The role of the firm: how corporate social responsibility affects income inequality
Statement of Originality

I, Rosalie Cecilia Tulen - 1041172, herewith declare to have written this document and that I am responsible for the content of it. I declare that the text and the work presented in this document is original and that no sources other than those mentioned in the text and its references have been used in creating it.
Abstract

Even though overall inequality has decreased over the past decade and the number of people living of less than a dollar a day is decreasing, income inequality is still globally increasing. Income inequality can be defined as substantial difference in income distribution between people, communities, races, social structures, or nations. Corporate social responsibility practices by firms could be of help in decreasing income inequality within a country. This study aims to reveal a relationship between corporate social responsibility levels within a country and the country’s income inequality and assesses the discussion on the responsibility of the firm for addressing income inequality. Building on existing work on drivers of income inequality, it asks: does corporate social responsibility influence the income inequality within a country? In this research, corporate social responsibility can be defined as a management concept whereby companies integrate social and environmental concerns in their business operations and interactions with their stakeholders.

Based on a review of the existing literature was concluded that there is an established body of literature regarding the firm-level implications of CSR, but country level implications seemed to be under-researched. A data analysis of 30 countries from all over the world was performed. A regression showed that its results could not provide final conclusions due to insignificance as a result of small sample size but concluded was that there is an effect. The size of the effect remains unknown. Also, evidence was found that social spending does decrease income inequality. On this basis, it is recommended that further research is performed with a different type of analysis to provide final conclusions regarding the effect of CSR on income inequality, which could provide guidance to firms and governments regarding their CSR practices.
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I. Introduction

In a world where the wealthiest 1 percent of the global population owns 44 percent of the global wealth (Credit Suisse, 2019), equality seems as unreachable as world peace. Income inequality can be defined as substantial difference in income distribution between people, communities, races, social structures, or nations (Howard & Carter, 2016). Income disparity is a significant aspect of the socioeconomic and gender stratification (Howard & Carter, 2016). It influences and is caused by many other aspects of inequality, such as wealth inequalities, political influence and the role of a community (Howard & Carter, 2016). Income is a significant determinant of the standard of life, influencing individuals and families' wellbeing, which differs through social characteristics such as sex, age, and race or ethnicity (Howard & Carter, 2016).

During most of the 20th century, the income gap, displaying income inequality, was assumed to decrease in most areas of the world (OECD, 2015). This means that relatively, the less well-off experienced an increase in their income whilst the well-off maintained their level of wealth. The Database of World Top Incomes shows this phenomenon started in North America and large parts of Europe during the 1920s and continued in several developing countries during the 1950s (OECD, 2015).

This phenomenon reversed during the 1980s where income inequality was rising again (OECD, 2015). When graphically expressing this phenomenon as a function of time and income, it would look like a parabola. This effect was not only observed in countries with a history of income inequality but was also found in countries where there was originally lower income inequality such as Denmark and Sweden (OECD, 2015). And whilst the rise of the economies of developing countries has decreased the number of people living in so-called ‘dollar-a-day’ poverty, relative poverty and relative income inequality is still increasing (OECD, 2015).

A large meta-data-analysis by OECD in 2012 revealed several different causes for income inequality within countries and find the effect of several government policies to be reducing income inequality. They argued that employment and anti-discrimination programs, well-designed labour market structures and large and/or progressive tax and transition systems would all minimize income inequality. The effect of progressive tax systems on income inequality is supported by Piketty in his book ‘Capital in the Twenty-First Century’ published in 2014 and his publication ‘Top Incomes in France in the Twentieth Century: Inequality and Redistribution, 1901-1998’ in 2003 where he argues that taxation can indeed control income inequality in countries.
In his analysis of income inequality, Cowell (2015) defines the relevance as to why individuals care about income equality and its absence, by using sociological research. Based on research by Foster and Sen (1997) he argues that it is rooted in an ethical approach to distributional questions regarding income. He continues that, based on research by Charness and Rabin (2002) and Fehr and Fischbacher (2002) social values are related to individual concerns and views: he argues that people are concerned about distributional justice and are concerned about justice in general, which has been observed through their behavior in experimental settings. Wilson and Pickett (2009) continue to stress the importance of researching income inequality as they argue that inequality and its acute understanding by the average EU citizen is a toxic aspect of today's European societies and one that appears to be correlated with decreased rates of trust, political involvement and participation, as well as with a host of other social problems, from poor health to violence, to underage pregnancies.

The different views on role of the firm in addressing this inequality will be assessed in the literature review in the stakeholder-shareholder debate. In this debate, corporate social responsibility as a tool for firms to address income inequality is discussed. Corporate social responsibility (CSR) can be defined as “a management concept whereby companies integrate social and environmental concerns in their business operations and interactions with their stakeholders” (UNIDO, 2020). The Triple-bottom-line as explained by Elkington (1994) where there should be a balance between people, profit and planet is a good example of CSR theory.

CSR theory argues that the responsibilities of the firm can be summarized in four obligations: the economic responsibility to be profitable, the legal responsibility to act according to the laws within a country, the ethical responsibility to behave ethical even when not obligated by law and the philanthropic responsibility to contribute to society well-being even when this is separate from a company’s main business line (Brusseau, 2012). The order of the above-mentioned responsibilities reflects the importance of these responsibilities from a firm perspective. The core business of a firm is to be profitable, and when faced with economically challenging times, firms tend to neglect their other responsibilities as described in CSR theory (Brusseau, 2012).

To address this issue, of the neglect of firm responsibilities in challenging times, the Triple-bottom-line theory (Elkington, 1994) builds on the idea that the three forms of sustainable business practice as defined in this theory. He defines economic sustainability, social sustainability and environmental sustainability which together cover more or less the same subjects as the four obligations defined by Brusseau (2012), should be regarded as separate in terms of results. By doing this, firms should aim to yield sustainable results on all
three of these business practices as opposed to neglecting non-economical practices when faced with economically challenging times.

Even though there is the general opinion amongst business professionals who argue that CSR practice is solely beneficial for society, from a resource-based perspective CSR can provide both internal and or external benefits (Branco & Rodrigues, 2006). Internal benefits may come from investments in socially beneficial practices by helping the organization build new know-how-related tools and capabilities (Branco & Rodrigues, 2006). Investing in practices and declaration of social responsibility may have significant consequences on the production and loss of the essential intangible assets within a company: the employees (Branco & Rodrigues, 2006). Also, externally CSR can benefit the companies pursuing it. These effects are linked to its reputation as a corporation. Companies with a strong reputation for social responsibility can boost relationships with outside stakeholders (Branco & Rodrigues, 2006). They may also recruit better staff or increasing the morale, engagement and loyalty of existing workers to the company (Branco & Rodrigues, 2006).

And whilst there is a high level of attention for the firm-level implications of CSR, there is less attention for the country-level implications of CSR. One would expect when investment in the people and planet increases, as part of the Triple-bottom-line theory, this would have implications for the parameters of wealth within a country. A research in 2006 by Melé, Debeljuh and Arruda examining the status of Corporate Ethical Policies (CEP), which is a form of CSR, in large companies in Argentina, Brazil and Spain concluded that there were many similarities between the countries and all firms had some level of CEP. Firms in which CEP was concluded to be low, revealed in interviews that there was a desire to implement a higher level of CEP. Whilst this study compares countries, it focusses on the firm-level implications of CSR, not on macro-economic effects within the countries of Argentina, Brazil and Spain.

