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The Correlation and Effectiveness Between Two Variables that are Considered in Sustainable Investing: ESG Ratings and Credit Ratings

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Abstract:

As the popularity of ESG ratings has been quickly increasing in the past few years, many financial institutions and investors are now understanding the importance of ESG ratings, especially when evaluating potential investments. ESG ratings can also serve as risk mitigation for investors because they show the inner workings of a company without being officially a part of the company itself. Credit ratings can also serve as a risk mitigation tool for portfolio investments as credit ratings can show the borrower's creditworthiness of being able to pay back the investment and more.

The data analysis of 36 companies gathered from the University of Tennessee, Knoxville Supply Chain Forum (UTSCF) analyzed the statistical correlation between ESG and credit ratings using a chi-squared test of independence for the years 2020, 2021, and 2022. Morgan Stanley Capital International (MSCI) was the designated ESG rating agency. Moody's Investor Services was the designated credit rating agency.

With the observational approach, it could be determined that there was not a statistically significant correlation between ESG and credit ratings for the 36 companies that were analyzed for 2020 and 2021. However, in 2022, the chi-squared test of independence resulted in a p-value that was less than .05, meaning that enough evidence was gathered to determine whether the correlation was statistically significant. Therefore, the relationship between ESG and credit ratings should not be heavily considered when making decisions for potential portfolio investments.

Introduction:

There has been a dramatic rise in interest in environmental sustainability. Large corporations have been affected by the increase in advocacy for environmental sustainability. Investors have also encouraged corporations to practice sustainable actions as investments rose from 5 billion in 2018 to 87 billion in the first quarter of 2022 (McKinsey, 2023). The growing interest in sustainability has also pushed corporations to make decisions based on environmental, societal, and governance concerns (McKinsey, 2023).

Investors can impact corporations to lower their carbon footprint and reduce the effects of climate change due to a well-known practice known as ESG investing (Boffo, 2020). In 2006, United Nations Principle for Responsible Investment (PRI) introduced the concept of ESG investing. The report stated that “ESG criteria was, for the first time, required to be incorporated in the financial evaluations of companies” (Atkins, 2020). ESG ratings help guide investors in making confident investment choices. ESG investing is a way to allow investors to have a better understanding of the company’s values and practices during critical times (Senz, 2021).

Through ESG investing, the actual investors can see potential sustainability risks that the company may face in the present or future (Stackpole, 2021). Investors are not only able to see any possible risk in the sustainability field, and companies can also utilize ESG ratings as a benchmark for better performance (Stackpole, 2021). The emphasis on ESG investing is significantly increasing as many investors now demand companies invest more in divisions that impact corporations’ ESG rating.

However, the emphasis on ESG investing has not been the only criteria investors advocate for when wanting to see the complete picture of the company’s performance and value.

Prominent investors are also placing a heavy emphasis on evaluating the credit ratings of major corporations (S&P 2022). Credit ratings are essential in an investor deciding whether to purchase bonds at a specific company. A company with a low credit rating tends to be a riskier investment as it could have a more significant probability that the company will be unable to make its bond payments (Claessens, 2018). Moody's began to issue credit ratings on bonds in 1909. However, credit ratings did not profoundly affect the market until 1936 when "a new rule passed that prohibited banks from investing in speculative bonds-that are, bonds with low credit ratings" (Kagan, 2022).

Credit ratings are still used as a "transparent global language" where investors can form their views and compare the likelihood of a corporation paying back their debt to investors. Many credit ratings are given through the three main agencies known as Moody's, Standard & Poor's, and Fitches. However, like ESG ratings, credit ratings for one company may differ between the three credit agencies as they weigh certain factors differently.

Credit ratings are only one of the many factors' investors consider when investing in a specific company. For instance, "as with 2021, more than a quarter of global investors say ESG is central to their investment approach (26% vs. 28% in 2021). But a higher proportion this year describe their ESG stance as one of "acceptance" (34% vs. 32%) and "compliance" (29% vs. 24%) (Ground 2022). The percentage of global users of ESG will increase to 89% in 2021. Therefore, one would expect that there should be a correlation between the main factors that investors look for when going through the decision-making process. The primary purpose of this thesis is to evaluate if there is a statistically significant correlation between the two factors of ESG and credit ratings.

According to Standard & Poor's, "ESG factors play a prominent role in creditworthiness; they can - and do - influence credit quality, specifically, the capacity and willingness of borrowers to meet financial commitments" (Standard & Poor's). ESG factors play a prominent role in credit ratings because the increasing investments toward increasing ESG factors act as risk mitigation toward the risk of the company's capability of repaying their debts (Amel-Zadeh 2018).

The lack of information on the correlation between factors that investors use in making decisions begs the question: Do ESG ratings have a statistically significant correlation to credit ratings? This thesis seeks to answer this question by analyzing a selection of 36 companies that are members of the University of Tennessee, Department of Supply Chain Management, Supply Chain Forum. These 36 companies represent a wide range of fields, so we can develop a better understanding of the correlation between ESG and credit ratings as there will be minimal bias as all fields will be analyzed.

In the thesis, the literature review will highlight the history of ESG and credit ratings as well as the potential for a significant correlation between the two factors that investors use in decision-making processes. This is followed by the methodology, including data collection and analysis of the 36 companies that are partners in the supply chain forum. The next section of the thesis will summarize the results of the data collection and analysis on whether the correlation between the two factors is statistically significant enough to facilitate the decision-making process of whether to invest or not. The last section will summarize limitations that the research might have faced, the next steps in the research topic, and recommendations.

Literature Review:

History of ESG:

The environmental, social, and governance (ESG) investment market has been growing since its introduction in the second half of the 20th century (Stanton, 2022). Therefore, this section will explain the increase of interest in ESG ratings in the investment world, how ESG ratings have an impact on the decision-making process for investor, and how ESG ratings have pushed more corporations to become more sustainable. The section will also explain the history of credit ratings, the purpose of credit ratings, and how credit ratings have an impact on investors. Further in the section, the relationship between ESG and credit ratings will be explained in further detail. Both variables are both important in the decision-making process for investors, so the correlation between these two variables were analyzed.

The interest in ESG ratings for corporations has been significantly increasing. ESG ratings allow investors to understand better the company's performance and values (Boffo, 2020). The purpose of ESG scores is to measure a corporation's performance based on evaluating factors associated with the environmental, social, and governance factors. Not only can ESG scores be a risk prevention method for financial investors, but they are also a way for investors to align their moral values with corporations that practice similar values (Amel-Zadeh, 2018). The rise of investing in funds that consider ESG criteria has attracted a net flow of 71.1 billion dollars (Berg, 2021).

Another variable in the sustainable investing field is the SRI variable. There has been increased interest in ESG rating and an increasing interest in Socially Responsible Investing, known as SRI. Socially Responsible Investing is investing in companies that perform socially

responsible acts. SRIs are known to consider both the return on investments and the impact that the investment has made on the community (Blume, 2021). However, the difference in ESG ratings as well as SRIs is “ESG is an objective measure of an organization’s environmental, social, and governance behavior, while SRI is a subjective criterion used by an investor to rate the social responsibility of an organization” (Aneta Group, 2022).

The increasing interest in ESG ratings and socially responsible investing is because investors can use the gathered data to help make more calculated investment decisions for specific portfolios (Pedersen, 2021). A frictionless market is a financial market without any transactional costs. Therefore, if investors invest in frictionless markets, then investing in ESG funds will have a very slim chance of making an impact on changing and improving the actions of large corporations.

For investors to consider how well corporations perform based on ESG criteria, professional data companies determine ESG ratings for specific corporations. The main companies that provide ESG ratings for corporations are MSCI (Morgan Stanley Capital International), S&P Global (Standard and Poor’s Global), and CDP. The environmental factor score evaluates the company’s impact on the environment, such as the carbon footprint, waste, water use, and conservation, and its clean technology to help them with its supply chain (CFA Institute, 2022). The social factor score evaluates the company’s impact on society and how it advocates for social good and change by looking specifically at human rights, employee benefits, employee health, safety, racial diversity focusing on inclusion, and community engagement by giving back to society (CFA Institute, 2022). The governance factor score evaluates the quality

of the company's management, executive compensation, diversity, shareholder rights, corporate political contribution, board independence, etc. (CFA Institute, 2022).

Environmental factors	Social factors	Governance factors
Natural resource use	Workforce	Board independence
Carbon emissions	Human rights	Board diversity
Energy efficiency	Diversity	Shareholder rights
Pollution/waste	Supply chain	Management compensation
Environmental opportunities		Corporate ethics

Figure 1: Key topics considered in each factor for ESG.

