

UNIVERSITY OF PIRAEUS



DEPARTMENT OF MARITIME STUDIES

MSc in SHIPPING MANAGEMENT

**ESG REPORTING IN SHIPPING
COMPANIES**

IOANNIS MEIMARIS

Master's Dissertation Submitted in partial fulfillment of the requirements of
University of Piraeus for the degree of M.Sc. in Shipping Management

Piraeus

October 2024

Declaration of Authenticity

“The person, who submit the Masters’ dissertation are fully responsible for the definition of the fair use of the material, which is based upon the following factors: the purpose and nature of the use (commercial, non-profitable or educational), the nature of the material which is used (part of the text, boards, shapes, pictures or maps), the percentage and the significance of the part, which is used in comparison to the whole, under copyright text, and of the possible consequences of this us in the purchase or the overall value of the under copyright text.”

Evaluation committee

“The current Master’s dissertation has been unanimously approved by the Tripartite Examination Committee, which has been designated by Special General Meeting of the Department of Maritime Studies of the University of Piraeus, according to the Operating Regulations of the Master’s Program in Shipping. The members of the Committee are:

- Mr. ANDREAS ANDRIKOPOULOS (Supervisor)
- Mr. VASILIOS NAOUM
- Mrs. ANASTASIA CHRISTODOULOU

The approval of the Master’s dissertation from the Department of Maritime Studies of the University of Piraeus does not imply acceptance of the writer’s opinion. ”

Table of Contents

Declaration of Authenticity	Error! Bookmark not defined.
Evaluation committee	3
List of Tables	5
Abstract	6
Περίληψη.....	6
Introduction	7
1. Environmental, social, and governance disclosures and performance affect corporate value.....	14
1.1. Social Disclosure	16
1.2. Social Disclosure and CSR Performance.....	19
2. CSR disclosure in shipping.....	24
2.1. Corporate Social Responsibility (CSR), the performance of a corporation, and the risk associated with the firm.....	25
2.2. Corporate Social Responsibility (CSR) conduct and the disclosure of CSR activities.....	30
2.3. CSR and the shipping industry	32
3. Analysis of ESG trends of international shipping companies.....	40
3.1. ESG in shipping	44
3.1.1. 'E' in Shipping ESG.....	47
3.1.2. 'S' in Shipping ESG	49
3.1.3. 'G' in Shipping ESG	49
3.2. Theoretical background	51
3.2.1. Positive elements of ESG-related regulations and policies	51
3.2.2. The need for ESG management of Global Shipping Companies	52
3.2.3. Investment Portfolio Theory.....	53
3.2.4. Financial performance.....	55
3.2.5. Financing.....	56
3.2.6. The ESG practice	58
3.3. Environmental, Social, and Governance challenges encountered by individuals and organizations involved in the maritime industry.	62
3.3.1. The challenges of climate change and the necessity of reducing carbon emissions.....	62
3.3.2. Investment and financing obstacles.....	63

3.3.3.	Obstacles associated with adhering to regulations and standards.....	63
3.3.4.	The challenges associated with data administration and the importance of transparency	63
3.3.5.	Specific obstacles that are peculiar to the maritime industry	64
3.3.6.	Standards and accountability concerns.....	64
3.4.	Incorporating environmental, social, and standards into the funding choices made by shipping corporations.	65
4.	Methods for Writing ESG Reports	67
4.1.	Environmental Monitoring and Reporting	71
4.2.	Societal Monitoring and Reporting.....	80
5.	Conclusions	84
	References	86

List of Tables

Table 1 ESG framework

https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Reports/2021/1015656/EBA%20Report%20on%20ESG%20risks%20management%20and%20Osupervision.pdf

8

Table 2 International Conventions and Codes Pertaining to the Environment" was published by the Organisation in 2019.

45

Table 3 International Conventions and Codes Pertaining to the Environment" was published by the Organisation in 2019.

46

Table 4 International Conventions and Codes Pertaining to the Environment" was published by the Organisation in 2019.

46

Table 5 The Four Poseidon Principles

48

Abstract

ESG (Environmental, Social and Governance) reporting has gained increasing importance in the shipping industry as companies face growing pressure to adopt sustainable practices. Shipping companies are incorporating ESG framework to enhance transparency, manage environmental impacts, and address social and governance challenges.

The International Maritime Organization's enforcement of more stringent environmental legislation, as well as the Poseidon principles, and other environmental changes, necessitates that shipping companies allocate additional resources to Environmental, Social, and Governance (ESG) activities. International liner transportation companies are discovering that the implementation of ESG management is necessary for increased competitiveness.

Key words: Environmental, Social, Governance reporting, shipping industry

Περίληψη

Τα περιβαλλοντικά, κοινωνικά και διοικητικά κριτήρια (ESG) έχουν αποκτήσει αυξανόμενη σημασία στη ναυτιλιακή βιομηχανία, καθώς οι εταιρείες αντιμετωπίζουν μεγαλύτερη πίεση να υιοθετήσουν βιώσιμες πρακτικές. Οι ναυτιλιακές εταιρείες ενσωματώνουν το πλαίσιο ESG για να ενισχύσουν τη διαφάνεια, να διαχειριστούν τις περιβαλλοντικές επιπτώσεις και να αντιμετωπίσουν κοινωνικές και διακυβερνητικές προκλήσεις.

Η επιβολή αυστηρότερης περιβαλλοντικής νομοθεσίας από τον Διεθνή Ναυτιλιακό Οργανισμό, από τις αρχές του Ποσειδώνα, καθώς και άλλες περιβαλλοντικές αλλαγές, απαιτούν από τις ναυτιλιακές εταιρείες να διαθέσουν επιπλέον πόρους σε Περιβαλλοντικές, Κοινωνικές και Διοικητικές δραστηριότητες (ESG). Οι διεθνείς εταιρείες τακτικών γραμμών ανακαλύπτουν ότι η εφαρμογή της διαχείρισης ESG είναι απαραίτητη για την αύξηση της ανταγωνιστικότητας.

Λέξεις Κλειδιά: Περιβαλλοντικά, κοινωνικά και διοικητικά κριτήρια, Βιομηχανία της Ναυτιλίας.

Introduction

The shipping industry plays a significant role in global trade and generally in economic growth. As industry continues to develop, it faces increasing controls about its Environmental, Social and Governance (ESG) performance. As a result of the consistently occurring changes in both our economy and our society, we are confronted with a wide variety of difficulties and opportunities in the world that we live in today, which is always changing. The year 2020 has witnessed a notable rise in the quantity of occurrences that are classified as "Black Swan" events. The epidemic caused by COVID-19, the collapse of the stock market in the United States four times in a span of two weeks, the outbreak of locusts in Africa, and the delisting of Luckin Coffee due to fraudulent activity have all contributed to the emergence of worries regarding the environment, society, and government. Integrated and sustainable development is a notion that has attracted the attention of people all around the world. As a result of the growing environmental, social, and economic difficulties that are linked with sustainable development, numerous national and international organizations and especially shipping companies have created action plans, such as ESG, in order to establish a framework that is both comprehensive and sustainable.

Table 1 presents a comprehensive framework that incorporates the environmental, social, and governance aspects of the ESG concept, as stated in the study that was conducted by the EBA in 2021. In the context of responsible investing, the concept of ESG originated. Responsible investing is a strategy approach that actively engages in ownership and includes environmental, social, and governance concerns into investment decisions, according to the Principles for Responsible investing (PRI), which defines responsible investment as a strategic approach (PRI, 2021). Investors utilize environmental, social, and governance (ESG) as a standard and methodology to evaluate the conduct of corporations and forecast the outcomes of future financial situations. In order to be able to evaluate the sustainability of enterprises, it is vital to have a solid understanding of the importance of ESG. Both the process of reviewing investments and the process of making decisions are significantly impacted by these three essential parameters. It is essential to take environmental, social, and governance (ESG) factors into account when evaluating

the long-term viability and societal impact of corporate activities. The European Banking Authority (EBA) asserts that these elements have the potential to exert a substantial impact on the financial performance and solvency of individuals, governments, and organizations alike.

Table 1 ESG framework

https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Reports/2021/1015656/EBA%20Report%20on%20ESG%20risks%20management%20and%20supervision.pdf

Dimension	Factors	Definition
Environmental (E)	• GHG emissions • Energy consumption and efficiency • Air pollutants • Water usage and recycling • Waste production and management (water, solid, hazardous) • Impact and dependence on biodiversity • Impact and dependence on ecosystems • Innovation in environmentally friendly products and services	Environmental matters that may have a positive or negative impact on the financial performance or solvency of an entity, sovereign, or individual.
Social (S)	• Workforce freedom of association • Child labor • Forced and compulsory labor • Workplace health and safety • Customer health and safety • Discrimination, diversity, and equal • Opportunity • Poverty and community impact • Supply chain management • Training and education • Customer privacy • Community impacts	Social matters that may have a positive or negative impact on the financial performance or solvency of an entity, sovereign, or individual.
Governance (G)	• Codes of conduct and business principles • Accountability • Transparency and disclosure • Executive pay • Board diversity and structure • Bribery and corruption • Stakeholder engagement • Shareholder rights	Governance matters that may have a positive or negative impact on the financial performance or solvency of an entity, sovereign, or individual.

Since its initial aspect in 2004, the ESG principle has been successfully adopted in a number of developed nations, including those in Europe, the United States, and other countries. In order to promote the expansion and development of the environmental, social, and governance components, as well as the overall ESG framework, we have put into action a variety of activities that have a significant impact upon the situation. The invention of the ESG Rating System, the ESG Disclosure Criteria, and the ESG Indicator System are all examples of these accomplishments. A new framework for sustainable development is being gradually shaped by these elements. The concept of environmental, social and governance (ESG) is gaining popularity and is being acknowledged more and more. Scholars all

over the world have shown a substantial amount of interest in the topic of environmental, social, and governance (ESG) due to extensive study, practical application, and promotion. In the present moment, there is an absence of literature reviews concerning ESG research. Daugaard (2020) highlights the fact that the primary focus is on environmental, social, and governance (ESG) initiatives. The importance of environmental, social, and governance (ESG) indicators in socially responsible investing (SRI) is shown in a study that was carried out by Widyawati (2020). In a study that was conducted not too long ago, Drempetic and colleagues (2020) investigated how the ESG score influences the evaluation of a company's performance in terms of sustainability. Eccles and Viviers (2011) investigate the historic significance of the term "ESG" in the context of the investment industry as well as its continued relevance in the present day. In addition, Ziolo et al. (2019) delves into the significance of environmental, social, and governance (ESG) factors in the process of making financial decisions. The effectiveness and functioning of corporate governance (G) in relation to environmental, social, and governance (ESG) concerns have also been investigated by Yoshikawa et al. (2021), who have performed literature studies on the subject. In addition, Aluchna and Roszkowska-Menkes (2019) investigate the relationship between corporate governance and the responsibility of corporations to their communities. In the present moment, it is obvious that environmental, social, and governance (ESG) evaluations concentrate exclusively on one aspect of ESG aspects, and there is a dearth of study on environmental (E) and social (S) factors. Additionally, it is of the utmost importance to evaluate the future financial performance and social effect of enterprises, taking into consideration issues pertaining to governance, social issues, and the environment. The environmental, social, and governance (ESG) principle is an important investment principle that plays a significant part in the long-term growth and sustainability of businesses. In addition to this, it is of the utmost importance to thoroughly evaluate the interaction between these many components.

The international shipping industry is a leading provider of logistical services all over the world. Supply chains around the world rely heavily on maritime transportation, which also serves as a gateway for countries to access markets in other countries. Approximately eighty percent of all freight transportation around the world is carried out by sea, as stated by the United Nations Conference on Trade and

Development (UNCTAD) in the year 2019. According to forecasts made by the United Nations (UN), the worldwide marine trade is anticipated to see a growth rate of 3.5% on an annual basis between the years 2019 and 2024. This will result in the transportation of an astounding 11 billion tonnes of goods. It is estimated that around one-third of world trade is comprised of oil, natural gas, and petroleum products. The remaining two-thirds of global trade is comprised of a variety of commodities, including iron ore, coal, and grain. The global economy is strongly dependent on the worldwide supply of food, basic commodities, and energy, which is why international shipping plays such an important part in driving the economy of the entire world.

According to a report that was published by the World Trade Organization in the year 2020, investors have been drawn to the transportation industry due to its rapid expansion in comparison to global production. According to the findings of a study that was carried out by Grelck et al (2009), it was found that investment portfolios that included shares of international transport companies resulted in a greater rate of return for investors. On the basis of this discovery, it would appear that investing in shipping equities could provide investors with a lucrative opportunity to extend their portfolio.

At the same time, several scholars have brought attention to the notion if the shipping business is sustainable. It is essential for marine companies to take into account a variety of factors, including economic instability, environmental impacts, social responsibilities, and long-term financial considerations, according to the findings of research carried out by a number of authors (Di Vaio et al., 2021; Fasoulis, Kurt 2019; Lee et al., 2019; Wu et al., 2020; Albertijn et al., 2011). Previous research (Giannakopoulou et al. 2016, Lirn et al. 2014) has mostly concentrated on determining the extent to which the global transportation industry has an effect on the economy. In order for governments to fulfill their social and environmental duties, it is necessary for corporations to fulfill those commitments. During the year 2019, the COVID-19 sickness outbreak had a huge influence on economies all across the world, including both developed and developing economies. The worldwide stock markets saw a significant loss of between 25 and 30 percent in March of the year 2020. Additionally, the COVID-19 epidemic that occurred in 2020–2021 had a significant influence on the share prices of transportation companies, which resulted in a significant amount of volatility. As a consequence of the rapid spread of the

coronavirus, the international shipping industry has been confronted with significant challenges in terms of maintaining cargo schedules. There is a paucity of research on the fundamental components that would enable international shipping firms to continue their operations in the middle of the COVID-19 epidemic, despite the fact that there is an increasing demand for the vital contributions to society that are produced by these enterprises.

Using particular financial indicators, investors often place a high priority on determining whether or not transportation companies are financially sustainable before investing in them. Earnings per share (EPS) and return on equity (ROE) are two financial measures that are frequently utilized. However, the long-term survival of transportation companies and their potential for expansion are impacted by factors that go beyond the traditional financial benchmarks that investors take into consideration.

In addition, in order to maintain their operations over the difficult COVID-19 period, these companies were dependent on borrowing money from outside sources. After the COVID-19 epidemic, financial institutions have grown more cautious in their lending procedures toward transportation industries. This is because of the increased risk of potential infections. As a result, the capacity of global shipping corporations to obtain money from the financial markets is a factor that restricts their capacity to expand their fleets. Funding for international shipping companies can be obtained through a variety of avenues, such as the market value of bonds, creditworthiness, maturity duration, and return on investment (Alexandridis, et al. 2018, Thai, Jie 2018). The importance of bonds cannot be overstated in this context. Prioritizing bond financing requirements was not given the priority it deserved prior to the COVID-19 crisis, despite the fact that they play a significant role in improving future cash flow for transportation businesses through fleet growth and financing. At the same time, global investors are becoming more aware of the significance of socially responsible investment, also known as SRI. This type of investment takes into account the social and environmental impacts of a firm in addition to its financial rewards.

In addition, governments all over the world have enacted legislation that mandate that publicly traded companies adhere to particular environmental, social,

and governance (ESG) requirements. These entities are consequently confronted with significant financial obligations as a consequence. Companies in the shipping industry are required to disclose the financial and nonfinancial information associated with the sustainability aspects of their operations associated with their operations. The costs that are linked with environmental, social, and governance projects, at the same time, may be concealed or may not be reported accurately (Lu et al. 2009). Shipping firms have the choice of replacing their older, more polluting ships with more contemporary boats that make use of desulfurization technology (Lu, et al 2009). This is because of the impact that shipping corporations have on the environment. It is recommended that maritime enterprises take into consideration the possibility of enhancing the circumstances of crew quarters that are not well maintained (Tamayo-Torres et al 2019, Shin, Thai 2015). This would aid in reducing the likelihood of the transmission of COVID-19 among crew members who share living quarters. Shipping companies have the chance to improve their safety procedures in order to protect their personnel, which is an aspect of social responsibility that they may take use of (Shin, Thai 2015). For the purpose of improving their corporate governance, maritime businesses have the option of appointing independent directors rather than family members (Tang, Gekara 2020).

In 2021, the United Nations emphasized that the significance of environmental, social, and governance practices has considerably expanded during the course of the COVID-19 period. Shipping firms are susceptible to being greatly impacted by a number of measurable elements that can have an effect on their operations. Instances of human or technical errors, such as the notable incident of the Evergreen cargo ship clogging the Suez Canal in March 2021, are among them. Other examples include the frequency of COVID-19 cases among dock workers. As a result of these circumstances, both tariffs and expenses have climbed dramatically.

In addition, shipping companies are frequently subjected to unfavorable occurrences, regardless of whether they are located on land or are operating in open waters. The COVID-19 outbreak has caused certain delays in the immediate transit of cargo for shipping companies. These delays have occurred on occasion. Through the implementation of proactive strategies, including the development of emergency response plans, the emphasis on worker safety, and the commitment to timely cargo delivery amidst the challenges posed by the COVID-19 pandemic, these organizations

successfully addressed these issues (Haider, et al 2019, Kavussanos, Tsouknidis 2014, Grammenos, et al 2007). In the course of the pandemic, when a person tested positive for COVID-19, shipping companies moved the entire crew back to their former ports of call in an effective manner. As a consequence of these circumstances, there is a risk that the ship may encounter a delay and will be required to increase its speed in order to unload on the date that was originally anticipated, which will result in increased consumption of fuel. These actions resulted in a drop in the income of the corporation, in addition to an increase in the expenses related to oil and operations. Due to the lack of financial accounting that were able to reflect these cost-influencing aspects during the COVID-19 epidemic, the full scale of the crisis has been obfuscated.

Generally speaking, businesses that put these plans and strategies into action tend to achieve better financial results than their rivals. Additionally, a shipping company can gain a competitive edge, improve income, and lower vessel utilization turnover rates by developing effective emergency plans to reduce traffic and crew diseases. These measures can be used to lessen the likelihood of employee sicknesses. Additionally, the cash flow and financial performance of the company are improved as a result of these aspects, which makes the company more appealing to prospective investors.

1. Environmental, social, and governance disclosures and performance affect corporate value

The relationship between Corporate Social Responsibility (CSR) and Financial Performance (FP) has been the subject of extensive and well-established research. For more than four decades, it has been acknowledged as a critical issue to determine whether the positive economic consequences of bearing positive social and environmental impact may also benefit the corporate entity. The potential for a financial compensation is all that is necessary to motivate ethical business practices and redirect attention from the realms of corporate ethics and moral philosophy to the contemporary economy. By employing the stakeholder theory (Freeman, 1983) and its practical implications (Jones, 1995), advocates of corporate social responsibility (CSR) have suggested that CSR can assist in the establishment and reinforcement of dependable relationships with a diverse array of stakeholders, including consumers, employees, local communities, environmental activists, and concerned citizens, which are essential to the company's long-term financial stability and success.

Some specialists contend that organizations do not generate financial benefits from their exceptional social performance. Milton Friedman, a distinguished economist, has consistently maintained his opposition to corporate social responsibility (CSR). The author of the renowned 1970 paper "The social obligation of firm is to expand its revenues" argued that shareholders bear an unwarranted and essentially undemocratic burden when they adopt Corporate Social Responsibility (CSR). He further stated that the expenses associated with the implementation of CSR surpass any potential practical benefits as a result of the misallocation and abuse of substantial corporate resources (Friedman, 1970).

Academics in a variety of disciplines, such as finance, marketing, environmental economics, business ethics, and strategic management, have empirically investigated the relationship between corporate social responsibility (CSR) and financial success. In an effort to ascertain whether or not corporate social responsibility (CSR) could actually result in significantly enhanced financial benefits for companies, these studies have investigated a variety of aspects and perspectives.

Over the past two decades, there has been a growing public interest in Corporate Social Responsibility (CSR) and the resulting expansion of the Socially Responsible Investment (SRI) sector. This has prompted researchers to investigate the potential correlation between financial performance (FP) and corporate social responsibility (CSR).

The scope and volume of the CSR-FP literature are partially responsible for its relevance. Griffin and Mahon (1997) conducted research that highlighted the diversity and breadth of the corpus of work that was already in existence at the time. Their argument was that the majority of empirical findings are not entirely reproducible. Over the years, the persuasiveness of this argument has grown (Malik 2015). Research on the connection between financial performance (FP) and corporate social responsibility (CSR) has identified the following differences:

- i. There are numerous methods for defining and generating financial performance (FP) and corporate social responsibility (CSR).
- ii. The potential outcomes from the implementation of various theoretical paradigms
- iii. The sector, country, and time period under consideration, as well as the type and magnitude of the Financial Performance (FP) measure used, the asset class being analyzed, and the specific dimension of interest in CSR, are all subject to variation.
- iv. Utilizing a variety of econometric methodologies.

Broad conclusions that would provide interested academicians or professionals with a comprehensive perspective on the subject have been challenging to reach in light of these diverse circumstances. Regrettably, the corpus of research on the subject is not adequately summarized in sufficient literature reviews that identify any significant knowledge gaps. The apparent inherent difficulty of the undertaking is exacerbated by this.

1.1. Social Disclosure

The term "social disclosure" refers to the information that a corporation discloses to the public regarding its operations, performance, or standards associated with the social impact of corporate operations. This information is typically included in the company's annual accounts or another report. Such documents are most commonly known as sustainability reports, but they are also variously known as corporate social responsibility reports, environmental impact reports, and corporate accountability reports. It is believed that the records contain essential information regarding the environmental sustainability of a company's operations. Sustainability is the ability to satisfy the requirements of current and future stakeholders without sacrificing the ability to meet the demands of the present. This is facilitated by the preservation of social, financial, and environmental resources (Dyllick and Hockerts, 2002).