Another research by Preuss, Barkemeyer and Glavas (2016) concluded in a cross-country comparison of 18 different countries that there is a negative relationship between so-called National Business Systems (NBS), providing information on a country’s socio-economic condition, and codes of conduct, which are a specific form of CSR, within a country. They argued that when the socio-economic systems were not in place, companies had to step in to overcome this deficiency. Their paper thus examines CSR on a country level but fails to discount specific effects. This paper can add to their findings by examining one of the elements of a National Business System, income inequality, and test its significance. This leads to the research question of this paper:
Does corporate social responsibility influence the income inequality within a country?

The findings of this paper would contribute to the scientific knowledge regarding the effects of CSR on countries, and more specific, on people. If this research would find a significant effect of CSR on income inequality across different countries, this could affect the outlook on the importance of CSR for companies but also for society. This could provide another incentive for companies to focus more on CSR, assuming that companies want to contribute to a better society. However, it could also provide an incentive for governmental institutions to focus more on the level of CSR within their country and could inspire to new legislation regarding ethical conduct within a country. An article by Falck and Heblich (2007) shows why companies would care about their CSR practices, and why the research performed in this paper could contribute to their CSR strategy. They claim that a corporation can ‘benefit well by doing well’ by strategically exercising CSR; they suggest that businesses will make a profit through pursuing CSR, while at the same time making the planet a better place. They argue that CSR’s business strategy will often require a long-term commitment to shareholder value, which often means a long-term perspective to profit maximization.

Based on literature (Marx, Salanauskaite & Verbist, 2013; Kenworthy, 2011; Freeman, 1986; McWilliams et al., 2002) and the research performed by Preuss, Barkemeyer and Glavas in 2016 which shares certain characteristics with this research, the expectation is that CSR will be negatively correlated to inequality within a country. This means that an increase in CSR will decrease income inequality in this country. Also is expected, based on literature by Iradian (2005) and Jones (2007) which will be elaborated on in the literature section, that social spending by governments has a significant effect on income inequality and this effect is a negative correlation meaning that when social spending increases, income inequality decreases.

The investigation of these hypotheses will be done by a cross-country comparison of 32 different countries. An online database from The Organization for Economic Co-operation and Development (OECD) will be used to provide data from which statistical results will be drawn. From this, a cross-country comparison can be performed from which general conclusions can formulated when statistical evidence is found.

II. Literature review

Income can be defined as a household’s disposable income for a certain year. Household income is the total aggregate income of all members of the household who are 15 or older and is a sum of all money as a return on sale or distribution of goods or as a return on savings.
Individuals may not be related in any way whilst they could still be considered part of the same household. Household income is an important risk factor used by borrowers to borrow, and a valuable economic predictor of living conditions in a region (Khan, Griffin, Riskin & Renwei, 1992). Looking at the statistics on household income is instructive when comparing affluence and living standards across different communities, states or countries (Datta & Meerman, 1980). Household income is adjustable gross income at an individual level, meaning it is the income left after tax (Khan et al., 1992).

Income inequality has been a widely studied phenomenon. Kuznets (1955) was one of the first academics to derive economic growth as the cause of income inequality. In his theory of the 'inverted-U,' Kuznets hypothesized that economic growth (i.e. an increase in total per capita income) could initially lead to an increase and then a fall in income inequality within a region. Since then, however, much evidence has been gathered against this theory. For example, Deininger and Squire (1996) find no confirmation of the inverted-U Kuznets curve using a large-scale cross-country and time series data set but rather a substantial correlation between initial income inequality and subsequent growth.

The link between income inequality and education levels within countries is established by Lopez, Vinod and Wang (1999) who argue that education increases wages and stimulates productivity as it helps to unlock the poor's productive capacity. In most nations, an excessively skewed education system appears to have a negative effect on per capita income. Education and income equity are related to the economic gains correlated with education (Thorbecke & Charumilind, 2002). In an essay by Banerjee and Duflo (2007) is concluded that poor individuals spend very little on schooling. Causes for this are lack of financial assets or free schooling in specific countries. However, concluded was that the free schooling provided was often of poor quality, resulting in parents withdrawing their children from school. If the educational prospects between rich and poor vary greatly, the gains of economic development are mostly gained by skilled workers. This in essence aggravates income inequality (Thorbecke & Charumilind, 2002). There could be concluded that the relationship between income inequality and education levels is evident and should therefore be included in the analysis.

The relationship between poverty and income inequality has been widely established. The degree of poverty reduction, as a result of economic growth, depends on how development occurs in income distribution, based on original wealth differences-based sources of production (Iradian, 2005). If income inequality rises, it is still possible for a country to experience strong economic growth without substantial helping the poorest section of the population. The wealthy get poorer while the poor's wages stagnate (Iradian, 2005). From this can be concluded that
poverty should be taken into account when analyzing income inequality and its causes and its effect can differ.

Piketty and Saez explained the relation between tax and income inequality in their paper ‘Income inequality in the United States, 1913–1998’ published in 2003. In this paper they performed a time-series analysis showing patterns of income inequality as a result of tax regulations. Such a similar analysis was performed by Piketty (2003) in the French economy which revealed similar patterns. Piketty argues that income inequality could hamper growth, as a response to Hayek (2013, first published 1960) who argued that taxes were insufficient and unjust. Piketty provides an argument for this statement by explaining that when such inequality contributes to the concentration of key decisions (new acquisitions, the development of new companies, etc.) by a small fraction of the population and excludes a reasonable number of those with worthwhile projects. Based on these findings is assumed that taxes within a country have a significant effect on income inequality and should therefore be included when examining the effects of variables on income inequality.

Social spending greatly influences income inequality based on literature. In order to mitigate poverty and foster human growth, greater public spending on social sectors (education, health, and housing) and infrastructure is essential (Iradian, 2005; Jones, 2007). The education and health care sectors are inefficient, and in many countries policymakers have no alternative but to interfere on the basis of equity and efficiency (Iradian, 2005; Jones, 2007). Particularly clear is the correlation between social spending and allocation of income, and public investment in human capital can be an important way to minimize long-term income inequality (Iradian, 2005; Jones 2007). Investment in infrastructure may also be considered as public expenditure which reduces poverty (Iradian, 2005). This conclusion is supported by the previously mentioned research by Preuss, Barkemeyer and Glavas (2016) who stated that when social spending fails to address income inequality, CSR practices often take in this position. This is referred to as the so-called substitute view. According to the substitute view, countries with less stable regulatory systems, a lower position of government in the provision of welfare or fewer defined forms of involving stakeholders are more in need of CSR and companies in those countries are more likely to engage in CSR activities to address these institutional deficiencies (Hiss, 2009; Jackson & Apostolakou, 2010). Therefore, is assumed that social spending is a relevant variable to account for when analyzing the effects of variables on income inequality.