Each ESG rating agency has differences in how they rate corporations. For MSCI, they rate corporations on their ESG performance by labeling corporations as industry leaders and laggards, so MSCI can show investors if they are investing in a company that is an industry leader compared to their competitors in that field (MSCI, 2022). MSCI rates corporations on a scale of AAA to CCC, where AAA and AA are industry leaders, while B and CCC are labeled as industry laggards. S&P rates corporations' ESG performance from 0 to 100 for each sector, where 0 is the lowest performer and 100 is the highest performer (S&P Global, 2022).

S&P awards point to each sector of a corporation's ESG performance by evaluating the quality and substance of value and comparing it to an ideal corporation that scored a maximum amount number of points on the scale (S&P, 2022). For CDP, they rate corporations on their ESG performance based on a scale of A-D. CDP combines the ratings of all three sectors (CDP, 2022). Within CDP's rating methodology, a corporation's performance in each sector of the ESG rating consists of four levels of quantitative analysis. Therefore, there is an inconsistency

between the ESG rating agencies as S&P might have a different definition of the highest quality and substance of value in the environmental, social, and governance sectors than MSCI.

Level A represents leadership where a corporation must show environmental leadership, disclosing action on climate change, deforestation, or water security. They must demonstrate best practices in strategy and act as recognized by frameworks such as the TCFD, Accountability Framework, and others (CDP, 2022). Level B represents corporations that are taking action on environmental impacts that the business has made. Still, they are not performing at the level where they are leaders in the industry (CDP, 2022). Level C represents corporations that are aware of their impact on the environment and is beginning to understand how they can help the environment (CDP, 2022). Level D represents corporations just starting a business's environmental journey of sustainability (CDP, 2022). CDP also rates companies an F if those companies refuse to release any information through them.

However, there are many critiques for the ESG rating agencies as each company measures and values ESG criteria differently, so there is an inconsistency of scores of a particular corporation between different rating agencies (Berg, 2022). As stated above, each rating agency has a different rating scale and expectations of how a corporation can receive a high ESG rating after analysis of its ESG performance. Therefore, investors and corporations have a difficult time adequately analyzing the ratings to determine solutions on how the corporation can be more environmentally, socially, and governmentally friendly (Blume, 2021). There is a divergence in scope, weight, and measurement.

Research has proven that measurement divergence is the primary driver in what makes ESG ratings so inconsistent between agencies (Berg, 2022). Therefore, to make ratings more consistent across agencies, NASDAQ released a report that includes rating agencies to focus on 30 metrics (10 for environmental, social, and governance). In the NASDAQ report, the environmental criteria consist of GhG emissions, emissions intensity, energy usage, energy intensity, energy mix, water usage, environmental operations, climate oversight/board, climate oversight/management, and climate oversight/management on product development (NASDAQ, 2023). In the NASDAQ report, the social criteria consist of CEO pay ratio, gender pay ratio, employee turnover, gender diversity, temporary work ratio, non-discrimination, injury rate, global health and safety, child and forced labor, and human rights (NASDAQ, 2023). In the NASDAQ report, the governance criteria consist of board diversity, board independence, incentivized pay, collective bargaining, supplier code of conduct, ethics and anti-corruption, data privacy, ESG reporting, disclosure practices, and external assurance (NASDAQ, 2023). This report is known to be helpful as it can integrate metrics that are already a part of existing principles.

Due to the increase in interest in investing in ESG funds, investors are demanding the release of more company data relating to ESG scores (Tayan, 2022). The main drivers of investing in ESG funds are social or moral considerations, the desire to mitigate risk, the desire for an alpha, and others (Merrill Lynch Wealth Management, 2022). Investing in ESG funds has increased because investors are more interested in building their portfolios with more sustainable strategies (PwC, 2022). They want to use their capital to help create a more sustainable world. As of 2020, Global Sustainable Alliance Investment Alliance reported that global sustainable investment reached 35.3 trillion dollars, with sustainable assets taking over one-third of total

assets managed (Stackpole, 2021). Adding to the tremendous increase in sustainable investing, Morgan Stanley has also conducted research to show that out of 110 asset owners in North America, Europe, and Asia Pacific, 8 in 10 believe that companies with strong ESG practices may make for better long-term investments (MSCI, 2022).

The acknowledgment of ESG ratings in certain investments could also lead to improved risk-adjusted returns, mitigation for long-term risks, and decreased cost of capital (Cheng, 2014). ESG risk analysis is embedded in 100% of regular portfolio risk reviews (Blackrock, 2021). In the article "New Sustainability Study: The 'Embracers' Seize Advantage," researchers released a global survey of large corporations showing that corporations invest heavily in sustainability because they believe it will become a source of advantage. Santiago Gowland, Vice-President of brand and global corporate responsibility at Unilever, claims, "The only way to continue growing and continue being a successful business is to treat sustainability as a key business lever in the same way that you treat marketing, finance, HR, or supply chain. So really, it's core to the ability of the business to grow".

After analyzing ESG ratings, investment tends to deliver long-term value (Boffo, 2020). In conclusion, there has been a significant rise in sustainable investing and demand for more data on ESG scores. The popularity of sustainable investing will continue to grow if investors see a financial benefit from it (Bernow, 2017).

History of Credit Risk Rating:

The objective of credit ratings is to be a quantifiable measure of the borrower's creditworthiness and how responsible the borrower is for refunding the money in loans (Lip, 2022). Credit risk can determine through credit analysis on the pros and cons of lenders. Credit

ratings became a significant decision-making factor for investors after the financial crisis in 2008 (Corporate Finance Institution, 2022). For instance, credit ratings are often described as reliable financial gatekeepers (Partnoy, 2009). The quantifiable measure of creditworthiness is another factor investors use when deciding whether to invest because it deters investors from investing in risky corporations. Therefore, investors rely on credit ratings to provide financial information that may not be seen or released to the public (Piccolo, 2022). For example, suppose a corporation has a low credit rating. In that case, investors can see that this corporation is less likely to make timely payments and generate sufficient investment returns. The corporation is likely to need help to repay its investors.

The credit risk drivers are the probability of default, loss given default, and exposure at default (Corporate Finance Institution, 2022). Banks, insurance companies, suppliers, etc., use credit ratings. Many credit rating agencies can assign corporations a creditworthiness score to help investors better understand the firm's value (Hung, 2019). Moody's, S&P Global, and Fitch Ratings are leading credit rating agencies. Credit rating agencies can decide on a credit rating through multiple metrics such as an entity's financial statements, competition, financial outlook, and macroeconomic factors (Moody's Investors Services, 2022). Corporations strive for a high credit rating (Moody's Investors Services, 2022). High credit ratings indicate the corporation is more likely to repay the loan without issues (Corporate Finance Institution, 2022). A low credit rating suggests that corporations have a more challenging time repaying loans or have many problems when trying to repay the loan (Corporate Finance Institution, 2022). A high credit rating is in the triple A's (AAA), and a low credit rating is in the C or D, meaning it is the lowest or "junk" quality.

Credit ratings are significant to investors because they can provide a more holistic picture of the company's financial state and help investors decide if they are making an intelligent investment (Iannotta, 2013). Credit ratings are also important to the firm for two reasons. Companies can obtain a higher amount in loans because investors are more likely to purchase bonds from companies with a history of paying the bonds back. Companies can have better control over interest rates if they have a higher credit rating.

There are three credit rating agencies: Moody's, Standard & Poors, and Fitch Ratings. Moody's was established in 1914, starting with rating commercial paper and bank deposits. Moody's methodologies of rating credit mainly focus on a specific industry and sector or class of issuers and transactions. Moody's ratings are opinions of future relative creditworthiness derived from fundamental credit analysis (Moody's Investors Services, 2022). Moody's credit ratings are categorized into AAA, Aa, A, Baa, Ba, B, Caa, Ca, and C. Moody's bond ratings are not specific to any particular investment horizon (Moody's Investors Services, 2022). Moody's establishes their credit ratings based on factors like the type of debt a company may have, how they react to interest rates, etc. (Investopedia, 2018).

Standard & Poor's established themselves after being acquired by McGraw-Hill Companies in 1966. After the acquisition, the company rebranded as S&P global in 2016. S&P Global rates the creditworthiness of borrowers by rating their debt and securities using a standardized rating score (S&P, 2022). S&P investigates common and preferred stocks, bonds, and commercial paper. S&P rating scale consists of AAA to D (AAA, AA, A, BBB, BB, B, CCC, CC, C, DDD, DD, D). Bonds rated a BBB with S&P are known to be investment grade, while bonds rated BB+ or below are known to be speculative (White, 2013).