Mandatory social disclosures are those that are mandated by law, while voluntary social disclosures are those in which corporations are permitted to determine the type and quantity of information they publish. The disclosure rates in these nations have been consistently increasing as a result of the gradual adoption of mandatory reporting requirements by a greater number of nations as disclosure laws have evolved (Ioannou and Serafeim, 2016). Brazil, China, Denmark, Hong Kong, India, Malaysia, and South Africa have implemented mandatory sustainability disclosure policies. In the late 2000s, the majority of these nations introduced their own legislation. However, the implementation of comprehensive and mandatory sustainability reporting for all companies appears to be a distant prospect, as disclosure regulations are typically implemented through a "comply or explain" strategy, which permits organizations to withhold information if they can provide a compelling justification. It is anticipated that the penalties for noncompliance will be less severe than those for failing to disclose conventional financial accounts (Ioannou and Serafeim, 2016). Nevertheless, the United Nations is promoting the submission of sustainability reports by all major corporations by 2030. Companies have the option to be proactive or reactive in their approach to social and environmental reporting. Proactive behavior is characterized by surpassing the minimum expectations of

stakeholders. Conversely, being reactive involves reacting to social pressures to the appropriate extent and at the appropriate time (O'Dwyer and Norfolk, 2004).

Gray et al. (1995, p.49) contended that social reporting "did not appear to be a systematic activity" at the time of their writing, and interest in making non-mandatory disclosures fluctuated as much as any fashion. This sentiment was consistent with Puxty's (1991) assertion that it was not a matter of importance to the majority of companies. The customs evolved over time and across numerous countries (Andrews et al., 1989; Guthrie and Parker, 1990; Teoh and Thong, 1984). Gray et al. (1995) also note that the percentage of companies making disclosures within their annual accounts and the extent of the information they present in the UK increased substantially between the 1970s and 1990s. This growth was particularly pronounced in community and environmental disclosures, in addition to employee-related disclosures, which were already prevalent. In 2004, Maltby conducted a study on a steelmaker from the early 20th century in the United Kingdom. The practice of disclosing corporate social responsibility is not as innovative as many contemporary writers perceive it. In reality, it has been occurring for over a century, although not consistently.

What specifications do companies disclose, and how has this information changed over time? Maltby (2004), Hogner (1982), and Guthrie and Parker (1989) conducted individual case studies on corporations in the United States, the United Kingdom, and Australia in the early 20th century. Their findings indicate that these organizations prioritized social value reporting in addition to assuring the safety of their employees and the quality of their work environment. Pollution and other environmental issues received significantly less attention. Recently, sustainability reporting has evolved, according to Hahn and Kühnen (2013, p. 5). Although environmental concerns, such as waste and emissions, received increased attention in the 1980s, the production of additional "social reports" to supplement conventional financial reports was infrequent in the 1970s. Joint reports, which combined financial and environmental data, began to appear in the late 1990s. This trend has persisted since the Global Reporting Initiative (GRI) program (Kolb, 2010). In recent years, comprehensive reports that illustrate a corporation's operations from all perspectives have been generated by consolidating economic, social, and environmental data into a

single document. This development has been spearheaded by South Africa (Adams and Simnett, 2011).

The absence of a universally agreed-upon theoretical framework that delineates the benefits of social reporting for companies and the various stakeholder groups it will affect is a recurring issue in the literature (Ullman, 1985). The majority of the academic discourse in this discipline is still dominated by philosophical questions. It examines the long-term sustainability of the current corporate landscape and the effects of social accounting on companies and society. This study raises ethical concerns about the extent to which accounting academics should challenge and advance dialogues on the societal and environmental issues that businesses create, as discussed in Bebbington and Thomson, 1996; Gray, 2002; Gray and Bebbington, 2000; and O'Dwyer, 2001.

What is the rationale behind the inclusion of information on social and environmental issues in the annual reports of enterprises, which is not required by law? Three hypotheses are presented by Matthews (1997): They aspire to *establish a "social compact"* in order to *increase their financial and social value*. Given the political climate of the 1960s and 1970s, companies were required to demonstrate their commitment to conducting business in a manner that was reflective of social and environmental concerns, a concept known as legitimacy (Roberts, 1992). The business benefits from obtaining legitimacy because it reduces the regulatory burden that would otherwise impede its ability to execute its plan and avoids the public's awareness of its environmental irresponsibility (Brammer and Pavelin, 2006, p. 1169). Companies that furnish sustainability information may accrue numerous financial advantages, according to Hahn and Kühnen (2013). Enhanced transparency, improved worker motivation, improved brand value and reputation, and support of the company's control mechanisms are among the benefits.

Proactive corporate behavior and financial performance can be demonstrated by emphasizing specific aspects of an organization's operations that either meet or exceed stakeholder expectations. Some observers harbor suspicions regarding corporate social responsibility (CSR) due to their belief that businesses may be engaging in unethical behavior. This raises concerns regarding "greenwashing," a

practice in which businesses enhance their social performance solely for cosmetic purposes, rather than genuinely enhancing sustainability. Occasionally, organizations emphasize solely the positive aspects of their corporate social responsibility initiatives, while concealing their inadequate performance in other domains.

Brammer and Pavelin (2006, p. 1169) contend that corporate disclosure is intended to influence the opinions of external financial stakeholders regarding the company's future financial prospects, rather than to genuinely mitigate environmental or social harm. This perspective is shared by Frost et al. (2005) and Aerts and Cormier (2009). Additionally, the same research indicates that, when organizations are permitted to disclose information without restriction, they typically opt to disclose a limited quantity of material that would favorably represent them. This phenomenon raises questions regarding the extent to which their corporate social disclosures are comprehensive. This emphasizes the necessity of independent verification for these narratives.

Some scholars contend that corporate "sustainability reporting" is a tool for companies to redefine the sustainability discussion in order to advance their own objectives, rather than being genuinely about sustainability (Gray, 2010). This argument posits that sustainability reporting should be entirely replaced with a more radical approach, as it is detrimental. Additionally, the argument discounts sustainability reporting as a passing trend that would soon dissipate (Burritt and Schaltegger, 2010, p. 829). In order for organizations to advance, Burritt and Schaltegger contend that this perspective is inadequate for addressing actual management issues. Therefore, a more pragmatic approach is required.

1.2. Social Disclosure and CSR Performance

Clarkson et al. (2008) suggest two hypotheses that predict distinct signals regarding the relationship between environmental performance and voluntary environmental disclosure. They argue that the two variables are expected to be positively associated according to economic theories of disclosure, which pragmatically evaluate a company's activities and are also referred to as the Dye (1985) approach. According to this approach less effective companies encounter greater challenges in competing with environmentally conscious corporations that are committed to demonstrating their exceptional qualities to investors. In contrast,

theories of stakeholder and legitimacy that are derived from political and sociological perspectives rather than economic ones suggest a negative correlation. This implies that organizations that are not performing well have a greater incentive to disclose data in order to persuade stakeholders that their actual actions exceed their perceptions and, as a result, improve their reputation. It is advisable to consider a third type of thought that is based on moral principles. This school of thought argues that companies should conduct themselves in a manner that is ethical and responsible in the social and environmental spheres, regardless of whether it benefits or harms their financial performance (Carroll, 1979; Jones, 1995).

Public awareness, consumer pressure or boycotts, and divestment by ethical investors are all significant risks that companies face when they conceal or obfuscate their inadequate social or environmental performance (Roberts, 1992; Sinclair-Desgagné and Gozlan, 2003).

Sustainability accounting is a technique that is employed to exclude the expenses necessary to preserve natural resources from accounting earnings, as per Bebbington and Gray (2001). According to Gray and Bebbington (2000) and Maunders and Burritt (1991), accounting academics were dissatisfied with the narrow emphasis on profit generation, which failed to account for social or environmental concerns. Additionally, as Milne (1996) observes, a significant number of individuals believed that monetary value was perpetually accessible. A set of Sustainability Accounting Guidelines was devised by the GRI in 2002, which significantly increased the formality and significance of this process. The metrics of these guidelines are categorized as social, environmental, and pecuniary. The concept of the "triple bottom line" is established through these measurements. Lamberton (2005) provides a conceptual framework for sustainable accounting in comparison to conventional financial accounting in his examination of the field's evolution.

Setting aside funds to establish the necessary procedures for measuring, accumulating, and reporting pertinent data is essential for the production of sustainability disclosures that contain tangible and quantifiable information (Buhr, 2002; Cormier and Magnan, 1999). Consequently, it is anticipated that companies would opt to disclose sustainability if the benefits outweigh the costs. Companies that exhibit exceptional social and environmental performance should provide more

comprehensive and detailed voluntary disclosures from this perspective. In contrast, organizations that experience difficulties in these regions may opt to restrict the scope of their disclosures in order to prevent future litigation from accumulating sufficient evidence to identify them. However, it is important to remember that a lack of transparency could also harm their brand, as stakeholders who are unaware of the situation may project the worst possible outcome. This line of reasoning is corroborated by empirical data. For example, Luo and Tang (2014) examined carbon disclosure, a voluntary practice that is rooted in the Carbon Disclosure Project (CDP), using a substantial sample of individuals from numerous countries. In line with preceding research conducted by Freedman and Jaggi (2004), which concentrated on a smaller sample of US utility companies, they demonstrated that environmental performance and voluntary carbon disclosure are positively correlated.

It is anticipated that the trade-offs outlined above will differ based on the sector and the specific characteristics of a company, including its scale, management approach, and technique. These disparities may be influenced by a company's operating manner, reputation capital, and media presence, whether they are business-to-business or business-to-consumer. Companies that have established a strong reputation may find that sustainability reports are beneficial in protecting their brands. Additionally, larger organizations are more inclined to disclose information voluntarily due to their ability to allocate the fixed costs of information generation across a broader scope. Large corporations have an impact on society and the environment, and they are also more closely monitored by the public as a result of their increased visibility (Fortanier et al., 2011). In contrast, organizations that are heavily dependent on leasing funds or have substantial debt would encounter difficulties in financing sustainability reporting. According to Stanny and Ely (2008), organizations that possess obsolete assets are less inclined to disclose information regarding sustainability, as they are more likely to employ outmoded technology that generates higher levels of pollution.

Companies in sectors that are recognized for their high pollution levels may be required to adhere to sector-specific reporting policies (Cormier and Magnan, 1999; Parsa and Kouhy, 2008). Further, it is a widely recognized fact that publicly traded companies are more inclined to disclose information regarding their social and environmental operations than privately held businesses (Haddock, 2005). In

comparison to other nations, Sweden, Norway, and Denmark have more stringent regulations that necessitate sustainability reporting. Companies are required to disclose their environmental impact on these countries (Hess and Dunfee, 2007). Although it is simple to exaggerate the differences in reporting methods between countries, de Villiers and Alexander (2014) have found that mining companies in South Africa and Australia have disclosure policies that are rather similar in almost every aspect, despite the significant differences in societal and environmental challenges.

Brammer and Pavelin (2006) conducted an empirical study to investigate the factors that influence the quantity and quality of environmental disclosures provided by a selection of significant UK companies. They exhibit that, despite the fact that firms with subpar environmental performance are no more likely to make an environmental disclosure than others, they will ensure that the disclosure is scrupulously nuanced to minimize the likelihood of adverse reactions once it is made.

Clarkson et al. (2008) conducted an investigation into the relationship between environmental disclosure and environmental performance. They discovered a positive correlation between the two, as evidenced by data on environmental disclosures made by US corporations in five highly polluting sectors in 2003. This is consistent with the signaling hypothesis, which is included in the list of economic justifications for such disclosures. Corporate social responsibility reports can assist a corporation in upholding its commitment to ethical conduct over time (Boot et al., 1993). Clarkson et al. (2008) assert, however, that the data corroborates socio-political theories. They contend that companies with a well-known negative environmental history attempt to establish credibility by sharing information. Nevertheless, stakeholders frequently encounter challenges or are unable to verify these assertions.

Patten (2002) argues that the contradictory research findings regarding the empirical relationship between environmental performance and disclosure may be the result of numerous methodological deficiencies that have plagued studies to date. These issues encompass difficulties in precisely identifying the primary variables, a paucity of control variables, and sampling issues. Another issue arises from the combination of mandatory and voluntary disclosures provided by numerous authors. Situations such as oil spills, penalties for environmental infractions, or injuries from

hazardous waste typically have significant consequences that are beyond the control of the individual. This implies that stakeholders may interpret these disclosures differently than they would if companies elect to demonstrate their exceptional performance by including additional environmental or social data in their annual reports.

According to certain studies, sustainability reporting can improve corporate social responsibility (CSR) performance by enabling external stakeholders to monitor and observe CSR activities (Topping, 2012). According to Christensen's (2016) research, organizations that disclose information readily are less inclined to engage in future misconduct, such as instances of discrimination or bribery that result in legal action. Businesses with more intricate organizational structures are particularly susceptible to this effect. Additionally, he determines that corporations that engage in malfeasance experience less severe losses in their stock prices if they are discovered to have submitted CSR reports. This is due to the fact that their prior good conduct provides them with a certain level of security.

2. CSR disclosure in shipping

In recent years, there has been a significant increase in the interest of legislators, companies, and authorities in corporate social responsibility (CSR) initiatives. This development can be partially explained by the numerous financial scandals that have recently impacted Bre-X Minerals, Exxon Mobil, Sea Star, Torrey Canyon, and numerous other energy accidents, as well as the collapses of Enron, Parmalat, and Lehman Brothers. Furthermore, a 2010 study conducted by the United Nations Global Compact on chief executive officers worldwide revealed that the vast majority of them believed that corporate social responsibility (CSR) was necessary to increase profitability (Drobetz et al 2014).

The current prevailing belief is that companies that are socially conscious—that is, those that make ethical and financial contributions to the local communities they serve—have a greater likelihood of achieving growth in terms of their reputation and income (Drobetz et al 2014). So, the subsequent research question is addressed: The global shipping sector has experienced a significant increase in corporate transparency as a result of the implementation of CSR disclosure regulations. If this is the case, the efficacy of a company should be directly correlated with its CSR disclosure. This subject is rendered even more intriguing by Hong et al. (2012)'s anecdotal evidence, which indicates that the annual corporate social responsibility (CSR) expenditures of US companies can exceed hundreds of millions of dollars. This suggests that the potential costs of corporate social responsibility (CSR) may outweigh any benefits it may offer.

Despite the fact that they have largely been unsuccessful in establishing a direct correlation between corporate value (or profitability) and CSR disclosure, previous research (Mattingly and Berman, 2006; Baron et al., 2011) has examined the Corporate Social Responsibility (CSR) paradox within a complex institutional framework. Margolis et al. (2007) have established a positive correlation between

financial performance of companies and CSR transparency. Nevertheless, the influence of this relationship is somewhat restricted. The industry has surpassed many other land-based companies in the development of a broadly accepted regulatory framework for corporate behavior, primarily due to factors such as globalization, intense competition, and great volatility. The primary significance of shipping is derived from its fundamental role in the sphere of global trade. Therefore, it consistently establishes the standard for promoting greater transparency and accountability regarding critical issues such as energy efficiency, worker safety and security, ocean and coastal health, global climate change, waste management, and the advantages and disadvantages of impacting nearby communities (Coady et al., 2013). The International Maritime Organization (IMO) regulates safety regulations in the shipping industry, while the International Labour Organization (ILO) supervises labor rights. Additionally, they provide the standard institutional framework that enables the disclosure of corporate social responsibility (CSR) strategies. The maritime industry's corporate governance system is significantly influenced by flag states, classification societies, and port regulations, which are essential for the enforcement of laws.

2.1. Corporate Social Responsibility (CSR), the performance of a corporation, and the risk associated with the firm

In the past, Friedman (1970) and others contended that individuals are responsible for social obligations rather than corporations. At that time, the notion of corporate social responsibility (CSR) was considered to be fundamentally incompatible with the objectives and essence of a company, which were intended to be exclusively dedicated to increasing shareholder profits. The concept of Corporate Social Responsibility (CSR) is not well defined, which is why managers are currently experiencing difficulty in determining the appropriate level of social responsibility that their companies should embrace. However, the decision as to whether their stock gains are a reasonable reflection of their social conscience is ultimately up to the individual shareholders. Lastly, the primary concern of CSR critics is that the initial costs of implementing CSR initiatives would likely exceed the long-term financial returns, thereby contradicting the objective of increasing shareholder value.

Nevertheless, a significant number of corporate management texts that have been published since Friedman's time have embraced corporate social responsibility

(CSR) as a morally sound business strategy that has the potential to increase the value of shareholders. Brooks (2012) asserts that the fundamental principles of corporate social responsibility are consistent with the principles of the free market. Freeman (1984) is of the opinion that corporate social responsibility (CSR) is the most effective method for minimizing the likelihood of stakeholder disputes and transaction costs. This perspective posits that corporate social responsibility, or CSR, is a potent tool for improving a company's reputation and reducing the likelihood of encountering consumer protests and legal action. In their concise review of the management literature, Eichholtz et al. (2010) suggest that organizations that implement proactive, well-defined corporate social responsibility (CSR) initiatives may outperform their competitors in terms of performance. This can be attributed to a variety of factors, such as improved firm reputations, reduced regulatory concerns, reduced intrusion from political and activist organizations, and increased profitability as a result of lower input prices and increased labor productivity. Additionally, performance can be associated with corporate social responsibility (CSR) due to its inherent assessment of managerial abilities, particularly those associated with long-term orientation and foresight. Additionally, Guenster et al. (2011) assert that it may serve as evidence of technical advancement and mitigates the risk of injury to runners.

Bouslah et al. (2013) maintain that the impact of corporate social responsibility (CSR) on anticipated future financial flows and/or risk is a prerequisite for its impact on business performance. According to Sharfman and Fernando (2008), the probability of environmental crises that can adversely impact a corporation's anticipated revenue flows is reduced by the implementation of improved environmental risk management strategies, such as the reduction of emissions and pollutants. The following are included: legal actions, fines, expenses for environmental incident cleanup, and a negative business reputation as a consequence of legal activities. Goodwill, which is occasionally referred to as "moral capital," is financed through corporate social responsibility (CSR) initiatives. According to Godfrey et al. (2009), moral capital functions as a form of insurance, providing protection during a crisis or unfavorable event.

Investors evaluate assets exclusively on the basis of payoffs, which in turn determine the total consumption they generate, in conventional asset pricing models. (Fama and French, 2007). The concept of perfect capital markets is challenged by

other theoretical models proposed by Heinkel et al. (2001), Barnea et al. (2005), and Mackey et al. (2007). These models are particularly focused on capital markets that are divided along the lines of Corporate Social Responsibility (CSR) and take into account variations in investor preferences (Chowdhry et al. 2019, Oehmke and Opp 2024). When making investment decisions, conventional investors consider only financial factors, such as risk and return. Conversely, socially conscious investors consider both financial variables and corporate social responsibility (CSR) criteria. The "neglect effect" that is induced by corporate social responsibility is consistently projected by these models (Drobetz et al 2014). This effect results in an increase in demand for securities of companies that prioritize social responsibility, while a decrease in demand for those that are perceived as "socially irresponsible." Subsequently, the former assets are occasionally assigned a higher value than they warrant (due to their initial higher returns but lower expected return and lower risk), whereas the latter assets are frequently assigned a lower value than they warrant (due to their initial lower yields but a higher expected return as compensation for the lack of risk-sharing opportunities and increased risk).

Merton's (1987) "investor recognition theory" enables the generation of comparable forecasts for inexpensive equities and fragmented markets. The model predicts two outcomes depending on whether companies with higher (lower) Corporate Social Responsibility (CSR) ratings are more likely to attract more (less) investors. The neglect effect and insufficient risk sharing of idiosyncratic risk will have an impact on pricing, rendering conventional asset pricing models ineffective. There will be a positive correlation between expected return and idiosyncratic risk if investors fail to diversify their assets. Second, as a firm's risk decreases with the size of its shareholder base due to increasing risk-sharing opportunities, firms with higher (lower) CSR will have lower (higher) expected returns. Consequently, firms would anticipate lesser (higher) returns as a result of increasing (decreasing) levels of Corporate Social Responsibility (CSR). Hong and Kacperczyk (2009) also substantiate the predictions of the investor recognition model by demonstrating that "sin" stocks—tobacco, alcohol, and gambling—have higher anticipated returns (and risks) due to the fact that they are not invested in by socially conscious corporations, such as pension funds. The model substantiates the notion that the market prioritizes

risk management and transparency policies associated with corporate social responsibility (CSR), as per Lee and Faff (2009).

The empirical data currently in the literature does not indicate a definitive correlation between corporate social responsibility (CSR) and business success. Research supporting this assertion is provided by Margolis and Walsh (2003), Orlitzky et al. (2003), Margolis et al. (2007), and Baron et al. (2011). However, an increasing number of empirical studies have demonstrated a direct correlation between corporate social responsibility (CSR) and numerous performance metrics for companies. For example, Preston and O'Bannon (1997) and Pava and Krausz (1996) both assert that financial performance and corporate social responsibility (CSR) are positively correlated. Strong stakeholder relationships and business success are positively correlated, as demonstrated by Stanwick & Stanwick (1998) and Verschoor (1998). Ruf et al. (2001) have found that corporate social responsibility (CSR) is positively correlated with sales growth and returns on sales. Bauer et al. (2005) investigate the active strategies implemented by conventional and "ethical" investment funds. They observe that learning helps moral fund managers perform even better, despite the conflicting outcomes they receive. The cost of instituting limits on socially responsible investments in relation to risk-adjusted returns is estimated by Geczy et al. (2005). They also demonstrate that the total proportion of socially responsible investments and the expertise of fund managers have an impact on these costs. The decision to support corporate social responsibility (CSR) is negatively correlated with insider ownership, as per the research conducted by Barnea and Rubin (2010). They comprehend this connection by employing the overinvestment theory as a framework. In particular, corporate social responsibility (CSR) contributes to the enhancement of shareholder value to a certain extent. The management opportunism theory, however, argues that employees of the firm may be inclined to overinvest in CSR initiatives in an effort to enhance their own reputation as moral business citizens beyond this point (Barnea, Rubin 2010). Eichholtz et al. (2010) have conducted research that suggests that rental rates for structures with a "green rating" are higher than those for nearly identical construction that lacks one. According to Guenster et al. (2011), "eco-efficiency" is the ability to generate additional value with fewer environmental resources and less environmental harm.

According to their research, the profitability, operational performance, and valuation of industrial corporations in the United States are influenced by eco-efficiency.