In the debate on the reduction of inequality by government practices, two questions were central: should social policies be targeted to low-income groups or be universal? And should benefits be equal for all or earnings-related? (Korpi & Palme, 1998). Arguments in favor of
regulating the allocation of transferred funds ignore other policy-relevant considerations: the magnitude of the redistributive budget is adjustable as it represents the structure of the welfare state institutions (Korpi & Palme, 1998). There is also a trade-off between the degree of reaching the low income and the scale of the budgets (Korpi & Palme, 1998). And their work has found that the effects of market-based distribution are far more skewed than those of government benefit schemes related to earnings (Korpi & Palme, 1998). In their research, Korpi and Palme concluded that “The more we target benefits at the poor and the more concerned we are with creating equality via equal public transfers to all, the less likely we are to reduce poverty and inequality” (p. 682).

This claim was reassessed by Marx, Salanauskaite and Verbist in 2013. They argue that this claim no longer holds as the environment has changed. They support this with a research of Kenworthy in 2011. Kenworthy (2011) reproduces and reviews analyzes by Korpi and Palme relating to the situation in 11 countries as of 1985. His results suggest that, for the period 1980 to 1990, countries with more universal benefits receive greater redistribution. The trend is harder to spot by 1995. Statistics for 2000 and 2005 appear to indicate that universal gains on redistribution no longer have any (positive or negative) impact. This research showed that the claim of Korpi and Palme that targeting the poor with extra benefits does not decrease inequality is outdated.

As explained in the research of Preuss, Barkemeyer and Glavas (2016) which is previously discussed, CSR tends to increase as social spending decreases as a result of the substitute effect. The debate on who is responsible for addressing this income inequality is represented in the stakeholder-shareholder dilemma. Shareholder theory, as first described by Friedman in 1965, suggests that managers are primarily responsible for maximizing shareholder returns and should use the company’s resources to achieve this (Carson, 1993). Friedman (1965) argued that the firm’s main responsibility is wealth creation and that distributive justice is the government’s job through taxation. On the other hand, as explained by Freeman (1999), stakeholder theory argues that a manager should not only focus on maximizing shareholder value but should also manage it for the benefit of other stakeholders such as customers, employees and local communities (Freeman, 1999). Both theories can be classified as normative theories on corporate social responsibility, providing statements on what the role of a corporation ought to be.

The development of CSR was not seen as a positive change by academics such as Theodore Levitt, in 1958. In his Harvard Business Review article ‘The Dangers of Social Responsibility’ he expresses the belief that “government’s job is not business, and business’s
job is not government” (1958, p. 47). His view was supported by Friedman (1970) who argued that CSR was nothing more than a display of the agent problem, as explained in the principal-agent problem. The problem with the principal agent relationship is a clash of interests between an individual or organization and the delegate who is allowed to act on their behalf (Grossman & Hart, 1992). An employee can behave in a manner that contravenes the principal's best interests (Grossman & Hart, 1992). Friedman (1970) argued that CSR simply was a result of mixed interests. He argued that resources could better be spent on either internal-value enhancing projects or return-enhancing projects acting from a principal perspective focusing on long term revenue as opposed to short term benefits as he classified CSR practices.

The fundamental principle of shareholder theory is that shareholders invest money in a corporation, and company managers are expected to spend corporate assets only by means allowed by a company's shareholders (Smith, 2003). Milton Friedman (1965) wrote, “There is one and only one social responsibility of business — to use its resources and engage in activities designed to increase its profits so long as it ... engages in open and free competition, without deception or fraud” (p.133).

Stakeholder theory provides a different insight into the value of ‘investment’. Whereas shareholder theory only accounts for monetary contribution to a company’s wealth, the stakeholder theory defines anyone who contributes to a company's wealth either voluntarily or involuntarily through activities or money and is therefore a potential beneficiary and/or a risk-bearer as a stakeholder (Post, Preston & Sachs, 2002).

The shareholder perspective has received criticism. Argued was that it is focused solely on profit and companies should go to extreme lengths to achieve this (Smith, 2003). However, according to the shareholder perspective, profit should be maximized solely in legal, nondeceptive ways (Smith, 2003). Also, it is often stated that according to shareholder theory, spending on charitable causes is prohibited when in fact this is not the case if is concluded that this is the best investment for the money available (Smith, 2003).

Other academics considered CSR a positive development. The CSR movement started with the book ‘Social Responsibilities of the Businessman’ by Bowen in 1953. ‘Social consciousness’ as it was referred to back then, meant that businesses managers were responsible for the effects of their acts in a domain much broader than that covered by their reports of income and loss. After this publication, Davis followed in 1960 arguing that such socially responsible business choices could be explained by a lengthy, complex thought method as having a strong chance of delivering long-term economic benefit to the company, thus reimbursing its socially responsible perspective. Freeman (1986) argued from a stakeholder
theory perspective that it would not make sense for a manager to only satisfy stock owners as the satisfaction of other stakeholders, for example employees, could enhance firm performance. The neglect of other non-financial stakeholders could lead to withdrawal of their support and could have a negative effect on firm performance. The clear distinction between stakeholder and shareholder theory is that stakeholder theory takes into account the needs of all stakeholders even when this means a reduction in company profitability (Smith, 2003). The stakeholder perspective argues that it is impossible for firms to focus solely on profit maximization as business practices cannot be separated from its social impact (Shim, 2014).

However, the stakeholder perspective has been argued to be too little profit orientated. And whilst this is indeed not the main focus of stakeholder theory, it aims to satisfy all stakeholders, including shareholders which are often satisfied by profitability (Smith, 2003).

And whilst there are numerous theories regarding the firm-level implications of CSR such as resource-based view (McWilliams et al., 2002), stakeholder theory (Donaldson and Preston, 1995), shareholder theory (Friedman, 1965) or agency theory (Friedman, 1970) all from a strategy point of view, there is little empirical data regarding the country-level implications of CSR. Preuss, Barkemeyer and Glavas (2016) provide information regarding the NBS of a country and the substitution effect where a decrease in NBS would lead to an increase in CSR. Based on their research and the above-mentioned effects of CSR and income inequality a conceptual model, figure 1, is developed.

*Figure 1: conceptual model*
The direct arrows represent the expected direct effects whereas the dotted lines represent the control variables chosen based on the above presented literature where a clear link between these variables and the dependent variable is established.

III. Methodology

Based on current literature regarding CSR and inequality, there could be concluded that there is a high level of research regarding the effects of government spending and social benefits on inequality, but there was still room for research to explore the effects of CSR on a country-level. What this research aims to do is examine the effect of non-legislation social responsibility acts of firms (CSR practices) on income inequality.

Chosen was to perform an Ordinary Least Squares (OLS) analysis. OLS models presume that the research suits a specification of a relationship between one or more explanatory variables and a constant or at least interval response variable that minimizes the total number of square errors where an error is the difference between the real and the predicted outcome variable (Zdaniuk, 2014).

To assess this presumed relationship, a cross-country data analysis was conducted. The aim of this cross-country analysis was to compare the effect of CSR on income inequality in different countries. The countries selected for this analysis have been selected based on the Gini coefficient of their population. The Gini coefficient is based on a comparison between the combined proportions of the population and the combined proportions of the income they obtain, which varies from 0 for perfect equality to 1 for perfect inequality (OECD, 2020). Based on this coefficient, a selection of 32 different countries has been made to represent the total range, from upper to lower bound, of this coefficient. The reason for selecting this sample is to achieve the highest variation between countries as possible to be able to make a comparison. Also, this was all data available regarding the researched parameters on OECD as of March 2020. Based on this, the 32 countries which will be compared in this research are: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Lithuania, Luxembourg, Mexico, Netherlands, Norway, Poland, Portugal, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States.

