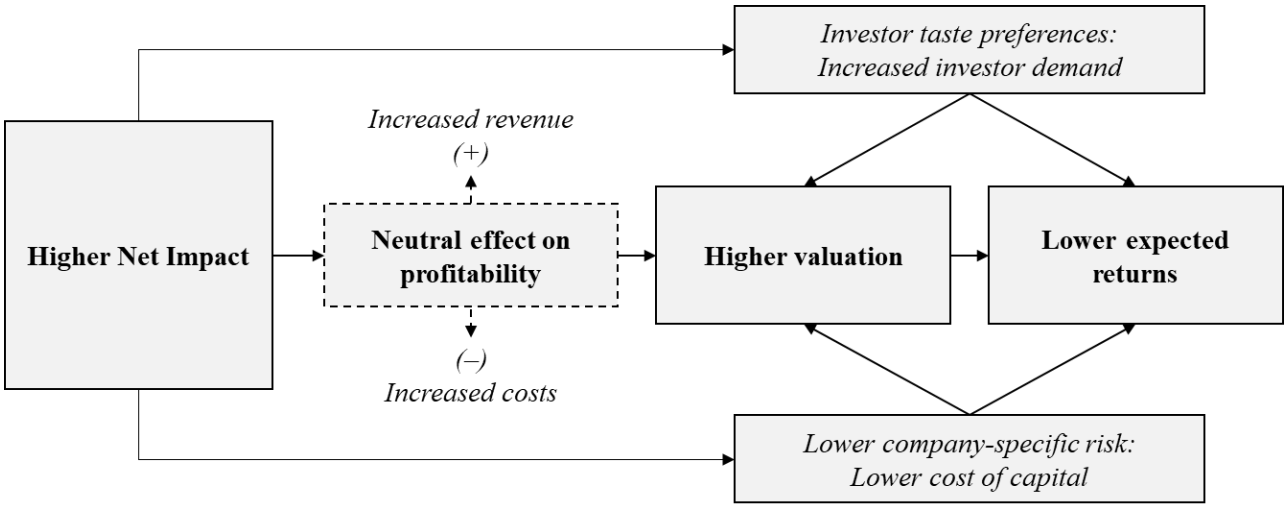
By examining this research question, we are willing to tie together the findings of the previous research questions as well as find out if investors could use the corporate net impact as a metric when assessing the potential expected returns in their investment decision. Pedersen et al. (2021) suggest in their paper that if there are enough investors motivated to invest in better CSR performing companies it leads to over-valuation of these stocks, and eventually leads to lower expected returns. Similar findings on lower expected returns have been made for example by Bolton & Kacperczyk (2021) and Hong & Kacperczyk (2009). Following the hypothesis' presented before, that better net impact does not affect firm profitability but still increases firm valuation level, we assume these factors to drive lower expected returns for better net impact companies. Our hypothesis for the third research questions is as follows:

H3: Higher corporate net impact leads to lower expected returns

The three key research questions presented here are all centered around the relationship between a company's net impact and their financial performance, measured here with profitability, valuation, and future expected returns. We present a theoretical framework to explain this relationship, which is illustrated below in *Figure 1* in a simplified manner.

To summarize, the basis of this framework is the assumption that corporate net impact does not affect firm profitability due to the trade-off between increased costs and increased revenues. Furter, we assume that investors may be more motivated to invest in companies with a better net impact due to their taste preferences towards sustainable companies or because these companies are perceived as having a lower risk profile. This increased demand results in higher valuation of the shares of these companies. Consequently, as the higher valuation of companies with a better net impact is mainly driven by the net impact and not by better fundamental performance, the stock price is not valued at the level of corresponding expected returns for the stock. Thus, there may exist an imbalance between company valuation and expected returns, which should lead into lower expected returns. The theoretical framework used in this study suggests that a company's net impact can influence its financial performance through various channels, including profitability, valuation level, and future expected returns. By investigating these relationships, we aim to provide new and valuable insights into the role of net impact in shaping a company's financial outcomes.

Figure 1: Simplified theoretical framework



2.5. Contribution

The most valuable contribution of this study is the introduction of a new measure for CSR into discussion of social responsibility's connection to financial performance. By measuring CSR with Upright Oy net impact data, we bring new empiric contribution to the existing literature, with fresh perspective on how the actual, measurable impact companies have on surrounding world is connected to their 1) profitability 2) valuation, and 3) expected stock returns. By using this novel measure, we help filling gaps in the currently noisy field of different CSR metrics. Although many others have also introduced new metrics in this field of studies, we want to emphasize the change of perspective from the prevalent ESG point of view to impact-focused standpoint. The introduction and testing of net impact as a new measure for CSR, is our tool to increase motivation for further, complementing academic studies using this measure.

While stepping into the discussion of the connection between CSR and CFP, we also contribute to the wider debate on role of CSR actions in business. By producing empirical evidence on the net impact of company operations, we contribute to the discussion of to which extent companies should prioritize social responsibility over other factors, such as those of a financial nature, and can these be achieved simultaneously.

In addition to the overall effect of net impact to financial performance, we also provide insights considering the different dimensions of the used net impact metric. By statistically analyzing the dimensions of *Society*, *Knowledge*, *Health,* and *Environment* described later in *Section 3.1,* we further contribute to the existing literature on more specific connections between different CSR aspects and financial performance. Finally, by introducing the new net impact metric, evaluating its connection for financial performance through empirical regression analysis and by highlighting the limitations and future possibilities of the data, we shed light into the usability of this CSR metric for future use in terms of academic research and investor decision making.

3. Data

3.1. Corporate net impact data

Although interest towards impact investing has been growing and is seemingly notable, there has not been yet found a commonly recognized metric for measuring company impact. In an endeavor to

change this, Finnish start-up company Upright Oy was established in 2017. Upright has since introduced *"an automated way to quantify companies' net impact on people, planet, society and knowledge"*. The net impact of a company refers to the net sum of negative and positive impacts the company creates, also including externalities. We use this measure of impact as our key independent variable of interest on this study. The costs and benefits company creates are measured in four main dimensions of *Society, Knowledge, Health*, and *Environment*.

The Upright model presents impact scores in each of these categories as relative values (Upright Oy, 2021b). This means the scores in each dimension in relative to the company size, measured as revenue. The mathematical formula for the relative impact score for company *c* in impact dimension *i* is

$$S_{r,c,i} = S_{a,c,i} \,/\, \frac{r_c}{R},$$

where $S_{a,c,i}$ is the absolute impact, r_c is the revenue of the company in question, and R is the total revenue of all companies (Upright Oy, 2021b). These scores can be regarded similarly as carbon intensities, in comparison to absolute carbon footprints. This allows comparison between impact categories and companies, regardless of the size of the observed companies.

The four main dimensions and their subcategories are presented in *Table 2*. Most of the subcategories can include both positive and negative impacts caused by company actions, where some only include positive impacts. For example, in *Society* dimension, the *Jobs* and *Taxes* subcategories are considered only to have positive impacts, since aspects such as employing people and paying taxes are considered to have merely positive impacts on society. On the other hand, under *Knowledge*, the *Scarce human capital*, which refers to the opportunity cost of using highly skilled work force, can only represent negative values. The impact can also be both direct and indirect. For example, creating greenhouse gas (GHG) emissions is considered as negative impact when they occur directly through the operations executed to produce the core products and services of the company, but also when they occur in its suppliers' operations or in the end-usage of the customers. Altogether, the total company net impact as well can be either positive or negative.

Table 2: Net Impact dimensions

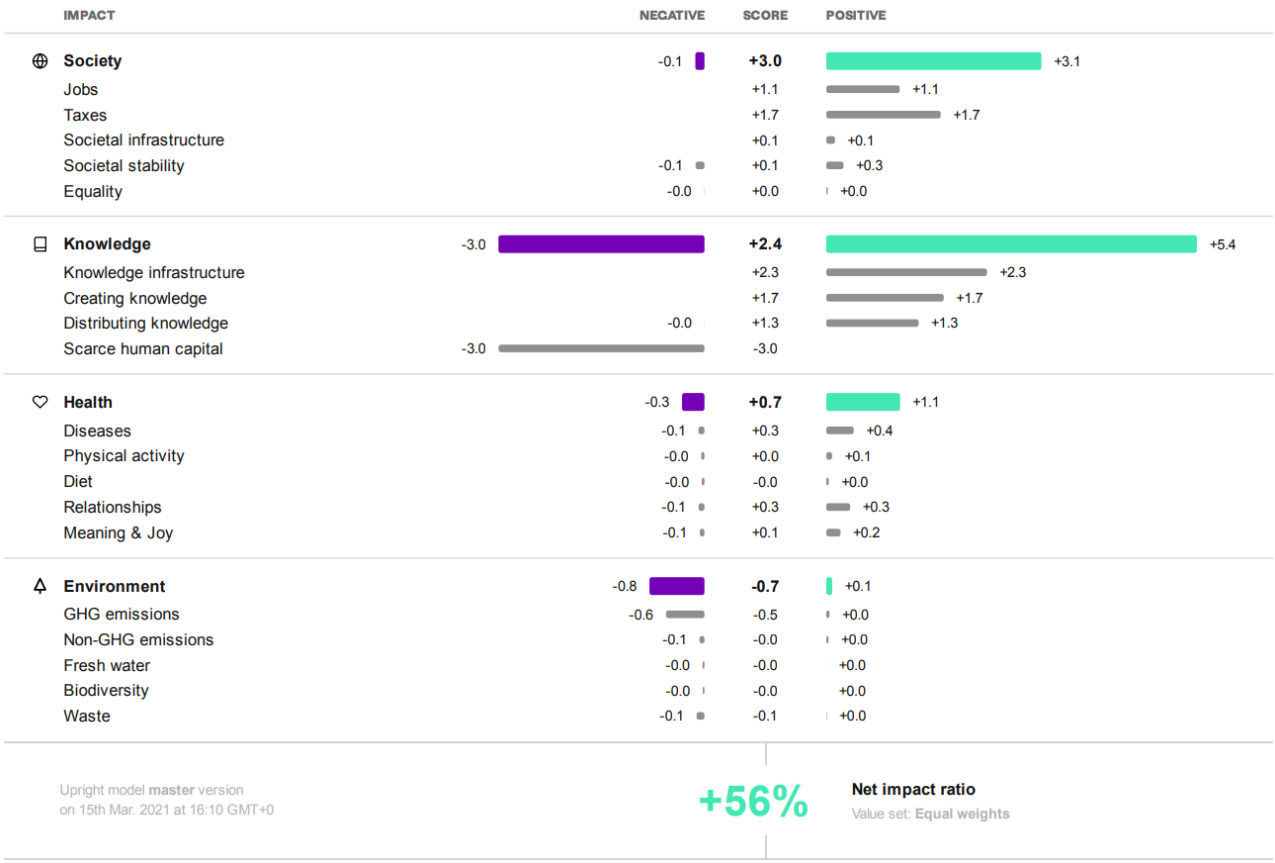
Four main dimensions and 19 subcategories of Upright net impact model, presented with possible direction of impact each subcategory can have. More detailed description of positive and negative impacts for each subcategory in the *Appendix Table 1*.

Society *(+/-)*		
	Jobs *(+)*	
	Taxes *(+)*	
	Societal infrastructure *(+)*	
	Societal stability & understanding among people *(+/-)*	
	Equality & human rights *(+/-)*	
Knowledge *(+/-)*		
	Knowledge infrastructure *(+)*	
	Creating knowledge *(+)*	
	Distributing knowledge *(+/-)*	***Company Net Impact***
	Scarce human capital *(-)*	
Health *(+/-)*		***(+/-)***
	Physical diseases *(+/-)*	
	Mental diseases *(+/-)*	
	Nutrition *(+)*	
	Relationships *(+/-)*	
	Meaning & joy *(+/-)*	
Environment *(+/-)*		
	GHG emissions *(+/-)*	
	Non-GHG emissions *(+/-)*	
	Scarce natural resources *(+/-)*	
	Biodiversity *(+/-)*	
	Waste *(+/-)*	

To clarify how the model quantifies company impact, we describe the Net Impact Scorecard of International Business Machines (IBM) from *Net Impact Report 2021* as an example in *Figure 2*. Overall, IBM has *Net Impact Ratio* of 56% driven by strong performance in the dimensions of *Society* and *Knowledge*. The positive *Net Impact Ratio* of 56% essentially means the company creates 56% more positive impacts than it creates negative impacts. In *Society* dimension, IBM has a net value of 3.0, which is mostly created by paying taxes and employing people. In *Knowledge* dimension IBM also generates net positive impact of 2.4, which consists of 5.4 positive impact driven by its cloud infrastructure services, cloud platform services, and system hardware products. On the other hand, this positive impact is offset by 3.0 negative impact by using scarce human capital. *Health* dimension does not pay that much role in IBM business model, resulting in a 0.7 positive net impact. IBM total net impact results in overall positive net impact of 5.4, after considering 0.7 negative net impact in *Environment* dimension, allocated to creating GHG and Non-GHG emissions and producing waste (Upright Oy, 2021a).

Figure 2: Net Impact Score Card example

International Business Machines IBM (Upright Oy, 2021b)



In our empirical analysis following this section, we assess the Upright Oy impact data in different forms. As one proxy we use the *Net Impact Ratio* calculated by Upright Oy based on the impact scores on each category. The ratio is calculated as follows:

$$Net\ Impact\ Ratio\ (NIR) = \frac{Positive\ impacts - Negative\ Impacts}{Positive\ Impacts}$$

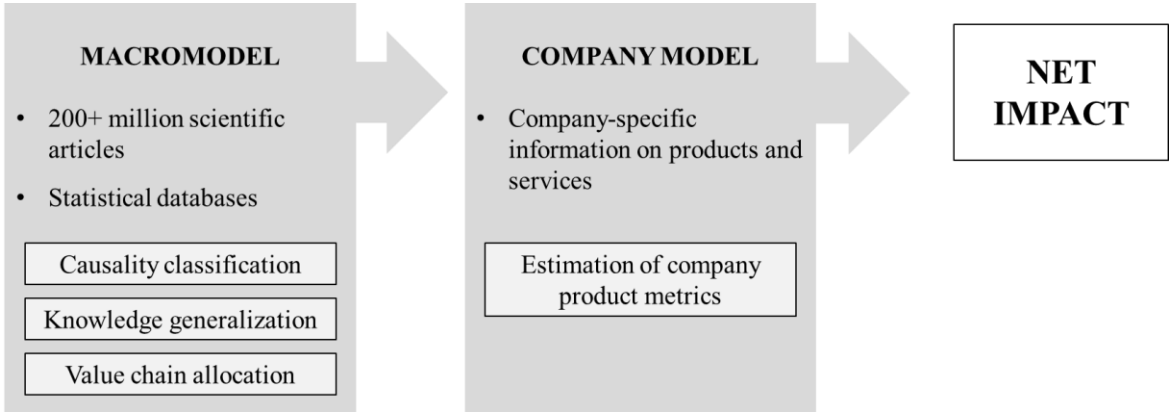
The highest possible value for the ratio is 100 %, representing a company with zero negative impacts, while minimum value for the ratio is infinite. For most companies, the *Net Impact Ratio* is between -200% and 70%. As a basic function of the Upright model, the ratio is calculated by weighting each four dimensions and their 19 impacts equally. In addition to the *Net Impact Ratio*, we assess each dimension score for each company separately, as well as compute a *Net Impact Score*. This score is simply the net sum of the net scores in each dimension. *Table 3* describes the used impact figures we analyze for each sample company, using the before-mentioned IBM as an example.

Table 3: Example of the used impact figures in the empirical analysis.

IBM (International Business Machines)					
Net Impact Ratio	Society	Knowledge	Health	Environment	Net Impact Score
56 %	3.0	2.4	0.7	-0.7	5.4

The net impact model consists of two parts: the macromodel and the company model. The macromodel incorporates information from more than 200 million scientific articles, as well as from statistical databases managed by, for example, OECD, World bank, IMF, Eurostat, and different market research reports. The company model uses the outputs from the macromodel explaining what kind of impacts different kinds of services and products have, combined with company-specific information detailing the products and services they provide. This combination provides an estimate for the company net impact (Upright Oy, 2022). *Figure 3* explains the simplified model logic.