Empirical research on the value implications of corporate social responsibility (CSR) is fundamentally challenged by reverse causation. The debate regarding whether companies are effective due to their corporate social responsibility (CSR) or whether CSR is performed as a result of their success is unresolved. This is especially true for research that investigates the correlation between corporate social responsibility (CSR) indicators and annual firm value measures or trading strategy results. Companies with fewer financial constraints frequently allocate more resources to virtue and achieve superior kindness ratings (Hong et al., 2012). Based on the slack resources theory, which was previously examined by McGuire et al. (1988), they contend that companies are only moral when they are financially stable. Krueger (2013) resolves this methodological issue by employing an event study methodology. In general, he observes that investors react unfavorably to events that involve poor corporate social responsibility (CSR) and only marginally negatively to events that involve excellent CSR. The response is particularly robust when the material pertains to employees, communities, or the environment. Investors are attracted to positive news regarding corporate social responsibility (CSR) and its correlation with businesses' inadequate stakeholder relationships. In contrast, individuals exhibit negative reactions to positive events when it is anticipated that these outcomes would result from agency-related concerns. In 2013, Dimson et al. reported that activist investors experience an average aberrant return of 1.8% when they participate in corporate social responsibility (CSR) initiatives with American public corporations. Organizations experience improvements in their operational performance, profitability, efficiency, and governance as a result of the successful resolution of environmental, social, and governance challenges.

The majority of research fails to distinguish between the impact of enhanced corporate social responsibility (CSR) on cash flow and risk. Conversely, other research emphasizes the importance of risk and contends that corporate social responsibility (CSR) primarily has a systematic impact. This argument is founded on the fundamental premise of portfolio theory, which posits that financial markets only consider systematic risk when making pricing decisions. Additional research indicates that Corporate Social Responsibility (CSR) is not uniform across businesses, resulting

in specific hazards being impacted. Lee and Faff (2009) provide evidence of a negative correlation between idiosyncratic risk and a comprehensive evaluation of corporate social responsibility (CSR). Additionally, Luo and Bhattacharya (2009) have identified a detrimental correlation between corporate social responsibility (CSR) and both systematic and individual risk. Bauer et al. (2009) assert that organizations experiencing improved employee relations experience reduced expenses, improved credit ratings, and reduced erratic risk. Additionally, they generate indices to quantify employee interactions. According to Bouslah et al. (2013), the level of risk that a company encounters is not influenced by certain components of corporate social responsibility (CSR). In particular, they find that the causal relationship between a firm's risk and its strengths or issues in corporate social responsibility (CSR) is contingent upon the specific dimensions of CSR.

2.2. Corporate Social Responsibility (CSR) conduct and the disclosure of CSR activities

Research has demonstrated that the performance of a company is significantly influenced by the discrepancies between corporate social responsibility (CSR) disclosure and behavior. The majority of empirical research on corporate social responsibility initiatives distinguishes between CSR methods that have a positive social impact and those that have a negative one. The efficacy and effectiveness of a variety of policies are the subject of numerous studies. However, this chapter concentrates on the voluntary corporate social responsibility (CSR) disclosures made by shipping companies, despite the sector's already robust institutional structure, as it have been observed a growing trend among these companies to disclose this information in recent years. The effectiveness of this type of disclosure is widely questioned due to concerns regarding non-comparability, plausible behavior by companies, and opportunistic acts by businesses (Ingram and Frazier, 1980; Hobson and Kachelowicz, 2005). However, disclosure of CSR practices could provide intriguing insights into organizational transparency, rather than assessing the quality of a company's CSR initiatives (Margolis and Walsh, 2003; Margolis et al., 2007). Dhaliwal et al. (2006) assert that investors necessitate additional information beyond quality assessments to assess an entity's overall corporate social responsibility (CSR)

performance. Their hypothesis is that companies that promote their CSR initiatives in a transparent manner demonstrate their confidence in their success to investors, thereby presenting a favorable image. In contrast, it enables organizations to justify their inadequate corporate social responsibility (CSR) initiatives. The researchers conclude that the information contained in CSR reports is more comprehensive than what performance ratings can offer.

Corporate executives believe that disclosing information without restriction will enable their organizations to reduce their financing expenditures (Graham et al., 2005). The relationship between financial disclosures and capital expenses has been the primary focus of previous research. The evidence of a detrimental relation is consistently revealed in this corpus of research. For a comprehensive examination, consult the 2006 publication by Dhaliwal et al. A company's ability to attract new investors and expand its investor base through increased disclosure could result in improved risk sharing and reduced capital costs (Merton, 1987). When the quality or accuracy of disclosures that are customized to the specific company improves, the correlation between the cash flows of a firm and those of other companies decreases. This decrease in correlation results in a decrease in the cost of capital and lower betas for individual companies (Hughes et al., 2007; Lambert et al., 2007). In addition, the information divide between management and investors can be bridged through increased disclosure, as suggested by Verrecchia (2001) and Amihud and Mendelson (1986). This can result in a decrease in transaction costs, a narrowing of the bid-ask gap, and a lower cost of equity capital. As long as the material pertains to the value, these guidelines should typically be applicable to both financial and non-financial disclosure, including CSR disclosure. In the final analysis, it is uncertain whether voluntary CSR disclosure would result in a lower cost of capital and, as a result, a lower expected return for investors. This can only be determined through empirical investigation.

A review of the published CSR reports from American businesses is conducted by Dhaliwal et al. (2006). The authors provide empirical evidence that illustrates how a potential decrease in equity incentives companies to submit voluntary CSR reports. In reality, organizations that demonstrate exceptional corporate social responsibility (CSR) performance experience a decrease in their cost of capital. Strong corporate social responsibility (CSR) performance typically attracts

committed institutional investors and garners more attention from financial analysts, in accordance with Merton's (1987) investor recognition theory. Brammer and Pavelin (2006) distinguish between the decision to disseminate environmental data freely and the assessment of its efficacy. Their empirical findings underscore the necessity of both types of decisions; however, there is significant heterogeneity among various groups in the factors that influence quality decisions and participation. Numerous studies have demonstrated that disclosing social performance events can mitigate adverse stock market repercussions, including those resulting from catastrophes or new regulations (Blacconiere and Patten, 1994; Freedman and Stagliano, 1991). The veracity of the provided material does not appear to influence this behavior.

2.3. CSR and the shipping industry

Numerous instances of corporate social responsibility that have gone awry in recent years have resulted in substantial financial losses for both individual companies and society as a whole. A sandbank in a protected section of the Great Barrier Reef was struck by a 230-meter-long ship that was carrying 65,000 tons of coal and 975 tons of heavy fuel oil in April 2010. The vessel was operating at maximum velocity. An oil spill occurred three kilometers after the gasoline tank detonation. The breach led to the most severe environmental disaster in the history of Australia. Trafigura, an oil trader, was fined one million euros in 2010 for unlawfully exporting hazardous garbage to West Africa. This is also a noteworthy example. This London-based corporation was initially convicted of crimes related to an environmental disaster. The case was centered on the toxic waste that was imported into Ivory Coast, which resulted in the illness of 30,000 Africans. For improper administration, four senior executives of the renowned state-owned Vietnamese shipping company Vinalines were apprehended in the summer of 2012. In 2009 and 2010, they were accused of making poor investment decisions and purchasing outdated vessels, resulting in a total cost of eighty million dollars.

The aforementioned instances are merely a small sample of the numerous incidents that have raised questions about Corporate Social Responsibility (CSR) in the marine industry. As a result, the implementation procedures are frequently enhanced and emphasized. In order to preserve its reputation, the maritime industry

must address the increasing societal expectations for transparency and corporate social responsibility (CSR) standards. Coady et al. (2013) provide a thorough examination of the corporate social responsibility (CSR) initiatives that are currently implemented in the maritime sector, as well as an examination of the industry's perspective on these strategies. Shipping companies are more inclined to make voluntary disclosures than companies in other sectors due to the industry's well-known environmental issues; however, the advantages of sharing such information are not as substantial in this case. It is anticipated that the increased transparency of shipping companies and the reduction of information collection expenses for investors will be facilitated by the increasing prevalence of corporate social responsibility (CSR) reporting. This has the potential to generate favorable financial outcomes.

Based on its inherent nature and dispersed character, the shipping sector may be characterized as having a substantial global focus. In reality, the maritime sector is fundamentally dependent on globalization. Ship owners would initially register their warships in their respective countries, and subsequently designate commanders and crew members from those same countries. Additionally, a substantial quantity of products would be transported to and from these countries. Nevertheless, ship owners were compelled to register their vessels in offshore nations, primarily as a result of the oil crisis of the 1970s. The primary objective is to reduce everyday operations and administration-related expenses, and the current workforce is comprised of workers from all over the globe. The shipping industry has been able to maintain and expand its position as a major participant in global trade as a result of globalization. Furthermore, it has been instrumental in facilitating the global transition to growing globalization. As a result, the maritime industry operates within a distinctive global institutional framework.

The International Maritime Organization (IMO) is the founding pillar of this global institutional system. It was primarily established following World War II and was known as the IMCO until 1982. The primary goal of SOLAS is to maintain and enhance the global standards for the preservation of life at sea. The second institutional pillar is the International Labor Organization (ILO), which was established in 1915 and is derived from the United States Seamen's Act. It was established subsequent to the Geneva International Labour Conference in 1920. The

Seamen's Code is primarily intended to provide guidelines and standards for shipboard personnel members.

Classification organizations impose restrictions on flag and port states, which are a fundamental element of national shipping architecture. A flag state is responsible for the implementation and maintenance of international maritime laws for all ships permitted to fly their flag, as stipulated by the United Nations Convention on the Law of the Sea (UNCLOS). A nation is obligated to lead the charge in preventing potentially hazardous or environmentally destructive ship activity as a flag state. Nevertheless, a significant portion of the flag state's operations are conducted by corporations that are located overseas. Enforcing flag laws by monitoring foreign ships is one of the numerous responsibilities of numerous national maritime administrations, such as those of port and coastal countries. The International Maritime Organization (IMO) and its members are responsible for the preservation of the legislative frameworks established to support SOLAS and the International Seamen's Code. The International Oil Pollution Compensation Fund (IOPC) is also monitored by flag states.

Regulatory agencies, which are occasionally referred to as classification societies, rigorously oversee each phase of a ship's existence, from design and construction to operation and disposal. They are of paramount importance in the advancement of technology. Over 90% of the bulk carrier and tanker vessels worldwide are regulated by the guidelines and standards developed by the thirteen member societies of the International Association of Classification Societies Ltd. These organizations supervise the construction of boats and ensure that they remain in compliance.

PSC, or port state control, is essential for the enforcement of corporate social responsibility policies. This company's objective is to verify the current state of foreign ships and ensure that they are adhering to international standards for marine safety, pollution management, and the living and working conditions of seafarers. PSC also ensures compliance in instances where the flag state or owner has failed to fulfill their obligation to adopt or guarantee compliance. Any deficiencies identified during an inspection may necessitate remediation either prior to or at the subsequent port of call. In the event that a vessel demonstrates significant deficiencies, it may be

stopped. Consequently, the Port State Control (PSC) serves as a safeguard against inadequate ship entry procedures in a port state.

Typically, it is believed that the maritime sector has a more sophisticated organizational structure than other land-based companies. In addition to ensuring the welfare of passengers and individuals, corporate social responsibility (CSR) initiatives can also mitigate environmental degradation. The implementation of Corporate Social Responsibility (CSR) in the shipping sector is primarily the responsibility of several institutional organizations, as national governments are unable to enforce standard shipping laws and regulations. Using a well-considered CSR approach could facilitate the interaction between shipping businesses and their consumers, as we suggest. The general reputation of shipping companies could be enhanced by the disclosure of Corporate Social Responsibility (CSR) information regarding practices and issues that are already under scrutiny by numerous institutional organizations. Additionally, they may provide financial assistance in difficult situations, such as loans (Det Norske Veritas, 2004; Coady et al., 2013).

It is probable that the extent of a company's disclosure of corporate social responsibility (CSR) is directly proportional to its financial leverage. In recent years, shipping companies, particularly those in the dry bulk and container sectors, have been under increasing pressure from lenders and shareholders to enhance the quality and consistency of their financial reporting. The necessity for increased transparency is a direct result of the inherent unpredictability of the shipping markets (Drobetz et al., 2012), which has resulted in a significant degree of uncertainty regarding the earnings of shipping businesses. There is a potential for a discrepancy between the book value and market value of a ship due to significant changes in market trends (vessel price risk). As a result of this situation, investors and financiers are currently more concerned about the future of their investments (Albertijn et al., 2011).

The term "slack" is used to describe the financial flexibility that arises from the use of minimal leverage, as per Graham and Harvey (2001). This theory posits that companies may effortlessly cover the administrative expenses associated with corporate social responsibility (CSR) disclosure if they possess sufficient resources. The "slack resources hypothesis," which is this theory, was investigated by McGuire

et al. (1988). Additionally, organizations with reduced debt levels may encounter decreased loan requests from their lenders. Their financial flexibility facilitates the financing of CSR disclosures, and they may be able to prioritize organizational initiatives that are only indirectly related to the company's financial success. The empirical data in Ferguson et al. (2002), Leftwich et al. (1981), and Brammer and Pavelin (2006), which extend beyond the maritime domain, reinforce comparable conclusions. CSR disclosure imposes an additional burden on businesses that are significantly indebted, which may result in covert resistance from investors. The information that these businesses disclose is typically limited to what is legally required, and they tend to reduce their corporate social responsibility (CSR) cost. The purpose of this is to safeguard shareholder interests and minimize expenses.

The relationship between a company's profitability and valuation and CSR disclosure is likely to be the subject of similar debates. A company is more likely to have the financial resources to disclose information regarding its Corporate Social Responsibility (CSR) when its profit rate is adequately high. This action is intended to reassure the company's stockholders of its robust financial status. Additionally, the company's managers may capitalize on this opportunity to augment their compensation (Marston and Polei, 2002). In the same vein, it is anticipated that a company's financial statements and operational procedures will be subject to greater public scrutiny when it maintains a notably high profit rate. Making a sustainability report public can function as a protective measure (Marston and Polei, 2002). Corporations that prioritize profits may also endeavor to enhance the social acceptability of their operations, particularly if those operations have a detrimental effect on stakeholders or the environment (Palazzo and Scherer, 2006). Brammer and Pavelin (2006) have verified a direct correlation between profitability and the voluntary disclosure of environmental information.

Building on the intrinsic relationship between profitability and business valuation observed in conventional discounted cash flow (DCF) valuation models, we suggest arguments that are derived from standard asset pricing theory to substantiate a correlation between CSR disclosure and firm valuation levels. In order to mitigate the risks associated with asymmetric knowledge, we recommend that shipping companies disclose their corporate social responsibility (CSR). This will attract shareholders by providing a more affordable cost of equity capital. Consequently, investors may

anticipate a lower rate of return from these companies than from those that suppress their information, which may make them appear to be less risky investments. Investors may enjoy higher valuation levels in subsequent stock issuances as a result of their ability to assign a lower discount rate to the projected future cash flows of CSR reporting firms (Dhaliwal et al., 2006).

Hamilton et al. (1993) assert that investors may encounter challenges in accurately evaluating the costs and benefits, resulting in a gradual integration of critical information into stock prices. In particular, the securities of companies that disclose their corporate social responsibility (CSR) procedures may be initially valued lower than those of corporations that do not disclose their CSR policies. However, in order to achieve the appropriate valuation level and a lower expected rate of return, these companies may eventually provide higher risk-adjusted returns. It is contended that the market has amassed sufficient experience to evaluate the costs and benefits of businesses that disclose a significant amount of information regarding their corporate social responsibility (CSR).

Jensen and Meckling's 1976 fundamental principal-agent model posits that the dispersion of ownership will result in significant challenges with adverse selection between managers and owners. A disjointed ownership structure results in a significant degree of information asymmetry, as minority shareholders are unable and unwilling to superintend management. Consequently, it is fair to presume that a corporation with a distributed ownership structure will be more inclined to voluntarily share information with shareholders through corporate social responsibility disclosures (Brammer and Pavelin, 2006). However, the transportation industry continues to be exceptional in this regard. As per Andrikopoulos et al. (2013), the level of stock concentration is positively correlated with the quantity of financial information disclosed by shipping businesses, rather than negatively. Ownership concentration and profitability in the maritime sector are positively correlated, as per Tsionas et al. (2012). Consequently, it is anticipated that an increase in ownership concentration will be accompanied by a greater emphasis on corporate social responsibility (CSR) reporting. Additionally, ship proprietors are motivated to establish and preserve their reputations in order to enhance their likelihood of survival

during periods of crisis. CSR disclosures are essential instruments that stakeholders employ to assess the operations of transportation companies.

In their 2014 study, Drobetz et al. examined a substantial panel dataset of 111 publicly traded transportation businesses. The investigation focused on the years 2002–2010 and encompassed data on approximately 8,850 registered ships. The researchers utilized suggested items to assess corporate social responsibility (CSR), incorporating findings from prior research conducted by Carroll (1979, 1999), Waddock and Graves (1997), and others. Additionally, they incorporated additional products that pertain to the maritime industry. They utilized these items to create a CSR disclosure index, based on the premise that companies would exhibit varying levels of CSR compliance. The direction and statistical significance of the relationships between various business factors were evaluated, and the CSR disclosure behavior of each company in their sample was approximated. It is noteworthy that they discovered a direct correlation, as determined by Tobin's Q, between the financial performance of all maritime companies in our sample and the extent of corporate social responsibility (CSR) disclosure. During a robustness test, they discovered that there was a negative correlation between operating performance (measured by return on assets) and CSR disclosure for certain sample companies. Nevertheless, they also demonstrated that this trend can be partially attributed to the selection of the sovereign state and the stock market listing. In summary, their findings are consistent with previous research that identified corporate performance, company size, leverage, and ownership concentration as the primary factors that influence CSR disclosure. Emphasizing these principles is imperative in the maritime sector. The shipping companies' apparent zeal to enhance the transparency of their CSR initiatives is substantiated by their results. Consequently, their research suggests that the causality issue may be resolved, despite the fact that enhancing corporate socially responsible behavior may enhance corporate performance. This has significant implications for the policy of transportation management. Several components of their CSR disclosure index are essential for the purpose of augmenting reputation and reducing costs by promoting transparency. These factors also establish the foundation for a transportation company's potential for long-term success. The reporting of corporate social responsibility by various corporations is influenced by firm-level factors. A shipping company's commitment to achieving long-term social

legitimacy, securing affordable financing in capital markets, and ensuring sustainability in the competitive transportation sector is determined by these attributes. CSR disclosure should be considered within the broader institutional framework of the marine industry with the objective of promoting and protecting stakeholder interests. Their findings have significant implications for both investors and corporate management. Investors' portfolio construction decisions may be affected by the inclusion of companies with updated CSR disclosures, as our research indicates that an investment portfolio's performance may be improved.. A shipping company that prioritizes social responsibility can expand its investor base and enhance the opportunities for risk sharing by recruiting more socially conscious investors. Our research suggests that managers should prioritize the enhancement of firm (shareholder) value by becoming more socially conscious at the firm level. In general, it is expected that the implementation of CSR disclosure standards will have significant and far-reaching effects, particularly in the shipping sector, which is considered an essential component of international trade.

Two promising research directions are the exhaustive examination of the quality of CSR reporting and the investigation of the extent to which businesses integrate CSR behavior into their distinctive strategies. Insightful data may be obtained by analyzing the impact of market conditions—bull and decline markets—on the volume and quality of corporate social responsibility disclosure.

3. Analysis of ESG trends of international shipping companies

The United Nations Principles for Responsible Investment were a significant factor in the development of the Environmental, Social, and Governance (ESG) framework in the year 2006. The Environmental, Social, and Governance (ESG) framework has been adopted by multinational organizations as a means of enhancing their corporate competitiveness (Aldowaish, et al 2022). This adoption came about as a result of the declaration made by the Business Roundtable (BRT) in 2019. Businesses that provide shipping services are using a variety of strategies in order to provide competitive shipping services in response to the growing globalization of the economy. Typical examples include the creation of intelligent integrated land and sea logistics systems, the implementation of mergers and acquisitions (M&A), the expansion of the controlled fleet, the increase in ship sizes, and the building of strategic partnerships. All of these examples are examples of typical cases. In the modern day, determining whether or not a shipping firm is competitive requires taking into account both the cost and the quality of the shipping services that it offers. The performance of the shipping sector will be significantly influenced by advancements in the future, and this influence will extend beyond the supply of options for high-speed and digital transportation. When it comes to powering vessels, it will be required to make use of fuels that are less harmful to the environment, such as liquefied natural gas (LNG), hydrogen, ammonia, and methanol. In addition to this, it will necessitate the establishment of a system for the ethical management of anti-corruption, the ethical management of tax evasion linked to symbols of prestige, the protection of the rights of seafarers, and the recognition of the diversity of international seafarers (Sun, Zhang 2022). It is of the utmost importance for these businesses to forsake their traditional approaches to the management of shipping

operations, which primarily prioritize the financial investments that are required for constant profitability through their management. An alternative course of action would be for them to transfer their attention to the growing idea of ESG. It is in the best interest of shipping companies to be conscious of the environmental impact that their activities have, both in terms of the pollution that they cause to the air and the water. It is possible for them to better prepare for unforeseen occurrences, like as the ongoing COVID-19 epidemic, if they comprehend and acknowledge this fact (Nõmmela, Kõrbe Kaare 2022).

The United Nations has formulated the Sustainable Development Goals (SDGs), which are a set of objectives that the international community must accomplish by the year 2030. The eradication of global poverty, the achievement of sustainable development, and the implementation of measures to combat and mitigate the effects of climate change are all included in these objectives. A further point to consider is that the Paris Climate Accord, which was signed in 2015 as a replacement for the Kyoto Protocol, was the first agreement to highlight the environmental part of environmental, social, and governance management. The Kyoto Protocol, which was approved in 1997, had the intention of establishing targets for the reduction of emissions of greenhouse gases. This particular component is necessary for establishments that operate on a national as well as a worldwide scale. According to the Paris Climate Agreement, it is absolutely necessary for all of the parties concerned to improve their policies and laws about the environment that produce zero carbon emissions. According to Ionescu et al. 2021, this will effectively reduce the amount of air pollution that ships create, both on land and at marine locations. There is a possibility that global ocean liner shipping corporations will face further challenges in this context if they do not incorporate environmental, social, and governance (ESG) management into their operational standards. The cost of waste treatment and pollution produced by ships, increased penalties for environmental harm, foreign charterers declining to accept specific cargo, and the cessation of ship funding are all issues that fall under this category. According to Lin et al. (2022), these factors have the potential to have a detrimental effect on the management of sustainability and the reputation of the corporation. Shipping firms all around the world are expected to implement a variety of steps in accordance with the 2020 Sulfur Oxide Regulation and Carbon Reduction Strategy of the International Maritime Organization (IMO).