In this research, income inequality will serve as the dependent variable in a multi-regression analysis. Income is defined as household disposable income in a particular year (OECD, 2020). This consists of wages, self-employment, and capital gains, as well as federal cash transfers; households subtract payroll taxes and social security payments. The household
's revenue is allocated to each of its owners, with an amendment representing variations in needs for households of different sizes (OECD, 2020). Income inequality is reflected in the Gini coefficient which will provide data for the multi-regression analysis. This coefficient can range for 0-1, where a 1 percent increase of the Gini coefficient will represent a 1 percent increase of income inequality.

Two independent variables have been selected based on literature. The main independent variable of this research is CSR rating. This is a score which can range from 1-100 where a score of 100 represents the best possible CSR rating of a country and a score of 1 represents the worst possible CSR rating of a country. The CSR ratings are retrieved from ‘CSRHub’. CSRHub provides access to corporate social responsibility and sustainability ranking, as well as information on 17,268 + businesses in 143 countries from 134 industries. They compute their scores based on four main categories: community, employees, environment and governance.

CSRHub's 'community' category in the CSR review encompasses the engagement and efficacy of the company within the state, regional and global society it is doing business in. This aspect also represents the company's patriotism, voluntary contributions, and volunteerism. It covers the environmental and social impact of the company's performance and the level of economic development (CSRHub Category and Subcategory Schema, 2014). For a more detailed description of the factors which are used to compute the category, see appendix 1.

The category 'employees' includes declarations of diversity policies, programs and performance, labor relations and labor rights, compensation, benefits, and the training of employees. It assesses the consistency of the procedures and compliance with the national laws and regulations. In this category, the focus is on assessing inclusive diversity policies and fair treatment of all staff (CSRHub Category and Subcategory Schema, 2014). For a more detailed description of the factors which are used to compute the category, see appendix 1.

The category 'environment' encompasses the relationships between a company and the planet at large, including the use of natural resources for production, and an enterprise's environmental effects. This category examines corporate environmental performance, compliance with environmental regulations, mitigation of environmental footprint, leadership in tackling climate change through appropriate policies and strategies, energy-efficient operations and the development of renewable energy and other alternative environmental technologies (CSRHub Category and Subcategory Schema, 2014). For a more detailed description of the factors which are used to compute the category, see appendix 1.
The category 'governance' includes the implementation of rules and practices, board accountability and equity, management pay, commitment to stakeholder interests, and consideration of an enterprise's ethical leadership and regulatory culture. Business governance applies to the company's organizational structure and the principles that dictate corporate strategy, ethics and efficiency (CSRHub Category and Subcategory Schema, 2014). For a more detailed description of the factors which are used to compute the category governance, see appendix 1.

CSRHub treats its data according to a six-steps plan to account for biases and inconsistency. Firstly, they map all subcategories into central schemes. This means that when data does not fit the subcategories a special issue is created, and the data element is still accounted for. By doing this, they control for data manipulation. Secondly all data is converted to a numeric scale. Thirdly, all data is normalized by analyzing the variation between different sources they use to determine possible biases. This to create a more consistent rating. Fourth, each source is weighed based on its credibility and value. Fifth, companies from which insufficient data is available, are dropped from the score to prevent biased scores. Sixth, each rated company is researched to determine the industry it participates in. This is not of importance for this research as it is focused on country level differences in CSR. After this analysis a score is computed to represent the overall level of CSR within a country. All this taken into account, it is assumed that this is a credible source.

Social spending will be included in this analysis as the second independent variable based on previously stated literature. Social spending includes cash incentives, direct in-kind delivery of goods and services, and social purpose tax cuts. In this analysis social spending will be used as a percentage of GDP. Benefits can be aimed at low-income families, the elderly, people with disabilities, ill, unemployed or young people (OECD, 2020). A recent study by Anderson, D'Orey, Duyendack and Esposito (2017) found a small negative effect of social spending on income inequality. However, they expect this effect to be influenced by moderating variables. Nevertheless, based on literature, this variable is included in the analysis.

Poverty rates will serve as a control variable in this analysis. The poverty rate is the proportion of the number of people whose income fell below the poverty line; calculated as half of the overall population's median household income (OECD, 2020). It can range from 0-1. This variable is taken into the analysis as was shown that it has a significant effect on income inequality and should therefore not be omitted (McKay, 2002), as well as on a literature analysis basis.
Adult education level will be included in the analysis as a control variable. This variable looks at adult education level as defined from a below upper secondary level of education completed by the 25-64-year-old population whereas an increase of the variable will mean an increase of adults with education below upper secondary level (OECD, 2020). De Gregorio and Wha Lee (2002) have demonstrated that this measure has an effect on income inequality, where they find observational support in a cross-country study of how schooling contributes to income distribution in a data collection panel spanning a broad variety of countries for the period 1960 to 1990. Therefore, this variable should not be omitted from the analysis.

Taxes as a percentage of GDP on personal income will serve as a control variable in this analysis based on previously stated literature. Personal income tax is defined as the taxes imposed on the individual’s net income (gross income minus permissible tax relief) and capital gains. This metric applies to the whole of government (all rates of government) and is expressed in proportion of the GDP and direct taxes. Statistically phrasing this model to a conceptual model equation:

\[
\text{IncomeInequal} = \beta_0 + \beta_1 \text{CSRrating} + \beta_2 \text{PovertyRates} + \beta_3 \text{Taxes} + \beta_4 \text{AdultEducationLevel} + \beta_5 \text{SocialSpending} + \epsilon
\]

From these variables, a multi regression analysis will be performed using STATA version 16 analysis software. To analyze the legitimacy of the sample and data, the six assumptions for regression analysis will be tested to account for several biases.

IV. Results

After data collection, the data was analyzed through STATA, version 16. The final sample contained 30 countries as 2 countries had insufficient data to perform the analysis. An analysis of the data showed that there can be found no significant effect of CSR rating by country with the Gini coefficient of this country. A multi regression analysis showed that the effect of CSR score of a country on the Gini coefficient of a country has a p-value of .693 and can therefore not be interpreted.

The effect of social spending on the Gini coefficient has been found statistically significant at a \(\alpha=0.01\) as can be derived from table 1. Therefore, the effect size can be interpreted. With a beta of -.2894, from this analysis can be concluded that when relative social spending, as a percentage of GDP, increases by one percent point, the Gini coefficient decreases by .2894 ceteris paribus.
Table 1: regression results

| Variable         | B    | Se   | t    | P>|t|  | 95% CI          |
|------------------|------|------|------|------|----------------|
| CSR Rating       | .0005| .0014| 0.40 | 0.693| [-.0023; .0035]|
| Social spending  | -.2894| .0985| -2.94| 0.007| [-.4927; -.0861]|
| Poverty Rates    | 1.1077| .1394| 7.95 | 0.000| [.8201; 1.3953]|
| Education level  | .0386| .0277| 1.38 | 0.179| [-.0189; .09561]|
| Taxes            | .0038| .0454| 0.08 | 0.935| [-.0897; .0974]|
| Constant         | .2106| .0773| 2.72 | 0.012| [.0510; .3702]|

Note: $R^2 = .85$ (N=30)

One of the control variables, poverty rates, was found to be statistically significant at $\alpha=0.01$ as can be seen from table 1. Therefore, this effect can be interpreted. From the analysis can be concluded that when the relative poverty increases by 1, the Gini coefficient would increase by 1.1077 ceteris paribus. However, as poverty rates will never increase by 1 as it is measured on a relative scale ranging from 0-1 and the same holds for the Gini coefficient, one should adapt its interpretation to this. Therefore, if poverty rates increase by 0.1, the Gini coefficient would increase by 0.1108. Generally phrasing this conclusion, concluded can be that when poverty rates increase, the Gini coefficient increases.

