# UNIVERSITY OF PIRAEUS

## DEPARTMENT OF MARITIME STUDIES

## MSc in SHIPPING MANAGEMENT

# The integration of ESG criteria and their role in the investment decisions of shipping companies

Valeria Cogilniceanu

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## ABSTRACT

This study examines the integration of environmental, social, and governance (ESG) criteria into the investment decisions of shipping companies and explores their role in promoting sustainable business practices within the industry. The shipping sector, a major contributor to global trade and economic growth, is facing increasing pressure to address environmental and social challenges while maintaining financial viability. Through an extensive literature review, case studies, and empirical analysis, this research aims to understand the importance of ESG factors in shaping investment decisions and their impact on the performance and long-term resilience of shipping companies.

The results of this study show that the incorporation of ESG principles into investment decisions is critical to risk management, competitive advantage, and overall sustainability in the shipping industry. In addition, the study highlights the need for a standardized ESG reporting framework to facilitate transparency and comparability among industry players. By adopting ESG criteria, shipping companies can improve their decision-making, attract sustainable investments, and contribute to a more environmentally and socially responsible industry.

**Περίληψη**

Η παρούσα μελέτη εξετάζει την ενσωμάτωση των περιβαλλοντικών, κοινωνικών και διοικητικών (ESG) κριτηρίων στις αποφάσεις επενδύσεων των ναυτιλιακών εταιρειών και διερευνά τον ρόλο τους στην προώθηση βιώσιμων επιχειρηματικών πρακτικών στην βιομηχανία. Ο τομέας της ναυτιλίας, που αποτελεί σημαντικό παράγοντα του παγκόσμιου εμπορίου και οικονομικής ανάπτυξης, αντιμετωπίζει αυξανόμενη πίεση για την αντιμετώπιση περιβαλλοντικών και κοινωνικών προκλήσεων, διατηρώντας παράλληλα τη χρηματοοικονομική αποδοτικότητα. Μέσα από μια εκτενή βιβλιογραφική ανασκόπηση, μελέτες περιπτώσεων και εμπειρική ανάλυση, η παρούσα έρευνα έχει ως στόχο να κατανοήσει τη σημασία των παραγόντων ESG στο διαμορφωμένο επενδυτικών αποφάσεων και την επίδρασή τους στην απόδοση και τη μακροπρόθεσμη ανθεκτικότητα των ναυτιλιακών εταιρειών.

Τα αποτελέσματα αυτής της μελέτης δείχνουν ότι η ενσωμάτωση των προτύπων ESG στις επενδυτικές αποφάσεις είναι ζωτικής σημασίας για τη διαχείριση των κινδύνων, τον επιτυχημένο ανταγωνισμό και την γενική βιωσιμότητα στη ναυτιλιακή βιομηχανία. Επιπλέον, η μελέτη υπογραμμίζει την ανάγκη για ένα πρότυπο πλαίσιο αναφοράς ESG που θα διευκολύνει τη
διαφάνεια και τη συγκρισιμότητα μεταξύ των εταιρειών του κλάδου. Με την υιοθέτηση των παραγόντων ESG, οι ναυτιλιακές εταιρείες μπορούν να βελτιώσουν τη λήψη αποφάσεων, να προσελκύσουν βιώσιμες επενδύσεις και να συμβάλουν σε μια πιο περιβαλλοντικά και κοινωνικά υπεύθυνη βιομηχανία.

## INTRODUCTION

The shipping industry plays a pivotal role in global trade and economic development, with more than 80% of the world's goods being transported by sea (UNCTAD, 2020). As the industry continues to grow, it faces increasing scrutiny concerning its environmental, social, and governance (ESG) performance. With [1]climate change, labor rights, and corporate governance emerging as critical concerns for investors, the integration of ESG criteria in the investment decisions of shipping companies has become a focal point for sustainable development and long-term value creation (Eccles & Serafeim, 2013).

This diploma thesis, titled "The Integration of ESG Criteria and Their Role in the Investment Decisions of Shipping Companies," aims to explore the importance and implications of ESG integration in the maritime sector. By examining the theoretical foundations of ESG, its regulatory trends, and the role of ESG scores and ratings, the study seeks to provide a comprehensive understanding of how ESG factors influence investment decisions in the shipping industry.