These efforts include the utilization of scrubbers, low sulfur fuel oil, and alternative fuels such as LNG, methanol, ammonia, and hydrogen. According to Stark et al. (2022), the purpose of these principles is to establish a new global baseline for more responsible ship financing.

Alliances have been formed by international maritime liner companies with the purpose of reducing the amount of excessive competition and ensuring that stable ship routes are maintained for liner services that are performed on a regular basis. Due to the fact that they hold a substantial portion of the available market for container transportation on a global scale, these relationships are extremely important to the business. It is anticipated that this market would expand in tandem with the expansion of the global economy and the proportion of container ships that are growing in size. HMM, which is Korea's only deepwater carrier and a member of three major shipping alliances, had a significant growth in its carrying capacity between the years 2016 and 2021. This expansion was based on a five-year shipping recovery strategy. The number of twenty-foot equipment units (TEU) more than doubled from 400,000 to 820,000. HMM has been able to maintain its global competitiveness as a result of the impact of the COVID-19 epidemic, which has led to an increase in the volume of cargo that has been transported (Pulse, 2022). On the other hand, there is no assurance that it will continue to exercise dominance over the market throughout the years to come. A complete and formal environmental, social, and governance (ESG) strategy that focuses on environmental sustainability has been established by Korean shipping businesses, conforming to the principles of classical economic theory. This policy ensures profitability regardless of the conditions of the market. Domestic shipping businesses are altering their environmental, social, and governance (ESG) framework in order to fit more closely with the expectations of various stakeholders, such as ship finance providers and charterers. This is in response to the growing understanding of the significance of sustainability in determining the value of a company. Integration of environmental, social, and governance (ESG) indicators that emphasize the reduction of carbon emissions and the preservation of the environment is required for this. At the moment, there is no framework that is in place to either assist the execution of a specific environmental, social, and governance strategy or to explain the connection between that strategy and the planning and operations of marine firms. A new environmental, social, and governance strategy needs to be incorporated into

the service delivery plan that local shipping businesses must establish in order to effectively compete with their foreign counterparts. The scope of this plan ought to go beyond major mergers and acquisitions and the integration of logistics in the land, sea, and airspace. Shipping companies need to be proactive in adjusting to changes in the external environment in order to maintain their competitive edge over the long run. They are adding an extremely large number of environmentally friendly ships to their fleets in order to acquire a competitive advantage over their rivals purely via sheer numbers. In addition, they are putting into effect new environmental laws in order to lessen the amount of air pollution that ships are responsible for.

In order to offer shipping businesses with essential policy principles that can serve as a platform for implementing environmental, social, and governance management, the purpose of this chapter is clear. In addition, it makes an effort to offer recommendations for potential additions and enhancements that could be made in the future. For the purpose of identifying the most important aspects of environmental, social, and governance (ESG) management inside shipping firms, it provides individualized support and improvement methods that are founded on extensive research and detailed assessments. Through the use of a semantic network analysis, this chapter examines the ESG management state and characteristics of each firm. A complete sustainability report has been produced by the Alliance, which is one of the top three international maritime alliances in the world. This study serves as the basis for the analysis. A comprehensive analysis and categorization of the environmental, social, and governance (ESG) management practices of these organizations has been carried out with the use of the quadruple helix model, which is founded on the concepts of multiple case theory. The purpose of this analysis is to determine the environmental, social, and governance (ESG) initiatives, shared policies, and industry-specific solutions that are required for the shipping industry. This chapter's purpose is to provide a summary of ways for improving performance and providing individualized assistance to shipping companies that are committed to environmentally friendly operations (green ESG policies), as well as to small domestic businesses that have not yet implemented ESG management practices.

3.1. ESG in shipping

The shipping sector is subject to a multitude of regulations, with the safety of marine personnel and the general public and the assessment of its environmental impact being the primary concerns. The marine sector is responsible for the transportation of approximately 90% of global commerce, according to data from the United Nations Conference on commerce and Development (UNCTAD 2022). The fleet of the industry increased by 63 million deadweight in a single year between 2021 and 2022.

The global fleet comprises approximately 103,000 vessels, with a combined deadweight of 2,199 million. In 2022, a UNCTAD research published in 2022 indicated that 94% of shipbuilding was conducted in Asia, with the Republic of Korea, China, and Japan being the primary locations. Additionally, Malta, Panama, Liberia, and the Marshall Islands registered slightly more than 45% of the global fleet. These authorities are frequently referred to as Flag Administrations in the business world.

ESG, or environmental, social, and governance, is not a novel concept in the maritime sector. The United Nations' International Marine Organization (IMO), a division that is dedicated to marine affairs, votes on resolutions that formally establish international codes, conventions, and principles that regulate the industry. The ESG pillars are used to organize the Codes, Conventions, and International Legislation, which can be observed in the tables below.

Table 2 International Conventions and Codes Pertaining to the Environment" (Buhagiar 2023).

ENVIRONMENT	
International Convention for the Prevention of Pollution from Ships (MARPOL)	International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention)
International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention)	Energy Efficiency Design Index (EEDI) / Shipboard Energy Efficiency Management Plan (SEEMP)
International Convention on Civil Liability for Oil Pollution Damage (CLC)	International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and
International Convention on Oil Pollution Preparedness, Response, and Co-operation (OPRC)	International Safety Management Code (ISM)
Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships	The Poseidon Principles
Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter	International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and
International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (INTERVENTION)	Nairobi International Convention on the Removal of Wrecks, 2007

Table 3 International Conventions and Codes Pertaining to the Environment" (Buhagiar 2023).

SOCIAL	
Maritime Labour Convention 2006 (MLC)	International Convention on the Rights of the Child
ILO Organisation	International Convention for the Safety of Life at Sea (SOLAS)
International Transport Workers' Federation (ITF)	International Convention on Maritime Search and Rescue
International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW)	Maritime Occupational Health and Safety Guidelines (MOHS)
International Ship and Port Facility Code (ISPS Code)	IMO Guidelines on the Fair Treatment of Seafarers in the Event of a Maritime Accident
International Safety Management Code (ISM Code)	Life Saving Appliances (LSA) Code / International Code for Fire Safety Systems (FSS)

Table 4 International Conventions and Codes Pertaining to the Environment" (Buhagiar 2023).

GOVERNANCE	
United Nations Convention on the Law of the Sea	European Maritime Safety Agency (EMSA)
Helsinki Commission (HELCOM)	Port State Control
MARPOL 73/78	International Convention on Oil Pollution Preparedness, Response, and Co-operation (OPRC)
Civil Liability for Oil Pollution (CLC) Convention	Co-ordinated Extended Pollution Control Operation (CEPCO)
EU's ESG Reporting and Transparency Requirements	Specific Legal and Regulatory Jurisdiction Compliance
Whistle-blower Protection	Risk Management Standards (Such as ISO 31000)

The industry's dedication to enforce mandatory laws, rules, and conventions in order to ensure the welfare of workers and the general public, safeguard the environment, and maintain effective governance is evident in the aforementioned lists.

3.1.1. 'E' in Shipping ESG

In July 2023, the 80th session of the Marine Environment Protection Committee (MEPC) of the International Maritime Organization demonstrated the significance of the environmental component of the ESG concept. The greenhouse gas (GHG) emission limits were significantly modified during this session. The goal is to reduce emissions by 20% by 2030 and 70% by 2040 in comparison to the 2008 levels. The primary goal is to achieve carbon-neutral shipping by 2050, which underscores the growing significance of environmental sustainability in the marine industry and its connection to the general Environmental, Social, and Governance (ESG) framework.

Table 2 demonstrates that the International Maritime Organization (IMO) has implemented a plethora of conventions and regulations that impose specific obligations on ship proprietors and management. These include the adoption of low-sulfur fuel oils, the development of scrubbers to reduce carbon emissions, the

installation of ballast water treatment facilities to treat both ballasted and de-ballasted water, and the promotion of innovative and efficient propulsion technologies, such as hydrogen-ready ships. (Lee, March 2023).

In 2019, the Poseidon Principles were developed through the collaboration of a variety of stakeholders, such as multinational shipping banks, classification societies, and other industry participants. The principles' primary goal is to reduce carbon emissions in the maritime sector, with a particular emphasis on four critical areas: assessment, accountability, enforcement, and transparency. The maritime industry's primary objective is to establish a framework for the reduction of carbon emissions and the promotion of sustainability. The majority of maritime banks that comply with the Principles are located in Scandinavia and Central Europe; the United States and Japan will shortly follow suit (Deloitte, 2021).

Table 5 The Four Poseidon Principles (Buhagiar 2023)

POSEIDON PRINCIPLES	
Principle of Assessment	Shipowners of co-signatories' jurisdictions will be required to measure the CO ₂ emissions and consequentially monitoring compliance to the global targets set such as the 80 th MEPC Session
Principle of Accountability	Banks expect shipping clients to set and implement strategies that align with the IMO's greenhouse gas reduction targets and national and regional regulations. This principle emphasizes collaboration between financial institutions and their clients to drive sustainable practices.
Principle of Enforcement	Banks utilize contractual mechanisms, such as loan covenants, to ensure that clients meet the environmental standards outlined in the Poseidon Principles. This principle establishes consequences for non-compliance and reinforces the commitment to sustainability.
Principle of Transparency	Financial institutions commit to transparently disclosing their carbon emissions from ship financing activities. This principle promotes openness and accountability, enabling stakeholders to monitor progress and make informed decisions.

3.1.2. 'S' in Shipping ESG

The maritime industry, which employs sea transportation to facilitate 90% of global commerce (Development, 2022), is significantly influenced by social factors. The smooth daily operation of the ships and their apparatus is contingent upon the multilingual seafarers who work on board ships, some of whom may work for as long as eleven months without a break (ILO, 2006).

Those in the maritime sector frequently disregard the social component of seafarers within the Environmental, Social, and Governance (ESG) framework. Throughout the years, there have been alarming instances of negligence that have led to the unpayment of salaries, suicides, and the regrettable situation of the bodies of deceased seafarers being refused removal from ships during the COVID-19 pandemic. It is consequently imperative that the global community as a whole, rather than solely

maritime stakeholders, be held accountable for the obstacles encountered by seafarers (Guddal, 2022).

While acknowledging that the majority of shipowners fulfill their obligation to ensure the safety of seafarers, it is important to avoid deriving any broad conclusions. These conditions satisfy the minimum standards established by legislation such as the MLC, which safeguards the rights of seafarers with respect to compensation, pauses, and the opportunity to land. Seafarers' rights have been fortified by the International Transport Worker's Federation (ITF), which has authorized measures such as vessel retention until unpaid wages are received and return is guaranteed.

Specific crew credentials are required by the OCIMF for oil and chemical tankers that are chartered to significant corporations such as Shell and BP. The objective of these regulations is to prevent ship managers from substituting crew members for lower-paid laborers and to ensure crew retention.

There is a substantial disparity in the representation of women in higher-level executive positions and as sailors. This component continues to be neglected, despite its importance (Buhagiar 2023).

Lloyd's Register, a classification society that is a member of the International Association of Classification Societies (IACS), has established four methods for assessing the social aspect, as indicated in L. Register (2022).

1. The aggregate number of incidents that were reported to have occurred on board.
2. The Total Number of Human Deaths on Cruises;
3. The quantity of discoveries regarding inadequate procedures at terminals;
4. Lost Time Incident Rate.

3.1.3. 'G' in Shipping ESG

Governance is one of the most critical components of the ESG framework. Bribery and corruption can lead to severe repercussions, including potential financial losses and legal action under internationally recognized laws and regulations, such as the US Foreign Corrupt Practices Act (FCPA) and the UK Bribery Act. Organizations should establish robust ethical policies and procedures that discourage employees from participating in unethical business practices in order to mitigate these risks.

It can be difficult to ascertain the appropriate amount of information to disclose to the public while still meeting the requirements of all parties due to the sector's global scope. As a result, it is recommended that the company submit a comprehensive report that delineates the methods by which its governance structure ensures compliance with relevant laws, penalties, and industry standards. Additionally, the report is required to include a comprehensive summary of the measures that the company has implemented to guarantee transparency and accountability in its operations, a difficult objective to accomplish (Solberg, February 2020).

3.2. Theoretical background

3.2.1. Positive elements of ESG-related regulations and policies

The utilization of ESG management can facilitate the assessment of a company's impact on governance, society, and the environment. ESG management is the process of allocating the revenue generated by a company's sales to social programs that assist underserved populations, with the objective of safeguarding the environment and upholding ethical and legal business practices, as per the results of the study conducted by Egorova et al. (2022). It is essential that nations prioritize the Paris Climate Agreement and the United Nations' Sustainable Development Goals (SDGs) in order to fulfill their responsibilities as global citizens. To achieve this, they must first improve the existing institutions and subsequently incorporate environmental, societal, and governance concerns into their industrial strategy. In order to effectively confront the obstacles posed by climate change and to attain sustainable economic growth, this approach is implemented. The Green New Deal of the United States, the Green Deal of the European Union (EU), and the "Korean New Deal" of the Korean government are among the numerous national programs that are noteworthy. All of these projects are examples of national and supranational initiatives. The shipping company Maersk has resolved to become the industry leader in lowering carbon emissions by the year 2050. This is an ambitious goal that the company has set for itself. The corporation has set this as a desirable goal, and it should be commended. In accordance with their goal, Maersk intends to launch a zero-carbon vessel that is capable of being economically successful by the year 2030 (Lee, Woo 2020). In addition, a great number of nations have resolutely pledged their dedication to the achievement of carbon neutrality, with the ultimate objective of fully

eradicating carbon emissions. According to Buettner (2022) and CGTN (2022), China has pledged to do this by the year 2060, while the European Union has established the lofty objective of accomplishing this by the year 2050 respectively.

Instead of depending simply on traditional financial indicators, businesses are now placing a larger emphasis on ESG performance measures. This is possible because of the growing awareness of climate change and the significance of human capital. As a result of the growing emphasis placed on sustainability, there has been an increase in both understanding and consciousness regarding the topic. As an additional point of interest, De Lucia et al. (2020) discovered that the incorporation of ESG indicators has inspired investors to make financial choices that are in accordance with their social responsibilities. Businesses are increasingly putting into action the Sustainable Development Goals (SDGs), which are an essential component of the United Nations' agenda for the global year 2030. At the moment, these institutions are putting into practice organizational strategies that concurrently address environmental, social, and corporate governance concerns, which is producing in benefits for all of the stakeholders concerned (Verteramo, 2023). The way that people think about corporate social responsibility (also known as CSR) has undergone a significant change as a result of the increasing awareness of the importance of sustainability. It is impossible to overlook the growing significance of environmental, social, and governance (ESG) management initiatives implemented by corporations. In the process of formulating policies, one of the most important steps is policy planning. In addition to fostering the overall competitive growth of the economy, a policy that has been properly prepared solves the unique issues that stakeholders in a variety of industries are currently facing simultaneously. In order to effectively address environmental, social, and governance (ESG) challenges and to maximize future benefits, it is essential to incorporate appropriate solutions into the process of formulating new policies (Zahid et al., 2023).

3.2.2. The need for ESG management of Global Shipping Companies

As is the case with any other kind of business, transportation businesses have to make boosting profits their primary priority in order to assure their continued existence over the long term (Stopford 2009). According to Fasoulis and Kurt (2019), global ocean liners have made great progress in improving their environmental, safety, health, and ethical policies. This is despite the fact that their major focus is on

corporate profits, which is in conformity with conventional economic theory. When it comes to the future, it will be essential for international shipping corporations to give priority to persons who are socially disadvantaged, such as those who work as sailors and port workers. It is also recommended that they make the transition to a management structure that is in accordance with international standards. There is a clear possibility to actively decrease pollution from ships and terminals (Ren, et al 2019). In order for these businesses to grow, they need to concentrate on three crucial aspects: having a constructive influence on the shipping sector, putting in place digital management systems that are effective, and giving environmental conservation the highest priority within global supply chain networks.

In the interim, analysts predicted that the global economy would contract swiftly and shipping demand would significantly decrease following the declaration of the COVID-19 pandemic by the World Health Organization in 2020. Nevertheless, in order to mitigate the influence of the temporary decrease in freight rates, global ocean liner shipping companies advocated for blank sailing, which was concentrated on shipping alliances. The global shipping market has also decided to extend the decommissioning of older ships during the third quarter of 2020 in order to conform to the environmental criteria set forth by the International Maritime Organization (IMO). As a direct consequence of this, the total capacity of these vessels was restricted. In spite of the fact that there was an increase in port congestion, which resulted in product shortages and an increase in the demand for freight, the expansion in shipping continued until January 2022 (Marineinsight, 2019). To satisfy the requirements of shippers and financiers, shipping companies have to make the adoption and enhancement of environmental, social, and governance management a top priority. This is absolutely necessary in order to keep shipping rates stable and to guarantee consistent market supremacy over the long run.

3.2.3. Investment Portfolio Theory

Modern portfolio theory has been a really helpful tool for investors developing asset allocation strategies since its development by Markowitz (1952). One uses this concept to examine the risk and return of the investment. Modern portfolio theory seeks to control risk so that the expected return targets are reached. Portfolio theory's goal is rather to reduce risk and optimize a portfolio's expected return. This approach encourages asset diversification to reduce industry-specific as well as market risk

vulnerabilities' exposure. Variability can assist lower risk in cases when the returns of several assets show a negative connection. This makes it imperative to maintain a varied investment portfolio including a range of assets. If this is followed, it will lower risk and guarantee a more steady financial condition. The shipping industry has drawn people's attention all around the world as the main way goods, natural gas, crude oil, and raw materials are transported (Otheitis, Kunc 2015). Regarding the movement of products, maritime transportation is safe and reasonably affordable. Furthermore attracting investors to the transportation sector is its remarkable expansion and great profitability (Hsieh et al., 2021). Among those sectors that have expanded quickest since 2000 is the marine one (McKinsey & Company 2017). "Globalization is blamed for the consistent development in the maritime sector during the past 20 years. This sector has benefited from both the expansion of commerce and the global economic development. Faster than the average global GDP rate of 2.3%, the maritime industry expanded at a rate of 3.8% between 2011 and 2016 (World Commerce Organization, 2020).

The demand for transportation services has increased noticeably in line with the increasing volume of global trade. The cost-effective nature of marine transportation has greatly raised economic activity since 2000 (Otheitis, Kunc 2015). Since 2001, there are now far more foreign transportation businesses ready for listing available. As Syriopoulos and Bakos point out in 2019, this development has also yielded consistent, robust profits for stock of shipping companies. Based on research by Albertijn and colleagues (2011), between 2002 and 2011 the thirty largest shipping companies globally had an average yearly return of 18.6%. Moreover, adding shipping equities to an investment portfolio can provide investors with significant diversification possibilities based on the results of an analysis of the systematic risk (beta) of shipping businesses (Albertijn et al. 2011). Grelck et al. (2009) claim that include a transportation stock into a standard stock and bond portfolio will boost the return-to-- risk ratio for investors. The researchers could show this. This is so because the 500 index transportation companies of Standard and Poor's (S&P) pose a significant risk to the broader sector.

Though they are more popular among investors, it is crucial to be aware of the inherent risks connected with shipping stocks. Haider et al. (2019) and Theodossiou et al. (2020) claim that the volatility of goods rates and the changing demand in

worldwide trade could cause notable investment losses. Usually, shipping businesses run a great spectrum of hazards. Financial risk, which results from poor performance; default risk, which results from principal and interest on bonds not paid; business risk, which results from regulatory noncompliance; and market risk, which may be set by outside events like the COVID-19 epidemic are among these hazards.

3.2.4. Financial performance

Profitability is frequently employed in academic literature to evaluate a company's financial performance. Investors are required to balance the risk and return of an investment, as per Markowitz (1991). In order to evaluate the return on investment, researchers have historically examined the four profit categories: profit, return on equity (ROE), return on assets (ROA), and profits per share (EPS). Sroufe and Goalakrishna-Remani (2019) conducted an investigation into the impact of social sustainability on the financial performance of Fortune 500 organizations by employing structural equation modeling (SEM). Using net profit margin as their benchmark, the researchers evaluated the company's financial performance by calculating return on investment (ROA). A positive correlation has been demonstrated between these economic indices and social sustainability.

The ownership structures of family-owned transportation enterprises had undergone an evolution, as per the research conducted by Tsionas et al. (2012). Numerous of these organizations have transitioned from private ownership to public trading. In order to ascertain the potential impact of ownership concentration on the performance of 107 marine enterprises worldwide, the researchers conducted an investigation into the percentage of shares owned by family or public investors. Their performance was evaluated through the calculation of return on equity (ROE) and return on assets (ROA). The results indicated that investors' assessments of the company's performance were significantly influenced by the degree of ownership concentration. In a study conducted by Kang et al. (2016), panel regression analysis was implemented to examine sixty-four transportation companies that operate across multiple countries. The objective was to identify the primary factor contributing to the company's value, thereby serving as a critical indicator. The study's findings indicate that investors' perceptions of transportation companies are significantly impacted by profitability, as measured by return on equity (ROE), rather than liquidity or asset development.

Between 1992 and 2014, logistic regression was implemented by Haider et al. (2019) to investigate the financial success and corporate failure of globally listed transportation corporations. In order to assess the efficacy of the companies, the researchers examined five distinct types of financial indicators. These encompassed liquidity, asset efficiency, profit, capital flow, and market ratio. They determined that liquidity was the most significant factor influencing the probability of a bank's failure. The meta-frontier approach was employed by Woo et al. (2019) to evaluate the operational efficiency of multinational shipping enterprises between 2001 and 2013. The outputs, which included income and net profits, were assessed in conjunction with the inputs, which included assets and capital expenses. Both components were investigated by one individual. Empirical data indicates that dry bulk shipping companies are more adept at utilizing specific inputs to achieve the best possible outcomes than container shipping companies.

3.2.5. Financing

The term "shipping finance" is defined by Woo et al. (2019) as the ability of transportation companies to raise funds. According to Kavussanos et al. (2017), the transportation industry is notorious for its substantial capital expenditures, which is why managers often encounter challenges in obtaining financing. The critical role of finance in the operations of transportation companies that are striving to remain operational was underscored by the global financial crisis of 2008 and the subsequent decline in commodities prices, according to Grammenos et al. (2007).