Fitch established their rating system in 1924, consisting of a rating system of AAA to D. Fitch ratings merged with IBCA of London, shown in the late 1990s (Investopedia, 2022). Later, Fitch also acquired competitors of Thomson BankWatch, and Duff & Phelps Credit Rating Co. Fitch's credit rating has a standard error of .002, meaning that the ratings are as accurate as could be because the smaller the spread, the more precise (Cheng, 2009).

Like ESG rating agencies, credit rating agencies are also inconsistent, where there might be inaccuracy in certain market events as these agencies have an issuer-pay model (Weidner, 2022). The inaccuracy of credit ratings is caused by credit agencies only revealing minimal information on their methodology of deciding on the creditworthiness of a corporation (Cheng, 2009). However, credit ratings have the reputation of being mostly accurate in their ratings, even if they do have an issuer-pay model. These credit rating agencies have a positive reputation that needs to be maintained (Weidner, 2022). Therefore, there is almost no possibility of seeing how accurate the credit rating that the agency established is.

Investors should consider credit ratings as one of the many factors in deciding whether to invest in a corporation. Still, they must consider many other factors and not solely rely on credit ratings, as they can sometimes be inconsistent (Cheng, 2009). Regulations set in place for credit rating agencies tend to have little impact on correcting the inaccuracies (Piccolo, 2022). Credit rating agencies tend to be more profitable as the quality of their ratings decreases because minimal litigation actions are taken against them to reprimand their overestimation of credit ratings given to investors. However, research has shown that credit ratings tend to be more precise whenever the credit rating agency has more significant market power (Hung, 2022). In summary, like ESG ratings, there are pros and cons to the ratings that the agencies establish for corporations.

Relationship Between ESG and Credit Risk Rating:

As ESG ratings and credit ratings are both factors for investors to utilize when deciding whether a corporation is worth the investment, there is undoubtedly a correlation between these two variables (Pineau, 2022). Both factors have the same denominator: they give investors a more holistic understanding of the corporation's performance, reputation, and values (Kiesel, 2019). Both ESG and credit ratings can help investors decide if the investment is risky or worth it (Pineau, 2022). Credit rating agencies consider ESG factors vital to them as these factors can highlight the company's ability to mitigate against risks associated with sustainability and their long-term performance overall (Kissel, 2019). As research has shown, higher ESG performance will have a more positive impact on a higher-level credit rating because the ESG ratings can also serve as risk mitigation (Jang, 2022). There seems to be a relationship between these two variables as both ratings have similar factors to consider when calculating the ratings.

S&P is one of the many credit rating agencies that claim they incorporate environmental, social, and governance credit factors into their credit analysis (S&P, 2022). For example, similar elements used in both calculations are climate transition risks, waste and pollution, social capital, human capital, governance structure, transparency, and reporting (S&P, 2022). ESG credit factors are known to be able to explain further the relevance of ESG factors that could be incorporated into analyzing credit ratings. Some ESG credit factors that can influence credit factors (later leading to credit ratings) are governance control and standards, operating costs and requirements, projected revenue base, cash flow, liquidity, etc.

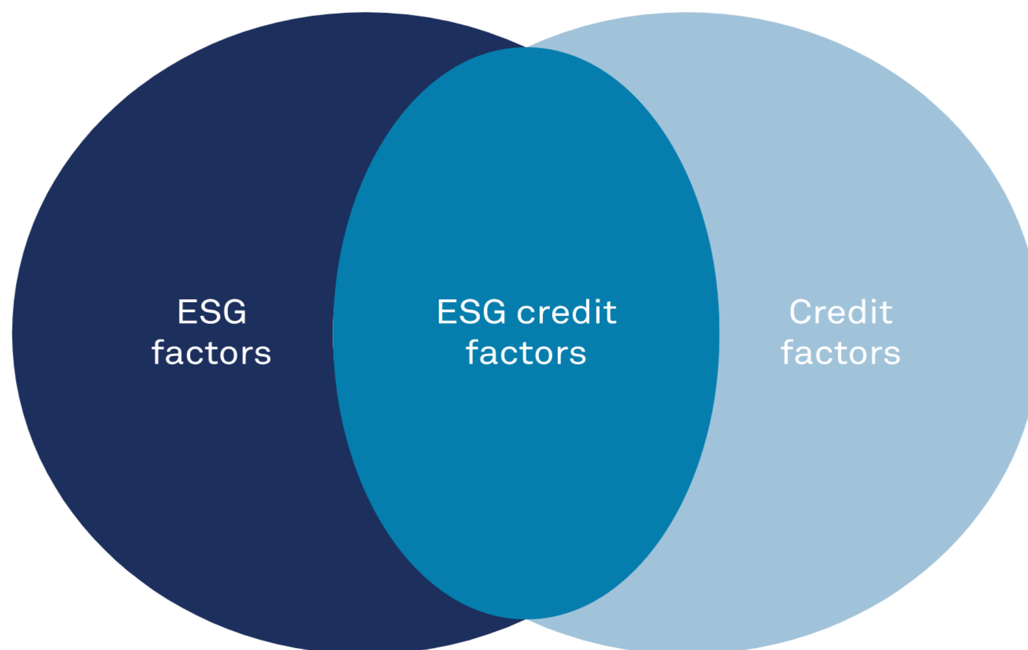

Figure 2: Intersection of ESG and Credit Ratings

ESG is used as a measure of credit ratings by many corporations because they help increase the transparency of a company's operations for stakeholders (Comstock, 2017). Credit rating agencies can benefit by using ESG scores as they can assess downside risks on credit quality (Kissel 2019). However, research shows that corporate social responsibility tends to have a more significant impact on credit ratings as corporate social responsibility investment is the most effective in determining the credit rating for a particular company as these investments directly impact the stakeholders (Attig, 2013).

Certain factors are often involved in corporate social responsibility, which is more significant to credit ratings than others (Pineau, 2022). However, corporate social responsibility is not the only factor that impacts credit ratings. The ESG rating has an impact on determining

the corporation's credit rating (Michalski, 2021). According to Moody's, one out of five organizations was negatively impacted in their credit ratings after assessing their ESG performance (Tyson, 2022). Moody's research has shown that "ESG considerations influence the credit rating of about 41% of companies in a way that is either positive, highly negative, or very highly negative" (Moody's Investor Services, 2022). Therefore, one can conclude if a corporation's ESG performance is low, then it will have a more significant effect on the corporation's credit rating.

Recently, many corporations have been actively practicing their values involved in environmental, social, and governance sectors. Therefore, many companies are now more willing to give more company information, especially about the environment, social, and governance, to the public (Tayan, 2022). Companies releasing information that will be widely available will also help them increase their ESG ratings, allowing them to develop their relationships with the stakeholders (Tayan, 2022). ESG does have a relationship with credit rating scores (Michalski, 2021). However, one must know that ESG ratings will only have a direct, impactful relationship with credit rating scores in specific sectors (Zanin, 2021). The key objective of integrating ESG and credit ratings is to measure a company's resilience to long-term, industry-material ESG risks and to assist the financial institution in better-informed decision-making while evaluating borrower (the corporation) (Moody's Investor Services, 2022).

One ESG sector might significantly impact credit ratings more than others (Michalski, 2021). So, the investors must not only look at the overall ESG rating, but they will have to look into the individual sectors of environmental, social, and governance (Zanin, 2021). For example, researchers were able to show that there is a strong relationship between how ESG scores can affect credit ratings. If ESG scores for specific sectors, such as shareholder and community

scores, increase (a part of the social governance), then the percentage of credit rating will also increase (Devalle, 2017). The p-values for shareholder and community scores had p-values more significant than .001, which means that they have a positive, statistically significant impact on increasing the credit rating score (Devalle, 2017). For example, raising one unit of community score will increase the credit score rating by 2.85% (Devalle, 2017). Growing one unit of shareholder score will end up in the credit score rating increasing by 1.0196% (Devalle, 2017). Therefore, if a corporation increases one unit of shareholder and community score in their ESG performance, they can also increase credit rating by 6.71%, which could help corporations improve their A to AA (Devalle, 2017).

Moody's ratings show that ESG events impact the energy, industrial, consumer cyclical, and technology sectors (Moody's Investor Services, 2023). ESG ratings help decrease the debt cost for certain bonds and equities by reducing default risk from an investor's perspective (Boffo, 2020). For example, many asset managers are starting to take more action and involvement in closing the gender gap between specific fields of the business world. Closing the gender gap will increase the GDP by 12 trillion dollars, so it is a wise investment decision to help complete the gender gap as it will help the GDP (McKinsey, 2015).