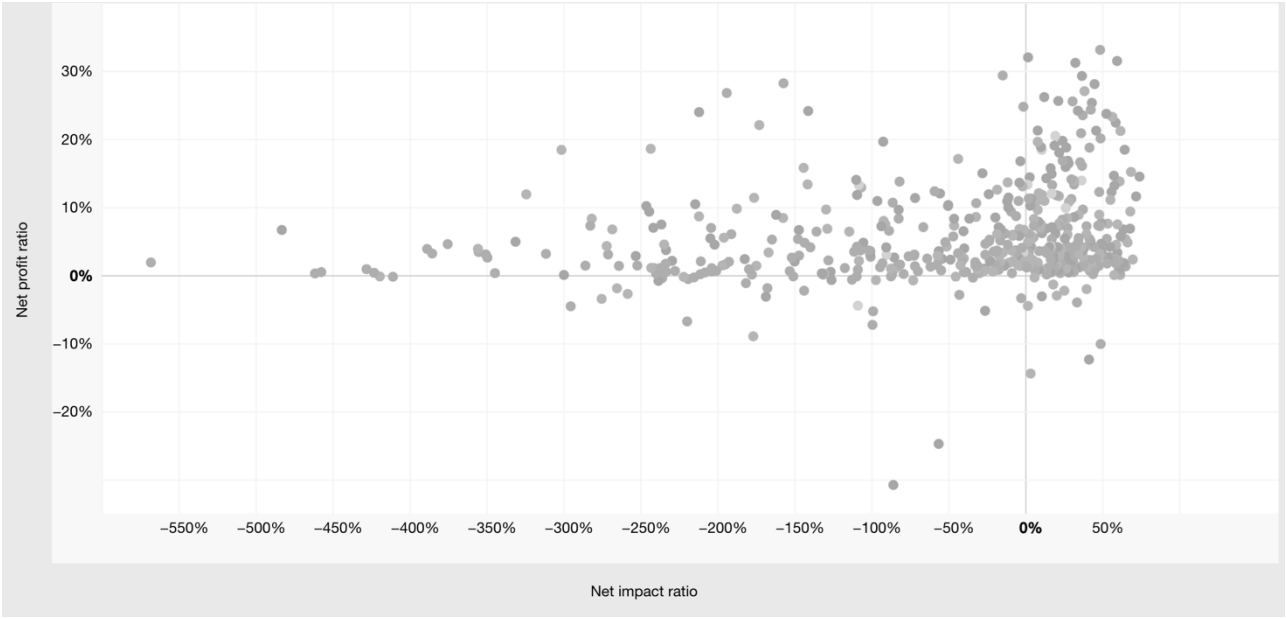
Figure 3: Visualized simplification of the Upright Oy Net Impact model



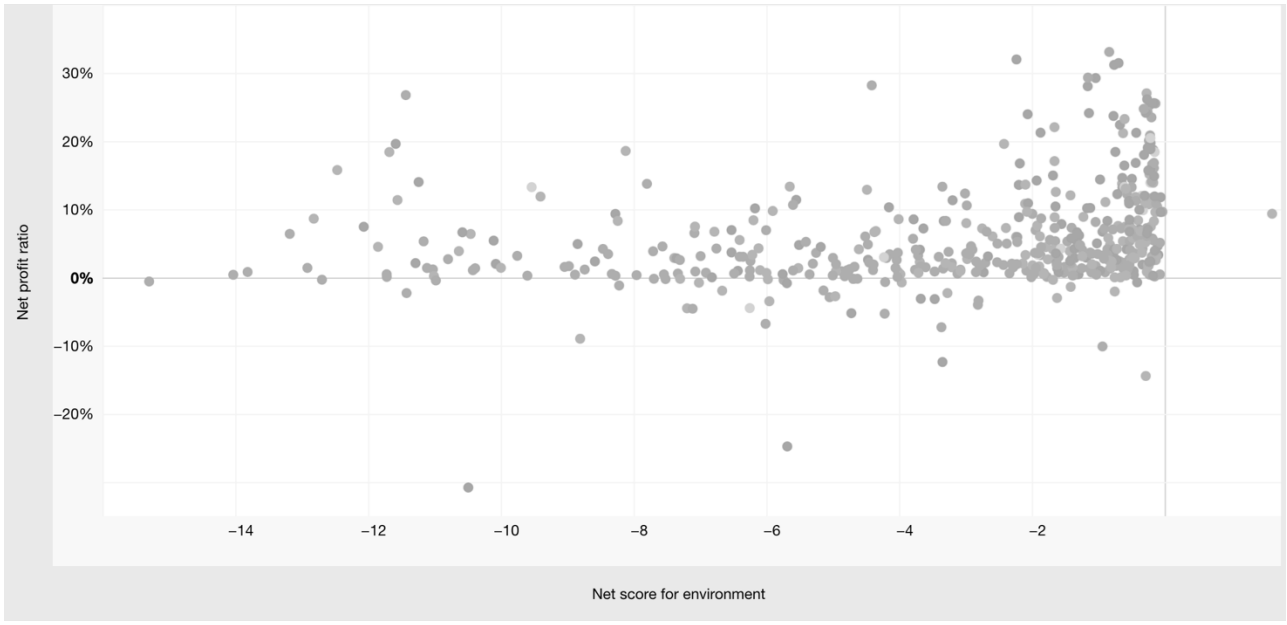
Although Upright Oy was founded already in 2017, the data have been available for public use only since 2021, when company published their first *Net Impact Report,* covering limited sample of companies. This also explains why this metric has not yet been used in relevant empirical research studying CSR and financial performance. To our knowledge, using this net impact measure in the CSR-CFP connection has only been done by Upright Oy themselves. In the *Net Impact Report 2021* they exhibit small statistically significant correlation of 0.23 between net impact ratios and net profit ratios of Fortune Global 500 companies. They have defined net profit ratio as revenue minus costs, divided by revenue. They find this correlation to be higher, 0.38, when only measuring the impact in environment category. *Figure 4* presents the net profit ratios plotted against their net impact ratios for these afore mentioned cases (Upright Oy, 2021a). Now, after opening parts of the generated net impact data for public, we are offered a possibility and motivation to introduce this metric to the discussion of the connection between CSR and CFP in academic literature.

Figure 4: Correlation between impact and profit by Upright Oy

Panel A: Net Profit Ratio and Net Impact Ratio (Upright Oy, 2021a)



Panel B: Net Profit Ratio and net score for Environment dimension (Upright Oy, 2021a)



Whereas in the rise of ESG ratings companies have been able to increase their ratings over a short period of time by increasing ESG reporting and transparency, we argue net impact figures to be less volatile since impact related changes in organization requires transformation of larger scale. Thus, in our analysis we will assume the net impact to be stable during the observed period, using the 2020 net impact figures published in the *Net Impact Report 2021* (Upright Oy, 2021a). The Upright net impact model is constantly developing, and thus the current values presented online on the Upright

Platform may differ from the values used in our analysis due to changes in the model definitions and methodology, that does not have any implications to actual company impact. This also speaks for using stable impact figures for this empirical analysis.

Net Impact as a measure for CSR

In order to test the objectivity of our chosen measure of net impact, we performed a simple correlation test between Upright Oy data and Refinitiv ESG data. Furthermore, we tested the correlation between the two CSR measures to actual reported emission data, provided by TruCost database. The emissions data in use cover all three scopes of emissions, based on the classification made by Greenhouse Gas (GHG) Protocol (World Resource Institute, 2004). Scope 1 emissions refer to the direct emissions from company-owned or -controlled sources. Scope 2 emissions refer to emissions resulting from the generation of purchased electricity and thus are indirect by nature. The Scope 3 emissions refer to all the rest indirect emissions resulting from company activities but are from sources not owned or controlled by the company. These emissions occur in the value chain of the company's products and thus are the trickiest aspect to measure. All in all, the ensemble of the three scopes is meant to represent all direct and indirect emissions relevant to the company's operations.

The results presented in *Table 4* can be concluded to speak in favor of Upright Oy impact data over Refinitiv ESG data. As extensively discussed above, there is a fundamental difference between Impact and ESG as concepts. The difference eventually results also in differences in measurement. This can evidently be seen as almost non-existent correlation between these measures for impact and ESG. When impact is measured as *Net Impact Ratio*, the correlation coefficient with the Refinitiv ESG score is only 0.01, and 0.02 when measured with *Net Impact Score* (the difference between these two is described in *Section 4.1*). Moreover, when observing only the environmental aspect of both net impact and ESG scores, net impact manages to capture the actual impacts better than ESG, when this is measured solely based on GHG emissions. Although the environmental pillar in both impact and ESG scores cover broader scope of environmental aspects beyond GHG emissions, the latter can be seen as if not the single most important aspect there, at least one of the most notable ones. The correlation between the *Environment* dimension of impact data and the emission data from TruCost covering scopes 1, 2 and 3 is negative 0.58. This speaks for the conclusion that in our sample data, higher emissions correlate with lower impact score in the *Environment* dimension. Since the dimension includes other aspect in addition to the emissions, we consider this correlation of 58% to

be rather solid evidence for the objectivity of the net impact measure in this matter. In contrast, the correlation between the *Environmental* pillar of Refinitiv ESG score and the TruCost emissions is 0.13. This weak correlation of illogical direction implies that the ESG score may not effectively capture the true environmental impacts of an organization's activities, at least in terms of emissions.

We argue this difference to exist in so prominent manner due to the difference in measured aspects. Whereas impact captures the actual impact the company has on environment, ESG can include targets in the measuring process to enhance the score. For example, in the Refinitiv ESG Score, under *Environmental,* factors such as "Targets Emissions" and "Targets Energy Efficiency" affect the score, based on "has the company set targets or objectives to be achieved on emission reduction / energy efficiency?", without any actual impact on emissions or energy efficiency yet occurring.

Table 4: Correlation between different CSR measures and their environmental aspects

Correlation coefficients between Upright Oy *Net Impact Ratio*, *Net Impact Score* and Refinitiv *ESG Score* are presented in Panel A. Panel B exhibits the correlation coefficients between Upright Oy impact scores in Environment (E) dimension, Refinitiv Environmental (E) score and TruCost Scope 1-3 emissions.

Panel A			
	Net Impact Ratio	Net Impact Score	ESG Score
Net Impact Ratio	1.00	0.92	0.01
Net Impact Score	0.92	1.00	0.02
ESG Score	0.01	0.02	1.00
Panel B			
	E - Upright	E - Refinitiv	CO2 - TruCost
E - Upright	1.00	-0.03	-0.58
E - Refinitiv	-0.03	1.00	0.13
CO2 - TruCost	-0.58	0.13	1.00

By further examining the accuracy of our net impact measure in *Environment* dimension, we see quite linear connection, presented in *Figure 5*, between the average impacts of each sector in this dimension and the emission intensities provided by TruCost. The correlation between the average figures for these between industries is high, with a coefficient of -0.94. This further build confidence for the correlation coefficient of -0.58 for the whole sample of observations, since all the industries are in line with the results and no single one is driving this effect. To compare this correlation of -0.94 to the Refinitiv ESG scores, the value for that corresponding dimension is 0.10, which again presents correlation in illogical direction. This implies that we can attribute more confidence for this net impact measure compared to the Refinitiv ESG scores in capturing the true relationship between corporate activities and environmental impact.

Figure 5: Correlation between Environment impact and emission intensities between sectors

Impact on Environment dimension (x-axis) and corresponding TruCost emission intensities (y-axis) plotted for each of the 11 GICS sectors.

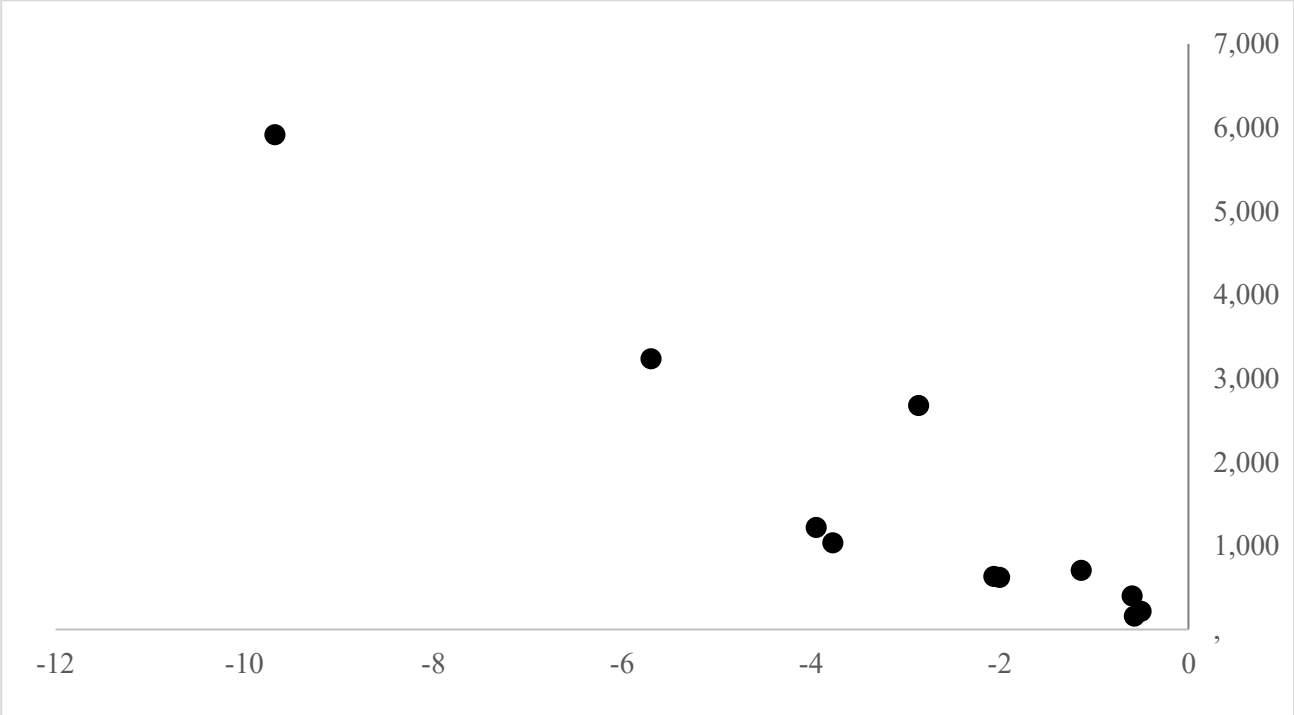


Table 5 represents average values for selected indicators from our data for each 11 observed GICS industries. We can see the correlation between *Environment* impact and emission intensities to be negative in all of the 11 GICS sectors, values varying between -0.15 and -0.58. This implies that net impact scores manage to capture the actual emission impacts quite well despite the sector. The smallest correlation is found for Real Estate, which has notably smallest number of observations in our sample, as can be seen from *Figure 6*.

Table 5: Average values and correlations within sectors

First three columns present the average values of Net Impact Ratio, impact on Environment dimension, and TruCost emission intensities for each 11 GICS industries in the used sample of Fortune 500 Global companies from 2020 list. Last two columns present the correlation coefficients between Environment dimensions of Impact and Refinitiv ESG score, and TruCost emission intensities.