Kotsantonis et al. (2016) conducted research that indicates that the global marine sector has allocated over 1.5 trillion dollars to the development of new ships. For example, the acquisition of a 5-year-old Capesize vessel cost a shipping company approximately USD24 million in 2016 (Kavussanos, et al 2017). The top ten shipping companies owned fleets of ships valued at USD450 billion in 2016. Hence, shipping companies take on much debt when building or purchasing new and more efficient vessels to replace obsolete ships.

After the year 2010, shipping businesses came to the realization that depending simply on bank loans was not adequate to meet their requirements for funding (Syriopoulos, Bakos 2019, Kavussanos, et al 2017). They started issuing a significant quantity of high-yield bonds as a means of raising capital in order to meet

the growing demand for shipping services (Syriopoulos, Bakos 2019, Kavussanos, et al 2017). This was done in order to fulfill the growing demand for shipping services. According to the findings of a study that was conducted by Kavussanos and Tsouknidis (2014), professional investors, such as managers of mutual funds, favor the inclusion of shipping bonds for creating a well-diversified portfolio. It is important to note that the transportation industry is prone to significant swings in freight prices, which can be highly unpredictable. As a consequence of this, it was discovered that the credit rating of bonds issued by transportation businesses came in lower than the investment grade during the time period under investigation. According to research carried out by Kavussanos and Tsouknidis (2014) and Grammenos et al. (2007), shipping bond spreads are indicative of premiums that are higher than risk-free rates.

There are a number of characteristics that have been discovered to have a substantial impact on the quantity of new high-yield bonds that are issued by shipping companies (Kavussanos and Tsouknidis 2014, Grammenos et al 2007, Grammenos and Arkoulis 2003). These factors include credit rating, length to maturity, and yield to maturity, and issuance amount. At least two of the three major credit rating agencies—Fitch Rating, Moody's Credit Rating, and the S&P 500—are normally responsible for issuing credit ratings. AAA, BBB, BB+, Aaa, Baa, Ba, AAA, AA+, BBB+, and so on are some of the ratings that are assigned by these respective agencies. It is possible to gain significant insights into the financial soundness of transportation companies and their capacity to fulfill their obligations to bondholders by utilizing these ratings. Investors rely on credit ratings to determine the likelihood of default, which is a measure of the capacity of shipping companies to maintain future cash flows and their sensitivity to volatility in the economy. As per the research conducted by Grammenos and Arkoulis (2003), investors prioritize the capacity of a shipping company to meet interest payments and the rate of return on shipping bonds within a certain timeframe.

A higher bond yield for investors and, consequently, a higher cost of capital for shipping companies are the results of an extended term to maturity, as per Grammenos et al. (2007). The bond yield to maturity is the percentage of the rate of return on a bond that is held by investors who purchased the bond at the market value until maturity, as defined by Grammenos and Arkoulis (2003). As a result of the

turbulent economic climate, a great number of organizations are struggling to meet their ongoing financial obligations. The fact that Hanjin Shipping, a Korean shipping company, filed for bankruptcy in August of 2016 brought to light the significance of efficient debt management for maritime firms (Lu et al. 2009). According to Kavussanos and Tsouknidis (2014), it is essential for governments and investors to keep a close eye on the debt that transportation companies in the global market are carrying in order to lessen the likelihood that they will fail on their obligations.

3.2.6. The ESG practice

According to the stakeholder theory developed by Freeman (1984), it is essential for managers to prioritize and take into consideration the interests of all individuals and social groups who are connected to a business. The Principles for Responsible Investment (PRI) were established by the United Nations (UN) in 2005, with a significant focus on environmental, social, and governance (ESG) concerns (Shin, Thai 2015). The purpose of the Principles for Responsible Investment (PRI) was to construct a grading system that would encourage sustainable and responsible investment, which would be beneficial to both the industry and society, while also having a good impact on the environment.

As stated in a study that was conducted by Kotsantonis et al. (2016), investors carefully examine the data of companies as well as the ESG practices of such companies in order to establish whether or not companies that apply ESG principles are able to earn considerable profits. At the beginning of the 1990s, there were only twenty organizations that contributed data for environmental, social, and governance (ESG) implementation. By 2014, the number of enterprises that contributed data had dramatically expanded to 8,500. Over one thousand four hundred institutional investors, with a combined asset management value of approximately sixty trillion dollars, have committed to taking into account the environmental, social, and governance data of the company when they are developing their investment portfolios (Kotsantonis et al. 2016).

According to Di Vaio et al. (2021) and Fasoulis and Kurt (2019), the United Nations' sustainability goals have made great progress as a result of the broad adoption of environmental, social, and governance (ESG) standards by shipping

businesses. Fasoulis and Kurt (2019) believe that in order to improve the perceived value of stakeholders, it is necessary to improve environmental, social, and governance practices.

The environmental challenges that the maritime sector faces are one of the most significant issues. These challenges encompass the presence of development sites in close proximity to ports, the production of carbon dioxide from ships, and the pollution of air and water. Furthermore, there are worries regarding the appropriate disposal of maritime assets, as well as the management of sewage and waste (Di Vaio et al., 2021; Vejvar et al., 2020). The ecology of the adjacent areas is significantly influenced by the development of seaport traffic and shipping routes in these regions. It is imperative to possess a comprehensive comprehension of the potential environmental repercussions of this new development and to implement the requisite measures to alleviate any adverse effects that may arise. The survey data of forty-five respondents who were employed by Taiwanese transportation companies was analyzed by Lirn et al. (2014) using structural equation modeling, also known as SEM. The respondents were surveyed regarding their experiences in the industry. Shipping companies can enhance their financial performance and simultaneously mitigate their environmental impact by implementing environmentally friendly policies, utilizing environmentally friendly ships, and collaborating with sustainable suppliers.

The research findings were insufficient to derive any definitive conclusions regarding the performance of maritime companies in relation to corporate social responsibility (CSR) activities. Research from a diverse array of studies has consistently demonstrated that shipping companies that implement corporate social responsibility (CSR) policies and processes are capable of distinguishing themselves from their competitors and are frequently regarded as exemplary enterprises within the industry. The financial performance of large transportation companies can be enhanced through the implementation of Corporate Social Responsibility (CSR) programs, as evidenced by research conducted by Lu et al. (2009), Narula (2014), and Dahalan et al. (2012). Conversely, there were researchers who advocated for an alternative perspective. Yuen et al. (2017) argue that businesses must find a method to

maximize revenues while also ensuring the effectiveness of corporate social responsibility (CSR) programs. Shipping companies frequently implement cost-cutting strategies, including the employment of substandard personnel and the failure to fulfill their obligations to conduct staff training (Fotteler, et al 2020). This is due to the substantial influence that freight cost fluctuations have on the operations of transportation companies. These methods frequently lead to catastrophes that are hazardous to both the environment and safety, as well as a detrimental effect on the quality of work. A study was conducted by Tang and Gekara (2020) to determine the extent to which the top 15 container shipping companies, which collectively account for eighty percent of the global container shipping market, have implemented corporate social responsibility (CSR) programs. The study's findings indicate that transportation corporations have demonstrated a substantial dedication to environmental preservation throughout their operations. They prioritized the reduction of carbon dioxide emissions and the safeguarding of the health and safety of their employees. They achieved this by implementing a diverse array of initiatives, such as personal safety precautions, training, and education. Additionally, the reports indicated that these shipping companies implemented environmentally favorable practices, including emission reduction, to address environmental concerns among their clients. Rather, these shipping companies are dedicated to upholding the fundamental components of labor laws and regulations that prioritize the health and safety of their employees.

Researchers have examined the governance of a company by concentrating on the two main categories of ownership and board composition, as documented in the existing literature. According to the findings of Kotsantonis et al. (2016), transportation businesses that are listed are expected to conform to corporate governance procedures. This requirement takes effect immediately. The general public is providing these companies with a rising quantity of capital through the sale of bonds and shares, which are being used by these commercial enterprises. Both the effective allocation of ownership and the resolution of the agency problem that arises as a result of different points of view held by shareholders and management are the goals of corporate governance. Corporate governance is a legal and institutional mechanism implemented to achieve the separation of ownership and to address the agency problem, which refers to the conflict between shareholders and managers [27],

allowing managers to align their interests with shareholders (Jensen & Meckling 1976).

Nevertheless, the extensive research conducted on corporate governance, encompassing ownership structures and board composition, has not consistently produced favorable outcomes regarding its influence on marine companies.

Tamayo-Torres et al. (2019) conducted a study analyzing the influence of environmental, social, and governance (ESG) characteristics on the valuation of 500 companies in the United States and Europe over a two-year timeframe. The findings indicate that governance and environmental issues do not influence the company's value. Moreover, the analysis indicated a negative correlation between social performance and corporate value. This was one of the conclusions drawn from the investigation. Siminica et al. (2019) conducted a thorough investigation into the interplay between corporate governance, financial performance—measured by ROA and ROE—and associated social, environmental, and economic factors. The researchers employed structural equation modeling, or SEM, to analyze data gathered from 614 prominent companies operating within the European Economic Area during the period from 2013 to 2017. The investigation revealed a positive correlation between corporate governance and the financial, social, and environmental performance within the shipping industry.

Historically, it was a prevalent practice for family members to retain ownership of a shipping firm following its establishment. Kotsantonis et al. (2016) indicate that family members often assume the roles of chief executive officers and presidents to safeguard the family's interests. Family ownership fosters a collaborative commitment to the organization's sustainable development, leading to a notable decrease in costs associated with agency-related issues. A study conducted by Syriopoulos and Tsatsaronis (2011) revealed a direct correlation between family ownership and financial performance.

A growing number of shipping companies have sought public listing since 2008 due to the necessity for significant funding. The public ownership of shipping companies increases the board's size, incorporating directors from diverse backgrounds and areas of expertise. Andreou et al. (2014) conducted a study examining the impact of corporate governance on the operating performance of thirty-

two transportation companies in the United States. In the analysis of corporate governance, several variables were evaluated, including ownership structure, board composition, and CEO duality. Research indicates that specific corporate governance measures can enhance financial performance and reduce agency costs. Additionally, studies conducted by Panayides (2019) and Siminica et al. (2019) demonstrate that integrating independent directors and enhancing board diversity within corporate governance frameworks can lead to an elevation in the value of shipping companies. Giannakopoulou et al. (2016) and the United Nations (2021) indicate that some academics suggest family ownership could create a potential conflict of interest between family and non-family members on the board of directors, potentially resulting in a decrease in the overall value of the company.

3.3. Environmental, Social, and Governance challenges encountered by individuals and organizations involved in the maritime industry.

The literature on environmental, social, and governance (ESG) practices in the maritime industry, along with extensive ESG research, indicates that the challenges faced by the shipping industry mirror those experienced by other sectors aiming for leadership in sustainability within their fields. This list includes a range of challenges such as decarbonization, climate change, financing, investment, regulation, compliance, transparency, data, talent shortages, and standardization. The following sections will examine the challenges as presented in the literature, along with how the shipping industry has responded to ESG compliance issues.

3.3.1. The challenges of climate change and the necessity of reducing carbon emissions

The maritime sector is confronted with obstacles in its efforts to mitigate climate change: and how to manage liquid waste, decreasing its greenhouse gas emissions and adjusting to its consequences. Nevertheless, its substantial dependence on fossil fuels presents significant challenges. The shipping industry's transboundary nature, the scarcity of alternative fuels, the high cost of updating electrified lines, and the lack of clarity surrounding regulations present obstacles to decarbonization (Fisk, 2022).

3.3.2. Investment and financing obstacles

Substantial capital is necessary for the maritime sector to transition to sustainability. Nevertheless, the market has experienced a decline in ship financing as a result of the banks' withdrawal (Damyanova, 2020). As a result of the global financial crisis, prominent maritime financiers, including Nord LB and HSH Nordbank, experienced substantial losses and consequently decreased their involvement in shipping financing. Consequently, there is currently a funding deficit. Alternative finance companies have emerged as a potential solution; however, they typically prioritize sustainability over profits (Damyanova, 2020). Shipping companies face difficulties in securing the required capital for sustainable initiatives due to changing financial dynamics (Damyanova, 2020). The examination of novel funding frameworks and the proactive engagement of alternative finance entities is crucial for effectively tackling these financial and investment obstacles.

3.3.3. Obstacles associated with adhering to regulations and standards

Numerous challenges exist in relation to regulatory compliance and the operations of sustainable transportation. Shipping corporations face several challenges, including inadequate long-term sustainability planning, compliance with stringent legal requirements, insufficient resources for measurement systems, and hesitance to invest in corporate social responsibility (CSR) initiatives. The adoption of sustainable practices is complicated by technological advancements, the effectiveness of regulations, and the volatility of fuel prices. The enforcement of emission control legislation is further complicated by factors such as the availability of emission testing apparatus, the reliability of bunker fuel delivery documentation, and the effectiveness of emission testing equipment (Yusheng, 2023). To address these challenges, it is essential to implement thorough corporate social responsibility (CSR) initiatives, allocate resources towards sustainable technologies, and ensure ongoing engagement with regulatory authorities.

3.3.4. The challenges associated with data administration and the importance of transparency

The lack of transparency and challenges related to data hinder the progress of sustainable shipping. Historically, the industry has shown a hesitance to share information, driven by competitive concerns, which has led to a notable absence of transparency (Stephens, 2021). The lack of uniform definitions, standards, and metrics

for ESG reporting leads to inconsistencies, thereby complicating the comparison and evaluation of sustainability performance. Businesses might participate in greenwashing, a deceptive practice that entails the creation of false narratives regarding their sustainability efforts. Focusing on immediate profits rather than long-term sustainability goals often hinders substantial advancement. To address these issues, it is essential to implement standardized reporting systems, enhance transparency, and depend on accurate data for informed decision-making (Dolan, 2021).

3.3.5. Specific obstacles that are peculiar to the maritime industry

The logistics and operations of maritime shipping corporations are currently influenced by environmental, social, and governance (ESG) concerns that have not been previously recognized. Unforeseen events, including the COVID-19 pandemic and incidents such as the grounding of the MV EVER GIVEN in the Suez Canal, intensify port congestion, leading to disruptions in trade. Larger container ships present benefits related to fuel efficiency and capacity; however, they simultaneously create inefficiencies at ports, potential mishaps, and navigational difficulties. The identified issues obstruct the flow of commodities, elevate emissions, and hinder the achievement of sustainability goals, ultimately adversely affecting ESG initiatives. Addressing the operational and environmental risks stemming from an overdependence on larger vessels is essential for the establishment of sustainable maritime operations. This may lead to a reduction in service quality and reliability (Vediakova, 2022).

3.3.6. Standards and accountability concerns

Standardization and accountability present substantial obstacles to sustainable shipping. The assessment and comparison of sustainability performance are complicated by the absence of standardized ESG reporting frameworks. It becomes increasingly difficult to hold business leaders and companies accountable as CEOs and boards undergo changes, as well as business strategies. When corporate strategy changes and boards and CEOs change, it becomes more difficult to assure the accountability of business executives and companies.

The situation is further complicated by the inconsistencies and contradictions present in ESG ratings and criteria. To enhance sustainable practices and foster

transparency, it is essential to create strong frameworks, implement clear reporting protocols, and boost accountability (Marwitz, 2022). Approaches to address these challenges involve engaging in the formulation of standardized ESG frameworks, facilitating dialogue with stakeholders and regulatory bodies, and collaborating with industry associations.

3.4. Incorporating environmental, social, and standards into the funding choices made by shipping corporations.

The shipping industry, a major player in global commerce, is currently facing heightened examination regarding its environmental, social, and governance (ESG) performance. A range of stakeholders, including investors, clients, and regulators, are calling for enhanced transparency and accountability concerning the environmental, social, and governance (ESG) practices of shipping companies (Cogilniceanu 2023).

The incorporation of Environmental, Social, and Governance (ESG) factors into the investment strategies of shipping companies should be emphasized, given their significant relevance. Shipping companies must comply with numerous international, regional, and national regulations, including those related to environmental protection, labor practices, and safety (IMO, 2020). Integrating ESG considerations into investment decisions is a prudent approach to ensure compliance with these requirements and reduce the likelihood of facing penalties, sanctions, or operational disruptions (Poulsen, Johnson, & Ponte, 2018). In 2020, UNCTAD indicated that the financial performance and long-term viability of a shipping firm are notably influenced by environmental, social, and governance (ESG) factors. Shipping companies can enhance their ability to identify, assess, and address risks linked to these factors by incorporating environmental, social, and governance (ESG) considerations into their investment strategies. This subsequently improves their capacity to efficiently handle hazards (Psarros, Skjong, & Eide, 2010).

Shipping companies are facing mounting pressure from investors, clients, and other stakeholders to showcase their dedication to sustainable business practices and ethical conduct (UNCTAD, 2020). Shipping companies have the opportunity to enhance the coherence between their operations and stakeholder expectations through the incorporation of environmental, social, and governance (ESG) criteria into their

investment strategies. This could lead to the attraction of further capital, customers, and strategic partners (Poulsen et al., 2018).

The incorporation of ESG factors into the investment strategies of maritime companies presents several benefits, such as bolstered reputation, refined risk management, and greater access to capital. (UNCTAD, 2020). Nonetheless, the maritime industry faces difficulties in incorporating environmental, social, and governance (ESG) factors. The constraints include the complex nature of the industry, the requirement for specialized knowledge and skills, and the restricted access to dependable and high-quality data (Poulsen et al., 2018).

To effectively integrate environmental, social, and governance (ESG) factors into their investment decisions, shipping companies can utilize a range of strategic approaches and guiding principles. These may encompass:

- The Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB) which are globally recognized sustainability reporting frameworks that shipping companies may employ to disclose their environmental, social, and governance (ESG) performance in a consistent, transparent, and comparable manner (GRI, 2020; SASB, 2020).
- The shipping industry has developed various specific standards for integrating environmental, social, and governance (ESG) factors. The Clean Shipping Index and the Poseidon Principles are included in this category. The principles provide a systematic framework for evaluating and reporting on ESG (Environmental, Social, and Governance) performance within the marine sector. This enables shipping businesses to assess their performance relative to other companies within the industry and adopt the most effective strategies (Poseidon Principles, 2019; Clean Shipping Index, 2020).
- Shipping companies can utilize ESG ratings and benchmarks from specialized research organizations like MSCI ESG Research and Sustainalytics to evaluate their ESG performance and pinpoint areas needing enhancement (MSCI, 2020; Sustainalytics, 2020).
- Shipping companies can enhance their operations by collaborating with other companies, investors, and stakeholders to share information, resources, and effective methods for integrating environmental, social, and governance (ESG)

considerations (UNCTAD, 2020). The shipping industry can enhance the implementation of environmental, social, and governance (ESG) initiatives through active participation in industry organizations such as the International Chamber of Shipping (ICS) and the World Shipping Council (WSC) (ICS, 2020; WSC, 2020). This involvement can yield critical insights and support.

- The effective incorporation of ESG elements necessitates a consistent dedication to continuous improvement and adjustment in light of changing regulations, stakeholder demands, and industry standards (UNCTAD, 2020). To ensure continued relevance, efficiency, and alignment with long-term business objectives, shipping companies must perform regular evaluations and updates of their ESG strategies, policies, and practices.

Maritime businesses must incorporate environmental, social, and governance (ESG) factors into their investment decisions to improve risk management, align with stakeholder expectations, and secure the company's long-term success. Adopting effective practices and frameworks for incorporating environmental, social, and governance (ESG) factors can significantly enhance the competitive edge, reputation, and risk management of shipping companies within a sustainability-oriented market landscape.

4. Methods for Writing ESG Reports

Currently, ESG is perceived more as a catchphrase than as a comprehensive solution to the increasing demand for data on business performance. In contrast to other three-letter acronyms that denote management breakthroughs, such as TQM, JIT, and BSC, ESG is not a singular concept. A nuance that proponents of ESG frequently neglect is that the three ESG domains present distinct opportunities and challenges for measurement. Designing a system of reporting, appraisal, and investment for metrics that are primarily defined by their absence is not a recipe for success, however.

In the absence of a shared context, the E, S, and G components of an ESG report may be in conflict with one another. Consider a company that is being

compelled by interested parties to reduce the carbon emissions generated by its fleet of fossil fuel-powered vehicles. According to ESG, the organization's ecological footprint is diminished by transitioning to electric vehicles. However, what would be the outcome if the companies that provide the raw materials for electric vehicle batteries utilized conflict minerals—such as gold, tungsten, tantalum, and tin—that were mined by prisoners who were sentenced to indentured servitude?

Consider a comparable example: an organization that has been subjected to criticism and excluded from investment portfolios as a result of an ESG report that disclosed an elevated number of workplace incidents. In order to resolve this issue, the organization implements an intelligent combination of automation and outsourcing. The forthcoming ESG report indicates that there has been a substantial decrease in workplace accidents. It is imperative to bear in mind that the report does not account for the unquantified and unrecorded loss of employment experienced by former employees, as well as the decline in the local economies of the company's previous supplier base and local communities.

The challenge of reconciling a variety of ESG activities is rooted in the difficulty of reaching objective moral conclusions. In the absence of a widely recognized consensus regarding the role of corporations in society, decisions regarding the evaluation of ESG data, its evaluation methodology, and its aggregated form are arbitrary and susceptible to manipulation. This situation places a significant burden on ESG report auditors, who typically respond by providing a double negative opinion that would state, "We have not identified any indications of misreporting in the company's ESG report."

Some proponents of ESG reporting exceed the scope of basic disclosure by assigning numerical values to the various components of an ESG report and incorporating each measured element into the organization's financial statement. They argue that an updated statement, such as this one, provides a more comprehensive and all-encompassing assessment of a business's actual profitability after considering its impact on society, the environment, and governance.

However, the value of the numerous components of ESG—including a company's carbon emissions, diversity in the workforce, labor policies, and governance practices—is significantly more complex than the projection of future

cash flows, which is the foundation of traditional financial reporting. Consider the decades-long endeavors of certain accountants to quantify the value of individuals by recording them as an asset on a company's balance sheet, based on a CEO's declaration of worth. These endeavors were unsuccessful due to the fact that the employee appraisals were either irrelevant or difficult to validate, or they were discretionary and contingent upon factors such as the cost of hiring and training. Furthermore, it will be exceedingly challenging, if not impossible, to identify a formula that integrates the evaluations of the numerous components of ESG. In order to negotiate the moral trade-offs within ESG, it would be necessary to establish an internationally recognized code of reporting, as previously mentioned.