There has also been more awareness towards sustainable and research investment (SRI) as it is a way to integrate ESG factors into the analysis and selection process of securities within an investment portfolio. SRIs evaluate ESG factors to help investors determine which asset is more capable of long-term returns (Boffo, 2020). Many companies are not involved in investing in ESG and SRI regulations for genuine ethical reasons. However, they are more motivated to use the data and analysis of ESG ratings to help in their financial performance (Bernow, 2017). In the USA in 2012, the SRI market was only generating $3,740, while in 2018, the SRI market

was generating around $11,995 (Boffo, 2020). Through the data captured by CAPM tests, the market premium variables can show systematic risk exposure to all portfolios exposed to high systematic risk. The market premium variables can also offer monthly excess returns of portfolios and their reason for the return being between a specific range of numbers.

In conclusion, high-rated portfolios can bring high returns, while low-rated ones get low returns (Abramov, 2015). The correlation between ESG rating and credit ratings within the firms ended up being 80%, a positive relationship between specific factors involved in ESG ratings (Zanin, 2021). ESG ratings are significant to stakeholders' decision-making process as the ratings can provide more information on the reliability of credit risks, such as future cash flows, the ability to repay, and the price of a bond (Breckinridge, 2016). Many corporations realize the importance ESG may have to their financial analysis for their portfolios. Over 72% of the S&P 500 have incorporated sustainability into their reports (S&P, 2022). For example, Deutsche bank has seen in their data that firms with high ratings for ESG scores tend to have a lower cost of capital and have more capability to outperform their competition through measurements of fund returns and cash flows (Clubb, 2016). Therefore, if ESG ratings are integrated into credit ratings, these two variables can become risk mitigation for stakeholders (Brogi, 2022).

However, for ESG ratings to accurately represent the company financially and in values, each sector of ESG has different components that need to be weighted differently in the analysis (Michalski, 2021). The environmental sector includes pollution, carbon emissions, resource depletion, renewable energy, etc. The social sector comprises the supply chain, community relations, diversity, political contributions, etc. The governance sector includes shareholder rights, staggered boards, cumulative voting, and executive compensation. Breckinridge Capital gathered enough data to support its hypothesis that there is a positive relationship between the

impact of ESG and corporate fixed income (related to credit ratings) (Clubb, 2016). Between 2005 and 2015, companies that have a higher ESG score usually have lower spreads than their peers that might have an ESG rating as high as their competitors. As long market cycles happen where there might be disruptions, the increase in ESG scores has a causation of a lower OAS spread (Clubb, 2016). Therefore, many companies are now using ESG scores as high-level indicators of reduced risk among corporate debt securities as ESG scores can consider the credit risk financial factors that will impact the market and portfolio (Clubb, 2016).

Methodology:

Company and Agency Selection:

The thesis utilizes the public scores from CDP (ESG ratings) and Standard & Poor's (credit rating). The thesis uses an observational approach to measure the correlation between credit and ESG ratings. The correlation analysis is gathered by looking at the credit ratings and ESG ratings for companies in various industrial fields. The companies were chosen because they provided a wide range of industries that could be analyzed. Focusing on a specific industry could cause bias and make it more prone to inaccuracy as it is a narrower outlook.

Therefore, the companies were selected from a list of partners participating in the University of Tennessee, Knoxville Supply Chain Forum. The forum has over 70 companies, and these companies represent around 16 industries. Some significant industries represented are software IT, retail, consumer goods, logistics, food, healthcare, hardware, machinery, defense, oil/petroleum, auto components, specialty chemicals, banks, utilities, and real estate. Figure 3 shows the number of companies, from the dataset, that are in each represented industry.

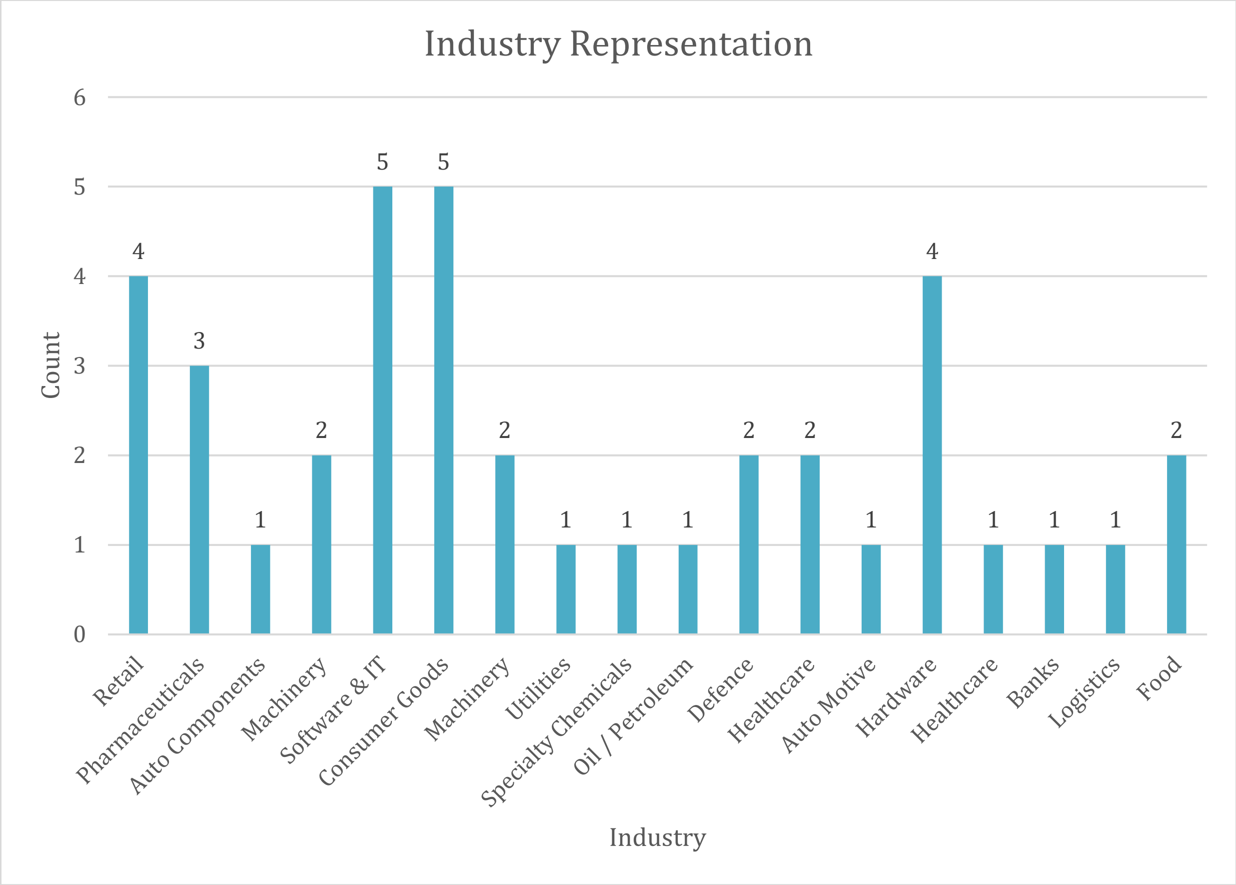

Figure 3: Industry Representation of Each Company in the Dataset

Therefore, 36 out of the 70 partners have been selected as they were able to provide publicly available information to receive an ESG and credit rating. These 36 companies will be analyzed to see if there is a statistically significant correlation between ESG and credit ratings. Thirty-six companies were selected as the analysis of these companies would provide an accurate picture of the relationship between these two variables and not be too large where they might cause relevance issues. The companies that were selected represents a wide range of industries where the companies both service and product manufacturers. The selected companies are publicly traded companies with headquarters all around the world, from the United States to the Netherlands. The selected companies have a wide range of revenue, from 10.5 billion to 3.246 trillion dollars. The selected companies also have a wide range of 14,000 employees to

1,541,000 employees. The wide range of values between the companies, for headquarters, employees, revenue, and industry, is one of the main reasons why these companies were selected as it will provide a broad, un-biased view on if there is a correlation between these two variables that is applicable to all companies and industries.

Data Collection:

Credit ratings for these companies were acquired through a credit rating agency known as Moody's Investor Service, also known as Moody's. ESG ratings for these companies were obtained through an ESG rating agency known as Morgan Stanley Capital International, also known as MSCI. These rating agencies were chosen as they were known to be the most reliable and the most similar in the rating process, which would help analyze the correlation later. The data was collected in the calendar year of 2020, 2021, and 2022 as these years can provide a more accurate correlation analysis to see if the potential correlation is consistent or a one-time thing. The data was collected from the public search engines Moody's and MSCI.