Furthermore, this research will analyze the benefits and challenges of incorporating ESG criteria into investment decisions and evaluate the effectiveness of various ESG investment strategies. The study will also investigate the ESG ecosystem within the shipping sector, examining the key stakeholders, regulatory frameworks, and industry initiatives that shape the industry's approach to sustainability.

A particular focus will be placed on the Greek shipping industry, exploring the current state of ESG integration, the regulatory landscape, and the opportunities and challenges faced by Greek

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shipping companies in attracting new investments and financing through improved ESG performance.

Finally, the thesis will present a qualitative analysis of the ESG reports from leading shipping companies, such as GasLog, COSCO, Latsco, Tsakos, and Diana Shipping, highlighting their ESG performance, trends, and the role of ESG criteria in their investment decision-making processes.

Through this research, the diploma thesis aims to contribute to the growing body of knowledge on ESG integration in the shipping industry and provide valuable insights for investors, policymakers, and industry stakeholders seeking to promote sustainable development and long-term value creation in the maritime sector.

# CHAPTER 1

## 1.1.Definition and Theoretical Approach of ESG

Environmental, Social and Governance (ESG) is a set of non-financial parameters used to evaluate the performance and sustainability of companies, organizations or investments. These parameters include a range of factors that can impact a company's long-term value creation and risk, such as environmental protection, social responsibility, and governance practices. ESG assessment enables investors to make informed decisions by considering these aspects along with traditional financial metrics (Friede et al., 2015).

The theoretical basis for ESG is based on several interrelated concepts, including stakeholder theory, corporate social responsibility (CSR), and sustainable development. Stakeholder theory states that companies have responsibilities not only to shareholders but also to various stakeholders such as employees, customers, communities, and the environment (Freeman, 1984). CSR emphasizes the inclusion of social and environmental factors in business operations and decision-making processes (Carroll, 1991). Sustainable development embodies the idea of meeting present needs without compromising the ability of future generations to meet their needs and emphasizes the importance of balancing economic, social, and environmental goals (Brundtland Commission, 1987).

Taken together, these concepts provide a theoretical basis for the importance and applicability of ESG criteria in evaluating companies and investments. By integrating ESG factors into their decision-making frameworks, investors can identify potential risks and opportunities related to a company's non-financial performance that promote long-term value creation and contribute to sustainable development.

## 1.2. **The three criteria of ESG.**

Environmental, Social, and Governance (ESG) criteria comprise a set of non-financial factors utilized to assess the performance and sustainability of companies, organizations, or investments. These criteria are generally classified into three separate categories: environmental, social, and governance. Each category tackles various aspects of a company's operations and potential impacts on diverse stakeholders and the broader society.

Environmental Criteria: Environmental criteria examine a company's influence on the natural environment and its dedication to minimizing adverse environmental outcomes. Crucial factors within environmental criteria encompass greenhouse gas (GHG) emissions, energy efficiency, waste management, water conservation, and protection of biodiversity (Scholtens, 2017). Companies demonstrating robust environmental performance are frequently more appealing to investors, as they show proactive efforts to mitigate environmental risks and contribute to long-term sustainability.

Social Criteria: Social criteria appraise a company's relationships with its employees, customers, suppliers, and communities. Vital factors within social criteria consist of labor practices, human rights, diversity and inclusion, health and safety, product responsibility, and community involvement (Khan et al., 2016). Companies that give precedence to social matters are more inclined to establish positive connections with stakeholders, minimize potential social risks, and promote fair and inclusive practices.

Governance Criteria: Governance criteria concentrate on the internal processes, structures, and policies that direct a company's decision-making and supervision. Essential factors within governance criteria include board diversity and independence, executive compensation, shareholder rights, transparency, and accountability (Gompers et al., 2003). Robust governance practices are crucial for reducing potential risks, guaranteeing responsible management, and preserving investor trust and confidence.

### 1.2.1 Environmental Factors

Environmental, social, and governance (ESG) factors have grown increasingly vital in assessing the sustainability and ethical implications of investments.