The long history of financial accounting, which spans over five centuries, and its foundation in currency, a single, readily comprehensible asset that is straightforward to value, are the reasons for its widespread acceptance and reliability. A \$1 increase in cash corresponds to a \$1 decrease in value. Financial accounting's fundamental principle is the accurate prediction of future cash transactions, as well as quantified ones from the past and present. In order to generate financial balance sheets, income statements, and cash-flow statements, cash-based financial elements are aggregated and subtracted, with each item expressed in a consistent monetary unit. Although a widely accepted carbon tax may be able to convert greenhouse gas (GHG) emissions into monetary terms, it is currently impossible to make a similarly accurate conversion for all other aspects of an environmental, social, and governance (ESG) report, particularly its impacts on society and governance.

What measures can be implemented to report on ESG? Despite the difficulties in quantifying them, the current requirements for businesses to report on their environmental and social implications are often justifiable and comprehensible. Global capitalism has yielded substantial financial and material benefits; however, it has also resulted in detrimental consequences, including the deterioration of the Earth's atmosphere, geology, and water supplies. Additionally, 1 billion individuals worldwide—or 15% of the global population—are still experiencing extreme poverty. This is defined as earning less than \$2 per day. Furthermore, corporate automation and outsourcing have resulted in the unemployment or underemployment of numerous individuals in industrialized nations.

In order for ESG reporting to be equivalent to financial reporting in terms of relevance and credibility, it is essential that it be firmly grounded in the unique measurement issues that are inherent in each of its dimensions. ESG campaigners have undermined their argument by representing a diverse array of non-financial performance as a singular, interchangeable concept. This reductionism complicates the process of conducting comprehensive analyses of the most effective methods for evaluating each individual component of ESG.

Environmental metrics are ideal for comprehensive corporate reporting due to their quantifiable, objective measurements of the volumes of gases, particulates, and liquids that businesses consume and generate. Given the various forms of environmental degradation, we are of the firm conviction that the most pressing concern for humanity is the potential existential threat presented by climate change. Consequently, we argue that the primary objective should be to enhance the monitoring and reporting of greenhouse gas (GHG) emissions by corporations and governments.

In instances where there is already a robust moral consensus, such as the prevention of slave labor in a company's supply chain, comprehensive reporting systems are particularly beneficial for communicating corporate social performance. Nevertheless, subjective value assessments are necessary for the meaningful interpretation of a number of alternative S metrics, such as the CEO to average worker pay ratio. Translating the diverse public preferences regarding a company's activities into broadly applicable metrics of the costs and benefits to society is a challenging endeavor, as we will demonstrate in the future.

The conceptual ambiguity of governance (G) reporting is the most pronounced among the three components of environmental, social, and governance (ESG). This is due to the fact that governance is a process rather than an outcome. The sole attribute that renders good governance valuable is its ability to result in improved financial, environmental, and social outcomes, as well as improved decision-making. In the absence of outcome-based metrics for governance, supporters have resorted to the aphorism "if you can't measure what you want, desire what you can measure" and have focused on evaluating compliance—such as the prevention of lawsuits—or inputs—such as the diversity of board members. The article does not provide any

indication of how input and compliance metrics could be employed to accurately predict significant improvements in company results.

It appears that the continuous triple-bottom-line reporting that sought to reveal information about the effects on the economy, the environment, and society was diverted by the emergence of the acronym ESG, which was coined two decades ago (The Global Compact 2004) by a consortium of financial institutions sponsored by the UN. We contend that the triple-bottom-line approach is a more rigorous and germane strategy for addressing the climate emergency and fulfilling corporate societal obligations, rather than attempting to salvage the conceptually confusing ESG method.

Companies have already implemented nonfinancial metrics to assess their development and supplement their conventional financial reporting. One example of a tool that can assist managers in the efficient execution of their profit-seeking strategies is the Balanced Scorecard. This solution encompasses metrics for customer satisfaction, process efficacy, innovation, and staff performance. Even if their primary objective is to maximize shareholder wealth, businesses can satisfy external demands for enhanced environmental and social performance by incorporating "E" and "S" outcome indicators into their strategy scorecard (Kaplan and McMillan 2021).

In the subsequent sections, we will delve further into the methods for evaluating a company's environmental and societal impact. Additionally, we will discuss the potential for these measurements to be as precise, significant, and verifiable as the financial indicators that are employed to assess the success of businesses.

4.1. Environmental Monitoring and Reporting

As of April 2021, the Washington Post reported that the atmospheric CO₂ levels worldwide are halfway to doubling from the levels that existed prior to the industrial revolution (5 <https://www.washingtonpost.com/weather/2021/04/05/atmospheric-co2-concentration-record/.0>). The concentration of greenhouse gases (GHGs) in the atmosphere is approaching the point at which it could have irreversible and catastrophic consequences. Sound accounting standards must be prioritized in order to guarantee the precise measurement and reporting of a company's greenhouse gas (GHG) performance in Environmental, Social, and Governance (ESG) reports.

Organizations should be motivated to reduce their greenhouse gas emissions by a well-designed greenhouse gas accounting system. Even in the absence of government regulations or carbon prices, companies' value chains generate greenhouse gas emissions. An analysis of consumer purchase decisions, which are influenced by a valid GHG measurement of a product or service, can be used to infer consumer willingness to pay for a business's reduced greenhouse gas (GHG) emissions. In order to evaluate and enforce a regional or global carbon tax, governments would require a greenhouse gas (GHG) accounting system that is both verifiable and trustworthy for individual companies. Even more, this underscores the importance of maintaining an efficient greenhouse gas accounting system.

Measuring and reporting greenhouse gas (GHG) emissions is a task that can be accomplished swiftly and easily, in addition to being a significant concern. A significant amount of scientific literature is presently accessible for the purpose of detecting greenhouse gases (GHGs). The majority of research has concentrated on the measurement of greenhouse gas (GHG) emissions at both the national and international levels. Nevertheless, the specific measurement of GHG emissions at the corporate level has been the subject of a limited number of publications and studies. A working group was established in the late 1990s by the World Resources Institute and the World Business Council for Sustainable Development. This group was composed of representatives from a wide range of organizations, including universities, NGOs, government agencies, and enterprises. In 2001, a Greenhouse Gas Protocol was established for the initiative. After undergoing numerous revisions, this protocol is currently the most frequently employed corporate standard in this industry. The following standard offers detailed instructions on the measurement and reporting of greenhouse gas (GHG) emissions, which are categorized into three categories.

Scope 1 signifies the actual greenhouse gas (GHG) emissions that are produced from sources that are under the company's custody or control. This covers the emissions produced by the organization's fleet of automobiles and production equipment. Scope 2 includes greenhouse gas (GHG) emissions produced at non-corporate facilities that provide the firm with the electricity it purchases and uses.

Scope 3 refers to the greenhouse gas emissions that are indirectly generated by a business's supply chain activities, consumers, and end users.

Despite the fact that scope 1 emissions are the most straightforward to quantify, they typically constitute a small proportion of an organization's total greenhouse gas (GHG) emissions into the atmosphere. Scope 2 emissions, which are associated with electricity consumption, were separated from Scope 3 emissions due to their ease of identification and monitoring in comparison to other types of Scope 3 emissions. At present, the GHG Protocol criteria are being adhered to by hundreds of businesses when reporting their Scope 1 and 2 GHG emissions.

Scope 3 emissions, which typically constitute the majority of a company's greenhouse gas (GHG) emissions, are the most significant challenge in accurately and consistently quantifying greenhouse gas (GHG) emissions across various organizations and over time. One effective method of illustrating the obstacles associated with Scope 3 assessment is to examine the obstacles that a vehicle door manufacturer encounters. The monitoring of all greenhouse gas (GHG) emissions that are the result of the operations of its upstream suppliers is required by Scope 3. These activities encompass the following:

- (1) The extraction of coal and iron ore through metallurgical processes;
- (2) The transportation of coal and ore to a steel producer;
- (3) The production of sheet steel from coal, iron ore, and other materials; and
- (4) The transportation of raw sheet steel from the steel factory to its private production facility.

The organizations should also assess the greenhouse gas (GHG) implications of various downstream operations. These actions include the following:

- (1) Transporting the car door to the client, the auto assembly facility;
- (2) Manufacturing the finished vehicle;
- (3) Relocating the finished vehicle to a display area; and
- (4) Allowing the end-user to operate the vehicle for a potential fifteen years.

Significant measurement errors and opportunities for bias and manipulation in a company's environmental reporting are a result of pre- and post-operational greenhouse gas calculations, particularly for businesses with complex value chains

that span multiple jurisdictions. Furthermore, in order to satisfy the reporting requirements of Scope 3, all companies within a value chain are required to calculate and submit the total greenhouse gas (GHG) emissions of the value chain as a. This is an exceedingly wasteful method that results in a fundamental accounting error—the duplication of emissions measurements.

Many companies choose to disregard Scope 3 reporting wholly due to its difficulty in measurement and the limited control over emissions that occur upstream and downstream. In hindsight, these companies were correct in their refusal to submit a report on Scope 3 emissions, as it would have been an unreliable and misleading method of assessing the environmental impact of a company's operations, both upstream and downstream.

To address the current GHG reporting framework, which expressly supports the addition of Scope 3 emissions, we can employ fundamental concepts from cost and financial accounting to compile and distribute a product's GHG emissions throughout its supply and distribution chain. The concepts are derived from the company's practice of procuring production costs from its suppliers upstream, adding its own fees, and subsequently charging its customers the full amount. Corporate accounting does not mandate that the car door manufacturer ascertain the precise purchase prices paid by each company at each stage of its supply chain. Rather, each organization simply monitors the expenses it incurs when purchasing products and services from its direct suppliers, as well as the revenue it generates from the sale of these items to clients.

For instance, presume that materials are transferred at the original cost, plus an additional sum for profit, as they progress from one stage to another. The acquisition costs of the car door company would encompass the costs incurred by the mining company to extract the raw materials, as well as all labor, machining, and indirect costs incurred by the various suppliers in the supply chain as they handle and process the materials until they are received by the car door manufacturer. The manufacturer adds its own labor, machining, and indirect charges to the purchased costs in order to determine the total production cost of the door. This fee is assessed at a later date when the door is sold and transmitted to the car assembly company. This process continues until the purchaser purchases the vehicle from the distribution network.

GHG measurement and reporting are not only the most critical priority, but they are also the most straightforward to implement in a timely manner. There is already a substantial body of scientific literature dedicated to the measurement of greenhouse gases. Although the majority of articles have concentrated on the measurement of greenhouse gas emissions at the global and national levels, there are numerous initiatives and articles that have addressed the measurement of greenhouse gas emissions at the corporate level. In the late 1990s, the World Resources Institute and the World Business Council for Sustainable Development convened a working group of representatives from hundreds of companies, government agencies, universities, and NGOs. The Greenhouse Gas Protocol, which was developed by the project in 2001, has been updated on numerous occasions and is presently the most widely used corporate standard in this field. In accordance with the taxonomy of the GHG reporting standard, the financial accounting system mandates that all businesses calculate only the costs associated with Scope 1 operations. These costs consist of indirect costs, which include charges for both manufacturing and administration, as well as labor and fabrication. These costs are also known as "overhead." The "Scope 1" value is subsequently incorporated into the cost of procuring supplies and other services, such as energy. The subsequent individual in the supply chain receives the collected sum. The same cost accounting and financial methods that are employed to monitor and document the actual quantities of CO₂, CH₄, and N₂O emissions in commercial value chains can also be employed to quantify greenhouse gas emissions.

For instance, we could commence with the supplier that is situated the furthest from the car door company, such as a mining company in Western Australia. This mining operation harvests coal and iron materials, which are subsequently utilized in the production of automobile doors. The mining industry quantifies its Scope 1 emissions by employing a combination of cost accounting, engineering, and chemistry. It designates the quantities of coal, iron ore, copper, and other minerals extracted during a specific period to account for the total emissions. This allocation procedure is comparable to the utilization of activity-based costing for indirect costs within a business. This algorithm generates an estimate of greenhouse gas emissions per metric ton of any specific material that is manufactured. While cost accounting treats the financial cost of a ton of material as an "asset," by recording the cost as

“inventory,” we can label the GHG units per ton of extracted material as an E-liability, reflecting its environmental liability to society.

The mining company transfers its substantial quantities of coal and iron ore to the shipping company, which then undertakes responsibility for any potential e-liabilities (e-liability, reflecting its environmental liability to society). In the same manner as it records the "inventory" in its financial accounting records, the shipping company records these e-liabilities in its accounting records. If the mining company transfers all of the materials it mined within a specific time frame to downstream entities, such as the shipping company, the E-liability account will possess the same quantity at the conclusion of the period as it did at the beginning.

The shipping company's E-liability account is updated with the quantity of greenhouse gas (GHG) emissions generated by its ocean barge during its journey from Perth, Australia to Port Talbot, Wales. This encompasses the emissions generated by the petroleum utilized to operate the ship's engines. The total quantity of greenhouse gas emissions produced during the trip is distributed among the commodities transported on board based on their weight or volume. When the shipping business physically transmits 38% of its ship's iron ore and 6% of its metallurgical coal to a steel maker at Port Talbot, it will transfer 38% of its iron ore E-liability and 6% of its coal E-liability to the steel company. This suggests that the steel company is now responsible for the E-liabilities.

A blast furnace and hot and cold rolling mills are employed by the steel company to manufacture coils of sheet steel, which generates its own Scope 1 emissions. The E-liability accounting system is employed by the steel mill to allocate the E-liability it has acquired and incurred to each ton of sheet steel it produces. A coil of sheet steel that is conveyed to a railroad company is responsible for its weight's share of the GHG emissions that result from the steel production process, the cumulative E-liability from the mining company that produced it, and any transportation expenses paid up to that point.

The E-liability of the steel coil, which encompasses its share of greenhouse gas emissions from the railroad company's transportation between Port Talbot and Solihull, will be transferred to the car door manufacturing company upon its arrival at the receiving dock in Solihull, England, in a few days. Until the buyer of the

completed vehicle receives both the vehicle and a report detailing the quantity of greenhouse gas emissions used during its production and delivery, this process will persist. This is comparable to a customer discovering nutritional information on a food item they purchased from a store at this juncture. This additional information frequently influences the consumer's purchasing decision. Blockchain technology enables the accumulation and conveyance of E-liabilities throughout the production process, thereby reducing the system's accounting and auditing expenses.

Companies may elect to implement direct measures to mitigate their greenhouse gas (GHG) emissions into the atmosphere. Examples of such actions include the cultivation of new trees or the utilization of carbon capture technologies. The quantity of greenhouse gas (GHG) emissions that a company reduces through Scope 1 contra-emissions is deducted from its E-liability account. As a result, the business may transmit a reduced E-liability to the subsequent firm in its supply chain, and ultimately to the final consumer. This decrease enhances the product's appeal and provides the organization with a competitive advantage when targeting environmentally conscious consumers.

The first of two critical measurement procedures in the GHG E-accounting approach is the allocation of this net E-liability, as well as any acquired E-liability, to the units of output produced during that period. Estimating the net E-liabilities generated and eradicated by the company in each period is the other process.

The quantity of greenhouse gas (GHG) emissions produced by a company's primary GHG activities can be estimated by environmental engineers at the outset. One of these activities is the combustion of hydrocarbons for the purposes of heat, power, and transportation. Waste management techniques, industrial processes such as the production of metal, cement, glass, and chemicals, and agricultural activities such as livestock emissions and reforestation and deforestation are among the other activities. This enables the regular recording and evaluation of a business's electronic liabilities.

In the same way that a company's broad array of products and services are allocated to a period's net greenhouse gas (GHG) emissions, corporate cost-accounting currently employs activity-based costing to allocate indirect expenses, such as overhead, to the products and services manufactured during the same time.

The two measurement challenges can be resolved by organizations to enable them to report on the stocks and flows of their E-liabilities on a regular basis in a manner similar to that of their opening inventory, yearly purchases of basic materials, production of completed goods, cost of goods sold, and closing inventory. The environmental (E) report of the company would contain the following information: disclose its beginning of period net E-liability, the liabilities acquired, the liabilities generated by the company during the period, the liabilities sold, and the net amount of liabilities remaining at the end of the period.

Some environmental activists may be concerned that a company will be able to elude inspection for its greenhouse gas-intensive operations if it transfers all of its Scope 1 emissions to its downstream customers. In the same way that an expert financial analyst examines a business' cost of goods sold and inventory levels to determine net income, an experienced environmental analyst can examine a business's acquisition, creation, and disposal of liabilities in greater detail than the E-liability balance at the end of the period. Moreover, the E-liability system does not prohibit a company from publishing Scope 3 comparable figures if it so chooses. The data required to calculate a company's Scope 3 emissions is provided by the E-liability disclosures throughout its value chain. In reality, the E-liability system provides more precise and verifiable reporting of Scope 3 emissions than the current greenhouse gas (GHG) reporting procedures.

Numerous benefits are associated with the proposed E-liability accounting system. Initially, it eliminates the intrinsic repetition of counting in Scope 3 measurement, including double, triple, quadruple, and so forth. Additionally, a company is unable to reduce its documented Scope 1 emissions by merely transferring production to external sources and subsequently declining to estimate Scope 3 emissions due to severe measurement errors and a lack of data on remote suppliers and end-user consumers. The corporation is responsible for any greenhouse gas emissions that are produced by an outsourced supplier when it purchases products from them. E-liabilities are assessed in a manner that aligns with incentives. A company would not derive any advantages from reducing the E-liability it transfers to its consumers, as this would inevitably result in an ongoing increase in its net E-liability. Nevertheless, purchasers will object to any attempt by a company to increase the amount of liability it transfers to its downstream customers, in the same way that

they would to price increases they consider to be excessive. If suppliers and consumers conduct transactions in a fair and impartial manner, it will be challenging to manipulate the transfer of electronic obligations.

Environmental reporting can implement a distinctive materiality criterion that is contingent upon the quantity of greenhouse gas (GHG) emissions as a result of the methodology. This criterion is not affected by the materiality factors that are considered in financial reporting. Currently, companies are required to disclose any situation in which environmental issues pose a material financial risk to the business in accordance with widely accepted ESG reporting standards. This loophole allows numerous greenhouse gas-intensive operations to remain unreported if their influence on a company's financial accounts is negligible.

Ultimately, an audit of a company's E-liability balance may be conducted in the same manner as an audit of its financial asset and liability statements. We propose that the external assurer, which will consist of environmental engineers, cost accountants, and blockchain specialists, validate the company's internal greenhouse gas (GHG) measurement and allocation models, as well as its purchases and transfers, particularly those related to GHG-intensive goods and services. Additionally, the E-liability will be balanced at the beginning and conclusion of the period. Auditors can verify the authenticity of a client's claim by comparing the E-liability transaction with the corresponding activity in the client's financial records. If the E-liabilities reported were abnormally minor in comparison to industry peers, a "red flag" would be raised, taken into account the client's inventory movements over a specific period of time.

The investment community's enthusiasm for ESG (Environmental, Social, and Governance) and GHG (Greenhouse Gas) reporting is primarily due to the wish to make investments that will contribute to the development of a more sustainable planet. However, a mandate applying only to publicly-traded companies provides a strong incentive for public companies to go private. This is particularly true for large private enterprises, such as Bechtel, Bosch, Cargill, Koch, and Mars, as well as those financed by limited partnerships, venture and equity capital firms, and joint ventures, which are required to report their E- liabilities. Greenhouse gas emissions are generated by a variety of enterprises worldwide, in addition to governmental and commercial entities. State-owned enterprises and government organizations that

generate a substantial proportion of the nation's greenhouse gas emissions include the energy, transportation, and defense ministries. In order to effectively reduce emissions, it is imperative that all entities—public, private, governmental, and supra-governmental—disclose their greenhouse gas emissions.

For instance, large corporations that have signed the Business Roundtable's "corporate purpose" declaration may demonstrate their dedication to E-liability reporting by voluntarily implementing it in the absence of laws or regulations. This is particularly important if they require the implementation of E-liability accounting for their consumers and vendors. In addition to their price, customers would be able to promptly evaluate the E-liability of the majority of the products and services they acquire. The voluntary signaling of their environmental performance by these well-known companies may assist them in competing with consumers who are more inclined to base their purchases on reducing their own environmental obligation.

The E-liability system simplifies the implementation of various carbon taxation strategies. Governments that aspire to be at the forefront of the battle against greenhouse gas (GHG) emissions may establish an E-tax system that concentrates on specific groups, such as investors, consumers, and producers, based on the group they wish to influence the most. The E-tax may operate similarly to a corporate value-added tax by restricting a company's liability acquisitions in comparison to its responsibility disposals. Alternatively, it may impose a tax on investors by calculating the difference between the E-liability levels at the commencement and conclusion of a company's period and calculating the obligation based on that difference. Additionally, an E-tax, which is similar to a sales tax, could generate consumer demand by imposing it on the entire E-liability of products and services acquired.

4.2. Societal Monitoring and Reporting

The assessment of a company's social impact is even more intricate than the calculation of the quantity of hazardous gases, liquids, and solids that the company releases into the environment. The term "society" does not denote a uniform or homogeneous entity. The opinions and preferences of various individuals and groups in society regarding corporate behavior that is either positive or negative are diverse. Initially, we will focus on the aspects of corporate social performance that are generally understood. The components that have been agreed upon include the

elimination of child and slave labor, the improvement of workplace safety, and the prohibition of corruption and extortion. Despite the fact that adhering to these guidelines may appear to be common sense, numerous businesses continue to encounter challenges in preventing these violations in their complex, multi-tiered global supply chains.

For example the United States and Europe-based multinational chocolate businesses have made substantial financial investments in a sustainability initiative in Ghana and the Ivory Coast, which collectively account for 60% of the world's cocoa supply. The initiative's objective was to verify that no minors were employed in the cocoa cultivation process and that no land that had been cleared of trees was utilized for this purpose. The initiative not only supplied farmers with free seedlings to replace their ancient and unproductive trees, but also provided them with instruction and training. Mars, Nestlé, and Hershey committed to discontinuing the use of cacao that was collected by children nearly twenty years ago, according to a headline published by the Washington Post on June 5, 2019. However, a substantial portion of the chocolate you purchase is still produced using child labor. The elderly farmers, whose own children had relocated to urban areas in search of employment, employed the children of their impoverished neighbors to clear and fire forest land in order to continue farming. Off-taking companies procured an increased quantity of cocoa from Tier-1 suppliers that were accredited as a consequence of the cocoa sustainability initiative. Nevertheless, the program was unable to verify that Tier-1 suppliers exclusively procured from lower-tier suppliers who refrained from employing child labor. Similar to the reporting of greenhouse gas emissions in a multi-tier supply chain, the utilization of traceable and secure blockchain technology can enhance the reporting of compliance with widely accepted social norms.