MSCI scoring methodology involves assessing the level of detail and comprehensiveness in a response. MSCI will score companies based on their environmental awareness, management methods, and progress toward ecological protection (MSCI, 2022). In the environmental sector, MSCI focuses on climate change, natural capital, pollution waste, and environmental opportunities (MSCI, 2022). MSCI focuses on human capital, product liability, stakeholder opposition, and social opportunities in the social sector (MSCI, 2022). In the governance sector, MSCI focuses on corporate governance and corporate behavior (MSCI, 2022).

MSCI ESG rating model is developed in a way to be able to answer these four questions: "What are the most significant ESG risks and opportunities" "How exposed is the company to

these key risks and/or opportunities" "How well is the company managing key risks and opportunities," and "What is the overall picture for the company and how does it compare to its global industry peers" (MSCI, 2022). MSCI uses a quantitative model to look at ranges and values for critical issues for each industry. After identifying the key points, MSCI will weigh each vital issue and then determine if the corporation is a significant contributor (highest weight) or minor contributor (lowest weight) to risk or opportunity in the specified industry (MSCI, 2022). After MSCI uses a weighted average approach, the committee will discuss a reasonable score after considering the weights of critical issues and the range and average values of all corporations in the specified industry (MSCI, 2022). The information on the company is gathered from specialized datasets, company disclosure, and media sources monitored daily. MSCI also focuses on data accuracy through constantly communicating with issuers.

Moody's credit rating methodology uses a global long-term 21-level rating scale, and Moody's also operates a global short-term rating scale that is mainly used for commercial paper (Moody's, 2022). The purpose of Moody's credit rating scale is to determine the likelihood of default on any short or long-term financial obligations and analyze the potential seriousness of any financial losses if there was a default (Moody's, 2022). Moody's will base their rating scale on analyzing multiple available information sources before establishing a credit rating for a specific corporation.

Moody's does not determine credit ratings through formulas, but they ascertain through methodologies. There is a different methodology for each company and the situation that they may be in. Moody's also creates several credit rating committees where there is minimal error that could be caused by human bias (Moody's, 2022). In figure 4, the steps of how Moody's credit rating methodology is listed. The establishment of the analytical team and committee is to

make sure that there is no bias and that the credit rating that is established is solely based on company information that is given.

Step 1: The analytical team is assigned upon execution of a commercial engagement
Step 2: The issuer shares company information with the analytical team.
Step 3: The issuer's management team meets with the analytical team to discuss financial deals.
Step 4: The analytical team reports back to the rating committee, where the committee will review, vote, and assign a rating for the issuer.
Step 5: The issuer will check the draft press release before publication
Step 6: There are consistent checkups with the issuers to determine if there needs to be a change made to the credit rating

Figure 4: Steps of Moody's Rating Methodology

Analysis of Collected Data:

The gathered data on ESG ratings and credit ratings were grouped by industry to find a possible correlation between these two variables for a specific industry, such as the possibility of a stronger correlation between these two variables in the industry of software compared to retail. The analysis of the correlation between ESG and credit ratings was also performed on each company. The analysis at the industry level and company level was performed for the years 2020, 2021, and 2022 to see if the correlation increased as interest in ESG has been significantly growing each year.

The analysis of the industry and the firm level was completed by gathering ESG ratings and credit ratings through these two agencies for 2020, 2021, and 2022. One could see the relationship between these two variables by looking at the score of each variable. However, when there was a significantly higher score in ESG rating or credit rating, but there was not a the

other variable did not have a similar score, then further research was done for that specific company in the specific year to see if there were any external factors that could have caused such a wide range of scores between these two variables. These instances will be described in further detail in the results section.

To be able to determine the statistical significance of the relationship, further analysis was conducted through R studio using a chi-squared independence test to determine the statistical significance of the correlation between these two variables. The chi-square test of independence was also able to show if these two variables have a statistically significant association between two categorical variables, which is another way to show if the correlation is strong enough to form a relationship (JMP, 2023).

Results:

Correlation Between ESG and Credit Ratings:

The results section consists of the analysis on the ESG and credit ratings of the thirty-seven companies that were selected. The results section will consist of analysis through bar graphs on if there is a relationship between the two variables as well as a statistical analysis through a chi-squared test of independence to see if the relationship is statistically significant. After collecting ESG and credit ratings for the 36 companies between 2020, 2021, and 2022, there was a linear representation between the ESG rating and the credit rating.

For example, in table 1, Amazon was directly linear between the relationship of these two variables, as seen in the table below. As ESG ratings increased, the credit ratings for Amazon increased as well. Moody's credit rating scale is like the MSCI rating scale, where AAA represents companies with the highest quality in the calculated field. Another example of the

potential relationship between Moody's credit rating and MSCI ESG rating is looking at the progression of Walgreens. As seen in table two, Walgreens has not increased its ESG rating since 2020, but they still have the same rating that it did in 2020 as they do now. However, Walgreens has no change to its ESG rating, and Moody's credit rating has barely changed.

Year	MSCI Rating	Moody's Rating
2020	BBB	A2
2021	BBB	A1
2022	A	A1

Table 1: Amazon ESG and Credit Rating throughout the three years.

Year	MSCI Rating	Moody's Rating
2020	BBB	BAA2
2021	BBB	BAA2
2022	BBB	BAA2

Table 2: Walgreen's ESG and Credit Rating through the three years

Moody's can capture a corporation's ability to repay short-term and long-term debt obligations. Therefore, Moody's can provide more information on the financial risk of investing in a particular corporation as it can capture the capability of repaying all types of loans. The numbers after Moody's credit rating represent their ability to repay short-term debt obligations, where 1 illustrates the corporation's superior ability to repay a debt obligation, and 3 represents the corporation's acceptable ability to repay a debt obligation.

For example, if a corporation has a credit rating of AA3, it shows that the corporation is of high quality and is known to have minimal credit risk in long-term debt obligations. However, the three at the end of the credit rating can inform investors that this corporation might have minimal credit risk in long-term debt obligation. Still, they are known to only have an 'acceptable' ability to repay short-term obligations. Therefore, investors are given meaningful information on whether they want to invest in a company that is known to be successful in repaying long-term obligations but might have trouble repaying short-term debt obligations. There were also a few companies that did not provide MSCI any information to obtain an ESG rating but provided enough information to Moody's to get a credit rating.

Many companies did not provide Moody's with any information to obtain a credit rating, but they offered MSCI enough ratings to receive an ESG rating. Therefore, with the lack of communication from both companies, those companies were not analyzed year-to-year as there was no way of knowing the correlation between the two variables by just looking at one variable.

Although Amazon is only one example of a direct correlation between ESG ratings, when ESG ratings increase, then the credit rating of the company will also increase. Evidence has shown that companies who score a BBB or lower on their ESG ratings for MSCI also score lower on their credit ratings for Moody's. Figures five through six represent all the corporations that scored a ESG and credit rating of A or higher as well as BBB or lower.

These figures represent all corporations with all three years combined to make a bar graph. The bar graph visually depicts the amount of times that a company has scored higher than an A or higher on ESG rating as well as an A or above on credit ratings. Therefore, the bar graph will consist of a numerical value that will be greater than 36 as the companies could have a ESG

rating of A or higher, and a credit rating of A or higher, but the same company could have a credit rating of B or lower in another year. Therefore, companies could repeat themselves to where the total number from the bar graph will be greater than 36. The graph depicts the opposite of the amount of times that a company has scored BBB or lower on ESG as well as B or lower on credit ratings.

Figure five shows that companies with a lower ESG score than their competitors will also tend to have a higher chance of scoring a lower credit rating. In 2020, 2021, and 2022, data has shown that companies with a BBB or lower will also have a higher chance of scoring a B or lower on their credit ratings. Companies with a credit rating of B or lower tend to be known for having moderate credit risk and are considered medium-grade. There are times when companies scored a BBB on ESG ratings but scored an A or higher on credit ratings, but these scenarios were only 37% of the time. Therefore, companies that score low on ESG but high on credit ratings are significantly less likely than those that score low on ESG and credit ratings.