The control variable education level was found to be statistically insignificant at all alpha levels below .20. However, it is significant at $\alpha=0.20$. Therefore, limited conclusions regarding the effect size can be derived. Concluded can be with a beta of .0386 that an increase of education level, meaning an increase of the percentage of adults with an education level bellow upper secondary by one percent point, the Gini coefficient will increase by 0.0386 ceteris paribus. Generally speaking, a decrease of education level will increase the income inequality.

The control variable taxes was found to be not statistically significant at any acceptable alpha levels. Therefore, the beta of this variable cannot be interpreted and from this data analysis cannot be concluded that there is an effect of taxes as a percentage of GDP on the Gini coefficient in a country.

The constant of this multiple linear regression analysis was found to be significant at an alpha of 0.05 and can therefore be interpreted. Concluded can be that without interference of any of the variables included in the analysis, the Gini coefficient is .2106. This means that when
all other factors included in the analysis are 0, the Gini coefficient in a country is .2106 on a scale from 0-1.

Based on the previously mentioned literature and hypothesis testing by using a Chow test, concluded was that even though some variables are insignificant, none should be excluded in order to avoid omitted variable biased from the analysis as all variables prove to have an individual effect on the dependent variable.

The overall model had a model fit of $R^2 = .85$, which means that 85% of the variance of the dependent variable, the Gini coefficient, is explained by the five variables included in the analysis. However, when analysis the strength of the model by doing an estimation of the power of a multiple linear regression model by performing an F test for $R^2$ by testing a subset of coefficients was concluded that the model has an overall strength of 0.1786. This is based on the number of observations, 30 as 2 countries had insufficient data to perform the analysis, an $\alpha=0.05$, in a model with 2 independent variables and 3 control variables. To increase the model strength, an increase in observations would be necessary. For a more detailed explanation of this test, see appendix 4.

To test the statistical significance of the model, the model was tested on several assumptions which are considered necessary to be fulfilled in order to perform a statistically significant multiple linear regression. Concluded was that the model is linear in parameters and the error term is additive. Also was concluded that the error term has a mean of 0 and that it is uncorrelated with all independent variables. Based on statistical testing was concluded that there is no perfect multicollinearity between the independent variables and there is no constant variable. Performing a Breusch-Pagan test showed that the errors of the model are homoscedastic, and no robust estimates have to be performed. For a detailed explanation of the assumption testing of the multiple linear regression model, see appendix 3.

In order to be suitable for this analysis, data had to be destringed and decoded and had to be converted from long variables to byte variables. By doing this, the variable gets changed from being seen as a string of data to single data points, which was necessary for this analysis.

V. Discussion

From the data analysis was concluded that the main independent variable measuring the CSR levels within a country was found to be statistically insignificant. Therefore, the main hypothesis that average CSR levels within a country have an influence on income inequality in a country cannot be supported by this research. The overall model was found to be significant
based on a model F-test and concluded was that no variables should be omitted from the analysis.

Based on the finding that the model is statistically significant and that all independent variables have an effect on the dependent variable, one can draw the very limited conclusion that CSR ratings do, to some extent, influence income inequality. However, no final conclusions can be drawn regarding the effect being either a positive or a negative effect, or the effect size. More research is needed to formally confirm the hypothesis. The possible explanations for its insignificance in this analysis will be revisited later on in the conclusion section of this paper.

The effect of social spending on income inequality was found to be statistically significant. Concluded was that when social spending increases, income inequality decreases. And with a beta of -.2984, this is a moderate to strong relationship. Anderson, D'Orey, Duyendack and Esposito (2017) found only a small negative relationship but where unsure of its validity. They argued that the relevance of social spending could be due to a moderating variable. To research this possibility, the individual relevance of the variable was tested and concluded was that social spending does have a significant direct effect on income inequality in this regression analysis as an increase in social spending decreases income inequality. This finding is supported by literature presented in the literature review by Iradian (2005) and Jones (2007) who stressed the relationship between social spending and income inequality in a cross-country analysis. This finding contributes to the argument that government interference in the so-called free market mechanism does decrease income inequality and plays an important role in decreasing poverty on a country level.

This conclusion provides a different view than the conclusion of Landes (1999). In his book ‘The Wealth and Poverty of Nations: Why Some Are So Rich and Some So Poor’ he argues that the main determinant for economic growth is a country’s culture and government interference. He concludes that a country culture where there is a market domination instead of a government domination will lead to a more prosperous country. According to his reasoning, the less government interference, the more economic growth, the less poverty and income inequality. However, critiques such as Holcombe (1999) point out that his reasoning contains some fallacies. For example, it does not account for within-country cultural differences. The finding of this research contribute to the debate on the effect of government interference and the free-market mechanism which will be briefly assessed.

Advocates of the free-market stress the benefits such as the absence of red tape for firms and the costs that can be saved for a firm to invest (Kaufman, 2015). Also, firms are free to innovate and there can be strong competition between the firms (Baumol, 2002). This is based
on the idea of perfect competition which is central in free-market arguments. The concept of perfect competition argues that the balance between supply and demand will result in the most optimal outcome for the economy and the economy is able to come to this balance itself (Azevedo & Gottlieb, 2017). Any interference of institutions would damage this mechanism and result in an imperfect market. One assumption that is made in this mechanism is the low entry barriers where firms can easily enter or leave market when there is either a supply or demand surplus.

This idea of perfect competition has started to receive the criticism from several academics such as Tarbell (1904), who argued that this mechanism has a tendency to lead to price fixing monopolies as entry barriers increase as firm sizes in a market increase and poses a very critical note on the assumption that markets will fix itself. This argument is supported by Klein (2007) who pleads for government interference in large and important industries to ensure competition. In her book ‘The Shock Doctrine’ she warns for the merging of companies into giant corporations and privatization of government-run industries and national assets which often are the beginning of monopolies or oligopolies which then require government intervention to re-introduce competition and ‘reasonable prices’.

The findings of this research argue in favor of government intervention if the aim is to reduce income inequality within a country. However, free-market advocates would argue that if there would be no government interference, which is currently in every country, the inequality might not even be there as a result of the market mechanism and the supply and demand of jobs as a result. This all boils down to the Friedman-Freeman debate which has been assessed in the literature review of this paper. To what extent should firms be responsible for the income inequality in a country, whereas their main focus as a business is to be profitable. This is more often in a free market without minimum wages or fixed exchange rates where firms are able to optimize their costs and prices to maximize their profit. However, one could also plea in favor of this responsibility for firms, and government interference when this responsibility is not taken by the firm, as their business has a direct effect on society and the world. Then, one could also argue that when firms take responsibility for doing sustainable business, less government interference is needed which would leave firms freer to determine their own business practices.