	Average values			Correlations with TruCOst	
	NIR	E (Impact)	TruCost	(E) Impact	(E) ESG
Communication Services	37.9 %	-0.57	157.88	-0.53	-0.07
Consumer Discretionary	-134.0 %	-3.94	1,220.21	-0.31	0.07
Consumer Staples	-43.0 %	-2.06	633.28	-0.58	0.19
Energy	-161.0 %	-9.68	5,913.15	-0.25	-0.02
Financials	4.9 %	-0.50	216.74	-0.27	0.02
Health Care	58.0 %	-0.60	398.97	-0.20	-0.13
Industrials	-85.0 %	-3.77	1,036.25	-0.24	0.45
Information Technology	10.0 %	-1.14	706.71	-0.38	-0.16
Materials	-198.0 %	-5.69	3,234.60	-0.25	0.14
Real Estate	-9.0 %	-2.00	623.53	-0.15	0.94
Utilities	37.0 %	-2.86	2,678.12	-0.21	0.32

3.2. Sample description

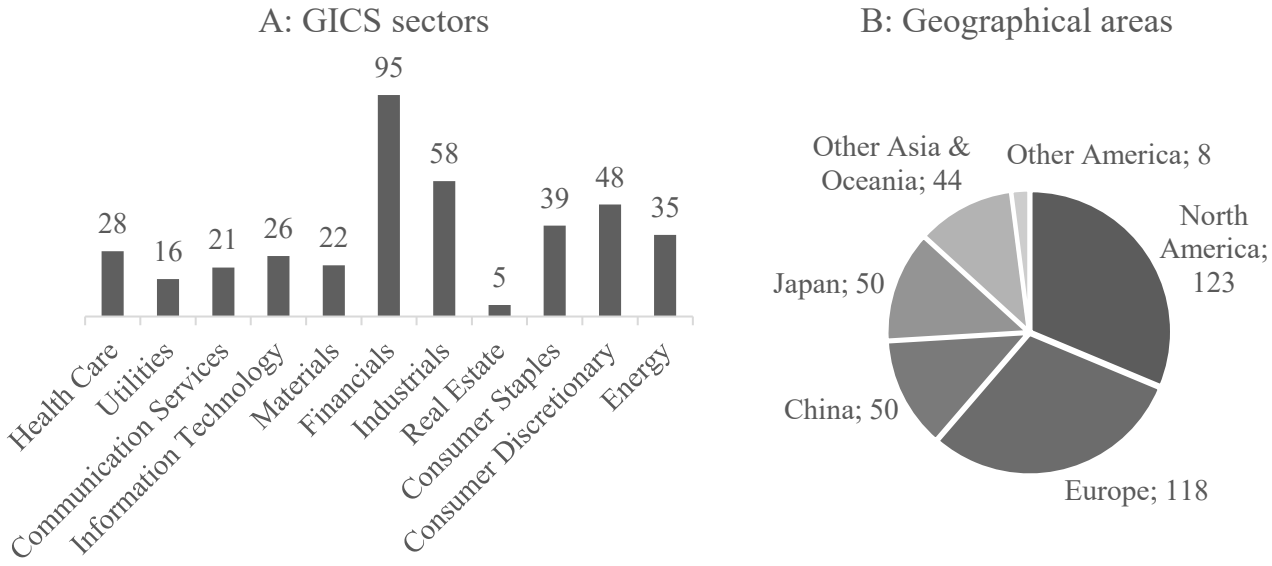
For the empirical analysis. we observe the previously described net impact figures for Fortune Global 500 companies from the year 2020. Fortune Global 500 annually ranks top 500 companies globally based on revenue. Originally this sample consists of companies that are publicly traded, as well as companies that are not. After considering only the relevant publicly traded companies with available data for the observed period, the sample size of companies settles to 393.

Using this set of Fortune Global 500 as our observed sample suits our empirical research well for several reasons: First of all, the global perspective enables a wider analysis covering different countries and regions. Secondly, sample of companies unrestricted to any specific industries allows us to capture various business activities increasing the external validity of the study. The sectorial and geographical distribution of our sample companies is presented in Figure 4. Thirdly, as the sample

is constructed from the largest companies on a global scale, it is undeniable that these are also companies that have large impact on the world as whole, making it even more interesting to understand the connection between their net impact and financial performance. Finally, related to the large size of the sample companies, these companies attract huge amount of public attention, increasing the available information for the sample.

Figure 66: Sample characteristics

Sample companies (N=393) divided into (A) CIGS sectors and into (B) geographical areas.



To construct our complete dataset, we combine our previously described net impact data with financial data from Refinitiv Workspace. This is started by collecting montlhy returns for all 393 sample companies' ordinary shares from January 2015 to January 2023, resulting in a total of 37,692 valid firm-month observations. This is further complemented with year-end Tobin's Q and Return on Assets (ROA) values for years 2015-2022, resulting in a total of 3,082 and 2,978 valid firm-year observations, respectively. Tobin's Q values have been calculated as Price-to-Book values of company equity based on financial data sourced from Refinitiv Workspace. ROA values are sourced directly as reported in Refinitiv Workspace.

In addition to company-specific financial data, we sourced factor loadings to account for market risk. size effect (minus big, SMB) and value effect (high minus low, HML) according to Fama & French (1992) plus adding momentum factor (up minus down, UMD) to this, as of Carhart (1997). To account for industry-related effects, we collect Global Industry Classification Standard (GICS) codes for the

sample companies. We perform the classification on a sector level (two-digit classification) due to the limited sample size observed. Our sample consists companies from all 11 GICS sectors, as presented in Figure 4.

Table 6: Descriptive statistics

Descriptive statistics for the variables used in the empirical analysis. The variable descriptions and sources are presented in *Appendix Table 2*.

Variable	N	Mean	SD	25 %	Median	75 %
Net Impact Ratio (%)	393	-0.456	1.062	-0.920	-0.040	0.280
Society	393	2.337	1.640	1.500	2.100	2.800
Knowledge	393	-0.560	0.906	-1.000	-0.700	-0.500
Health	393	-0.073	2.100	-0.700	0.000	0.400
Environment	393	-2.824	3.060	-4.200	-1.600	-0.600
Net Impact Score	393	-1.118	4.334	-3.400	-0.100	1.100
P/B	3,082	2.865	17.117	0.845	1.382	2.640
ROA (%)	2,978	3.944	5.145	0.939	3.073	6.006
Beta	3,128	1.078	0.414	0.812	1.047	1.310
Mcap (BNUSD)	3,080	78.609	168.919	17.412	36.878	79.278
Returns (%)	37,692	0.870	8.922	-4.005	0.656	5.402
MKT (%)	97	0.765	4.530	-1.730	1.070	3.000
SMB (%)	97	-0.100	1.484	-1.155	-0.050	1.050
HML (%)	97	-0.124	3.076	-1.800	-0.660	1.750
UMD (%)	97	0.358	3.080	-1.535	0.580	2.530
RF (%)	97	0.074	0.085	0.000	0.030	0.140

4. Methodology

To test our hypothesis regarding the connection between corporate net impact and (1) firm profitability, (2) valuation, and (3) expected returns we apply total three different models, one for each hypothesis. First, we test the connection between corporate net impact and firm profitability using ROA as a proxy for the profitability of a company. Second, we assess how the net impact performance affects firm valuation by using Tobin's Q as a proxy for valuation. Last, we assess how the net impact performance affects expected returns using Carhart's Four-Factor Model. We base our used methodology on papers of Pedersen et al. (2021) and Borgers et al. (2013).

Methodology to test the connection between corporate net impact and firm profitability

To answer our first research question *"Does corporate net impact affect firm profitability?"* we run an ordinary least squares (OLS) regression with sector fixed effects. We apply similar methodology used by Pedersen et al. (2021) do in their paper, but we use Return on Assets (ROA) as the dependent variable instead of Return on Net Operating Assets (RNOA), for simplicity and we assume ROA to capture the potential connection adequately. We include three control variables which are market beta, natural logarithm of market capitalization and natural logarithm of Tobin's Q measured as price-to-book ratio. As the key independent variable of interest, we use the *Net Impact Ratio (NIR)*. In addition, we will run the same regression by replacing the *NIR* with all its four dimensions (*Society, Knowledge, Health*, and *Environment*) and their sum *(Net Score*) separately, to examine if there is some specific dimension that drives the profitability more than others. The regression formula for measuring the connection between corporate net impact and firm future profitability looks as follows:

$$(1)\ ROA_{i,t} = \propto + \beta_1 NIR_{i,2020} + \beta_2 Market\ Beta_{i,t} + \beta_3 LN(Mcap)_{i,t} + \beta_4 LN\left(\frac{P}{B}\right)_{i,t} + \beta_5 ROA_{i,t} + IndustryFE + YearFE + \varepsilon_{i,t}$$

As already stated, we followed the methodology used by Pedersen et al. (2021) when choosing the control variables. Market beta measures the sensitivity of stock returns on changes in the overall market and thereby captures the market risk associated with profitability as a control variable. Market capitalization and Tobin's Q illustrates firm size and valuation respectively and as a control variable captures the potential strong firm characteristics affecting the profitability. In addition, we include sector fixed effects to account for omitted variable bias across industries that might influence the profitability. Since we have net impact data only from the year 2020, we are not able to run a panel data regression. However, as we assume net impact data to have a static nature and that the net impact figures have not critically changed over time, we are going to run separate cross-sectional regressions from 2015 to 2022 as well as an aggregated regression with average values of the variables over this time period to assess our research question.

With the results of this regression, we aim to analyze if the corporate net impact factors could predict firm profitability. We are willing to assess the connection between net impact and firm fundamentals to gain better understanding which factors are driving the investor decisions later in our analysis.

Methodology to test the connection between corporate net impact and valuation

To answer our second research question *"Does corporate net impact affect firm valuation?"* we run an OLS regression with sector fixed effects. We use Tobin's Q (price-to-book ratio) as the dependent variable, which is commonly used measure for firm valuation (Albuquerque et al., 2019; Pedersen et al., 2021). We use market beta as the control variable as does Pedersen et al. (2021) in their paper. As the key independent variable of interest, we use the *NIR, Net Score* and its dimensions separately similarly than in regression (1). Our regression formula for measuring the connection between corporate net impact and firm valuation looks as follows:

$$(2)\ LN\left(Tobin's\ Q_{i,t}\right) = \propto + \beta_1 NIR_{i,2020} + \beta_2 Market\ Beta_{i,t} + IndustryFE + YearFE + \varepsilon_{i,t}$$

We are going to use the natural logarithm of the dependent variable Tobin's Q to simplify the analysis of the results. We exclude the control variable measuring for the company size (Market Capitalization), which is used in the regression (1), since it is related to the valuation metric by its nature. We use sector fixed effects in our regression to control for potential omitted variable bias. Similarly than in regression (1) we are going to run cross-sectional regressions for separate years between the time period from 2015 and 2022 as well as an aggregated regression with average values for the variables over this time period to assess our research question.

With the results of this regression, we aim to analyze if the corporate net impact factors have causal impact on firm valuation. We assume that the potential connection tells us about the investor preferences, the corporate risk profile, or the combination of these two factors.

Methodology to test if corporate net impact has an effect on expected returns

To assess our third and last research question *"Does corporate net impact affect expected returns?"* we apply similar methodology as used by Pedersen et al. (2021) and Borgers et al. (2013) in their papers. We divide the sample of 393 companies into three separate portfolios based on the companies' net impact pact performance as of 2020. We then calculate the average returns for each month for the top and bottom portfolios, using equal and value weighting methods. Next, we calculate the excess long-short strategy returns for the portfolios for each month by extracting bottom returns from top returns and further extracting the risk-free rate of return. Then we apply the four-factor model introduced by Carhart (1997), which builds upon Fama & French (1992) to test if the long-short net

impact strategy produces abnormal positive or negative returns. Carhart four-factor model includes the Fama-French three-factor model factors (1) the excess return on the market, (2) the excess return of small over big stocks, (3) the excess return of value over growth stocks and additionally (4) the excess return of positive over negative momentum stocks. Our regression formula for measuring the portfolios' financial performance in excess stock returns looks as follows:

$$(3)\ R_{i,t} - R_{f,t} = \propto + \beta_{1,i}\left(R_{m,t} - R_{f,t}\right) + \beta_{2,i}SMB_t + \beta_{3,i}HML_t + \beta_{4,i}UMD_t + \varepsilon_{i,t}$$

Where $R_{i,t} - R_{f,t}$ is excess portfolio returns, as of portfolio returns over risk-free returns. $R_{m,t} - R_{f,t}$ is excess market return, and *SMB*, *HML*, and *UMD* factor loadings refer to size, value, and momentum effect respectively.

With this model, we aim to test if investing with long-short net impact strategy could produce arbitrary abnormal returns and if the corporate net impact could work as a predictor for expected returns. Alpha will be the key point of interest. A positive Alpha indicates that firms with better net impact outperform those with poorer net impact, while a negative Alpha suggests the opposite.

5. Results and discussion

In this section we present and discuss the results of our empirical analysis made to test our hypotheses. We first present and discuss the results for the regression (1), (2) and (3), each assessing one of our research questions separately. After that, we continue by presenting additional robustness tests and discussing the limitations considering this study.

5.1. Does corporate net impact affect firm profitability?

We start our empirical analysis by investigating corporate net impact and its four dimensions (*Society*, *Knowledge*, *Health*, and *Environment*) connection with firm profitability. We use the ordinary least squares (OLS) regression method with sector fixed effects as described in the *Section 4*. We examine the time period between 2015 and 2022, with cross-sectional regressions first by running a single regression with aggregated average values for each variable during the time period and second by running separate regression for each year during the observed time period.

The results of the regression with the aggregated data are presented in *Table 7*. The key independent variables of interest are *Net Impact Ratio (NIR)*, the four dimensions of it, and the sum of the dimensions (*Net Score*). The results are presented separately for each key independent variable with and without sector fixed effects in columns (1) to (12).

Table 7: Does corporate net impact affect firm profitability?

*This table reports the regressions of future profitability on underlying Corporate Net Impact scores and its pillars, where profitability is measured by Return on Assets (ROA). The sample consists of 372 aggregated average firm annual data observations from 2015 to 2022. We consider six Net Impact metrics (Net Impact Ratio as "NIR", Society, Knowledge, Health, Environment & Net Score) and three control variables (market beta, the natural logarithm of market capitalization and the natural logarithm of price-to-book ratio). The results are presented with and without the sector fixed effects. T-statistics are shown in parenthesis. Significance levels are shown in stars *, ** and *** as 10%, 5% and 1% respectively.*

	Dependent variable: ROA											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	-0.524***	-0.091										
	(-3.455)	(-0.489)										
Society			-0.084	-0.018								
			(-0.875)	(-0.150)								
Knowledge					0.235	-0.685***						
					(1.339)	(-2.940)						
Health							-0.159**	-0.048				
							(-2.020)	(-0.497)				
Environment									-0.146***	0.025		
									(-2.874)	(0.273)		
Net Score											-0.115***	-0.041
											(-3.108)	(-0.806)
Market Beta	-1.334***	-1.386***	-0.941**	-1.344***	-0.822*	-1.444***	-1.067**	-1.381***	-1.080**	-1.333***	-1.261***	-1.400***
	(-2.844)	(-2.829)	(-2.040)	(-2.783)	(-1.784)	(-3.017)	(-2.298)	(-2.829)	(-2.356)	(-2.749)	(-2.695)	(-2.873)
LN(MCap)	0.672***	0.787***	0.634***	0.787***	0.643***	0.743***	0.623***	0.777***	0.634***	0.786***	0.635***	0.779***
	(4.824)	(5.672)	(4.495)	(5.607)	(4.557)	(5.399)	(4.451)	(5.586)	(4.550)	(5.662)	(4.569)	(5.624)
LN(P/B)	1.940***	1.436***	1.943***	1.429***	1.936***	1.452***	2.010***	1.445***	1.991***	1.428***	1.982***	1.443***
	(10.369)	(7.219)	(10.018)	(7.073)	(10.083)	(7.382)	(10.616)	(7.227)	(10.608)	(7.127)	(10.584)	(7.251)
Constant	-12.254***	-14.340***	-11.334***	-14.192***	-11.743***	-13.503***	-11.173***	-14.030***	-11.806***	-14.015***	-11.358***	-14.314***
	(-3.602)	(-4.066)	(-3.292)	(-4.040)	(-3.404)	(-3.882)	(-3.259)	(-3.981)	(-3.460)	(-3.933)	(-3.339)	(-4.074)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	372	372	372	372	372	372	372	372	372	372	372	372
Adjusted R^2	0.407	0.489	0.389	0.489	0.391	0.501	0.394	0.489	0.401	0.489	0.403	0.490

*p<0.1; **p<0.05; ***p<0.01

Column (1) shows us statistically significant negative connection between *NIR* and ROA at 1% significance level when not including the sector fixed effects in the model. When including the sector fixed effects, the statistical significance is lost as shown in column (2), suggesting that the negative connection between *NIR* and ROA may be driven by differences between sectors rather than by the *NIR* itself. The similar observation could be made for the other overall net impact metric*, Net Impact Score*, as shown in columns (11) and (12). Anyway, the coefficients remain negative also after controlling for sector fixed effects, giving some indication of potential negative connection between corporate net impact and firm profitability.