In addition to adhering to fundamental social norms, numerous organizations endeavor to generate social advantages through employee involvement in charitable organizations and philanthropy. Contributions to the workplace are beneficial, provided that they do not divert attention from the organization's primary objectives. It must be accurately documented and acknowledged in the S-report. However, the evaluations of staff hours and financial contributions in volunteer non-profit activities are indicators of the "S" inputs (i.e., inputs) rather than the "S" outputs (i.e.,

outcomes). In order to be completely understood, philanthropic S reporting must be linked to the company's values of generating societal value.

Businesses have a positive and negative socioeconomic impact on the local areas in which they operate, as well as their employees, in addition to meeting basic compliance and charitable standards. The communities in close proximity to the former employees' employment may experience adverse consequences as a result of workforce reductions caused by global sourcing, automation, or competition. Displaced workers and their communities may experience substantial short-term consequences as a result of plant closures, which are readily apparent. A potential element of societal reporting would involve the company's assessment of the nature and severity of the adverse socioeconomic short-term consequences that its closure decisions have had on the community and its workforce. Nevertheless, quantifying the socio-economic consequences of these closures is a formidable task. The outcome is contingent upon local economic factors, including the unemployment rate, the prospect of new customers for the company's former suppliers, and the availability of suitable employment opportunities for the company's former employees.

Market-driven capitalism is inherently confronted with the challenges posed by competing forces. Apple, Walmart, and Amazon are among the businesses that have achieved success by employing disruptive yet highly effective business strategies. These models have resulted in the elimination of both current enterprises and their workforces in a wave of creative destruction, in accordance with the theories of economist Joseph Schumpeter. Proponents of S-reporting propose that disruptive enterprises be assigned low grades due to their substantial detrimental effects on established corporations, as well as the workers, suppliers, and communities that are associated with these failing businesses (Ramanna, Kaplan 2021). Nevertheless, this grading system disregards the preferences of the pioneering company's workers, suppliers, communities, consumers, and even investors in favor of those who stand to benefit financially from an immutable (and apparently ineffective) current state of affairs. Upon analyzing the effects of Walmart's expansion between 1985 and 2004, analysts discovered that the company had significantly reduced the costs of food and other retail purchases for low-income consumers by 25%. This cost-cutting measure is comparable to the total quantity of financial assistance that the government provides to low-income households (Hausman and Leibtag 2005). Capitalism is characterized

by disruption, and not as a vulnerability. Allowing the present state of affairs—which encompasses the customers, suppliers, employees, and communities of all established enterprises—to persist in an unfavorable manner leads to stagnation and, inevitably, a significant decrease in potential earnings, wealth, and job creation.

This incident implies that effective businesses should refrain from advocating for specific tax exemptions and benefits that could potentially increase the financial burden on the community through adjustment plans. Additionally, it implies that corporate misconduct in S-reporting should be recognized for any commercial strategies that aim to redirect income through offshore tax havens, as well as for any lobbying activities (Karthik Ramanna 2020). It is intriguing that the Business Roundtable, which is known for its innovative approach to corporate purpose, also boasts the nation's lowest corporate tax rates. These corporations also experience higher rates of labor and environmental compliance infractions and receive more government subsidies than their non-signatory counterparts (Raghunandan and Rajgopal 2021).

The inverse of this condition also transpires. Businesses enhance the socioeconomic status of the region by fostering development and providing employment opportunities for local suppliers. For instance, certain organizations are presently endeavoring to establish connections with individuals who have not been affected by corporate supply chains during the preceding seventy-five years of global economic expansion. A new chapter (Kaplan et al 2018) asserts that businesses have the potential to offer a more sustainable and cost-effective supply of trained labor, services, and products. This can also assist individuals residing in underprivileged communities and areas in enhancing their social and economic circumstances. The establishment and preservation of the intricate ecosystems necessary for these inclusive growth initiatives are challenging endeavors. Nevertheless, effective enterprises may attract recognition and investment from external sources by quantifying and disclosing the beneficial impacts they have on a variety of factors, including income, education, health, employment prospects, and family cohesiveness. The total "S" economic impact of an organization's activities encompasses not only its

own profits, but also the economic activity and earnings generated throughout its supply chain, which includes the wages paid to the employees of its suppliers.

Another potential domain for S-reporting is the essential functions of a business. For example, certain businesses, including those that cultivate tobacco, operate private prisons, manufacture weapons, operate casinos, extract fossil fuels, and develop specific pharmaceuticals, are inherently ethically conflicted in their daily operations. Variations in the severity of these issues are contingent upon the time and region, as well as the perceived profitability of the enterprises and societal norms. In light of the growing trend of institutional investors financing ethical businesses, it will be necessary for all companies to demonstrate how their primary value-creation strategies align with the prevailing and evolving social norms.

5. Conclusions

ESG reporting is an essential requirement for transportation companies to demonstrate their commitment to ethical and environmentally responsible business practices. By taking environmental, social, and governance factors into account, shipping companies can enhance their reputation, comply with regulations, and attract socially conscious investors. Nevertheless, the shipping organizations continue to encounter challenges with respect to data collection and the necessity of standardized reporting tools. It necessitates sustained concentration and innovative thinking to surmount these challenges.

Environmental, social, and governance (ESG) reporting is an increasingly important issue for shareholders and stakeholders in shipping companies. The shipping industry, as part of the broader logistics and supply chain process, can promote its reputation by providing good ESG practices in the conduct of its operations. There are several benefits of such reporting. First, ESG reporting encourages companies to consider risks and opportunities that could impact their

operations for the short to medium term. Second, companies that implement ESG reporting as part of their strategic vision can assess the progress of their sustainability initiatives. Third, companies can benchmark their social, environmental, and economic performance against their rivals. Lastly, ESG reports are a tool for storytelling, helping companies to promote their activities and accomplishments.

Because of these practical implications, there is growing regulatory pressure on shipping companies to report on their social, environmental, and governance performance. As a baseline, the International Maritime Organization has adopted a wide range of international instruments aimed at increasing the protection of people and the environment. There are regional measures, like the forthcoming Monitoring, Reporting, and Verification framework, which will require shipping companies calling ports to report key data. The importance of social, environmental, and governance performance to the world of investors and hence to access to capital in global trade can be assessed.

Shipping companies that excel and implement strong ESG policies gain a competitive edge through better risk management and improved operational efficiency. By recognizing a board range of external stakeholders, such as customers, suppliers, and policymakers who have the power to influence or block certifications, and concentrating on human rights and modern slavery risks, they satisfy both financial stakeholders and regulators, facilitating trade. As technology continues to enhance data collection, analysis, and decision-making, it is likely that the sharing of ESG information will become increasingly important in the near future. A strong ESG strategy will encourage obtaining a social license to operate and social license to operate is paramount.

References

- Adams, S. and Simnett, R. (2011) Integrated reporting: an opportunity for Australia's not-forprofit sector *Australian Accounting Review* 21, 292–301.
- Aerts, W. and Cormier, D. (2009) Media legitimacy and corporate environmental communication *Accounting, Organizations and Society* 34, 1–27.
- Albertijn, S., Bessler, W., Drobetz, W., 2011. Financing shipping companies and shipping operations: a risk-management perspective. *J. Appl. Corp. Financ.* 23, 70–82.
- Aldowaish, A.; Kokuryo, J.; Almazyad, O.; Goi, H.C. Environmental, social, and governance integration into the business model: Literature review and research agenda. *Sustainability* 2022, 14, 2959. [CrossRef]
- Alexandridis, G.; Kavussanos, M.G.; Kim, C.Y.; Tsouknidis, D.A.; Visvikis, I.D. A survey of shipping finance research: Setting the future research agenda. *Transport. Res. Part E Logist. Transp. Rev.* 2018, 115, 164–212. [CrossRef]

- Aluchna, M.; Roszkowska-Menkes, M. Integrating corporate social responsibility and corporate governance at the company level. Towards a conceptual model. *Eng. Econ.* 2019, 30, 349–361. [CrossRef]
- Amihud, Y., Mendelson, H., 1986. Asset pricing and the bid-ask spread. *J. Financ. Econ.* 17, 223–249.
- Andreou, P.C.; Louca, C.; Panayides, P.M. Corporate governance, financial management decisions and firm performance: Evidence from the maritime industry. *Transport. Res. Part E Logist. Transp. Rev.* 2014, 63, 59–78. [CrossRef]
- Andrews, B.H., Gul, F.A., Guthrie, J.E. and Teoh, H.Y. (1989) A note on corporate social disclosure practices in developing countries: The case of Malaysia and Singapore *British Accounting Review* 21(4), 371–376.
- Andrikopoulos, A., Merika, A., Merikas, A., Triantafyllou, A., 2013. Internet disclosure and corporate performance: a case study of the international shipping industry. *Transport. Res. Part A* 47, 141–152.
- Barnea, A., Heinker, R., Kraus, A., 2005. Green investor and corporate investment. *Struct. Change Econ. Dyn.* 16, 332–346.
- Barnea, A., Rubin, A., 2010. Corporate social responsibility as a conflict between shareholders. *J. Bus. Ethics* 97, 71–86.
- Baron, D., Harjoto, M., Jo, H., 2011. The economics and politics of corporate social performance. *Bus. Polit.* 13, 1–46.
- Bauer, R., Derwall, J., Hann, D., 2009. Employee relations and credit risk. In: Working Paper. Maastricht University.
- Bauer, R., Koedijk, K.C.G., Otten, R., 2005. International evidence on ethical mutual fund performance and investment style. *J. Bank. Finance* 29, 1751–1767.
- Bebbington, K.J. and Thomson, I. (1996) *Business Conceptions of Sustainability and the Implications for Accountancy* ACCA, London.
- Blacconiere, W.G., Patten, D.M., 1994. Environmental disclosures, regulatory costs, and changes in firm value. *J. Account. Econ.* 18, 357–377.
- Boot, A.W., Greenbaum, S.I., and Thakor, A.V. (1993) Reputation and discretion in financial contracting *American Economic Review* 83(5), 1165–1183.

- Bouslah, K., Kryzanowski, L., M’Zali, B., 2013. The impact of the dimensions of social performance on firm risk. *J. Bank. Finance* 37, 1258–1273.
- Brammer, S., Pavelin, S., 2006. Voluntary environmental disclosures by large UK companies. *J. Bus. Finance Account.* 33, 1168–1188.
- Brooks, A.C., 2012. *The Road to Freedom: How to Win the Fight for Free Enterprise*. Basic Books, New York, NY.
- Buettner, S.M. Roadmap to neutrality—What foundational questions need answering to determine one’s ideal decarbonisation strategy. *Energies* 2022, 15, 3126. [CrossRef]
- Buhr, N. (2002) A structuration view on the initiation of environmental reports *Critical Perspectives on Accounting* 13(1), 17–38.
- Burritt, R.L. and Schaltegger, S. (2010) Sustainability accounting and reporting: fad or trend? *Accounting, Auditing and Accountability Journal* 23(7), 829–846.
- Carroll, A. (1979) A three-dimensional conceptual model of corporate performance *Academy of Management Review* 4(4), 497–505.
- Carroll, A.B., 1999. Corporate social responsibility: evolution of a definitional construct. *Bus. Soc.* 38, 268–295.
- CGTN. Available online: <https://news.cgtn.com/news/2020-09-22/Xi-Jinping-China-aims-to-achieve-carbon-neutrality-by-2060-TZX22EfJiE/index.html> (accessed on 7 September 2022).
- Christensen, D.M. (2016) Corporate accountability reporting and high-profile misconduct *Accounting Review* 91(2), 377–399.
- Clarkson, P.M., Li, Y., Richardson, G.D. and Vasvari, F.P. (2008) Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis *Accounting, Organizations and Society* 33, 303–327
- Clean Shipping Index. (2020). *Clean Shipping Index: A transparent tool for cargo owners*. Retrieved from <https://www.cleanshippingindex.com/>
- Coady, L., Strandberg, C., Ota, Y., 2013. The role of corporate social responsibility (CSR) in the international shipping sector. In: Working Paper. University of British Columbia.

- Cormier, D. and Magnan, M. (1999) Corporate environmental disclosure strategies: determinants, costs and benefits *Journal of Accounting, Auditing and Finance* 14(4), 429–451.
- Dahalan, W.A.; Zainol, Z.A.; Yaa'kub, N.I.; Kassim, N.M. Corporate social responsibility (csr) from shipping companies in the straits of malacca and singapore. *Int. J. Bus. Soc.* 2012, 13, 197.
- Damyanova, V. (2020, January 27). 'Hydra' of ESG is barrier to private investments in shipping, investor says. *The SNL Insurance Daily*, pp. pp. 1-2.
- Daugaard, D. Emerging new themes in environmental, social and governance investing: A systematic literature review. *Account. Financ.* 2020, 60, 1501–1530. [CrossRef]
- De Lucia, C.; Pazienza, P.; Bartlett, M. Does good ESG lead to better financial performances by firms? Machine learning and logistic regression models of public enterprises in Europe. *Sustainability* 2020, 12, 5317. [CrossRef]
- de Villiers, C. and Alexander. D. (2014) The institutionalisation of corporate social responsibility reporting *British Accounting Review* 46, 198–212.
- Deloitte. (2021). ESG in the Shipping Sector - The role of ESG in the Evaluation of Shipping Companies. Greece: Deloitte Certified Public Accountants Societe Anonyme.
- Det Norske Veritas, 2004. Corporate social responsibility and the shipping industry-project report. Report 2004-1535, rev. 1.
- Development, O. f.-o. (2022). OECD. Retrieved from Ocean Shipping and Shipbuilding: <https://www.oecd.org/ocean/topics/ocean-shipping/>
- Dhaliwal, D., Li, O., Tsang, A., Yang, Y., 2006. Voluntary non-financial disclosure and the cost of equity capital: the initiation of corporate social responsibility reporting. *Account. Rev.* 86, 59–100.
- Di Vaio, A.; Varriale, L.; Lekakou, M.; Stefanidaki, E. Cruise and container shipping companies: A comparative analysis of sustainable development goals through environmental sustainability disclosure. *Marit. Policy Manag.* 2021, 48, 184–212. [CrossRef]
- Dimson, E., Karakas, O., Li, X., 2013. Active ownership. In: Working Paper. London Business School.

- Dolan, C. (2021). Transparency in ESG and the Circular Economy. New York: Business Expert Press Economics and Public Policy Collection.
- Drempetic, S.; Klein, C.; Zwergel, B. The influence of firm size on the ESG score: Corporate sustainability ratings under review. *J. Bus. Ethics* 2020, 167, 333–360. [CrossRef]
- Drobetz W., Merikas A., Merika A., Tsionas M. 2014. Corporate social responsibility disclosure: The case of international shipping. *Transportation Research Part E* 71 18–44
- Drobetz, W., Richter, T., Wambach, M., 2012. Dynamics of time-varying volatility in the dry bulk and tanker freight markets. *Appl. Financ. Econ.* 22, 1367–1384
- Ducruet, C. Multilayer dynamics of complex spatial networks: The case of global maritime flows (1977–2008). *J. Transp. Geogr.* 2017, 60, 47–58. [CrossRef]
- Dye, R.A. (1985) Disclosure of non-proprietary information *Journal of Accounting Research* 23(1), 123–145.
- Dyllick, T. and Hockerts, K. (2002) Beyond the business case for corporate sustainability *Business Strategy and the Environment* 11, 130–141.
- EBA. EBA Report on Management and Supervision of ESG Risks for Credit Institutions and Investment Firms. Available online: https://www.eba.europa.eu/sites/default/documents/fifiles/document_library/Publications/Reports/2021/1015656/EBA%20Report%20on%20ESG%20risks%20management%20and%20supervision.pdf (accessed on 31 July 2021).
- EBA. Environmental Social and Governance Disclosures. Available online: https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Consultations/2021/Consultation%20on%20draft%20ITS%20on%20Pillar%20disclosures%20on%20ESG%20risk/963626/Factsheet%20-%20ESG%20disclosures.pdf (accessed on 31 July 2021).
- Eccles, N.S.; Viviers, S. The origins and meanings of names describing investment practices that integrate a consideration of ESG issues in the academic literature. *J. Bus. Ethics* 2011, 104, 389–402. [CrossRef]

- Egorova, A.A.; Grishunin, S.V.; Karminsky, A.M. The impact of ESG factors on the performance of information technology companies. *Procedia Comput. Sci.* 2022, 199, 339–345. [CrossRef]
- Eichholtz, P., Kok, N., Quigley, J.M., 2010. Doing well by doing good? Green office buildings. *Am. Econ. Rev.*, 2492–2509.
- Fama, E.F., French, K.R., 2007. Disagreement, tastes, and asset prices. *J. Financ. Econ.* 83, 667–689.
- Fasoulis, I.; Kurt, R.E. Embracing sustainability in shipping: Assessing industry’s adaptations incited by the, newly, introduced “triple bottom line” approach to sustainable maritime development. *Soc. Sci.* 2019, 8, 208. [CrossRef]
- Ferguson, M.J., Lam, K.C.K., Lee, G.M., 2002. Voluntary disclosure by state-owned enterprises listed on the stock exchange of Hong Kong. *J. Int. Financ. Manage. Account.* 13, 125–152.
- Fisk, G. (2022, March). The Financial Impact of Climate Disclosures. Editorial – Sea Technology, p. pp. 7.
- Fortanier, F., Kolk, A., and Pinkse, J. (2011) Harmonization in CSR reporting: MNEs and global CSR standards *Management International Review* 51, 665–696.
- Fotteler, M.L.; Andrioti Bygvraa, D.; Jensen, O.C. The impact of the maritime labor convention on seafarers’ working and living conditions: An analysis of port state control statistics. *BMC Public Health* 2020, 20, 1586. [CrossRef] [PubMed]
- Freedman, M. and Jaggi, M. (2004) Carbon dioxide emissions and disclosures by electric utilities *Advances in Public Interest Accounting* 10, 105–129.
- Freedman, M., Stagliano, A.J., 1991. Differences in social-cost disclosures: a market test of investor reactions. *Account., Audit. Account. J.* 4, 68–82.
- Freeman, R. E. (1983). Strategic management: A stakeholder approach *Advances in Strategic Management* 1(1), 31–60.
- Friedman, M. (1970). The social responsibility of business is to increase its profits *New York Times Magazine* 13, 32–33.

- Frost, G., Jones, S., Loftus, J. and Laan, S. (2005) A survey of sustainability reporting practices of Australian reporting entities *Australian Accounting Review* 15, 89–96.
- Geczy, C.C., Stambaugh, R.F., Levin, D., 2005. Investing in socially responsible mutual funds. In: Working Paper. University of Pennsylvania.
- Giannakopoulou, E.N.; Thalassinou, E.I.; Stamatopoulos, T.V. Corporate governance in shipping: An overview. *Marit. Policy Manag.* 2016, 43, 19–38. [CrossRef]
- Godfrey, P.C., Merrill, C.B., Hansen, J.M., 2009. The relationship between corporate social responsibility and shareholder value: an empirical test of the risk management hypothesis. *Strateg. Manage. J.* 30, 425–445.
- Graham, J.R., Harvey, C.R., 2001. The theory and practice of corporate finance: evidence from the field. *J. Financ. Econ.* 60, 187–243.
- Graham, J.R., Harvey, C.R., Rajgopal, S., 2005. The economic implications of corporate financial reporting. *J. Account. Econ.* 40, 3–73.
- Grammenos, C.T.; Alizadeh, A.H.; Papapostolou, N.C. Factors affecting the dynamics of yield premia on shipping seasoned high yield bonds. *Transport. Res. Part E Logist. Transp. Rev.* 2007, 43, 549–564. [CrossRef]
- Grammenos, C.T.; Arkoulis, A.G. Determinants of spreads on new high yield bonds of shipping companies. *Transport. Res. Part E Logist. Transp. Rev.* 2003, 39, 459–471. [CrossRef]
- Gray, R. (2010) Is accounting for sustainability actually accounting for sustainability ... and how would we know? An exploration of narratives *Accounting, Organizations and Society* 35, 47–62.
- Gray, R., Kouhy, R. and Lavers, S. (1995) Corporate social and environmental reporting: A review of the literature and a longitudinal study of UK disclosure *Accounting, Auditing and Accountability Journal* 8(2), 47–77.
- Gray, R.H. (2002) Of messiness, systems and sustainability: towards a more social and environmental finance and accounting *British Accounting Review* 34, 357–386.
- Gray, R.H. and Bebbington, K.J. (2000) Environmental accounting, managerialism and sustainability: is the planet safe in the hands of business

and accounting? *Advances in Environmental Accounting and Management* 1, 1–44.

- Grelck, M.B.; Prigge, S.; Tegtmeier, L.; Topalov, M. Diversification properties of investments in shipping. *J. Altern. Invest.* 2009, 12, 55–74. [CrossRef]
- GRI (Global Reporting Initiative). (2020). GRI Standards. Retrieved from <https://www.globalreporting.org/standards/>
- Griffin, J.J. and Mahon, J.F. (1997). The corporate social performance and corporate financial performance debate twenty-five years of incomparable research *Business and Society* 36(1), 5–31.
- Guddal, C. (2022, November 2). Focus on seafarer wellbeing – a reflection on the “S” in “ESG”. Retrieved from Gard: <https://www.gard.no/web/articles?documentId=34430053>
- Guenster, N., Bauer, R., Derwall, J., 2011. The economic value of corporate eco-efficiency. *Eur. Financ. Manage.* 17, 679–704.
- Guthrie, J.E. and Parker, L.D. (1990) Corporate social disclosure practice: a comparative international analysis *Advances in Public Interest Accounting* 3, 159–176.
- Haddock, J. (2005) Consumer influence on internet-based corporate communication of environmental activities: the UK food sector *British Food Journal* 107, 792–805.
- Hahn, R. and Kühnen, M. (2013) Determinants of sustainability reporting: a review of results, trends, theory, and opportunities in an expanding field of research *Journal of Cleaner Production* 59, 5–21.
- Haider, J.; Ou, Z.; Pettit, S. Predicting corporate failure for listed shipping companies. *Marit. Econ. Logist.* 2019, 21, 415–438. [CrossRef]
- Hamilton, S., Jo, H., Statman, M., 1993. Doing well while doing good? The investment performance of socially responsible mutual funds. *Financ. Anal. J.* 49, 62–66.
- Hausman Jerry and Leibtag Ephraim, October 2005, “Consumer Benefits from Increased Competition in Shopping Outlets: Measuring the Effect of Wal-Mart.” NBER WP 11809, December 2005.