One more important aspect of shareholder theory to note, which is a critique on stakeholder theory, is the fact that the interference of firms in corporate governance is essentially undermining democracy (Sternberg, 1997). Where democratically chosen leaders can be held accountable for their actions, this is not the case for boards of large firms (Sternberg, 1997). According to Sternberg (1997), stakeholder theory specifically denies companies to be
accountable to their owners: it is an integral stakeholder concept theory that businesses should be equally responsible to all their owners. Nevertheless, this central theory is not only completely unjustified but also unworkable in his opinion. He argues that an organization that is accountable to all, is in fact accountable to no one: diffuse accountability is in fact inexistent. Multiple accountability can only work if a clear common purpose is agreed by everyone involved and he argues that this is impossible following stakeholder theory. Sternberg (1997) concludes that firms should focus on their core business, profits, and should leave corporate governance to the democratically chosen individuals.

Central in this argument is the responsibility of the firm, which leads to the theory of the firm as it has been defined in the past century. Whereas firms were first treated as ‘black boxes’ where there was no attention for the internal whereabouts of the firm, this theory which was first introduced by Coase (1937) aimed to answer questions such as: What is a firm? Where do the boundaries of one firm cease and those of another firm begin? His theory was mostly focused on the effects of merging for transaction costs where firms shift from a price mode to a quantity mode (Coase, 1937). But this theory also shed light on the relation between ownership and control. The principle that ownership is related to residual property rights forms the basis of an integration theory which was developed by Grossman and Hart (1986). Their paper suggests that there is an optimal division of residual control rights in a system of imperfect contracts; thus, insofar as possession goes hand in hand with residual control rights there is therefore an optimal allocation of asset ownership where there should be a division between ownership and control. This argument provides critique on the stakeholder view where controlling agencies are viewed as stakeholders and vice versa. This situation could lead to a conflict of interests with the main purpose of those firms which would likely affect the extent to which such controlling firms can control the CSR practices of firms. This is a situation for which should be watched out for according to shareholder theory.

In this discussion with rather opposing points of view, Ferrero, Hoffman and McNulty (2014) argue that the two theories could actually be more related than first assumed because of the element of limited liability of shareholders in Friedman’s argumentation. Limited liability lets businesses privatize their gains while outsourcing their liabilities. When firms fail to meet payment for received products or services, shareholders can only be liable to the size of their investment, their share. Because of this mechanism, corporate parties can become involuntary creditors (Ferrero et al., 2014). Sole proprietors on the other hand are also liable for their total personal wealth. So, shareholders can gain unlimited, but are only liable for the size of their investment when businesses go bankrupt. Based on Ferrero et al.’s claim, it is argued that while
Friedman never addresses this limited liability explicitly, he would have embraced the practice on the grounds of his adherence to liberalism, where limited liability is regarded as a pillar of the legal climate in which companies work. Ferrero et al. (2014) state that this ‘taxation without representation’ is contradictory to the argument of voluntary exchange of Friedman. If Friedman accepts a corporation's obligation to honor the obligations inherent in free market transactions, he must do so in full, and not pick and choose when to fulfill those obligations (Ferrero et al., 2014). According to Friedman's principle of voluntary exchange, if a company imposes unrecognized or unintended costs on another, the group in question would be paid in some form, and failure to do so will incur additional costs which, in Friedman’s words, would represent a kind of "illegitimate tax" (Friedman 1970, p. 179) on those who are affected.

When companies go bankrupt their investors are obliged to cover the bills. Suppliers risk income owed by the company as well as future gains from it; the country where the company is based loses tax revenue; all of the company's employees risk their jobs; and if the companies are ‘too big to fail,’ the society will bail them out of their debt using taxes from their own income (Ferrero et al., 2014). Ownership theory means the owners will gain the benefit, but they can still cover all the risks, anticipated and unforeseen. Nonetheless, one might argue that while stakeholders have no choice but to absorb the losses when a business goes bankrupt, the stakeholders should also benefit from the positive improving the company while it is profitable (Ferrero et al., 2014). Especially when the business becomes stable, management should consider the needs of stakeholders as ends in order to avoid the unfair result that only profit can be privatized when losses can be 'socialized.' Friedman never fully neglected stakeholders but argued that they did not invest in the company and therefore shareholders, who did invest, had more right to the profits generated and their well-being should be addressed. This argument regarding limited liability and its effects on society, however, offers a different view on this argument. Friedman’s commitment to a functional free-market economic model is based on the existence of limited liability, thereby accepting that businesses are actually participating in a shared risk and benefiting economic ecology (Ferrero et al., 2014). This view then is in fact rather close to the stakeholder view as explained by Freeman.

From this one can conclude that what at first seemed as opposing views actually does seem to have some common ground. As earlier explained, Freeman does not fully disagree with the shareholder perspective of Friedman but thinks it’s just too limited to only take into account this group as the shareholder view covers all group which are directly or indirectly effected by the business. The debate on the responsibility of the firm for addressing the well-being of
individuals within a country remains, but arguments show that the views may not be as opposing as first thought. And by debating different views, suitable solutions can be found.

Poverty rates was also found to have a significant effect on the Gini coefficient in a country. As concluded by Iradian (2005), economic growth does not mean that poverty will decrease. The relationship between poverty rates and income inequality makes sense as high levels of poverty will result in a larger difference between high-income and low-income groups when it is assumed that economic growth fluctuates. This variable was included in the analysis as a control variable to avoid omitted variable bias as its relation was proven. However, the effects of poverty rates on income inequality will not be further assessed as this was not one of the main foci of this research paper. Nevertheless, this finding strengthens previous research and contributes to the knowledge regarding income inequality and its accelerators.

The control variable education levels was only found to have a weak statistical significance in this analysis but based on the confidence intervals, some general conclusions could be drawn. Concluded was that when the level of educated people in a country decreases, income inequality will decrease. This is in line with previously stated research by Banerjee and Duflo (2007) who stressed the importance of good schooling for lower income individuals to receive higher pays. As well as Thorbecke and Charumilind (2002) who explained that if there is a big difference between rich and poor in educational prospects, the gains of economic development are mostly experienced by skilled workers. Their researches, and many others, showed the importance of education on expected income and therefore the income inequality. Unskilled workers are expected to employ lower-paid jobs than people who received education. This shows why individuals are willing to invest in their education. In countries where there is a high level of uneducated people, the wage gap between educated individuals and non-educated individuals is expected to be bigger than in countries where this gap is smaller as a result of supply and demand (Freeman, 1986). However, the effects of education levels on income inequality will not be further assessed as this was not one of the main foci of this research paper.

The low strength of the overall model is due to the low level of observations. However, in a cross-country comparison the sample size is limited due to the limited number of countries in the world. Therefore, the limited model strength is not seen as a problem for drawing conclusions from the regression. The insignificance of the other variables included in the analysis could have multiple reasons. It is likely that multiple variables are insignificant due to what is referred to as ‘noisy data’. This means at the variables are in fact significant in this regression, but their estimates remain noisy due to a small sample size. This seems likely as the overall model has a high R-squared. This again influences the model strength. To rule out this
possibility, further research is needed. Another possibility for the insignificance of the included variables could be high correlation between independent variables. However, in this regression this seems absent and therefore highly unlikely. Even though this cannot be ruled out completely, assumed can be that it has not influenced the estimates to a large extent.