Among the net impact dimensions presented in columns (3) – (10) the results show statistically significant negative coefficient for the *Knowledge* dimension at 1% significance level when including the sector fixed effects in the model. The results suggest that one point increase in *Knowledge* net impact leads to 0.685%-point decrease in ROA. For *Health* and *Environment* dimensions the results suggest statistically significant negative connection with ROA when not including the sector fixed effects in the model. However, the connections lose their statistical significance when including the sector fixed effects.

The results presented in *Table 7*, illustrating the outcome of the regression using the aggregated values of the observed time period, indicate corporate net impact not to have a connection with firm profitability, when sector fixed effects are included. As discussed in the *Section 2.4,* we assume that higher net impact leads to higher operative costs but that it should also increase the topline through competitive advantage eventually leading to neutral effect on firm profitability. However, we observe that even though the results for overall impact figures becomes statistically insignificant, the coefficients remain negative, suggesting that there may still lay some weak negative connection between net impact and firm profitability. The negative connection would suggest that the effect of cost trade-off is higher than the potential topline benefit gained with higher net impact.

To further examine the connection between net impact and firm profitability we run cross-sectional regressions for each separate year between the observed time period from 2015 to 2022. The results for the years 2022 and 2021 are shown in *Table 8* in *Panel A* and *Panel B* respectively. The results for the rest of the years are presented in the *Appendix Table 3*. The key independent variables of interest are *Net Impact Ratio (NIR)*, the four dimensions of it, and the net sum of the dimensions (*Net Score*). The results are presented separately for each key independent variable with and without sector fixed effects in columns (1) to (12).

Results in *Panel A* of *Table 8* suggest negative connection between *NIR* and firm profitability with strong statistical significance in 2022. Statistical significance remains also when controlling for sector fixed effects but drops from 1% significance level to 5% significance level. The same connection could also be found between *Net Score* and future profitability. Additionally, the results show statistically significant negative connection between *Environment* and firm profitability. Interestingly, we also find statistically significant positive connection between *Society* dimension and firm profitability, which however becomes negative and statistically insignificant when controlling for sector fixed effects.

Table 8: Annual cross-sectional regressions on firm profitability

This table reports the regressions profitability on underlying Corporate Net Impact scores and its pillars, where profitability is measured by Return on Assets (ROA). In Panel A the sample consists of cross-sectional data from year 2022 and in Panel B from year 2021. We consider six Net Impact metrics (Net Impact Ratio as "NIR", Society, Knowledge, Health, Environment & Net Score) and three control variables (market beta, the natural logarithm of market capitalization, the natural logarithm of price-to-book ratio and the ROA). The results are presented with and without the sector fixed effects. T-statistics are shown in parenthesis. Significance levels are shown in stars *, ** and *** as 10%, 5% and 1% respectively.

Panel A: Cross-sectional sample from 2022

	Dependent variable: ROA											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	-1.253***	-0.710**										
	(-4.668)	(-2.185)										
Society			-0.147	-0.184								
			(-0.873)	(-0.897)								
Knowledge					0.794**	-0.656						
					(2.558)	(-1.615)						
Health							-0.168	-0.057				
							(-1.197)	(-0.337)				
Environment									-0.497***	-0.549***		
									(-5.621)	(-3.552)		
Net Score											-0.287***	-0.262***
											(-4.395)	(-2.954)
Market Beta	-1.089	-0.861	-0.094	-0.600	0.256	-0.754	-0.240	-0.638	-0.928	-0.870	-1.033	-0.913
	(-1.509)	(-1.206)	(-0.132)	(-0.847)	(0.359)	(-1.059)	(-0.333)	(-0.894)	(-1.334)	(-1.242)	(-1.428)	(-1.290)
LN(Mcap)	1.159***	1.272***	1.087***	1.294***	1.132***	1.228***	1.072***	1.254***	1.077***	1.203***	1.080***	1.209***
	(4.846)	(5.421)	(4.421)	(5.435)	(4.628)	(5.195)	(4.371)	(5.255)	(4.577)	(5.171)	(4.512)	(5.168)
LN(P/B)	1.564***	1.098***	1.566***	1.013***	1.514***	1.087***	1.653***	1.087***	1.608***	1.197***	1.629***	1.160***
	(5.179)	(3.545)	(4.972)	(3.199)	(4.879)	(3.497)	(5.292)	(3.419)	(5.397)	(3.881)	(5.379)	(3.748)
Constant	-23.087***	-23.023***	-21.470***	-23.584***	-22.801***	-21.582***	-21.327***	-22.976***	-22.112***	-21.946***	-20.989***	-20.973***
	(-3.938)	(-3.843)	(-3.564)	(-3.909)	(-3.802)	(-3.538)	(-3.542)	(-3.767)	(-3.827)	(-3.698)	(-3.574)	(-3.492)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	357	357	357	357	357	357	357	357	357	357	357	357
Adjusted R^2	0.257	0.379	0.212	0.372	0.225	0.375	0.214	0.370	0.276	0.392	0.252	0.386

Panel B: Cross-sectional sample from 2021

	Dependent variable: ROA											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	0.218	0.388										
	(0.932)	(1.297)										
Society			-0.474***	-0.357*								
			(-3.411)	(-1.908)								
Knowledge					0.367	-0.534						
					(1.410)	(-1.473)						
Health							0.004	0.028				
							(0.033)	(0.183)				
Environment									0.233***	0.386***		
									(3.066)	(2.756)		
Net Score											0.069	0.043
											(1.209)	(0.521)
Market Beta	-3.265***	-3.088***	-3.620***	-3.263***	-3.310***	-3.363***	-3.448***	-3.231***	-3.018***	-3.051***	-3.204***	-3.189***
	(-5.319)	(-4.812)	(-6.308)	(-5.195)	(-5.627)	(-5.304)	(-5.813)	(-5.060)	(-5.109)	(-4.853)	(-5.208)	(-4.971)
LN(Mcap)	0.950***	1.041***	1.023***	1.134***	0.998***	1.027***	0.970***	1.062***	0.943***	1.076***	0.959***	1.059***
	(4.682)	(5.013)	(5.131)	(5.391)	(4.932)	(4.936)	(4.804)	(5.093)	(4.726)	(5.237)	(4.755)	(5.103)
LN(P/B)	0.879***	0.533*	0.710***	0.435	0.812***	0.552**	0.865***	0.533*	0.885***	0.479*	0.869***	0.533*
	(3.568)	(1.941)	(2.879)	(1.556)	(3.267)	(2.008)	(3.492)	(1.911)	(3.642)	(1.752)	(3.534)	(1.935)
Constant	-17.418***	-18.801***	-17.725***	-20.010***	-18.410***	-17.567***	-17.807***	-19.092***	-16.962***	-19.298***	-17.734***	-19.173***
	(-3.495)	(-3.523)	(-3.622)	(-3.743)	(-3.699)	(-3.243)	(-3.580)	(-3.552)	(-3.450)	(-3.648)	(-3.573)	(-3.580)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	361	361	361	361	361	361	361	361	361	361	361	361
Adjusted R^2	0.264	0.334	0.286	0.338	0.266	0.335	0.262	0.331	0.281	0.345	0.265	0.331

*p<0.1; **p<0.05; ***p<0.01

The opposing findings from year 2021 compared to other years are interesting and putting the findings presented in *Table 6* above under criticism. One potential explanation for these contradicting results could be the potential realization of the impacts in profitability caused by Covid-19 crisis characterized by large-scale lockdowns as well as other unusual measures impacting the business

operations and customer behavior. As discussed earlier in *Section 2.4*, our assumption is that the positive connection between net impact and firm valuation could be partly driven by the lower corporate risk of companies with better net impact. In the context of the Covid-19 crisis, companies with a better net impact may have been able to realize their better risk resilience in terms of relatively higher profitability after the effects of the crisis time have been realized in their operative business, thereby explaining the opposing findings for the year 2021. It could be argued that companies with better net impact, could enjoy better brand reputation, stakeholder relations, and management quality, which can enhance their operational resilience particularly during the crises. We assume that having better net impact, especially in *Environment* dimension, improves the brand reputation and thus resilience among the customers, as customers, similarly to investors, want to make their own impact with their decisions. With better stakeholder relations we mean that better net impact leads to better relations with employees and suppliers which additionally enhance the operational resilience especially during the crisis times like Covid-19. We also assume that companies having better net impact is in general having higher quality of management which further lowers the risk profile.

To summarize, with the aggregated data sample we are not able to find statistically significant connection between corporate net impact and firm profitability. However, within the annual cross-sectional regressions we are able to find weak evidence of negative connection between net impact and profitability. The results for year 2022 showed statistically significant negative connection between net impact and firm profitability as well as all the other years except for 2021 but without statistical significance. Therefore, it is possible to make a tentative conclusion that there might still exist some negative connection between net impact and firm profitability. This conclusion is not in line neither with our hypothesis nor the findings of McWilliams & Siegel (2001). However, we find this opposing tentative evidence also logical. We theorize it to suggest that the effect of cost trade-off is higher than the potential benefit which increases the topline. Anyway, if it was so, we still cannot exclude the possibility that the upside of higher net impact has not been realized because the time frame used in this study does not capture it properly and that it might be realized further in the future. It is plausible to assume that the cost trade-off would be realized earlier, since for example usage of ethical labor has an immediate increasing impact on costs, but the potential benefits of better impact for example through better brand reputation would begin cumulating later.

5.2. Does corporate net impact affect firm valuation?

We continue our empirical analysis by investigating if corporate net impact or its four dimensions can explain firm valuation. To do this, we use the OLS regression method with sector-year fixed effects as described in the *Section 4*. We examine the time period between 2015 and 2022, with cross-sectional regressions first by running a single regression with aggregated average values for each variable during the time period and second by running separate regression for each year during the observed time period.

The results of the regression with the aggregated data sample are presented in *Table 9*. The key independent variables of interest are *Net Impact Ratio (NIR)*, the four dimensions of it, and the sum of the dimensions (*Net Score*). The results are presented separately for each key independent variable with and without sector fixed effects in columns (1) to (12).

Table 9: Does corporate net impact affect firm valuation?

*This table reports the regressions of firm valuation on underlying Corporate Net Impact scores and its pillars, where valuation is measured by natural logarithm of Tobin's Q (measured as price-to-book ratio). The sample consists of 389 aggregated average firm annual data observations from 2015 to 2022. We consider six Net Impact metrics (Net Impact Ratio as "NIR", Society, Knowledge, Health, Environment & Net Score) and one control variable (market beta). The results are presented with and without the sector fixed effects. T-statistics are shown in parenthesis. Significance levels are shown in stars *, ** and *** as 10%, 5% and 1% respectively.*

	Dependent variable: LN(P/B)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	0.001	0.050										
	(0.025)	(0.915)										
Society			-0.101***	-0.076**								
			(-3.640)	(-2.142)								
Knowledge					0.157***	-0.016						
					(3.088)	(-0.232)						
Health							0.049**	0.039				
							(2.082)	(1.340)				
Environment									0.014	0.062**		
									(0.913)	(2.325)		
Net Score											0.010	0.016
											(0.893)	(1.045)
Market Beta	-0.697***	-0.407***	-0.721***	-0.421***	-0.638***	-0.430***	-0.637***	-0.399***	-0.678***	-0.398***	-0.666***	-0.408***
	(-5.061)	(-2.823)	(-5.530)	(-2.975)	(-4.826)	(-3.019)	(-4.723)	(-2.779)	(-5.061)	(-2.810)	(-4.852)	(-2.848)
Constant	1.246***	1.571***	1.508***	1.718***	1.270***	1.607***	1.184***	1.414***	1.265***	1.629***	1.223***	1.526***
	(8.224)	(7.535)	(9.181)	(8.317)	(8.545)	(7.749)	(7.769)	(5.605)	(8.353)	(8.105)	(8.026)	(6.926)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	389	389	389	389	389	389	389	389	389	389	389	389
Adjusted R^2	0.062	0.219	0.093	0.227	0.085	0.217	0.073	0.221	0.064	0.228	0.064	0.219

*p<0.1; **p<0.05; ***p<0.01

The results in columns (1), (2), (11) and (12) show statistically insignificant results for the connection between overall corporate net impact and firm valuation, suggesting that such connection would not exist. This finding is not in line with our hypothesis, presented in the *Section 2.4,* assuming that better

net impact would lead to higher valuation level due to increased investor demand and/or lower corporate risk associated with higher net impact companies.

The results within the net impact dimensions are shown in columns (3) – (10). These results show negative statistically significant coefficient for *Society* dimension and statistically significant positive coefficient for *Environment* dimension. For *Knowledge* and *Health* dimensions the results show positive statistically significant coefficient which however becomes statistically insignificant when the fixed effects are included. Thus, the results suggest that *Society* and *Environment* dimensions are the main impact drivers affecting firm valuation but having contradicting connection with it.

To further examine the connection between corporate net impact and firm valuation we run additionally separate cross-sectional regressions for each year similarly than in the previous section. The results for years 2022, 2021 and 2020 are shown in *Table 10* in *Panel A*, *Panels A-C* respectively. The results for the rest of the years are presented in the *Appendix Table 4*. The key independent variables of interest are *Net Impact Ratio (NIR)*, the four dimensions of it, and the sum of the dimensions (*Net Score*). The results are presented separately for each key independent variable with and without sector fixed effects in columns (1) to (12).

Table 10: Annual cross-sectional regressions on valuation

This table reports the regressions of firm valuation on underlying Corporate Net Impact scores and its pillars, where valuation is measured by natural logarithm of Tobin's Q (measured as price-to-book ratio). In Panel A the sample consists of cross-sectional data from year 2022, in Panel B from year 2021 and in Panel C from year 2020. We consider six Net Impact metrics (Net Impact Ratio as "NIR", Society, Knowledge, Health, Environment & Net Score) and one control variable (market beta). The results are presented with and without the sector fixed effects. T-statistics are shown in parenthesis. Significance levels are shown in stars *, ** and *** as 10%, 5% and 1% respectively.