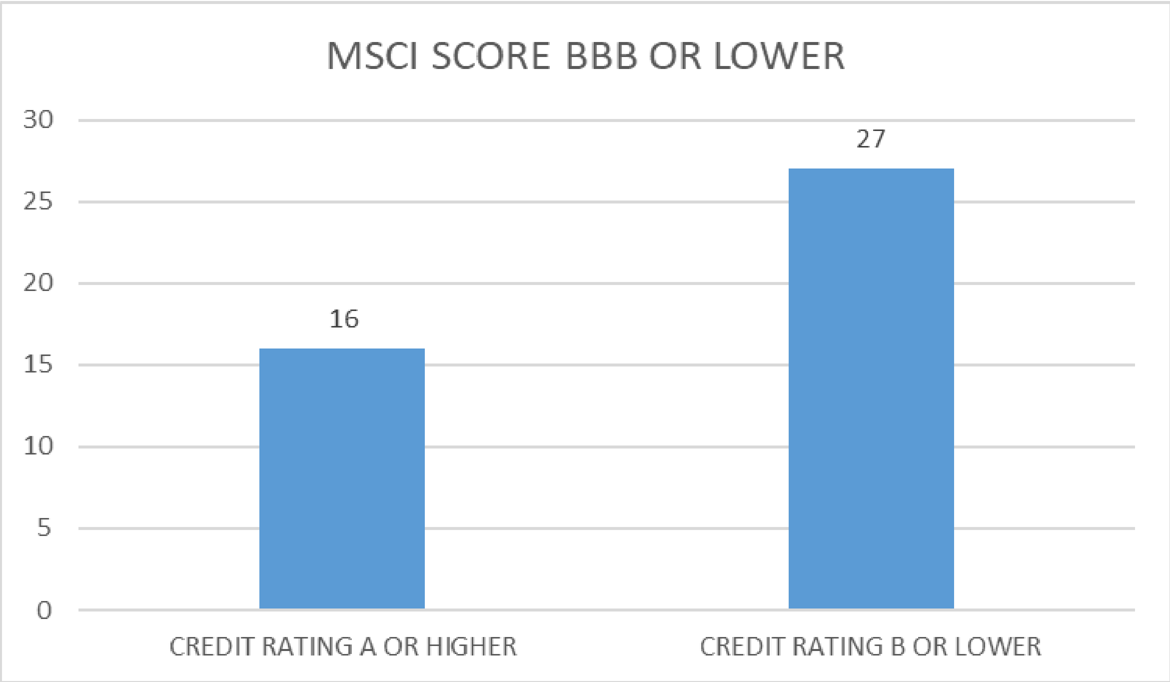

Figure 5: Credit Ratings of companies who scored BBB or lower on the MSCI ESG rating

Evidence has also shown that companies that score an A or higher on their ESG ratings for MSCI also score higher on their credit ratings from Moody's. Figure six visually indicates that companies that score an ESG rating of A or higher tend to have a higher chance of scoring a credit rating of A or higher. Out of all the companies that have scored an A or higher on ESG ratings for the observed years, there is a 55% chance that the company will score an A or higher on credit ratings. There is also a 44% chance that the company will get BAA or lower credit ratings. There is still a significant difference in the likelihood of a company scoring higher on credit ratings from Moody's if they can also obtain a high score on ESG ratings from MSCI.

Evidence shows that companies who score an A or higher on the MSCI ESG rating tend to have a higher chance of scoring an A or higher on credit ratings. In figure six, one can see that there have been more times that a corporation has scored a credit rating of A or higher as well as scored a ESG rating of A or higher. For instance, there has been 45 times when companies had a credit rating of A or higher when their ESG score was A or higher, and there were only 36 times that a corporation had a ESG rating of A or higher, but a credit rating of BAA or lower. However, comparing figure five with six, in figure five, there were only 16 times they had a credit rating of A or higher when their ESG score was BBB or lower. These values show a direct correlation between ESG ratings and credit ratings. The relationship between these two variables is linear. If the ESG rating increases, then the credit rating will also increase. Amazon was only one of the many companies that were able to show the relationship between ESG and credit ratings. As years have passed, the data shows that as companies improve their ESG ratings, their credit ratings will also increase.

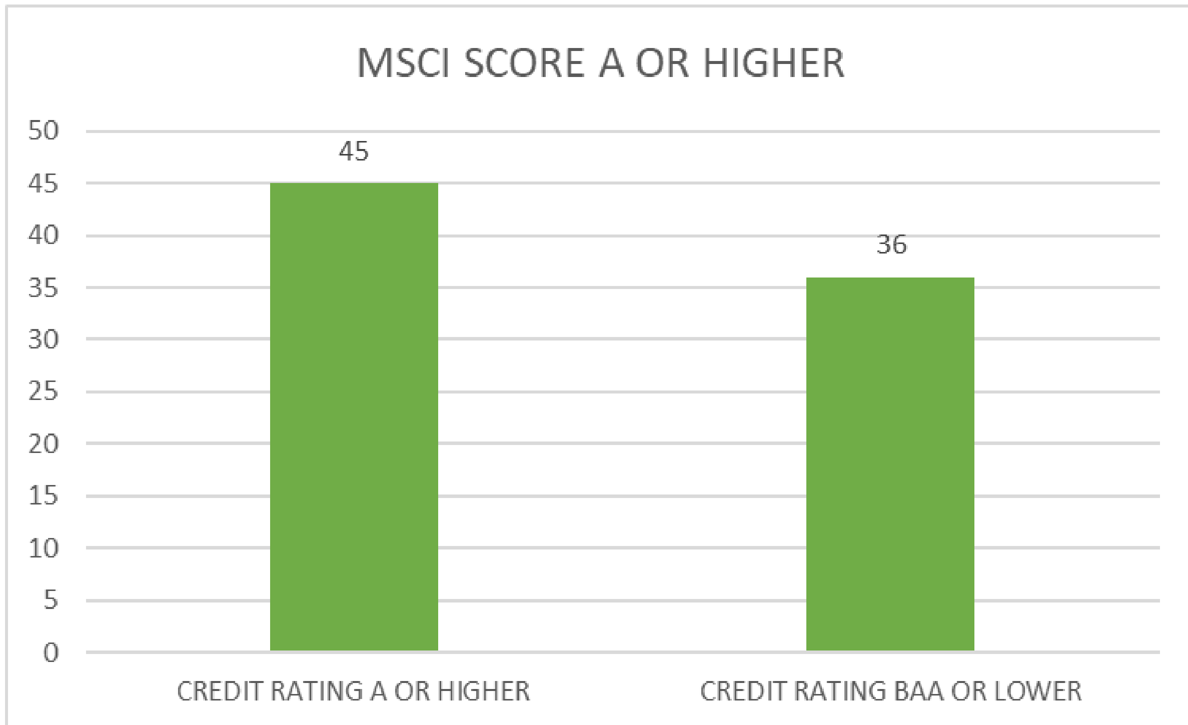

Figure 6: Credit Ratings of Companies who score an A or higher on the MSCI ESG rating

Now that the raw data can show a correlation between ESG and credit ratings where one might influence the outcome of the other variables, the question of 'How do ESG ratings impact credit ratings?' arises. ESG has an impact on credit ratings as ESG ratings are a way to mitigate risk on debt obligations because if a corporation tends to be socially responsible, then those values are carried into creating a strategy of investing in improving credit ratings.

Statistical Significance of the Correlation:

The collected data can show that there is a linear relationship. Whereas ESG ratings increase, then credit ratings will also increase. Therefore, with the naked eye, we can see there is a correlation between these two variables. However, a chi-squared test of independence was performed to analyze the statistical significance of the correlation. In table 3, the chi-squared independence test showed the p-value between the ESG and credit rating variables. The chi-

squared test of independence represents all thirty-seven companies for year 2020, 2021, and 2022.

In 2020, one can see that the p-value between ESG and credit ratings is around a .1581, meaning that the correlation between these two variables is not statistically significant, meaning there is a weak relationship between these two variables. In 2021, one can see below that the p-value between ESG and credit ratings is around .3236 meaning that the correlation between ESG and credit ratings is not statistically significant. The p-value confirms a weak relationship between these two variables where the impact on one variable will not translate the same to the other variable.

However, there is a tremendous change in the year 2022 as ESG and credit ratings are statistically significant in their correlation. In 2022, the p-value for these two variables was around .0125, meaning that it is statistically significant between these two categorical variables. The correlation is statistically significant for 2022 is that there was a considerable increase in interest in ESG ratings where companies felt more pressured to release all information regarding their ESG rating and invest back into themselves by increasing their ESG rating. If a p-value is below .05, a statistically significant relationship exists between the two variables, as the p-value can determine if a null hypothesis should be accepted or rejected.

In this study, we saw that the p-value between ESG and credit rating was insignificant in every analyzed year. Therefore, since the p-value between credit ratings and ESG ratings is higher than .05 in the years 2020 and 2021 but not 2022, there is not a strong enough correlation between being able to analyze only one of these variables when making investment decisions for a portfolio for years 2020 and 2021.

A p-value greater than .05 does not mean there is not a statistically significant relationship. However, it means that there is no substantial evidence to be able to determine that there is a statistically significant relationship between ESG and credit ratings. Since the p-value is only .05 than the preferred p-value for a statistically significant association, we can conclude that there is a correlation. Still, it is not statistically significant enough with the dataset to obtain a p-value of .05 or less in a chi-square test of independence.