VI. Conclusion
The aim of this research was to identify the possible effect of CSR on income inequality within a country and to draw conclusions based on this finding. Based on the analysis of 30 different countries from all continents, concluded was that there could be derived no conclusion based on the insignificance of the generated estimates. Based on the findings of the research by Preuss, Barkemeyer and Glavas (2016) that NBS were affected by CSR within a country, the hypothesis was derived that income inequality, which is a part of NBS, would be affected by CSR. Even though no final conclusions can be derived, the hypothesis still holds as it cannot be confirmed or rejected. The overall model was found to be statistically significant and all individual variables were found to be significant and should not be omitted from the analysis. Therefore, more research is needed to investigate this possible effect, as the importance of the investigation of the drivers and accelerators for society was displayed by Cowell (2015), Foster and Sen (1997), Charness and Rabin (2002) and Fehr and Fischbacher (2002). As previously explained, there is an extensive body of literature regarding the effects of CSR on a firm level. However, the country level implications seem under-researched whilst the findings could be useful for both firms and government strategies. This research aimed to fill this literature gap and provide a base for further research but was unable to do so. Findings regarding this possible effect could serve as an incentive for government policy to focus on stimulating CSR for firms within their country. Therefore, it is still assumed this information would be valuable and alternative research options to investigate this possible relationship should be investigated to find statistically significant results.

The effect of social spending on income inequality was confirmed by this research. This is in line with previous research by Iradian (2005) and Jones (2007). This finding strengthens the argument that the redistribution of wealth by governments decreases income inequality and that when the aim is to decrease income inequality, this is a suitable strategy. However, political climates determine to what extent this is on a country’s political agenda and this differs from country to country.

The insignificance of some variables in this analysis is most likely due to a small sample size and a large number of independent variables. Therefore, for further research, as the sample
size is limited due to the number of countries in the world, the variables included should be critically assessed. Also, this research was performed on existing data regarding CSR, income inequality and the included control variables. This has resulted in a limited sample with some data gaps. This reduced the strength of the overall model and the ability to draw conclusions from it. For further research is recommended that either an alternative data analysis is performed where a smaller sample could still yield significant results, or more data is collected to increase the sample size.

Even when significant results were found, the question remains as to if this is really the firm’s responsibility. Shouldn’t firms just focus on wealth creation and leave the wealth distribution to governments? This view is supported by Friedman in his shareholder perspective where he states that the firm should only account for the needs of financial investors of a firm, the shareholders. Freeman on the other hand argues that also non-financial investors are either voluntarily or involuntarily affected by the practices of the business and therefore their interests should also be taken into account in determining a business strategy. And even though their shareholder-stakeholder debate seemed unsolvable, concluded was that the two views are more alike than they might think (Ferrero et al., 2014). Freeman and Friedman will most likely never agree on the ‘outcome’ of the debate, but maybe it is the debate which helps economists and the government search for a happy medium to create a better society.
VII. References


Marx, I., Salanauskaite, L., & Verbist, G. (2013). The paradox of redistribution revisited: and that it may rest in peace?.


# Appendix 1: CSRHub Category and Subcategory Scheme

## Community

<table>
<thead>
<tr>
<th>Community Dev &amp; Philanthropy</th>
<th>Product</th>
<th>Human Rights &amp; Supply Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Community Category covers the company's commitment and effectiveness within the local, national and global community in which it does business. It reflects a company's citizenship, charitable giving, and volunteerism. This category covers the company's human rights record and treatment of its supply chain. It also covers the environmental and social impacts of the company's products and services, and the development of sustainable products, processes and technologies.</td>
<td>The Product subcategory covers the responsibility of a company for the development, design, and management of its products and services and their impacts on customers and society at large. This subcategory reflects a company's capacity to reduce environmental costs, create new market opportunities through new sustainable technologies or processes, and produce or market goods and services that enhance the health and quality of life for consumers. This subcategory rating covers the integrity of a company's products and sales practices, including their labeling and marketing, social impacts and end-of-life disposition. It also relates to product safety and quality and the company's response to problems with safety and quality.</td>
<td>The Human Rights and Supply Chain subcategory measures a company's commitment to respecting fundamental human rights conventions, its ability to maintain its license to operate by supporting freedom of association and excluding child, forced or compulsory labor. This subcategory covers a company's transparency in overseas sourcing disclosure and monitoring and a company's relationship with and respect for the human rights of indigenous peoples near its proposed or current operations.</td>
</tr>
</tbody>
</table>

## Employees

<table>
<thead>
<tr>
<th>Compensation &amp; Benefits</th>
<th>Diversity &amp; Labor Rights</th>
<th>Training, Health &amp; Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Compensation and Benefits subcategory covers a company's capacity to increase its workforce loyalty and productivity through rewarding, fair, and equal compensation and financial benefits. It includes benefits that engage employees and improve worker development. This subcategory also focuses on long-term employment growth and stability by promotion practices, lay-off practices, and relations with retired employees.</td>
<td>The Diversity and Labor Rights subcategory covers workplace policies and practices covering fair and non-discriminatory treatment of employees, and its diversity policies. It covers a company's labor-management relations and participation by employees, National Labor Relations Board (NLRB) violations or patterns of anti-union practice, conformance to internationally recognized worker rights, as defined in the basic conventions of the International Labor Organization (ILO). Fundamental labor rights include freedom of association and protection of the right to organize; right to bargain collectively; a minimum wage for the employment of children; a prohibition against forced labor; lack of employment and occupational discrimination; and equal compensation. This subcategory measures a company's ability to maintain diversity, provide equal opportunities regardless of gender, age, ethnicity, religion or sexual orientation, and promote work-life balance.</td>
<td>The Training, Safety and Health subcategory measures a company's effectiveness in providing a healthy and safe workplace. This subcategory includes accident and safety performance, as well as job training, safety standards and training, and employee-management safety teams. It includes programs to support the health, well-being and productivity of all employees. This subcategory includes workplace policies and programs that boost employee morale, workplace productivity, company policies and practices to engage employees, and worker development.</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>The Environment category data covers a company’s interactions with the environment at large, including use of natural resources, and a company’s impact on the Earth’s ecosystems. The category evaluates corporate environmental performance, compliance with environmental regulations, mitigation of environmental footprint, leadership in addressing climate change through appropriate policies and strategies, energy-efficient operations, and the development of renewable energy and other alternative environmental technologies. The subcategory includes energy use, emissions to air of CO2 and other Greenhouse Gas Emissions (GHG).</td>
<td>The Energy and Climate Change subcategory measures a company’s effectiveness in addressing climate change through appropriate policies and strategies, energy-efficient operations, and the development of renewable energy and other alternative environmental technologies. The subcategory includes energy use, emissions to air of CO2 and other Greenhouse Gas Emissions (GHG).</td>
<td>The Environmental Policy and Reporting subcategory includes a company’s policies and intention to reduce the environmental impact of a company and its value stream to levels that are healthy for the company and for the environment, now and in the future. The data includes the company’s environmental reporting performance, adherence to environmental reporting standards such as the Global Reporting Initiative, and compliance with investor, regulatory and stakeholders’ requests for transparency. Compliance data consists of breaches of regulatory limits and accidental releases.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Governance</th>
<th>Board</th>
<th>Governance</th>
<th>Leadership Ethics</th>
<th>Transparency &amp; Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Governance category covers disclosure of policies and procedures, board independence and diversity, executive compensation, attention to stakeholder concerns, and evaluation of a company’s culture of ethical leadership and compliance. Corporate governance refers to leadership structure and the values that determine corporate direction, ethics and performance. This category rates factors such as corporate policies and practices aligned with sustainability goals, the management of the corporation transparent to stakeholders; are employees appropriately engaged in the management of the company; are sustainability principles integrated from the top down into the day-to-day operations of the company. Governance focuses on how management is committed to sustainability and corporate responsibility at all levels.</td>
<td>The Board subcategory covers a company’s effectiveness in following best practices in corporate governance principles related to board membership, independent decision making through experienced, diverse and independent board members, effectiveness toward following best practices related to board activities and functions, and board committee structure and composition. It includes how the company provides competitive and proportionate management compensation and its ability to incent executives and board members to achieve both financial and extra-financial targets.</td>
<td>The Leadership Ethics subcategory measures how a company manages its relationships with its various stakeholders, including investors, customers, communities, and regulators. This subcategory measures a company’s effectiveness in treating its stakeholders equitably. Leadership ethics includes the company’s culture of ethical decision making. It measures a company’s commitment and effectiveness toward the vision of integrating social and environmental aspects into the overall strategy and whether sustainability principles are integrated from the top down into the day-to-day operations of the company.</td>
<td>The Transparency and Reporting subcategory rates factors including corporate policies and practices aligned with sustainability goals, is the management of the corporation transparent to stakeholders, are employees appropriately engaged in the management of the company, and do sustainability reports comply with standards such as the Global Reporting Initiative, AccountAbility (AA1000) and other standards, and are these reports made publicly available. This subcategory includes whether the company provides a list of its major stakeholders and how it engages with them, it also covers whether the company is a signatory of Global Compact and other leading global entities. It evaluates the assurance (3rd party audit) of the accuracy, completeness, and reliability of its Sustainability or Corporate Social Responsibility reports.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 2: regression model

```
. reg corrected_GiniCoef CSRRating corrected_socialspleen corrected_PovRates corrected_A
> d1EcLevl corrected_Tax
```