Panel A: Cross-sectional sample from 2022

	Dependent variable: LN(P/B)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	0.021	0.088										
	(0.396)	(1.352)										
Society			-0.090***	-0.104**								
			(-2.830)	(-2.532)								
Knowledge					0.119**	-0.006						
					(2.004)	(-0.072)						
Health							0.074***	0.096***				
							(2.788)	(2.857)				
Environment									0.001	0.057*		
									(0.083)	(1.812)		
Net Score											0.009	0.026
											(0.697)	(1.423)
Market Beta	-0.538***	-0.202	-0.558***	-0.228	-0.507***	-0.234	-0.466***	-0.187	-0.552***	-0.208	-0.524***	-0.206
	(-3.819)	(-1.407)	(-4.220)	(-1.613)	(-3.755)	(-1.633)	(-3.426)	(-1.321)	(-4.020)	(-1.459)	(-3.723)	(-1.438)
Constant	0.896***	0.559**	1.118***	0.865***	0.921***	0.458*	0.817***	0.503**	0.906***	0.983***	0.882***	0.617**
	(5.931)	(2.241)	(6.734)	(3.028)	(6.188)	(1.897)	(5.403)	(2.124)	(6.024)	(2.629)	(5.779)	(2.351)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	374	374	374	374	374	374	374	374	374	374	374	374
Adjusted R^2	0.040	0.162	0.060	0.172	0.050	0.158	0.059	0.176	0.039	0.165	0.041	0.162

*p<0.1; **p<0.05; ***p<0.01

Table 10 continued

Panel B: Cross-sectional sample from 2021

	Dependent variable: LN(P/B)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	0.014	0.107										
	(0.259)	(1.644)										
Society			-0.097***	-0.076*								
			(-2.961)	(-1.884)								
Knowledge					0.168***	-0.030						
					(2.791)	(-0.368)						
Health							0.074***	0.090***				
							(2.722)	(2.709)				
Environment									0.001	0.055*		
									(0.044)	(1.748)		
Net Score											0.010	0.027
											(0.761)	(1.527)
Market Beta	-0.604***	-0.173	-0.627***	-0.219	-0.545***	-0.221	-0.531***	-0.163	-0.614***	-0.192	-0.579***	-0.182
	(-4.255)	(-1.227)	(-4.732)	(-1.582)	(-4.039)	(-1.579)	(-3.894)	(-1.173)	(-4.434)	(-1.376)	(-4.069)	(-1.295)
Constant	1.132***	0.566**	1.378***	0.769**	1.156***	0.449*	1.050***	0.482*	1.140***	0.957**	1.110***	0.616**
	(7.147)	(2.207)	(7.911)	(2.588)	(7.472)	(1.786)	(6.644)	(1.949)	(7.271)	(2.539)	(6.912)	(2.294)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	378	378	378	378	378	378	378	378	378	378	378	378
Adjusted R^2	0.048	0.243	0.070	0.245	0.068	0.238	0.067	0.253	0.048	0.244	0.050	0.243

Panel C: Cross-sectional sample from 2020

	Dependent variable: LN(P/B)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	0.015	0.109*										
	(0.275)	(1.733)										
Society			-0.114***	-0.090**								
			(-3.610)	(-2.286)								
Knowledge					0.195***	-0.031						
					(3.371)	(-0.393)						
Health							0.067**	0.098***				
							(2.532)	(3.066)				
Environment									0.013	0.067**		
									(0.721)	(2.219)		
Net Score											0.013	0.031*
											(1.038)	(1.796)
Market Beta	-0.574***	-0.199	-0.593***	-0.238*	-0.509***	-0.248*	-0.510***	-0.181	-0.563***	-0.205	-0.540***	-0.203
	(-4.402)	(-1.524)	(-4.904)	(-1.868)	(-4.123)	(-1.928)	(-4.058)	(-1.415)	(-4.435)	(-1.599)	(-4.144)	(-1.570)
Constant	1.100***	0.451*	1.381***	0.694**	1.129***	0.333	1.026***	0.361	1.117***	0.945***	1.071***	0.519**
	(7.409)	(1.865)	(8.482)	(2.489)	(7.814)	(1.401)	(6.900)	(1.557)	(7.596)	(2.647)	(7.127)	(2.051)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	380	380	380	380	380	380	380	380	380	380	380	380
Adjusted R^2	0.052	0.244	0.083	0.249	0.079	0.238	0.068	0.257	0.053	0.248	0.054	0.245

*p<0.1; **p<0.05; ***p<0.01

Results in *Panel A* and *Panel B* of *Table 9* suggest statistically insignificant connection between overall net impact and firm valuation but show still positive coefficients for the overall metrics. This observation is in line with the aggregated regression results shown in *Table 8*. However, in *Panel C* of *Table 9* showing the results for year 2020, shows weakly statistically significant positive connection between overall net impact and firm valuation. Same observation could be made from results of year 2016 shown in *Panel D* of *Appendix Table 4*, with slightly stronger significance. Results for all other years, presented in *Appendix Table 4* are also showing positive coefficient for the overall impact metrics, however without statistical significance. Thus, even though the results are mostly showing statistically insignificant coefficients, it could be argued that there might lay some

positive connection between overall net impact and firm valuation since the results point to same direction. It could be possible that our limited data sample is not able to capture this connection adequately, thus encouraging for further research within this question with more comprehensive data set.

For the net impact dimensions the separate cross-sectional regressions suggest results that are in line with each other. For all the years results suggest statistically significant positive connection between *Environment* and firm valuation. Also, all the years except 2019 suggest statistically significant negative connection between *Society* and firm valuation. These observations are in line with the findings made with the aggregated regression results shown in *Table 9.* Interestingly we also find statistically significant positive connection between *Health* dimension and firm valuation for most of the years, which was not observed earlier in the results shown in *Table 9.* Thus, the results of cross-sectional regressions for all separate years between 2015 and 2022 indicate that *Environment* and *Health* dimensions are the main drivers for potential positive connection between net impact and firm valuation whereas *Society* dimension is having a contradicting effect on it.

To summarize, the results with the aggregated sample does not provide us evidence of connection between corporate net impact and firm valuation. However, despite mostly being statistically insignificant the positive coefficient for valuation repeats itself throughout the different observed years. Thus, we can make a tentative conclusion of net impact having some positive connection with firm valuation, suggesting it to be in line with our hypothesis. Also, according to our findings this potential weak connection seems to be driven mostly by *Environment* and *Health* dimensions. This interpretation would be in line with the findings of Pedersen et al. (2021), who found positive connection between ESG and firm valuation and which was especially driven by Environment pillar.

The tentative conclusion of net impact having positive connection with firm valuation would suggest that despite net impact having neutral or even negative connection with firm profitability, investors would value better net impact companies over worse net impact companies, which seems irrational according to the traditional shareholder theory presented by Friedman, (1970). One potential explanation for this could be the co-effect of two aspects. Firstly, investors having non-pecuniary preferences in addition to the more obvious monetary ones, which results in factors, such as impact on overall level, to be a part of their investment decisions. These non-pecuniary preferences have been popularly referred explanation for this observed effect, as presented, for example, by Baker et al. (2018). Secondly, higher valuation of better net impact companies could be explained by the lower

risk these companies have. The lower risk results in lower cost of capital, which increases the valuation. This, again is widely agreed explanation, as can be seen for example in Heinkel et al. (2001), Pástor, et al. (2021), and Pedersen et al. (2021). However, as we could make only a tentative conclusion of such connection which is most likely due to the small and static sample used, we encourage future research to use larger data set when such is available to confirm our suggested findings.

5.3. Does corporate net impact affect expected returns?

We end our empirical analysis by investigating the corporate net impact and its four dimensions as a return predictor. We use the Carhart Four-Factor Model to test our hypothesis, as described in *Section 4*. We examine the period between January 2015 and January 2023 using monthly long-short portfolio return observations as a dependent variable. The results are presented in *Table 11*. Each net impact measure used for portfolio categorization are shown in the columns (1) to (6). *Panel A* shows the results for equally weighted portfolio returns and in *Panel B* shows the results for value weighted portfolio returns. The key variable of interest is the Alpha that illustrates the potential abnormal return that the long-short net impact portfolio strategy predicts. To be more specific, a positive alpha would suggest that firms with better net impact outperform those with poorer net impact, while a negative alpha would suggest the opposite.

Table 11: Does corporate net impact affect expected returns?

This table reports the regression of high-Net Impact minus low-Net Impact portfolio returns on Carhart four-factor model. The sample consists of monthly return observations from time period between 1/2015 and 1/2023. In the sample companies are categorized in three equal sized portfolios based on their Net Impact score in each dimension (Net Impact Ratio as "NIR", Society, Knowledge, Health, Environment & Net Score). Further, the portfolio return for each month is calculated by extracting the returns of bottom (third) portfolio of the top (first) portfolio. Panel A exhibits the results with equally weighted returns and Panel B with value weighted returns. T-statistics are shown in parenthesis. Significance levels are shown in stars *, ** and *** as 10%, 5% and 1% respectively.

Panel A

	Dependent variable: equal-weighted Returns					
	NIR	Society	Knowledge	Health	Environment	Net Score
Rm-Rf	-0.247***	0.017	-0.096**	-0.178***	-0.138***	-0.247***
	(-5.908)	(0.413)	(-2.047)	(-4.409)	(-2.815)	(-6.121)
SMB	-0.289**	0.182*	-0.045	-0.352***	-0.260**	-0.323***
	(-2.590)	(1.691)	(-0.362)	(-3.263)	(-1.988)	(-2.995)
HML	-0.361***	0.214***	-0.332***	-0.453***	-0.185**	-0.406***
	(-5.787)	(3.570)	(-4.753)	(-7.519)	(-2.535)	(-6.740)
UMD	0.057	0.032	0.118	0.068	-0.028	0.035
	(0.840)	(0.483)	(1.541)	(1.025)	(-0.346)	(0.536)
Alpha	-0.217	-0.114	-0.035	-0.131	-0.171	-0.202
	(-1.300)	(-0.707)	(-0.185)	(-0.812)	(-0.874)	(-1.252)
Adjusted R^2	0.551	0.146	0.348	0.594	0.172	0.588

*p<0.1; **p<0.05; ***p<0.01

Table 11 continued

Panel B

	Dependent variable: value-weighted Returns					
	NIR	Society	Knowledge	Health	Environment	Net Score
Rm-Rf	-0.107**	-0.013	0.034	-0.048	-0.165***	-0.118**
	(-2.158)	(-0.280)	(0.612)	(-1.137)	(-2.817)	(-2.282)
SMB	-0.213	0.278**	-0.350**	-0.416***	-0.212	-0.275**
	(-1.613)	(2.315)	(-2.342)	(-3.690)	(-1.356)	(-1.995)
HML	-0.630***	0.357***	-0.506***	-0.789***	-0.457***	-0.740***
	(-8.545)	(5.319)	(-6.055)	(-12.525)	(-5.227)	(-9.620)
UMD	-0.069	-0.024	0.042	-0.066	-0.034	-0.081
	(-0.848)	(-0.331)	(0.463)	(-0.961)	(-0.353)	(-0.960)
Alpha	-0.004	-0.208	0.256	0.045	-0.074	0.029
	(-0.020)	(-1.156)	(1.140)	(0.268)	(-0.314)	(0.142)
Adjusted R^2	0.506	0.334	0.395	0.704	0.317	0.569

*p<0.1; **p<0.05; ***p<0.01

Contrary to our hypothesis, our model does not suggest any statistically significant negative abnormal returns for the long-short net impact strategy. However, it is worth noting that when we examine for the equally weighted returns, all of the alphas are negative, indicating some alignment with our original hypothesis. As we noted in the earlier section of the paper, we found some weak indication that better corporate net impact leads to lower profitability, which could be due to the potential costs associated with achieving better net impact. We further found some weak indication that better net impact leads to higher valuation level, which could be explained by investor's will to "do good" with their investments or that the better net impact companies are having lower risk profile.

According to the prevailing theory used by for example Pedersen et al. (2021), these findings are suggesting that better net impact should lead to lower expected returns, which however we did not find with our model. Nonetheless, the insignificant negative abnormal results we observed may be attributed to the relatively short time period and small number of companies included in our sample. When testing for the robustness of our results, later in the *Section 5.4*, we are able to find statistically significant alpha using an alternative method of dividing companies into two portfolios, in a way that one includes all the companies having positive net impact figures and second all the negative net impact figures. This finding suggests us further to believe that the hypothesized connection might exist. Anyway, displeased by this non-significant result on our third research question, we call for further academic action on this question. We acknowledge the causation of our limited sample in this matter.

To summarize, our empirical results show weak indication of a phenomenon according to our hypothesis. Our results give indication of the applicability of the Upright Project's new net impact metric and strongly encourage for future academic research to use the net impact data in larger manner to confirm the suggested findings, to examine further the open questions and simultaneously considering the limitations of this study.

5.4. Robustness tests

To increase the robustness of our primary results we run different robustness tests for each regression. For the regressions (1) and (2) we have already tested the robustness throughout different years running the cross-sectional regression for each separate year of the observed time period from 2015 to 2022. In addition, we are willing to test the robustness of these regressions by dividing our sample into two groups; developed and developing economies[4]. By this we will test if the results are robust to potential differences between different areas. As our sample is relatively small, it is not fruitful to divide the sample by each separate country which is why we use the division into two groups. This also allows us to review the robustness to potential differences between levels of industrialization and capital income per capita. For the regression (3) we will run regressions with alternative portfolio distribution methodologies as done by Borgers et al. (2013).

In *Table 12* we show the robustness test results for the aggregated sample values testing for the connection between net impact and firm profitability after dividing the sample into developed and developing economies. *Panel A* shows the results for the developed economies and *Panel B* for the developing economies. The results are in line with our main findings, suggesting statistically insignificant but negative coefficients for the overall net impact metrics. The results suggest that in developing economies the negative connection is stronger than in developed economies, but due to the statistical weakness it is difficult to confirm such a conclusion. Also, the results of different net impact dimensions are mostly in line with the key findings presented earlier.

[4] The division to developed and developing economies is based on the country classification presented in the World Economic Situation and Prospects 2023 report (United Nations, 2023)

Table 12: Robustness test on firm profitability

This table reports the regressions of future profitability on underlying Corporate Net Impact scores and its pillars, where profitability is measured by Return on Assets (ROA). The sample consists of 372 aggregated average firm annual data observations from 2015 to 2022. The sample is divided into two categories, developed and developing categories, based on the company's location. Panel A shows the results for the developed economies and Panel B for developing economies. We consider six Net Impact metrics (Net Impact Ratio as "NIR", Society, Knowledge, Health, Environment & Net Score) and three control variables (market beta, the natural logarithm of market capitalization and the natural logarithm of price-to-book ratio). The results are presented with and without the sector fixed effects. T-statistics are shown in parenthesis. Significance levels are shown in stars *, ** and *** as 10%, 5% and 1% respectively.