Year	P-Value	Statistically Significant?
2020	.1581	Not Statistically Significant
2021	.3236	Not Statistically Significant
2022	.01259	Statistically Significant

Table 3: Chi-Square Test of Independence Between ESG and Credit Ratings

One can also see the correlation between ESG and credit ratings, as seen in the scatterplots below. The scatterplots consist of all 36 corporations analyzed yearly (2020, 2021, and 2022). ESG and credit ratings for the 36 companies were converted into numerical numbers to create the scatterplot. Within MSCI, value one is the best, and value seven is the worst. Within Moody's, value one is the best, and value twelve is the worst. The purpose of the scatterplot was to display the type of relationship the variables represent. The points not being around the trendline indicate little correlation between the two variables. The scatterplots show no significant relationship, as there is little change to one of the variables when the other variable changes.

In figure 7, the year 2020, the scatterplot showed little correlation between the two variables as multiple points were not close to the best line set by the scatterplot. Each data point

had a numerical ESG and credit rating that would have represented their alphabetical rating (AAA-C). However, many companies would have the same ESG and credit ratings, so those companies were grouped with one point designated on the scatterplot.

In figure 8, 2021, the scatterplot shows that there was even less correlation between ESG and credit ratings compared to 2020. The scatterplot in 2021 showed that there were more points that the trendline did not pass through, and the data points were not close to the best-fit line, meaning there is not a significant relationship between the two variables. However, in figure 9, the year of 2022, one can see a correlation between ESG and credit ratings, not only from the chi-squared test of independence but also from the scatter plot. The scatter plot showed that many data points passed through the trendline, and many data points were close to the trendline, meaning there is a relationship between ESG and credit ratings as most points were around the line of best fit.

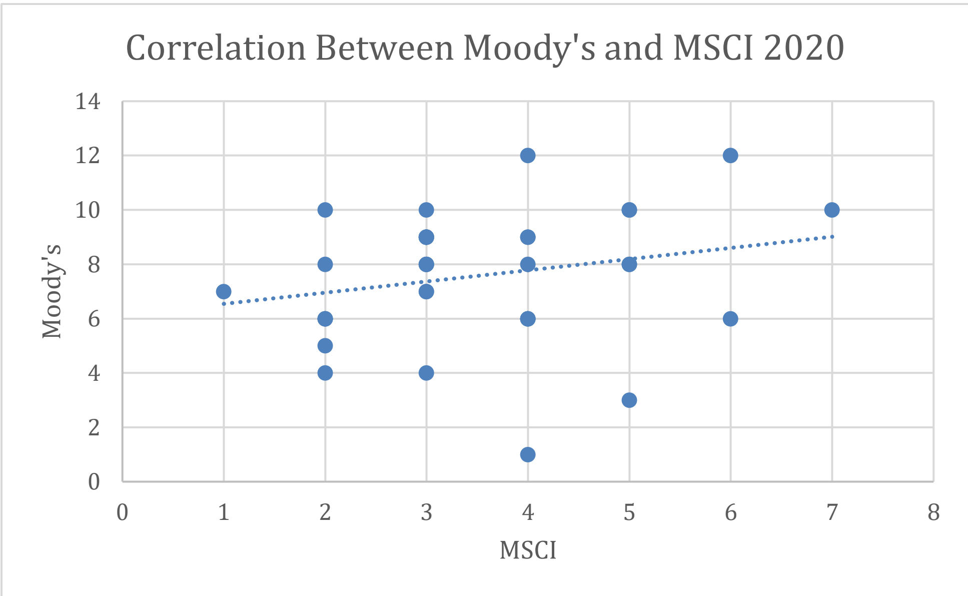

Figure 7: Scatterplot Between Moody's and MSCI (Year 2020)

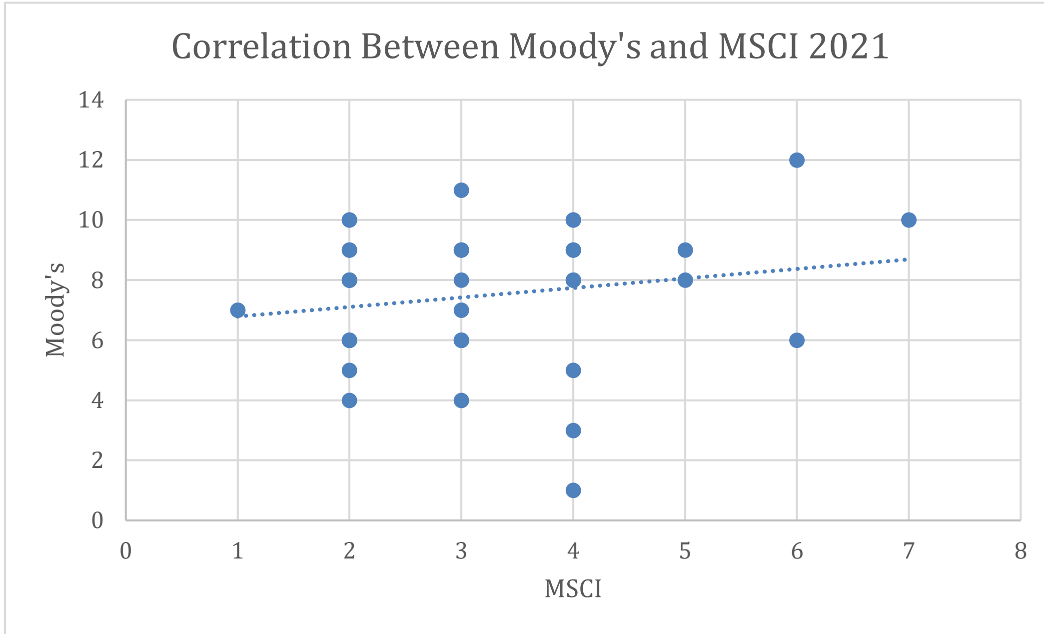

Figure 8: Scatterplot Between Moody's and MSCI (Year 2021)

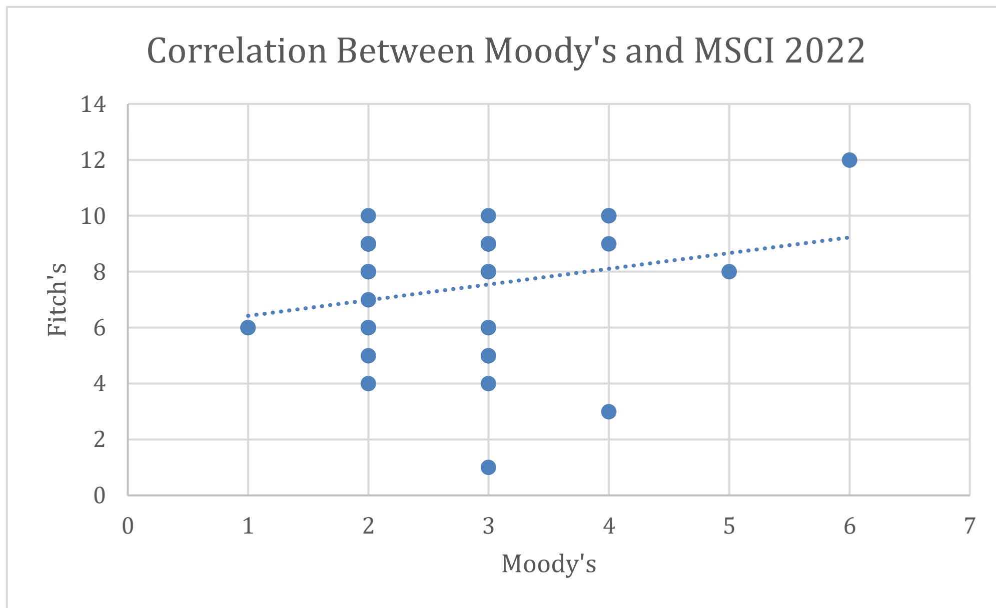

Figure 9: Scatterplot Between Moody's and MSCI(Year 2022)

Having a positive ESG and credit rating will show the corporation's values and if they are less risky to invest in compared to their competitors in specific industries. Therefore, as seen in the analysis of historical data over the past few years, if companies are working and investing to become more sustainable in their ESG sectors, credit ratings might increase throughout the years. In the years 2020 and 2021, as seen with statistical models being evaluated, there is not a strong enough correlation between these two variables to be statistically significant, where investors can assume that if ESG scores increase, then the company's credit rating will also increase. There is a statistically significant relationship between ESG and credit ratings in the year 2022, as the p-value is below .05, meaning that there is sufficient evidence to determine that the correlation is statistically significant enough.