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>Number of obs</th>
<th>F(5, 24)</th>
<th>Prob &gt; F</th>
<th>R-squared</th>
<th>Adj R-squared</th>
<th>Root MSE</th>
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</thead>
<tbody>
<tr>
<td>Model</td>
<td>.07945822</td>
<td>5</td>
<td>.015891644</td>
<td></td>
<td>26.39</td>
<td>0.0000</td>
<td>0.8461</td>
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<td>.02454</td>
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<td>Residual</td>
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<td>24</td>
<td>.000602124</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
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<td>29</td>
<td>.003238248</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| corrected_GiniCoef | Coef. | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|--------------------|-------|-----------|-------|-------|---------------------|
| CSRRating          | .0005597 | .0014023  | 0.40 | 0.693 | -.0023346 to .0034539 |
| corrected_socialspleen | -.2894123 | .0984872  | -2.94 | 0.007 | -.4926799 to -.0861448 |
| corrected_PovRates | 1.107745 | .1393487  | 7.95 | 0.000 | .8201438 to 1.395347  |
| corrected_Ad1EcLevl | .0383585 | .027739   | 1.38 | 0.179 | -.0188921 to .0956091 |
| corrected_Tax      | .0037677 | .0453668  | 0.08 | 0.935 | -.0898647 to .0974001 |
| _cons              | .2106393 | .0773366  | 2.72 | 0.012 | .0510244 to .3702542  |

Appendix 3: Assumption testing

**Assumption 1:**
This assumption states that the population model should be linear in parameters, and the error term should be additive. As the data is a sample and not a complete population, still one can assume by extension and the representativeness of the sample that this will apply to the population model. All parameters in the sample model ($\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$) are linear. Therefore assumption 1 is considered to be met.

**Assumption 2:**
This assumption states that the error term should have a population mean of 0. This assumption will be met when the constant term, $\beta_0$, is included in the regression. Since the model is built on a sample, one can only test the mean of the residual. Looking at the table below, the mean is very close to 0. Therefore assumption 2 is considered to be fulfilled.

```
sum resid
```

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
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<tr>
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<td>-6.22e-11</td>
<td>.0223229</td>
<td>-.0374132</td>
<td>.0583074</td>
</tr>
</tbody>
</table>

**Assumption 3:**
This assumption states that all independent variables should uncorrelated with the error term. When calculating the correlation of the independent variables in the multivariate model, data showed a correlation of 0. Therefore assumption 3 is considered to be met.
Assumption 4:
This assumption states that there cannot be perfect multicollinearity between independent variables in the analysis and no variable should be a constant. None of the independent variables are perfect linear functions of each other, as can be seen below. Therefore assumption 4 is considered to be fulfilled.

```
.corr CSRRating corrected_PovRates corrected_AdEcLevl corrected_socialspen corrected_
> Tax resid
(obs=30)

<table>
<thead>
<tr>
<th>CSRRat~g</th>
<th>correc~s</th>
<th>correc~l</th>
<th>correc~n</th>
<th>correc~x</th>
<th>resid</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSRRating</td>
<td>1.0000</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>corrected~s</td>
<td>-0.3103</td>
<td>1.0000</td>
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</tr>
<tr>
<td>corrected~l</td>
<td>-0.0116</td>
<td>0.2921</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>corrected~n</td>
<td>0.3771</td>
<td>-0.4115</td>
<td>-0.1769</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>corrected~x</td>
<td>-0.0011</td>
<td>-0.1200</td>
<td>-0.0998</td>
<td>0.3156</td>
<td>1.0000</td>
</tr>
<tr>
<td>resid</td>
<td>-0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
<td>-0.0000</td>
<td>-0.0000</td>
</tr>
</tbody>
</table>
```

Assumption 5:
This assumption states that there cannot be serial correlation. Since this does not apply to cross-sectional analysis, this assumption is left out of the analysis. Therefore assumption 5 is considered irrelevant.

Assumption 6:
This assumption states that errors must be homoscedastic. In order to test for heteroscedasticity, one needs to perform a Breusch-Pagan test.

```
.estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
   Ho: Constant variance
   Variables: fitted values of corrected_GiniCoef
   chi2(1)  =  3.18
   Prob > chi2 =  0.0746
```

Concluded is that the formula is homoscedastic and no robust estimates have to be performed.
Appendix 4: Estimated model power

```
. power r_squared 0.0, n(32) ncontrol(3) ntested(2) diff(.05)
```

Estimated power for multiple linear regression
F test for R2 testing subset of coefficients
Ho: R2_F = R2_R versus Ha: R2_F != R2_R

Study parameters:

```
alpha = 0.0500
N = 32
delta = 0.0526
R2_R = 0.0000
R2_F = 0.0500
R2_diff = 0.0500
ncontrol = 3
ntested = 2
```

Estimated power:

```
power = 0.1786
```