Panel A: Developed economies

	Dependent variable:											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	-0.322*	-0.037										
	(-1.912)	(-0.187)										
Society			-0.114	-0.027								
			(-1.091)	(-0.214)								
Knowledge					0.263	-0.625**						
					(1.305)	(-2.458)						
Health							-0.131	-0.046				
							(-1.624)	(-0.465)				
Environment									-0.032	0.107		
									(-0.538)	(1.076)		
Net Score											-0.056	-0.015
											(-1.360)	(-0.278)
Market Beta	-0.767	-0.851	-0.489	-0.831	-0.307	-0.965*	-0.596	-0.872	-0.464	-0.790	-0.640	-0.853
	(-1.402)	(-1.463)	(-0.937)	(-1.456)	(-0.587)	(-1.701)	(-1.129)	(-1.509)	(-0.881)	(-1.384)	(-1.179)	(-1.479)
LN(MCap)	0.661***	0.673***	0.632***	0.675***	0.624***	0.658***	0.631***	0.665***	0.628***	0.681***	0.639***	0.670***
	(4.069)	(4.315)	(3.897)	(4.303)	(3.853)	(4.274)	(3.903)	(4.257)	(3.865)	(4.374)	(3.939)	(4.300)
LN(P/B)	2.122***	1.649***	2.119***	1.641***	2.135***	1.644***	2.175***	1.657***	2.160***	1.617***	2.147***	1.651***
	(10.060)	(7.600)	(9.870)	(7.487)	(10.087)	(7.668)	(10.344)	(7.611)	(10.228)	(7.410)	(10.178)	(7.602)
Constant	-12.797***	-11.781***	-11.977***	-11.817***	-12.086***	-10.712***	-12.127***	-11.590***	-12.277***	-11.946***	-12.313***	-11.687***
	(-3.237)	(-2.962)	(-3.025)	(-2.968)	(-3.058)	(-2.708)	(-3.073)	(-2.901)	(-3.091)	(-3.008)	(-3.114)	(-2.929)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	277	277	277	277	277	277	277	277	277	277	277	277
Adjusted R^2	0.452	0.548	0.447	0.548	0.448	0.558	0.450	0.549	0.445	0.550	0.448	0.548

Panel B: Developing economies

	Dependent variable:											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	-1.212***	-0.763										
	(-3.622)	(-1.434)										
Society			0.125	0.075								
			(0.554)	(0.206)								
Knowledge					0.414	-0.503						
					(1.150)	(-0.976)						
Health							-0.475*	-0.444				
							(-1.761)	(-1.306)				
Environment									-0.388***	-0.257		
									(-4.214)	(-1.227)		
Net Score											-0.290***	-0.198
											(-3.592)	(-1.483)
Market Beta	-1.524	-1.751*	-1.417	-1.800*	-1.355	-1.812*	-1.545	-1.890*	-1.702*	-1.932**	-1.754*	-1.881*
	(-1.658)	(-1.846)	(-1.444)	(-1.851)	(-1.387)	(-1.895)	(-1.594)	(-1.979)	(-1.889)	(-2.011)	(-1.898)	(-1.978)
LN(MCap)	0.692***	1.154***	0.595**	1.095***	0.732**	1.028***	0.558**	1.063***	0.576**	1.082***	0.545**	1.085***
	(2.692)	(3.956)	(2.128)	(3.537)	(2.544)	(3.362)	(2.048)	(3.618)	(2.292)	(3.699)	(2.112)	(3.731)
LN(P/B)	1.786***	1.156**	1.833***	1.126**	1.590***	1.178**	1.905***	1.278**	1.968***	1.185**	1.981***	1.231**
	(3.908)	(2.304)	(3.655)	(2.199)	(3.115)	(2.315)	(3.911)	(2.468)	(4.376)	(2.341)	(4.293)	(2.428)
Constant	-12.247*	-21.969***	-9.864	-20.873***	-12.639*	-18.491**	-8.655	-19.798**	-10.023	-20.465***	-8.377	-19.835***
	(-1.923)	(-2.943)	(-1.446)	(-2.705)	(-1.792)	(-2.312)	(-1.284)	(-2.626)	(-1.614)	(-2.730)	(-1.314)	(-2.645)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	95	95	95	95	95	95	95	95	95	95	95	95
Adjusted R^2	0.306	0.404	0.208	0.389	0.216	0.396	0.231	0.402	0.336	0.400	0.305	0.405

*p<0.1; **p<0.05; ***p<0.01

Table 13 shows the results for the aggregated sample values testing for the connection between net impact and firm valuation after dividing the sample again into developed and developing economies. *Panel A* shows the results for the developed economies and *Panel B* for the developing economies. The results are in line with our main findings, suggesting statistically insignificant but positive coefficients for the overall net impact metrics. Also, the results regarding the net impact dimensions are in line with our main findings, suggesting *Environment* and *Health* dimensions to be the main drivers for the positive connection and *Society* dimension to be opposing driver. Interesting notion is that the statistical significance for the *Environment* dimension could be found in developed countries but not in developing. This could imply investors to value *Environment* net impact more in companies from developed economies, which again could be explained by the increasing pace of new sustainability taxations being presented in the developed countries. Overall, we can conclude the conclusions of our main findings to be robust for potential changes between different geographical areas.

Table 13: Robustness test on firm valuation

This table reports the regressions of firm valuation on underlying Corporate Net Impact scores and its pillars, where valuation is measured by natural logarithm of Tobin's Q (measured as price-to-book ratio). The sample consists of 389 aggregated average firm annual data observations from 2015 to 2022. The sample is divided into two categories, developed and developing categories, based on the company's location. Panel A shows the results for the developed economies and Panel B for developing economies. We consider six Net Impact metrics (Net Impact Ratio as "NIR", Society, Knowledge, Health, Environment & Net Score) and one control variable (market beta). The results are presented with and without the sector fixed effects. T-statistics are shown in parenthesis. Significance levels are shown in stars *, ** and *** as 10%, 5% and 1% respectively.

Panel A: Developed economies

	Dependent variable:LN(P/B)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	-0.031	0.063										
	(-0.573)	(1.006)										
Society			-0.097***	-0.066*								
			(-3.012)	(-1.652)								
Knowledge					0.143**	-0.025						
					(2.298)	(-0.305)						
Health							0.032	0.030				
							(1.240)	(0.966)				
Environment									0.002	0.071**		
									(0.132)	(2.274)		
Net Score											0.0002	0.017
											(0.014)	(1.008)
Market Beta	-0.943***	-0.659***	-0.937***	-0.689***	-0.842***	-0.699***	-0.863***	-0.666***	-0.908***	-0.665***	-0.911***	-0.668***
	(-5.768)	(-3.691)	(-6.158)	(-3.952)	(-5.399)	(-3.973)	(-5.435)	(-3.750)	(-5.784)	(-3.818)	(-5.620)	(-3.778)
Constant	1.617***	1.828***	1.843***	1.985***	1.603***	1.878***	1.545***	1.729***	1.600***	1.909***	1.597***	1.789***
	(9.054)	(7.755)	(9.649)	(8.528)	(9.215)	(8.093)	(8.572)	(6.113)	(9.063)	(8.481)	(8.869)	(7.176)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	291	291	291	291	291	291	291	291	291	291	291	291
Adjusted R^2	0.103	0.265	0.129	0.270	0.118	0.263	0.107	0.265	0.102	0.276	0.102	0.265

*p<0.1; **p<0.05; ***p<0.01

Table 13 continued
Panel B: Developing economies

	Dependent variable: LN(P/B)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	0.042	0.140										
	(0.580)	(1.282)										
Society			-0.072	0.013								
			(-1.517)	(0.162)								
Knowledge					0.165**	0.019						
					(2.267)	(0.160)						
Health							0.074	0.159**				
							(1.254)	(2.088)				
Environment									0.021	0.047		
									(0.941)	(0.967)		
Net Score											0.021	0.046
											(1.155)	(1.529)
Market Beta	0.003	0.157	-0.014	0.149	-0.005	0.152	0.013	0.183	0.013	0.181	0.022	0.177
	(0.016)	(0.720)	(-0.064)	(0.673)	(-0.024)	(0.690)	(0.062)	(0.849)	(0.063)	(0.816)	(0.102)	(0.810)
Constant	0.155	0.444	0.341	0.524	0.234	0.545	0.147	-0.136	0.193	0.541	0.148	0.335
	(0.647)	(0.882)	(1.264)	(1.034)	(0.987)	(1.074)	(0.618)	(-0.232)	(0.789)	(1.080)	(0.620)	(0.653)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	98	98	98	98	98	98	98	98	98	98	98	98
Adjusted R^2	-0.017	0.135	0.003	0.118	0.031	0.118	-0.004	0.161	-0.012	0.128	-0.007	0.142

*p<0.1; **p<0.05; ***p<0.01

Finally, we test the robustness of the results of regression (3), which examines if the net impact functions as a return predictor, by running the regressions with different portfolio distributions. In our main empirical tests on expected stock returns we divided companies into three equal size portfolios as we assumed then portfolios to be large enough to capture the potential return predicting characteristic of corporate net impact. For the reference, Pedersen et al. (2021) divided their sample in five equal size portfolios when examining similar connection using ESG as a CSR measure. Further, Borgers et al. (2013) divided their sample in three, four and five equal size portfolios when examining the connection between stakeholder relations and expected returns with similar methodology. In the *Table 14* we present the results when the sample is divided in four equally sized portfolios. The results are in line with the main findings, suggesting negative abnormal returns without statistical significance when using equal-weighted returns. We did not test the results when dividing companies in five portfolios, since the sample size of individual portfolio would be too low to have sufficient results.

Table 14: Robustness test on expected returns I

This table reports the regression of high-Net Impact minus low-Net Impact portfolio returns on Carhart four-factor model. The sample consists of monthly return observations from time period between 1/2015 and 1/2023. In the sample companies are categorized in four equal sized portfolios based on their Net Impact score in each dimension (Net Impact Ratio as "NIR", Society, Knowledge, Health, Environment & Net Score). Further, the portfolio return for each month is calculated by extracting the returns of bottom (fourth) portfolio of the top (first) portfolio. Panel A exhibits the results with equally weighted returns and Panel B with value weighted returns. T-statistics are shown in parenthesis. Significance levels are shown in stars *, ** and *** as 10%, 5% and 1% respectively.

Panel A

	Dependent variable: equal-weighted Returns					
	NIR	Society	Knowledge	Health	Environment	Net Score
Rm-Rf	-0.293***	0.047	-0.086	-0.248***	-0.128**	-0.289***
	(-6.216)	(0.958)	(-1.583)	(-5.207)	(-2.166)	(-5.873)
SMB	-0.360***	0.129	-0.100	-0.352***	-0.243	-0.451***
	(-2.856)	(0.980)	(-0.691)	(-2.762)	(-1.546)	(-3.432)
HML	-0.433***	0.208***	-0.348***	-0.502***	-0.178**	-0.534***
	(-6.143)	(2.840)	(-4.301)	(-7.056)	(-2.021)	(-7.271)
UMD	0.158**	0.078	0.122	0.110	-0.064	0.077
	(2.040)	(0.974)	(1.372)	(1.408)	(-0.668)	(0.957)
Alpha	-0.226	-0.115	-0.156	-0.193	-0.149	-0.216
	(-1.198)	(-0.584)	(-0.718)	(-1.012)	(-0.632)	(-1.095)
Adjusted R^2	0.624	0.064	0.298	0.601	0.083	0.622

Panel B

	Dependent variable: value-weighted Returns					
	NIR	Society	Knowledge	Health	Environment	Net Score
Rm-Rf	-0.158***	0.141***	0.056	-0.124**	-0.124*	-0.155***
	(-2.773)	(2.636)	(0.864)	(-2.546)	(-1.725)	(-2.798)
SMB	-0.302*	0.156	-0.408**	-0.384***	-0.119	-0.363**
	(-1.986)	(1.093)	(-2.339)	(-2.948)	(-0.622)	(-2.450)
HML	-0.723***	0.217***	-0.578***	-0.747***	-0.536***	-0.845***
	(-8.512)	(2.724)	(-5.934)	(-10.272)	(-5.010)	(-10.214)
UMD	0.001	-0.080	0.017	-0.026	-0.110	-0.072
	(0.012)	(-0.915)	(0.155)	(-0.329)	(-0.934)	(-0.798)
Alpha	0.017	-0.150	0.239	-0.103	-0.030	0.001
	(0.076)	(-0.699)	(0.913)	(-0.528)	(-0.105)	(0.005)
Adjusted R^2	0.547	0.216	0.377	0.631	0.228	0.612

*p<0.1; **p<0.05; ***p<0.01

In addition, we tested how the results of regression (3) change if we divide sample in two portfolios in a way that top portfolio includes all the positive net impact companies and bottom all the negative net impact companies of our sample. The results are shown in the *Table 15.* The results suggest statistically significant negative abnormal results for *Net Impact Ratio* and *Net Score*, which is in line with our hypothesis and which we didn't find in the main results. This finding gives enhancing indication that the existence of the connection suggested by our hypothesis might exist. The Alpha becomes insignificant and slightly positive when using value-weighted portfolio returns. As the market capitalization has quite large variety in our sample and our sample is relatively small, we see that value-weighted returns don't illustrate the potential connection as good as equal weighted returns.

Table 15: Robustness test on expected returns II

This table reports the regression of high-Net Impact minus low-Net Impact portfolio returns on Carhart four-factor model. The sample consists of monthly return observations from time period between 1/2015 and 1/2023. In the sample companies are categorized in two portfolios based on their Net Impact score in each dimension (Net Impact Ratio as "NIR", Society, Knowledge, Health, Environment & Net Score), so that the first portfolio consists only of companies having positive net impact and second of companies with negative net impact. Further, the portfolio return for each month is calculated by extracting the returns of bottom (second) portfolio of the top (first) portfolio. Panel A exhibits the results with equally weighted returns and Panel B with value weighted returns. T-statistics are shown in parenthesis. Significance levels are shown in stars *, ** and *** as 10%, 5% and 1% respectively.

Panel A

	Dependent variable: equal-weighted Returns					
	NIR	Society	Knowledge	Health	Environment	Net Score
Rm-Rf	-0.154***	-0.074	-0.063	-0.145***	0.021	-0.161***
	(-5.366)	(-0.711)	(-1.630)	(-4.267)	(0.128)	(-5.651)
SMB	-0.225***	0.496*	-0.192*	-0.246***	-0.428	-0.206***
	(-2.934)	(1.775)	(-1.861)	(-2.709)	(-0.956)	(-2.716)
HML	-0.212***	-0.202	-0.219***	-0.355***	-0.435*	-0.217***
	(-4.943)	(-1.291)	(-3.804)	(-6.992)	(-1.738)	(-5.100)
UMD	0.018	-0.519***	0.076	0.051	0.091	0.029
	(0.378)	(-3.030)	(1.199)	(0.923)	(0.330)	(0.623)
Alpha	-0.208*	-0.223	-0.191	-0.080	0.149	-0.199*
	(-1.805)	(-0.532)	(-1.232)	(-0.588)	(0.222)	(-1.745)
Adjusted R^2	0.486	0.099	0.284	0.554	0.028	0.509

Panel B

	Dependent variable: value-weighted Returns					
	NIR	Society	Knowledge	Health	Environment	Net Score
Rm-Rf	0.028	-0.053	0.119**	-0.028	0.013	0.023
	(0.712)	(-0.481)	(2.416)	(-0.830)	(0.078)	(0.587)
SMB	-0.238**	0.274	-0.383***	-0.278***	-0.133	-0.239**
	(-2.225)	(0.928)	(-2.922)	(-3.109)	(-0.294)	(-2.265)
HML	-0.433***	-0.567***	-0.514***	-0.518***	-0.108	-0.441***
	(-7.254)	(-3.437)	(-7.009)	(-10.349)	(-0.428)	(-7.465)
UMD	-0.102	-0.520***	-0.018	-0.001	0.005	-0.092
	(-1.560)	(-2.876)	(-0.228)	(-0.014)	(0.017)	(-1.422)
Alpha	-0.001	-0.270	0.274	0.018	0.306	0.006
	(-0.006)	(-0.610)	(1.395)	(0.134)	(0.452)	(0.035)
Adjusted R^2	0.420	0.111	0.476	0.635	-0.039	0.436

*p<0.1; **p<0.05; ***p<0.01

The robustness tests described above, gives us validation for the primary conclusions of the regression analysis on the connection between corporate net impact and firm financial performance in terms of profitability, valuation and expected returns. By dividing our sample into two groups, developed and developing economies in regressions (1) and (2) enabled us to test for the potential geographical biases our results might have included. Additionally, using different methodologies in portfolio construction provided us convincing evidence of suggested connection between corporate net impact and expected returns. Overall, the robustness tests conducted gives us validation of the conclusions made based on our primary results. However, we acknowledge that our study included several limitations which will be further discussed in the next section.

5.5. Caveats and limitations

In this paper, we have studied the connection between corporate social responsibility and financial performance by the means of empirical analysis. We have been able to test our hypothesis on various regressions presented in *Section 4* and found weak evidence supporting the theory we rely on. However, empirical studies, such as this one, tend to be subject to limitations, resulting in challenges of generalizing the found evidence. In this section we describe the main limitations in this study, which are mostly connected to the limited availability of the net impact data. We will also present the potential we see there to be for further research using the full set of net impact data from Upright Oy.

In this study, we were only able to analyze a set of Fortune Global 500 companies from 2020, as we used the open-source data provided by Upright Oy in their *Net Impact Report 2021*. While constructing the complete data set, the number of observed companies totaled to 393. This limited sample may present a challenge in generalization of the empirical results of this study. However, for the purpose of this "introductory" study utilizing the new net impact measure this sample was regarded adequate, yet further encouraging following academic research on this matter to observe a broader sample in order to assess the CSR-CFP connection more thoroughly.