- Heinkel, R., Kraus, A., Zechner, J., 2001. The effect of green investment on corporate behavior. *J. Financ. Quant. Anal.* 36, 431–449.
- Hess, D. and Dunfee, T.W. (2007) The Kasky-Nike threat to corporate social reporting: implementing a standard of optimal truthful disclosure as a solution *Business Ethics Quarterly* 17, 5-32
- Hobson, J.L., Kachelmeier, S.J., 2005. Strategic disclosure of risky prospects: a laboratory experiment. *Account. Rev.* 80, 825–846.
- Hogner, R.H. (1982) Corporate social reporting: eight decades of development at US Steel. In Preston, L.D. (ed.) *Research in Corporate Social Performance and Policy*, pp. 243–250, JAI Press, Greenwich.
- Hong, H., Kacperczyk, M., 2009. The price of sin: the effects of social norms on markets. *J. Financ. Econ.* 93, 15–36.
- Hong, H., Kubik, J.D., Scheinkman, J.A., 2012. Financial constraints on corporate goodness. In: *Working Paper*. National Bureau of Economic Research.
- Hsieh, H.P.; Kuo, K.; Le, M.; Lu, W. Exploring the cargo and eco-efficiencies of international container shipping companies: A network-based ranking approach. *Manage. Decis. Econ.* 2021, 42, 45–60. [CrossRef]
- Hughes, J.S., Liu, J., Liu, J., 2007. Information asymmetry, diversification, and cost of capital. *Account. Rev.* 82, 705–729.
- ILO. (2006). *The ILO Maritime Labour Convention, 2006*. 4th Edition. International Chamber of Shipping.
- IMO. (2020). *International Maritime Organization: Regulations*. Retrieved from <https://www.imo.org/en/OurWork/Environment/Pages/Default.aspx>
- Ingram, R.W., Frazier, K.B., 1980. Environmental performance and corporate disclosure. *J. Account. Res.* 18, 614–622.
- Ioannou, I. and Serafeim, G. (2016) *The consequences of mandatory corporate sustainability reporting: Evidence from four countries* Mimeo., London Business School.
- Ionescu, G.H.; Jianu, E.; Patrichi, I.C.; Ghiocel, F.; Tenea, L.; Iancu, D. Assessment of sustainable development goals (SDG) implementation in Bulgaria and future developments. *Sustainability* 2021, 13, 12000. [CrossRef]

- Jensen, M.C., Meckling, W.H., 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. *J. Financ. Econ.* 3, 305–360.
- Jones, T. (1995) Instrumental stakeholder theory: A synthesis of ethics and economics *Academy of Management Review* 20(2), 404–437.
- Kang, H.; Wang, G.W.Y.; Bang, H.; Woo, S. Economic performance and corporate financial management of shipping firms. *Marit. Econ. Logist.* 2016, 18, 317. [CrossRef]
- Kaplan and McMillan, “Reimagining the Balanced Scorecard for the ESG Era,” HBR Online, February 3, 2021
- Kaplan RS, Serafeim G, Tugendhat E, “Inclusive Growth: Profitable Strategies for Tackling Poverty and Inequality.” *Harvard Business Review* 96, no. 1 (January–February 2018): 127–133.
- Karthik Ramanna, “Friedman at 50: Is It Still the Social Responsibility of Business to Increase Profits?,” *California Management Review*, 2020 62(3):28-41.
- Kavussanos, M.G.; Tsouknidis, D.A. The determinants of credit spreads changes in global shipping bonds. *Transport. Res. Part E Logist. Transp. Rev.* 2014, 70, 55–75. [CrossRef]
- Kavussanos, M.G.; Visvikis, I.D.; Alexopoulos, I. Managing financial resources in shipping. In *Shipping Operations Management*; Visvikis, I.D., Panayides, P.M., Eds.; Springer: Cham, Switzerland, 2017; pp. 153–175. [CrossRef]
- Kolb, A. (2010) Trajectories of sustainability reporting by MNCs *Journal of World Business* 45, 367–374.
- Kotsantonis, S.; Pinney, C.; Serafeim, G. ESG integration in investment management: Myths and realities. *J. Appl. Corp. Finance* 2016, 28, 10–16. [CrossRef]
- Krueger, P., 2013. Corporate goodness and shareholder wealth. In: Working Paper. University of Geneva.
- Lambert, R., Leuz, C., Verrecchia, R.E., 2007. Accounting information, disclosure, and the cost of capital. *J. Account. Res.* 45, 385–420.
- Lamberton, G. (2005) Sustainability accounting – a brief history and conceptual framework *Accounting Forum* 29, 7–26.

- Lee, D.D., Faff, R.W., 2009. Corporate sustainability performance and idiosyncratic risk: a global perspective. *Financ. Rev.* 44, 213–237.
- Lee, J. (March 2023). Identifying ESG Trends of International Container Shipping Companies Using Semantic Network Analysis and Multiple Case Theory. *Sustainability*, Vol 15. pp. 1-20.
- Lee, J.H.; Woo, J. Green new deal policy of South Korea: Policy innovation for a sustainability transition. *Sustainability* 2020, 12, 10191. [CrossRef]
- Lee, P.; Kwon, O.; Ruan, X. Sustainability challenges in maritime transport and logistics industry and its way ahead. *Sustainability* 2019, 11, 1331. [CrossRef]
- Leftwich, R., Watts, R.L., Zimmerman, J.L., 1981. Voluntary corporate disclosure: the case of interim reporting. *J. Account. Res.* 19, 50–77.
- Lin, A.J.; Chang, H.Y.; Hung, B. Identifying key financial, environmental, social, governance (ESG), bond, and COVID-19 factors affecting global shipping companies—A hybrid multiple-criteria decision-making method. *Sustainability* 2022, 14, 5148. [CrossRef]
- Lirn, T.; Lin, H.; Shang, K. Green shipping management capability and firm performance in the container shipping industry. *Marit. Policy Manag.* 2014, 41, 159–175. [CrossRef]
- Lu, C.; Lin, C.; Tu, C. Corporate social responsibility and organisational performance in container shipping. *Int. J. Bus. Logist.* 2009, 12, 119–132. [CrossRef]
- Luo, L. and Tang, Q. (2014) Does voluntary carbon disclosure reflect underlying carbon performance? *Journal of Contemporary Accounting and Economics* 10, 191–205.
- Luo, X., Bhattacharya, C.B., 2009. The debate over doing good: corporate social performance, strategic marketing levers, and firm-idiosyncratic risk. *J. Mark.* 73, 198–213.
- Mackey, A., Mackey, T.B., Barney, J.B., 2007. Corporate social responsibility and firm performance: investor preferences and corporate strategies. *Acad. Manage. Rev.* 32, 817–835.
- Malik, M. (2015). Value-enhancing capabilities of CSR: A brief review of contemporary literature. *Journal of Business Ethics* 127(2), 419–438.

- Maltby, J. (2004) Hadfields Ltd: its annual general meetings 1903-1939 and their relevance for contemporary social reporting *British Accounting Review* 415–439.
- Margolis, J.D., Elfenbein, H.A., Walsh, J.P., 2007. Does it pay to be good? A meta-analysis and redirection of research on the relationship between corporate social and financial performance. In: Working Paper. Harvard Business School.
- Margolis, J.D., Walsh, J.P., 2003. Misery loves companies: rethinking social initiatives by business. *Adm. Sci. Q.* 48, 268–305.
- Marineinsight. Available online: <https://www.marineinsight.com/maritime-law/6-major-trends-in-container-shipping-in-2022> (accessed on 20 November 2022).
- Markowitz, H.M. Foundations of portfolio theory. *J. Financ.* 1991, 46, 469–477. [CrossRef]
- Marston, C., Polei, A., 2002. Corporate reporting on the internet by German companies. *Int. J. Account. Inf. Syst.* 5, 285–311.
- Marwitz, C. (2022). ESG Challenges: Talent shortage and lack of consistent standards. ALM Media, pp. 1.
- Matthews, M.R. (1997) Twenty five years of social and environmental accounting research: is there a silver jubilee to celebrate? *Accounting, Auditing and Accountability Journal* 10(4), 481–531.
- Mattingly, J.E., Berman, S.L., 2006. Measurement of corporate social action: discovering taxonomy in the Kinder Lydenberg Domini ratings data. *Bus. Soc.* 45, 20–46.
- Maunders, K. and Burritt, R.L. (1991) Accounting and ecological crisis *Accounting, Auditing and Accountability Journal* 4(3), 9–26.
- McGuire, J.B., Sundgren, A., Schneeweis, T., 1988. Corporate social responsibility and firm financial performance. *Acad. Manage. J.* 31, 854–872.
- McKinsey & Company. Container Shipping: The Next 50 Years by USA. Available online: <https://www.freightwaves.com/news/2017/10/26/mckinsey-forecasts-the-next-50-years-of-container-shipping> (accessed on 26 August 2021).

- Merton, R.C., 1987. A simple model of capital market equilibrium with incomplete information. *J. Finance* 42, 483–510.
- Milne, M.J. (1996) On sustainability: the environment and management accounting *Management Accounting Research* 7(1), 135–161.
- Mohagheghi, V.; Mousavi, S.M.; Aghamohagheghi, M.; Vahdani, B. A new approach of multi-criteria analysis for the evaluation and selection of sustainable transport investment projects under uncertainty: A case study. *Int. J. Comput. Intell. Syst.* 2017, 10, 605. [CrossRef]
- MSCI. (2020). ESG Research. Retrieved from <https://www.msci.com/esg-research>
- Narula, K. Emerging trends in the shipping industry—Transitioning towards sustainability. *Marit. Aff.* 2014, 10, 113–138. [CrossRef]
- Nõmmela, K.; Kõrbe Kaare, K.K. Maritime policy design framework with ESG performance approach: Case of Estonia. *Economies* 2022, 10, 88. [CrossRef]
- O'Dwyer, B. (2001) The legitimacy of accountants participation in social and ethical accounting, auditing and reporting *Business Ethics: A European Review* 10(1), 27–39.
- Orlitzky, M., Schmidt, F.L., Rynes, S.L., 2003. Corporate social and financial performance: a meta-analysis. *Org. Stud.* 24, 403–441.
- Otheitis, N.; Kunc, M. Performance measurement adoption and business performance: An exploratory study in the shipping industry. *Manag. Decis.* 2015, 53, 139–159. [CrossRef]
- Palazzo, G., Scherer, A., 2006. Corporative legitimacy as deliberation: a communicative framework. *J. Bus. Ethics* 66, 71–88.
- Panayides, P.M. *The Routledge Handbook of Maritime Management*, 1st ed.; Routledge: London, UK, 2019. [CrossRef]
- Parsa, s. and Kouhy, R. (2008) Social reporting by companies listed on the alternative investment market *Journal of Business Ethics* 79, 345–360.
- Patten, D. (2002) The relation between environmental performance and environmental disclosure: A research note *Accounting, Organizations and Society* 27, 763–773.

- Pava, L., Krausz, J., 1996. The association between corporate social responsibility and financial performance. *J. Bus. Ethics* 15, 321–357.
- Poseidon Principles. (2019). Poseidon Principles: A global framework for responsible ship finance. Retrieved from <https://www.poseidonprinciples.org/>
- Poulsen, R. T., Johnson, K., & Ponte, S. (2018). Incorporating social and environmental concerns in shipping management. *International Journal of Shipping and Transport Logistics*, 10(5-6), 599-619.
- Preston, L., O'Bannon, D., 1997. The corporate social–financial performance relationship. *Bus. Soc.* 36, 5–31.
- PRI. What is Responsible Investment? Available online: <https://www.unpri.org/an-introduction-to-responsible-investment/what-is-responsible-investment/4780.article> (accessed on 31 July 2021).
- Psarros, G., Skjong, R., & Eide, M. S. (2010). On the development of an environmental index for ships. *Ocean Engineering*, 37(2-3), 223-233.

Pulse. Available online:

<https://pulsenews.co.kr/view.php?year=2022&no=712443> (accessed on 11 November 2022).

- Puxty, A.G.(1991) Social accountability and universal pragmatics *Advances in Public Interest Accounting* 4, 35–46.
- Raghunandan A. and Rajgopal S., “Do Socially Responsible Firms Walk the Talk,” *Columbia Business School Working Paper* (April 2021).
- Register, L. (2022). The Rise of ESG in Maritime. Retrieved from Putting the 'S' into ESG in maritime: <https://horizons.lr.org/october-2022/putting-the-s-into-esgin-maritime>
- Ren, R.; Hu, W.; Dong, J.; Sun, B.; Chen, Y.; Chen, Z. A systematic literature review of green and sustainable logistics: Bibliometric analysis, research trend and knowledge taxonomy. *Int. J. Environ. Res. Public Health* 2019, 17, 261. [CrossRef]
- Roberts, R.W. (1992) Determinants of corporate social responsibility disclosure *Accounting, Organizations and Society* 17(6), 595–612.

- Ruf, B.M., Muralidhar, K., Brown, R.M., Janney, J.J., Paul, K., 2001. An empirical investigation of the relationship between change in corporate social performance and financial performance: a stakeholder theory perspective. *J. Bus. Ethics* 32, 143–156.
- SASB (Sustainability Accounting Standards Board). (2018). SASB Standards. Retrieved from <https://www.sasb.org/standards-overview/download-current-standards/>
- Sharfman, M.P., Fernando, C.S., 2008. Environmental risk management and the cost of capital. *Strateg. Manage. J.* 29, 569–592.
- Shin, Y.; Thai, V.V. The impact of corporate social responsibility on customer satisfaction, relationship maintenance and loyalty in the shipping industry. *Corp. Soc. Responsib. Environ. Manag.* 2015, 22, 381–392. [CrossRef]
- Siminica, M.; Cristea, M.; Sichigea, M.; Noja, G.G.; Anghel, I. Well-governed sustainability and financial performance: A new integrative approach. *Sustainability* 2019, 11, 4562. [CrossRef]
- Sinclair-Desgagné, B. and Gozlan, E. (2003) A theory of environmental risk disclosure *Journal of Environmental Economics and Management* 45(2), 377–393.
- Solberg, H. (February 2020). Guidelines - ESG Reporting in the Shipping and Offshore Industries. Norway: The Governance Group.
- Sroufe, R.; Gopalakrishna-Remani, V. Management, social sustainability, reputation, and financial performance relationships: An empirical examination of U.S. firms. *Organ. Environ.* 2019, 32, 331–362. [CrossRef]
- Stanny, E. and Ely, K. (2008) Corporate environmental disclosures about the effects of climate change *Corporate Social Responsibility and Environmental Management* 15, 338–348.
- Stanwick, P.A., Stanwick, S.D., 1998. The relationship between corporate social performance and organizational size, financial performance and environmental performance: an empirical examination. *J. Bus. Ethics* 17, 195–204.
- Stark, C.; Xu, Y.; Zhang, M.; Yuan, Z.; Tao, L.; Shi, W. Study on applicability of energy-saving devices to hydrogen fuel cell-powered ships. *J. Mar. Sci. Eng.* 2022, 10, 388. [CrossRef]

- Stephens, A. (2021, January 14th). Financial Stakeholders are Key to Shipping's Green Transition. Retrieved from Nordea: <https://www.nordea.com/en/news/financial-stakeholders-are-key-to-shippingsgreen-transition>
- Stopford, M. (2009). *Maritime Economics*. London: Routledge
- Sun, Z.; Zhang, Y. Strategic crisis response of shipping industry in the post COVID-19 era: A case of the top 10 shipping lines. *J. Mar. Sci. Eng.* 2022, 10, 635. [CrossRef]
- Sustainalytics. (2020). ESG Risk Ratings. Retrieved from <https://www.sustainalytics.com/esg-risk-ratings/>
- Syriopoulos, T.; Bakos, G. Investor herding behaviour in globally listed shipping stocks. *Marit. Policy Manag.* 2019, 46, 545–564. [CrossRef]
- Syriopoulos, T.; Tsatsaronis, M. The corporate governance model of the shipping firms: Financial performance implications. *Marit. Policy Manag.* 2011, 38, 585–604. [CrossRef]
- Syriopoulos, T.C. Financing Greek shipping: Modern instruments, methods and markets. *Res. Transp. Econ.* 2007, 21, 171–219. [CrossRef]
- Tamayo-Torres, I.; Gutierrez-Gutierrez, L.; Ruiz-Moreno, A. Boosting sustainability and financial performance: The role of supply chain controversies. *Int. J. Prod. Res.* 2019, 57, 3719–3734. [CrossRef]
- Tang, L.; Gekara, V. The importance of customer expectations: An analysis of CSR in container shipping. *J. Bus. Ethics* 2020, 165, 383–393. [CrossRef]
- Thai, V.; Jie, F. The impact of total quality management and supply chain integration on firm performance of container shipping companies in Singapore. *Asia Pac. J. Mark. Logist.* 2018, 30, 605–626. [CrossRef]
- The Global Compact, *Who Cares Wins: Connecting Financial markets to a Changing World*. 2004.
- Theodossiou, P.; Tsouknidis, D.; Savva, C. Freight rates in downside and upside markets: Pricing of own and spillover risks from other shipping segments. *J. R. Stat. Soc. Ser. Stat. Soc.* 2020, 183, 1097–1119. [CrossRef]
- Topping, N. (2012) How does sustainability disclosure drive behavior change? *Journal of Applied Corporate Finance* 24(2), 45–48.

- Tsionas, M., Merikas, A., Merika, A., 2012. Concentrated ownership and corporate performance revisited: the case of shipping companies. *Transport. Res. Part E* 48, 843–852.
- Tsionas, M.G.; Merikas, A.G.; Merika, A.A. Concentrated ownership and corporate performance revisited: The case of shipping. *Transport. Res. Part E Logist. Transp. Rev.* 2012, 48, 843–852. [CrossRef]
- Ullman, A.E.(1985) Data in search of a theory: a critical examination of the relationships among social performance, social disclosure and economic performance of US firms *Academy of Management Review* 10(3), 540–557.
- UNCTAD. (2020). Review of Maritime Transport 2020. Retrieved from https://unctad.org/system/files/official-document/rmt2020_en.pdf
- UNCTAD. (2022). Handbook of Statistics 2022 - Merchant Fleet. Switzerland: UNCTAD
- United Nation Conference on Trade and Development UNCTAD. Review of Maritime Transport 2019; United Nation Conference on Trade and Development UNCTAD: Geneva, Switzerland, 2019; Available online: https://unctad.org/system/files/officialdocument/rmt2019_en.pdf (accessed on 27 August 2021).
- United Nations. Principles for Responsible Investment. Available online: <https://www.unpri.org/sustainability-issues> (accessed on 27 August 2021).
- United Nations. The 17 Goals of Sustainable Development. Available online: <https://sdgs.un.org/goals> (accessed on 28 August 2021).
- VEDIKOVA, T. (2022, July 24th). Ocean Carriers Facing Increased ESG Risk Amidst Supply Chain Crisis. Retrieved from Sustainalytics: <https://www.sustainalytics.com/esg-research/resource/investors-esgblog/ocean-carriers-facing-increased-esg-risk-amidst-supply-chain-crisis>
- Vejvar, M.; Lai, K.; Lo, C.K.Y. A citation network analysis of sustainability development in liner shipping management: A review of the literature and policy implications. *Marit. Policy Manag.* 2020, 47, 1–26. [CrossRef]
- Verrecchia, R.E., 2001. Essays on disclosure. *J. Account. Econ.* 32, 97–180.
- Amihud, Y., Mendelson, H., 1986. Asset pricing and the bid-ask spread. *J. Financ. Econ.* 17, 223–249.

- Verschoor, C.C., 1998. A study of the link between a corporation's financial performance and its commitment to ethics. *J. Bus. Ethics* 17, 1509–1516.
- Verteramo, S. The impact of ESG practices in industry with a focus on carbon emissions: Insights and future perspectives. *Sustainability* 2023, 15, 6685. [CrossRef]
- Waddock, S.A., Graves, S.B., 1997. The corporate social performance–financial performance link. *Strateg. Manage. J.* 18, 303–319.
- Widyawati, L. A systematic literature review of socially responsible investment and environmental social governance metrics. *Bus. Strateg. Environ.* 2020, 29, 619–637. [CrossRef]
- Woo, S.; Lai, P.; Chen, Y.; Yang, C. Meta-frontier function approach to operational efficiency for shipping companies. *Marit. Policy Manag.* 2019, 46, 529–544. [CrossRef]
- World Trade Organization. International Trade Statistics 2020. Available online: https://www.wto.org/english/res_e/statis_e/wts2020_e/wts20_toc_e.htm (accessed on 27 August 2021).
- Wu, X.; Zhang, L.; Feng, H. Green strategic planning approach for international shipping activities. *Sustainability* 2020, 12, 41. [CrossRef]
- Wu, X.; Zhang, L.; Luo, M. Discerning sustainability approaches in shipping. *Environ. Dev. Sustain.* 2020, 22, 5169–5184. [CrossRef]
- Yoshikawa, T.; Nippa, M.; Chua, G. Global shift towards stakeholder-oriented corporate governance? Evidence from the scholarly literature and future research opportunities. *Multinatl. Bus. Rev.* 2021, 29, 321–347. [CrossRef]
- Yuen, K.F.; Thai, V.V.; Wong, Y.D. Corporate social responsibility and classical competitive strategies of maritime transport firms: A contingency-fit perspective. *Transp. Res. A Policy Pract.* 2017, 98, 1–13. [CrossRef]
- Yusheng, Z. (2023). Sustainable shipping: A critical review for a unified framework and future research agenda. *Marine Policy* (148), pp. 1 - 15.
- Zahid, R.M.A.; Taran, A.; Khan, M.K.; Chersan, I.-C. ESG, dividend payout policy and the moderating role of audit quality: Empirical evidence from Western Europe. *Borsa Istanb. Rev.* 2023, 23, 350–367. [CrossRef]

- Ziolo, M.; Filipiak, B.Z.; Bak, I.; Cheba, K. How to design more sustainable financial systems: The roles of environmental, social, and governance factors in the decision-making process. *Sustainability* 2019, 11, 5604. [CrossRef]