Conclusion:

Historical data shows that ESG ratings have been a prominent factor in the financial world. Investors believe that ESG ratings could lower risks for portfolio investments because they could be a good representation of the interworks in a company. Credit ratings are another increasing, prominent factor in the financial world where its purpose is to lower portfolio investment risks. With credit ratings, investors can evaluate the risk and potential of having their investments returned to them later. Credit ratings have been a factor in portfolio investment for quite some time. Still, ESG ratings have been more recent, as in the past few years is when there has been significant interest from financial institutions.

If the financial community takes a consistent interest in ESG ratings, especially in the decision-making process for investments, then not only would it be able to help the clients, but it will push for a more sustainable future and the planet. Therefore, sustainable investing benefits

multiple parties of the world, and it is not solely there to help with investment decisions. Overall, this study highlights the importance of ESG and credit ratings to portfolio investments, as these two factors are heavily considered by portfolio managers when making investments for their clients.

The intended purpose of this study was to see if there is a strong correlation between ESG ratings and credit ratings, as both are factors in the decision-making process for making investments. The purpose of this study was to see if there would be a statistically significant relationship where if ESG ratings increase, then credit ratings will follow suit and increase. Therefore, if a correlation was found, then portfolio managers, investors, and clients can generally assume that if a company has a high ESG score, then the probability of the company being able to pay back its investors is also a high value. Therefore, this study could be able to help mitigate further risk for portfolio investments, and it could make the decision-making process for investments easier when understanding the statistical importance of the factors as well as their correlation to each other.

This study could not find a statistically significant correlation between ESG and credit ratings. The chi-squared test of independence could not show a p-value that was less than .05, meaning that the relationship between the two categorical variables is not statistically significant. However, there is a correlation. Still, it is just not as substantial enough to be solely able to make investment decisions by looking at only one factor and expecting the other factor to be around the same value as the first factor. Therefore, investors should use both ESG and credit ratings when managing a portfolio as they are a good representation of the inner works of a company, the risk of being able to be paid back one's initial investment, and more. Still, the p-values

rejected the null hypothesis because there was weak evidence or insufficient evidence to lower the p-value to a value that would be considered statistically significant.

ESG and credit ratings are substantial as they serve the purpose of risk mitigation. However, one should not assume that if ESG scores are increasing, then the credit rating for that corporation will also increase, meaning that there is minimal risk mitigation in investing. There is a relationship between these two variables, but not significant enough to decide solely based on evaluating only one of the factors (either ESG rating or credit rating). This is due to the chi-squared test of independence showing that the p-value was greater than .05 for 2020 and 2021. However, the p-values were not high enough to rule out any possibility of a correlation between ESG and credit ratings.

Future Research:

Although there was not a statistically significant correlation found in this study between ESG and credit ratings, data visualizations demonstrated that it is more common for ESG ratings with an A or higher also to have a credit rating of A or higher. However, the statistical model was unable to find a statistically significant correlation to be able to rely solely on one factor when evaluating potential investments for a portfolio. Therefore, further research could focus on specific industries instead of grouping multiple industries in data analysis. For example, further research could be done to find if there is a statistically significant relationship between ESG and credit ratings solely for corporations that fall under the Technology & IT industry, such as Apple, Microsoft, Google, etc.

There could also be further research done to find if there is a statistically significant relationship between these two variables for retailers, logistics, and automobile industries. There

is a higher chance of finding an accurate correlation between ESG and credit ratings when focusing on specific sectors because each industry has a different business model and strategy that it may need to follow to become a leader in that industry.

The different business models and strategies could affect a corporation's credit rating and ESG rating. Finding a statistically significant correlation for specific industries will also be helpful in investment decisions for portfolios. Investors would be able to make a more informed decision as they can look at only one factor and know there would be a correlation with other factors. However, if there is no correlation, investors need to consider all factors in making investment decisions.

Further research could also be done to see if the correlation between ESG and credit ratings will continue to be statistically significant in 2023, 2024, and 2025 as one should not solely rely on the year 2022's p-value being statistically significant. Suppose the relationship between ESG and credit ratings is statistically significant in future years when considering multiple industries at once. In that case, portfolio managers and investors could confidently use only one variable as a risk mitigation tool because the impact of one variable will be around the same impact as the other variable. ESG and credit ratings are valuable tools for portfolio investments if they are evaluated and analyzed correctly.

Appendix A: Year 2020 of Company’s ESG and Credit Ratings

Company	MSCI	Moody's
Amazon	BBB	A2
Bayer Healthcare	BB	Baa1
Bridgestone Americas Tire Operations	BBB	A2
Caterpillar	A	A3
CGI	A	Baa1
Colgate-Palmolive	AA	Aa3
Clorox Company	AA	Baa1
Cummins	AA	A2
Dell, Inc	BBB	Ba2
Dominion Energy	A	Baa2
Eastman Chemical Company	BB	Baa3
FedEx Services	BBB	Baa2
HollyFrontier	BB	Baa3
IBM	AA	A2
International Paper	A	Baa2
Johnson & Johnson	BBB	AAA
Kimberly-Clark Corporation	AA	A2
L3Harris	A	Baa2
Leidos	A	Baa3
Lockheed Martin Aeronautics Company	A	A3
Lowe's	A	Baa1
McCormick & Company, Inc.	A	Baa2
PepsiCo	AA	A1
Pfizer	B	A2
Philips	BB	Baa1
Nissan	CCC	Baa3
Procter & Gamble	A	Aa3
SAIC	B	Ba2
Schneider Electric	AAA	A3
Smith & Nephew	A	Baa2
Sysco	BBB	Baa1
Tractor Supply Company	A	Baa1
Trimble	AA	Baa3
Walgreens	BBB	Baa2
Walmart	BB	Aa2
Truist / Suntrust	BBB	A2

Appendix B: Year 2021 of Company's ESG and Credit Ratings

Company	MSCI	Moody's
Amazon	BBB	A1
Bayer Healthcare	BB	Baa2
Bridgestone Americas Tire Operations	A	A2
Caterpillar	A	A2
CGI	A	Baa1
Colgate-Palmolive	AA	Aa3
Clorox Company	AA	Baa1
Cummins	AA	A2
Dell, Inc	A	Ba1
Dominion Energy	AA	Baa2
Eastman Chemical Company	BBB	Baa3
FedEx Services	BBB	Baa2
HollyFrontier	BBB	Baa3
IBM	AA	A2
International Paper	A	Baa2
Johnson & Johnson	BBB	AAA
Kimberly-Clark Corporation	AA	A2
L3Harris	A	Baa2
Leidos	AA	Baa3
Lockheed Martin Aeronautics Company	A	A3
Lowe's	AA	Baa1
McCormick & Company, Inc.	AA	Baa2
PepsiCo	AA	A1
Pfizer	B	A2
Philips	BB	Baa1
Nissan	CCC	Baa3
Procter & Gamble	A	Aa3
SAIC	B	Ba2
Schneider Electric	AAA	A3
Smith & Nephew	BBB	Baa2
Sysco	BBB	Baa1
Tractor Supply Company	AA	Baa1
Trimble	AA	Baa3
Walgreens	BBB	Baa2
Walmart	BBB	AA2
Truist / Suntrust	A	A2

Appendix C: Year 2022 of Company's ESG and Credit Ratings

Company	MSCI	Moody's
Amazon	A	A1
Bayer Healthcare	A	Baa2
Bridgestone Americas Tire Operations	AA	A2
Caterpillar	A	A2
CGI	A	Baa1
Colgate-Palmolive	AA	Aa3
Clorox Company	AA	Baa1
Cummins	AAA	A2
Dell, Inc	A	Baa3
Dominion Energy	AA	Baa2
Eastman Chemical Company	BBB	Baa2
FedEx Services	A	Baa2
HollyFrontier	BBB	Baa3
IBM	AA	A3
International Paper	AA	Baa2
Johnson & Johnson	A	AAA
Kimberly-Clark Corporation	AA	A2
L3Harris	AA	Baa2
Leidos	AA	Baa2
Lockheed Martin Aeronautics Company	AA	A3
Lowe's	AA	Baa1
McCormick & Company, Inc.	AA	Baa2
PepsiCo	AA	A1
Pfizer	A	A1
Philips	BB	Baa1
Nissan	BBB	Baa3
Procter & Gamble	A	Aa3
SAIC	B	Ba2
Schneider Electric	AAA	A3
Sysco	A	Baa1
Tractor Supply Company	AA	Baa1
Trimble	AA	Baa3
Walgreens	A	Baa2
Walmart	BBB	Aa2
Truist / Suntrust	A	A2
Smith & Nephew	A	Baa2

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