For the same availability reason we relied on the limited data, we observed the sample companies with an assumption that the net impact remains stable during the observed time period from 2015 to 2023. Although we do not believe this is a major issue due to the nature of the Upright impact measure, as described in *Section 3.1*, it still is possible that during our observed period of time the net impact of some companies in our sample could have been slightly changed into some direction. In addition, the assumption of the static nature of the net impact data prevents us for example analyzing the potential reverse causality bias the examined connection might have and using methodologies such as panel-data regressions, which could produce more convincing results. However, Upright Oy is currently working to provide restated time series data for companies (Upright Oy, 2022b). *"Once this is available, each release will contain a restated annual time series for each company in which changes across time will reflect only changes to the companies themselves"*, the company explains. Thus, in future research, the connection could be also analyzed in time-series and panel-data format.

In addition, in the scope of our "introductory" study with the relatively limited data sample we left out potential additional robustness tests that could be considered in the future research. For example, using different metrics to measure firm profitability in addition to ROA such as gross profit margin

or return on net operating assets. In addition, the empirical analysis on firm fundamentals could be widened by studying also other metrics in addition to profitability such as cash flows or asset-based figures. Also, studying the investors preference in more detailed would be one are to extend our research in the future. For example, by studying net cash flows to funds with different net impact profiles would be interesting way to study investor preference.

In conclusion, this study provides an introductory analysis of the relationship between corporate social responsibility and financial performance using new metric for CSR. While our empirical study offers insights and perspective to the increased discussion of CSR-CFP connection, the limitations considering the data used here should be taken into consideration when assessing the findings of this study. With full access to the data, the implications of the results found in this study could be further tested with broader sample of companies as described above. While we were to make most out of our limited sample of Fortune Global 500 companies from 2020, with a broader access one could study the net impact of more than 24,000 companies, over 5,000 funds and many key indices. The usage of notably broader sample of companies can provide more fruitful basis for empirical analysis by using time-series data enabling also new methodologies to test the researched connection. Altogether, in future research considering the connection between company net impact and financial performance, we encourage wider accommodation of this novel data provided by Upright Oy. With broader access to the Upright platform providing the net impact data, future studies may build upon the results of this study by examining the CSR-CFP connection more thoroughly.

6. Conclusion

Over the past decade or two, the connection between corporate social responsibility (CSR) and corporate financial performance (CFP) have been increasingly popular subject of academic studies. Conducting this study, we have contributed into this vast area of existing literature by introducing a new CSR metric provided by Upright Oy, corporate net impact, and evidence of its connection between CFP. While typically used CSR measures of ESG-scores tells *how* certain companies operate from environmental, social and governance perspective, net impact aims to capture *what* companies do and what actual and measurable impact companies have on the surrounding world. With this study, we provide weak empirical evidence to support the prevailing theory in academic literature that CSR increases firm valuation level and thereby lead in lower expected returns.

Based on our results, we are able to make a tentative conclusion of net impact having negative connection with firm profitability. The conclusion is not in line with our hypothesis, nor the finding suggested by McWilliams & Siegel (2001) suggesting neutral connection between CSR and firm profitability. We theorize this finding to tell us that higher net impact companies having larger increase in their cost base than the increases in revenue, at least over the relatively short time period observed within our sample, which leads to negative effect on profitability.

Further, we were able to make a tentative conclusion that higher net impact is connected to higher firm valuations, which suggests investors in general to have a preference to invest in better net impact companies. We argue that investors are attracted to companies with better net impact performance due to non-pecuniary benefits, rather than lower risk profile, since we find the moderate evidence of positive connection with valuation despite of negative connection with profitability.

Finally, opposing to our hypothesis, we were not able to find statistically significant evidence on the connection between net impact and expected returns. However, we find the coefficients for total net impacts and all the dimensions to be negative and thus to point towards the direction of our hypothesis and with an alternative portfolio construction method we were able to find some weak statistically significant evidence of negative connection. Thus, the results anyhow suggest the hypothesized negative connection to possibly exist, even though our findings were not robust through different portfolio categorization methods, and highly encourage for further research with more comprehensive dataset considering the question if higher net impact could lead to lower expected returns.

Additionally, we tested for the applicability of the net impact as a measure for CSR. We find evidence speaking for the usage of impact scores rather than ESG scores when assessing the actual impact companies have on environment. By comparing the correlation between the environmental scores of Upright Oy net impact data, Refinitiv's ESG metrics and the actual Scope 1-3 emissions sourced from TruCost, we find a correlation of -0.58 between environmental impacts (Upright Oy) and the actual emissions, while between the environmental aspects of ESG-score (Refinitiv) and the actual emissions the correlation was 0.13. This means higher (better) environmental score in impact data correlates to lower emissions, while higher (better) ESG environmental score loosely correlates with higher emissions, implying some level of illogicality in the metric.

This paper contributes to the existing academic literature on corporate social responsibility by introducing a new and to extent of our knowledge the most comprehensive company-level impact metric into discussion. We provide evidence of the applicability of the new CSR metric net impact as well as complementary evidence between net impact and corporate financial performance which is in line with the prevailing theory around the subject. In addition, we provide contribution to the ongoing discussion about the role of businesses in addressing significant societal challenges. Our findings encourage further research by academics in this area and with this metric. By exploring the effectiveness of Upright Oy's net impact metric and its relationship with other CSR metrics and financial performance, we offer valuable insights that could be useful for investors who rely on net impact metrics.

Due to the data limitations related to the net impact data provided by Upright Oy, our study provided introductory analysis of the relationship between CSR and financial performance using new CSR metric, corporate net impact. Even though our findings provide insights on the subject, also the limitations of the study need to be considered. For the future research we encourage a wider usage of the novel net impact data. In the future, as access becomes more widespread, further research could expand on the findings of this study by exploring the long-term effects using larger and more diverse samples.

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8. Appendix

Appendix Table 1: Examples of possible positive and negative impact for subcategory (Upright Oy, 2022)

Society	**Example of positive impact**	**Example of negative impact**
Jobs	*A company employs 700 people.*	-
Taxes	*A company pays its corporate taxes.*	-
Societal infrastructure	*A company builds sewer systems.*	-
Societal stability & understanding among people	*A company offers translation services that help people with no common language understand each other.*	*A company produces firearms that are used in armed conflicts.*
Equality & human rights	*A company provides microloans to women in developing countries, enabling them to start a business.*	*A company uses conflict minerals to produce consumer electronics.*
Knowledge	**Example of positive impact**	**Example of negative impact**
Knowledge infrastructure	*A company produces base stations for mobile networks.*	-
Creating knowledge	*A company provides preclinical research services.*	-
Distributing knowledge	*A company broadcasts television programs.*	*A company runs fake news websites.*
Scarce human capital	-	*A company occupies 140 highly skilled programmers*
Health	**Example of positive impact**	**Example of negative impact**
Physical diseases	*A company develops and produces vaccines.*	*A company produces cigarettes that have been proven to cause lung cancer.*
Mental diseases	*A company offers psychotherapy services for the treatment of depression.*	*A company produces slot machines that cause addiction.*
Nutrition	*A company sells legumes, which have been proven to be a healthy source of protein and various other nutrients.*	-
Relationships	*A company offers couple therapy services that help individuals establish and maintain healthy relationships.*	*A company produces alcohol that causes aggression and violence*
Meaning & joy	*A company produces chocolate, which makes some people feel enjoyment.*	*A company produces fashion advertisements that enforce beauty standards causing anxiety and loss of self-esteem.*
Environment	**Example of positive impact**	**Example of negative impact**
GHG emissions	*A company creates carbon-capture technology, or produces wind power.*	*A company runs a factory that produces GHG emissions.*
Non-GHG emissions	*A company produces oil spill clean-up technology.*	*A company produces fertilizers that contain ammonia which can seep into lakes, or diesel-powered passenger cars that create particulate emissions.*
Scarce natural resources	*A company produces water desalination systems, which increase the amount of fresh drinking water available.*	*A company runs an industrial process that uses large amounts of fresh water, or produces solar panels with rare earth metal components.*
Biodiversity	*A company breeds bees which help pollinate surrounding flora.*	*A company cuts down forests to produce palm oil, or utilises intensive animal farming to produce dairy products.*
Waste	*A company treats hazardous waste, or runs a platform on which customers can sell used goods.*	*A company manufactures disposable plastic cups.*

Appendix Table 2: Description and sources of variables used in empirical analysis.

Variable	Description	Source
Net Impact Ratio (%)	(Positive impacts – Negative impacts) / Positive impacts	Upright Oy
Society	Impact on Jobs, Taxes, Societal infrastructure, Societal stability & understanding among people, and Equality & human rights	Upright Oy
Knowledge	Impact on Knowledge infrastructure, Creating knowledge, Distributing knowledge, and Scarce human capital	Upright Oy
Health	Impact on Physical diseases, Mental diseases, Nutrition, Relationships, and Meaning & Joy	Upright Oy
Environment	Impact on GHG emissions, Non-GHG emissions, Scarce natural resources, Biodiversity, and Waste	Upright Oy
Net Impact Score	Net sum of impacts on Society, Knowledge, Health, and Environment	Upright Oy
P/B	Price-to-book ratio calculated dividing market capitalization with book equity value	Refinitiv Workspace
ROA (%)	Return on Assets calculated dividing net income by total assets	Refinitiv Workspace
Market Beta	Measure of how much stock value moves for a given move in the market	Refinitiv Workspace
Mcap (BNUSD)	Market Capitalization calculated by multiplying the share price by outstanding # of shares	Refinitiv Workspace
Returns (%)	Total monthly returns for ordinary stock of the company	Refinitiv Workspace
MKT (%)	Expected return on market above risk-free rate of return	Kenneth R. French
SMB (%)	Small minus big, size effect	Kenneth R. French
HML (%)	High minus low, value effect	Kenneth R. French
UMD (%)	Up minus down, momentum effect	Kenneth R. French
RF (%)	Risk-free rate, measured as one month Treasury bill rate	Kenneth R. French

Appendix Table 3: The effect of corporate net impact on profitability

This table reports the regressions of future profitability on underlying Corporate Net Impact scores and its pillars, where profitability is measured by Return on Assets (ROA). In Panel A the sample consists of cross-sectional data from year 2020, in Panel B from year 2019, in Panel C from year 2018, in Panel D from year 2017, in Panel E from year 2016 and in Panel F from year 2015. We consider six Net Impact metrics (Net Impact Ratio as "NIR", Society, Knowledge, Health, Environment & Net Score) and three control variables (market beta, the natural logarithm of market capitalization and the natural logarithm of price-to-book ratio). The results are presented with and without the sector fixed effects. T-statistics are shown in parenthesis. Significance levels are shown in stars *, ** and *** as 10%, 5% and 1% respectively.

Panel A: Cross-sectional sample from 2020

	Dependent variable: ROA											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	-0.586***	-0.205										
	(-3.023)	(-0.810)										
Society			-0.095	-0.154								
			(-0.804)	(-0.976)								
Knowledge					0.098	-0.535*						
					(0.446)	(-1.711)						
Health							-0.082	-0.004				
							(-0.833)	(-0.031)				
Environment									-0.170***	0.046		
									(-2.645)	(0.375)		
Net Score											-0.121**	-0.042
											(-2.565)	(-0.608)
Market Beta	-1.178**	-1.279**	-0.746	-1.180**	-0.683	-1.307**	-0.799*	-1.195**	-0.988**	-1.163**	-1.106**	-1.254**
	(-2.440)	(-2.427)	(-1.605)	(-2.289)	(-1.451)	(-2.521)	(-1.687)	(-2.280)	(-2.099)	(-2.229)	(-2.285)	(-2.384)
LN(Mcap)	0.886***	0.980***	0.838***	1.003***	0.843***	0.936***	0.834***	0.975***	0.861***	0.980***	0.848***	0.970***
	(5.169)	(5.406)	(4.858)	(5.474)	(4.847)	(5.140)	(4.833)	(5.337)	(5.029)	(5.395)	(4.951)	(5.339)
LN(P/B)	1.547***	1.190***	1.540***	1.136***	1.553***	1.192***	1.591***	1.180***	1.575***	1.167***	1.585***	1.194***
	(7.451)	(4.983)	(7.204)	(4.691)	(7.251)	(5.013)	(7.535)	(4.848)	(7.570)	(4.852)	(7.609)	(4.977)
Constant	-17.704***	-20.056***	-16.538***	-20.402***	-16.907***	-18.413***	-16.618***	-20.070***	-17.551***	-20.168***	-16.739***	-19.769***
	(-4.197)	(-4.298)	(-3.883)	(-4.364)	(-3.945)	(-3.874)	(-3.905)	(-4.259)	(-4.149)	(-4.315)	(-3.967)	(-4.208)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	362	362	362	362	362	362	362	362	362	362	362	362
Adjusted R^2	0.323	0.346	0.307	0.347	0.306	0.351	0.307	0.345	0.319	0.345	0.318	0.346

Panel B: Cross-sectional sample from 2019

	Dependent variable: ROA											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	-0.946***	-0.105										
	(-4.852)	(-0.435)										
Society			0.023	-0.073								
			(0.183)	(-0.471)								
Knowledge					0.194	-0.945***						
					(0.835)	(-3.147)						
Health							-0.213**	0.088				
							(-2.023)	(0.694)				
Environment									-0.372***	-0.001		
									(-5.768)	(-0.006)		
Net Score											-0.231***	-0.035
											(-4.855)	(-0.522)
Market Beta	-1.244**	-1.855***	-0.649	-1.821***	-0.624	-1.914***	-0.851	-1.772***	-1.030*	-1.833***	-1.256**	-1.862***
	(-2.261)	(-3.243)	(-1.163)	(-3.194)	(-1.122)	(-3.403)	(-1.522)	(-3.077)	(-1.928)	(-3.213)	(-2.280)	(-3.253)
LN(Mcap)	0.813***	0.929***	0.724***	0.938***	0.741***	0.870***	0.724***	0.938***	0.757***	0.925***	0.750***	0.922***
	(4.664)	(5.353)	(4.032)	(5.347)	(4.122)	(5.062)	(4.068)	(5.383)	(4.419)	(5.331)	(4.325)	(5.318)
LN(P/B)	2.218***	1.676***	2.232***	1.649***	2.183***	1.697***	2.290***	1.645***	2.285***	1.673***	2.281***	1.683***
	(9.196)	(6.493)	(8.747)	(6.279)	(8.622)	(6.666)	(9.161)	(6.302)	(9.582)	(6.433)	(9.443)	(6.504)
Constant	-15.618***	-17.450***	-13.714***	-17.558***	-13.964***	-15.000***	-13.501***	-17.756***	-15.142***	-17.407***	-13.937***	-17.219***
	(-3.673)	(-3.944)	(-3.137)	(-3.959)	(-3.189)	(-3.386)	(-3.105)	(-3.990)	(-3.616)	(-3.932)	(-3.292)	(-3.880)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	360	360	360	360	360	360	360	360	360	360	360	360
Adjusted R^2	0.347	0.439	0.304	0.439	0.305	0.454	0.312	0.439	0.363	0.438	0.347	0.439

*p<0.1; **p<0.05; ***p<0.01

Appendix Table 3 continued

Panel C: Cross-sectional sample from 2018

	Dependent variable: ROA											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	-0.880***	-0.271										
	(-3.809)	(-0.902)										
Society			0.023	0.110								
			(0.159)	(0.575)								
Knowledge					-0.158	-1.153***						
					(-0.583)	(-3.091)						
Health							-0.438***	-0.367**				
							(-3.575)	(-2.365)				
Environment									-0.215***	0.120		
									(-2.690)	(0.808)		
Net Score											-0.207***	-0.100
											(-3.654)	(-1.210)
Market Beta	-1.687**	-1.493**	-1.303*	-1.503**	-1.333*	-1.448**	-1.626**	-1.688**	-1.444**	-1.452*	-1.685**	-1.511**
	(-2.408)	(-2.005)	(-1.836)	(-2.012)	(-1.881)	(-1.971)	(-2.320)	(-2.266)	(-2.056)	(-1.949)	(-2.400)	(-2.030)
LN(Mcap)	0.482**	0.583***	0.390*	0.554**	0.382*	0.504**	0.401*	0.538**	0.414*	0.585***	0.428**	0.567***
	(2.248)	(2.665)	(1.789)	(2.500)	(1.749)	(2.327)	(1.876)	(2.473)	(1.925)	(2.675)	(2.004)	(2.599)
LN(P/B)	1.564***	1.024***	1.559***	1.031***	1.584***	1.061***	1.637***	1.074***	1.586***	0.969***	1.603***	1.036***
	(5.943)	(3.606)	(5.725)	(3.593)	(5.781)	(3.785)	(6.178)	(3.798)	(5.957)	(3.377)	(6.071)	(3.647)
Constant	-6.821	-6.959	-4.682	-6.559	-4.480	-3.986	-4.610	-5.744	-5.671	-7.023	-5.373	-6.387
	(-1.312)	(-1.259)	(-0.888)	(-1.182)	(-0.848)	(-0.721)	(-0.890)	(-1.043)	(-1.084)	(-1.270)	(-1.038)	(-1.155)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	356	356	356	356	356	356	356	356	356	356	356	356
Adjusted R^2	0.178	0.230	0.144	0.229	0.145	0.249	0.174	0.241	0.161	0.230	0.175	0.231

Panel D: Cross-sectional sample from 2017

	Dependent variable: ROA											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	-0.560***	-0.207										
	(-3.084)	(-0.902)										
Society			-0.109	0.133								
			(-0.919)	(0.900)								
Knowledge					0.017	-1.003***						
					(0.079)	(-3.511)						
Health							-0.147	-0.044				
							(-1.533)	(-0.365)				
Environment									-0.108*	-0.011		
									(-1.698)	(-0.098)		
Net Score											-0.100**	-0.039
											(-2.250)	(-0.617)
Market Beta	-1.197***	-1.196***	-1.079**	-1.158***	-1.030**	-1.126**	-1.092**	-1.168***	-1.030**	-1.154**	-1.125**	-1.173***
	(-2.687)	(-2.675)	(-2.395)	(-2.605)	(-2.296)	(-2.577)	(-2.435)	(-2.612)	(-2.308)	(-2.589)	(-2.517)	(-2.631)
LN(Mcap)	0.322*	0.494***	0.281	0.458**	0.269	0.423**	0.266	0.482***	0.279	0.485***	0.280	0.484***
	(1.821)	(2.802)	(1.571)	(2.563)	(1.499)	(2.429)	(1.496)	(2.729)	(1.568)	(2.744)	(1.578)	(2.746)
LN(P/B)	2.250***	1.591***	2.231***	1.637***	2.279***	1.605***	2.299***	1.596***	2.308***	1.598***	2.289***	1.596***
	(9.706)	(6.517)	(9.257)	(6.584)	(9.581)	(6.685)	(9.816)	(6.530)	(9.853)	(6.473)	(9.821)	(6.532)
Constant	-4.418	-7.647*	-3.018	-7.191	-3.064	-4.979	-2.955	-7.438*	-3.629	-7.538*	-3.342	-7.383
	(-1.022)	(-1.707)	(-0.693)	(-1.599)	(-0.700)	(-1.115)	(-0.680)	(-1.654)	(-0.834)	(-1.679)	(-0.772)	(-1.644)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	354	354	354	354	354	354	354	354	354	354	354	354
Adjusted R^2	0.308	0.396	0.291	0.396	0.290	0.415	0.294	0.394	0.295	0.394	0.300	0.395

*p<0.1; **p<0.05; ***p<0.01

Appendix Table 3 continued

Panel E: Cross-sectional sample from 2016

	Dependent variable: ROA											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	-0.946***	-0.105										
	(-4.852)	(-0.435)										
Society			0.023	-0.073								
			(0.183)	(-0.471)								
Knowledge					0.194	-0.945***						
					(0.835)	(-3.147)						
Health							-0.213**	0.088				
							(-2.023)	(0.694)				
Environment									-0.372***	-0.001		
									(-5.768)	(-0.006)		
Net Score											-0.231***	-0.035
											(-4.855)	(-0.522)
Market Beta	-1.244**	-1.855***	-0.649	-1.821***	-0.624	-1.914***	-0.851	-1.772***	-1.030*	-1.833***	-1.256**	-1.862***
	(-2.261)	(-3.243)	(-1.163)	(-3.194)	(-1.122)	(-3.403)	(-1.522)	(-3.077)	(-1.928)	(-3.213)	(-2.280)	(-3.253)
LN(Mcap)	0.813***	0.929***	0.724***	0.938***	0.741***	0.870***	0.724***	0.938***	0.757***	0.925***	0.750***	0.922***
	(4.664)	(5.353)	(4.032)	(5.347)	(4.122)	(5.062)	(4.068)	(5.383)	(4.419)	(5.331)	(4.325)	(5.318)
LN(P/B)	2.218***	1.676***	2.232***	1.649***	2.183***	1.697***	2.290***	1.645***	2.285***	1.673***	2.281***	1.683***
	(9.196)	(6.493)	(8.747)	(6.279)	(8.622)	(6.666)	(9.161)	(6.302)	(9.582)	(6.433)	(9.443)	(6.504)
Constant	-15.618***	-17.450***	-13.714***	-17.558***	-13.964***	-15.000***	-13.501***	-17.756***	-15.142***	-17.407***	-13.937***	-17.219***
	(-3.673)	(-3.944)	(-3.137)	(-3.959)	(-3.189)	(-3.386)	(-3.105)	(-3.990)	(-3.616)	(-3.932)	(-3.292)	(-3.880)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	360	360	360	360	360	360	360	360	360	360	360	360
Adjusted R^2	0.347	0.439	0.304	0.439	0.305	0.454	0.312	0.439	0.363	0.438	0.347	0.439

Panel F: Cross-sectional sample from 2015

	Dependent variable: ROA											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	-0.507**	0.049										
	(-2.416)	(0.191)										
Society			0.037	0.223								
			(0.279)	(1.374)								
Knowledge					0.772***	0.077						
					(3.216)	(0.237)						
Health							-0.237**	-0.106				
							(-2.183)	(-0.793)				
Environment									-0.176**	0.014		
									(-2.435)	(0.104)		
Net Score											-0.101*	0.021
											(-1.959)	(0.291)
Market Beta	-0.284	0.197	-0.090	0.192	0.022	0.185	-0.246	0.136	-0.109	0.186	-0.220	0.197
	(-0.557)	(0.387)	(-0.177)	(0.381)	(0.044)	(0.367)	(-0.483)	(0.268)	(-0.217)	(0.368)	(-0.432)	(0.390)
LN(Mcap)	0.817***	1.036***	0.752***	1.001***	0.815***	1.042***	0.761***	1.031***	0.789***	1.038***	0.780***	1.038***
	(4.129)	(5.434)	(3.790)	(5.224)	(4.163)	(5.454)	(3.870)	(5.418)	(4.011)	(5.453)	(3.955)	(5.456)
LN(P/B)	1.766***	1.187***	1.776***	1.223***	1.604***	1.184***	1.796***	1.187***	1.835***	1.183***	1.803***	1.184***
	(7.288)	(4.710)	(7.135)	(4.841)	(6.525)	(4.695)	(7.388)	(4.718)	(7.521)	(4.658)	(7.394)	(4.696)
Constant	-16.485***	-22.077***	-14.993***	-21.740***	-16.049***	-22.276***	-14.981***	-21.882***	-16.303***	-22.111***	-15.563***	-22.173***
	(-3.402)	(-4.571)	(-3.094)	(-4.509)	(-3.353)	(-4.562)	(-3.113)	(-4.529)	(-3.372)	(-4.579)	(-3.224)	(-4.587)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	349	349	349	349	349	349	349	349	349	349	349	349
Adjusted R^2	0.234	0.348	0.222	0.352	0.244	0.348	0.232	0.349	0.235	0.348	0.230	0.348

*p<0.1; **p<0.05; ***p<0.01

Appendix Table 4: The effect of corporate net impact on valuation

This table reports the regressions of firm valuation on underlying Corporate Net Impact scores and its pillars, where valuation is measured by natural logarithm of Tobin's Q (measured as price-to-book ratio). In Panel A the sample consists of cross-sectional data from year 2019, in Panel B from year 2018, in Panel C from year 2017, in Panel D from year 2016 and in Panel E from year 2015. We consider six Net Impact metrics (Net Impact Ratio as "NIR", Society, Knowledge, Health, Environment & Net Score) and one control variable (market beta). The results are presented with and without the sector fixed effects. T-statistics are shown in parenthesis. Significance levels are shown in stars *, ** and *** as 10%, 5% and 1% respectively.

Panel A: Cross-sectional sample from 2019

	Dependent variable: LN(P/B)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	0.062	0.036										
	(1.324)	(0.636)										
Society			-0.097***	-0.044								
			(-3.296)	(-1.223)								
Knowledge					0.191***	0.021						
					(3.608)	(0.292)						
Health							0.040	-0.003				
							(1.639)	(-0.114)				
Environment									0.050***	0.074***		
									(3.136)	(2.666)		
Net Score											0.028**	0.015
											(2.500)	(0.969)
Market Beta	-0.544***	-0.327***	-0.587***	-0.338***	-0.526***	-0.336***	-0.540***	-0.338***	-0.550***	-0.324***	-0.525***	-0.326***
	(-4.877)	(-2.954)	(-5.418)	(-3.092)	(-4.838)	(-3.066)	(-4.859)	(-3.061)	(-5.061)	(-2.982)	(-4.754)	(-2.965)
Constant	1.159***	0.417**	1.405***	0.549**	1.217***	0.385*	1.129***	0.371*	1.278***	1.064***	1.142***	0.472**
	(8.976)	(2.043)	(9.522)	(2.290)	(9.499)	(1.958)	(8.663)	(1.926)	(9.601)	(3.310)	(8.883)	(2.171)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	372	372	372	372	372	372	372	372	372	372	372	372
Adjusted R^2	0.068	0.245	0.090	0.247	0.095	0.244	0.070	0.244	0.087	0.258	0.079	0.246

Panel B: Cross-sectional sample from 2018

	Dependent variable: LN(P/B)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	0.009	0.018										
	(0.193)	(0.318)										
Society			-0.096***	-0.068*								
			(-3.411)	(-1.934)								
Knowledge					0.152***	-0.021						
					(2.977)	(-0.292)						
Health							0.040*	0.007				
							(1.727)	(0.241)				
Environment									0.023	0.061**		
									(1.461)	(2.241)		
Net Score											0.013	0.008
											(1.183)	(0.491)
Market Beta	-0.431***	-0.232**	-0.459***	-0.233**	-0.402***	-0.236**	-0.410***	-0.233**	-0.430***	-0.225**	-0.418***	-0.232**
	(-4.023)	(-2.159)	(-4.395)	(-2.196)	(-3.826)	(-2.214)	(-3.851)	(-2.173)	(-4.075)	(-2.120)	(-3.922)	(-2.168)
Constant	1.028***	0.532***	1.280***	0.776***	1.077***	0.497***	1.004***	0.514***	1.087***	1.078***	1.024***	0.560***
	(8.303)	(2.687)	(8.978)	(3.375)	(8.719)	(2.612)	(8.084)	(2.765)	(8.366)	(3.442)	(8.283)	(2.646)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	375	375	375	375	375	375	375	375	375	375	375	375
Adjusted R^2	0.038	0.198	0.067	0.206	0.061	0.198	0.046	0.197	0.044	0.208	0.042	0.198

*p<0.1; **p<0.05; ***p<0.01

Appendix Table 4 continued

Panel C: Cross-sectional sample from 2017												
	Dependent variable: LN(P/B)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	0.007	0.018										
	(0.155)	(0.328)										
Society			-0.115***	-0.086**								
			(-4.183)	(-2.469)								
Knowledge					0.132***	-0.046						
					(2.641)	(-0.657)						
Health							0.035	0.002				
							(1.525)	(0.059)				
Environment									0.026*	0.067**		
									(1.704)	(2.516)		
Net Score											0.010	0.004
											(0.912)	(0.238)
Market Beta	-0.371***	-0.270**	-0.403***	-0.268**	-0.356***	-0.272***	-0.357***	-0.273***	-0.369***	-0.255**	-0.363***	-0.272***
	(-3.435)	(-2.567)	(-3.843)	(-2.582)	(-3.355)	(-2.604)	(-3.327)	(-2.602)	(-3.455)	(-2.455)	(-3.376)	(-2.594)
Constant	1.031***	0.612***	1.332***	0.921***	1.085***	0.559***	1.015***	0.591***	1.098***	1.211***	1.030***	0.614***
	(8.222)	(3.146)	(9.372)	(4.100)	(8.622)	(2.988)	(8.097)	(3.234)	(8.381)	(3.962)	(8.230)	(2.946)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	375	375	375	375	375	375	375	375	375	375	375	375
Adjusted R^2	0.026	0.189	0.070	0.202	0.044	0.190	0.032	0.189	0.034	0.203	0.029	0.189
Panel D: Cross-sectional sample from 2016												
	Dependent variable: LN(P/B)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	0.062	0.118**										
	(1.297)	(1.986)										
Society			-0.083***	-0.070*								
			(-2.750)	(-1.824)								
Knowledge					0.205***	0.038						
					(3.795)	(0.490)						
Health							0.059**	0.052*				
							(2.333)	(1.651)				
Environment									0.021	0.081***		
									(1.273)	(2.746)		
Net Score											0.021*	0.029*
											(1.742)	(1.726)
Market Beta	-0.530***	-0.381**	-0.571***	-0.366**	-0.516***	-0.392***	-0.509***	-0.361**	-0.542***	-0.372**	-0.517***	-0.379**
	(-3.635)	(-2.576)	(-3.993)	(-2.464)	(-3.629)	(-2.644)	(-3.512)	(-2.419)	(-3.742)	(-2.531)	(-3.549)	(-2.558)
Constant	0.964***	0.718***	1.175***	0.799***	1.033***	0.574**	0.918***	0.569**	1.008***	1.301***	0.945***	0.744***
	(5.996)	(2.986)	(6.658)	(3.034)	(6.500)	(2.482)	(5.695)	(2.521)	(6.149)	(3.682)	(5.872)	(2.955)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	376	376	376	376	376	376	376	376	376	376	376	376
Adjusted R^2	0.038	0.184	0.053	0.183	0.069	0.176	0.047	0.181	0.038	0.192	0.041	0.182
Panel E: Cross-sectional sample from 2015												
	Dependent variable: LN(P/B)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NIR	0.042	0.069										
	(0.937)	(1.286)										
Society			-0.109***	-0.090***								
			(-3.958)	(-2.612)								
Knowledge					0.176***	-0.013						
					(3.503)	(-0.189)						
Health							0.071***	0.069**				
							(3.083)	(2.430)				
Environment									0.019	0.059**		
									(1.235)	(2.252)		
Net Score											0.017	0.021
											(1.547)	(1.381)
Market Beta	-0.444***	-0.248*	-0.505***	-0.246*	-0.429***	-0.263**	-0.396***	-0.216*	-0.450***	-0.246*	-0.425***	-0.245*
	(-3.519)	(-1.941)	(-4.184)	(-1.943)	(-3.530)	(-2.058)	(-3.199)	(-1.691)	(-3.628)	(-1.943)	(-3.362)	(-1.917)
Constant	0.994***	0.623***	1.296***	0.870***	1.058***	0.526**	0.929***	0.551***	1.034***	1.088***	0.974***	0.666***
	(7.122)	(2.931)	(8.355)	(3.664)	(7.667)	(2.568)	(6.647)	(2.757)	(7.328)	(3.430)	(6.936)	(2.993)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	379	379	379	379	379	379	379	379	379	379	379	379
Adjusted R^2	0.035	0.218	0.071	0.229	0.063	0.215	0.056	0.227	0.036	0.226	0.039	0.219

*p<0.1; **p<0.05; ***p<0.01