- Climate Change and Greenhouse Gas Emissions

Climate change is among the most urgent environmental challenges we face today. The Intergovernmental Panel on Climate Change (IPCC) has stressed the necessity of restricting global temperature increases to 1.5°C above preindustrial levels to avoid the most severe consequences of climate change (IPCC, 2018). Companies have a critical role in this endeavor by curbing greenhouse gas (GHG) emissions, which are the primary cause of global warming. Businesses that neglect these emissions may encounter regulatory risks, reputation harm, and financial setbacks (Carney, 2015).

- Efficient Resource Utilization and Waste Management

Effective resource management, encompassing the prudent use of water, energy, and raw materials, is another crucial environmental aspect in ESG assessments. Companies that maximize resource use can decrease operational expenses, reduce waste, and enhance their environmental impact (Epstein & Buhovac, 2014). Waste management is also an important environmental concern, as improper disposal can result in pollution, land deterioration, and risks to public health (Hoornweg & Bhada-Tata, 2012).

- Preserving Biodiversity and Ecosystem Services

Biodiversity and ecosystem services are fundamental to environmental sustainability. Businesses that adversely affect biodiversity, such as through deforestation or habitat destruction, may experience regulatory consequences, reputation damage, and loss of stakeholder confidence (TEEB, 2010). Companies can aid in conserving biodiversity by employing responsible sourcing policies and land-use practices (Kumar, 2012).

- Adherence to Environmental Regulations

Environmental regulations are instrumental in motivating companies to adopt sustainable practices. These regulations often aim to decrease pollution, safeguard natural resources, and encourage waste management. Companies that disregard these regulations may face fines, penalties, and reputation damage, which can negatively impact their financial performance (Bansal & Roth, 2000). In contrast, proactive environmental management and compliance can result in cost savings, expanded market opportunities, and better stakeholder relations (Porter & van der Linde, 1995).

Environmental factors form a crucial part of ESG evaluation and significantly influence the sustainability of businesses. By addressing climate change, resource management, waste management, biodiversity conservation, and environmental compliance, companies can mitigate risks, bolster their reputation, and enhance their long-term financial performance. Transparent ESG reporting and disclosures are essential for companies to convey their commitment to environmental sustainability and attract conscientious investors. As businesses increasingly acknowledge the importance of environmental stewardship, incorporating these factors into corporate strategy and decision-making will become ever more critical for enduring success.

### 1.2.2 Social Factors

Social factors play a vital role in assessing the sustainability and ethical implications of investments within the ESG framework.

- Fair Labor Practices and Safe Working Environments

Fair labor practices and safe working conditions are essential social factors in ESG evaluations. Companies that ensure fair labor practices, such as providing decent wages, maintaining secure working conditions, and respecting workers' rights, can boost employee satisfaction, decrease turnover, and increase productivity (Gjølberg, 2009). Companies that ignore these issues may encounter regulatory risks, reputation loss, and potential legal liabilities (Locke, 2013).

- Upholding Human Rights

Adhering to human rights is another crucial aspect of the social dimension of ESG. Companies are expected to follow international human rights standards, such as the United Nations Guiding Principles on Business and Human Rights (UNGPs) (Ruggie, 2011). Failing to respect these principles can lead to negative outcomes, including legal actions, consumer boycotts, and harm to brand reputation (Kolk & van Tulder, 2004).

- Promoting Diversity, Equity, and Inclusion

Diversity, equity, and inclusion (DEI) are important social factors that affect a company's ability to attract and retain talent, stimulate innovation, and enhance decision-making (Hunt, Layton, & Prince, 2015). Companies that prioritize DEI are more likely to outperform their competitors in terms of financial performance, employee satisfaction, and overall competitiveness (Bärtschi et al., 2021). Encouraging DEI necessitates adopting policies and practices that guarantee equal opportunities, representation, and treatment for all individuals, regardless of their race, gender, age, sexual orientation, or other characteristics (Oswick & Noon, 2014).

- Employee Health and Safety

Ensuring the health and safety of employees is a crucial social factor in ESG evaluations. Companies that prioritize their workforce's well-being can experience higher productivity, reduced absenteeism, and lower healthcare costs (ILO, 2005). Implementing comprehensive health and safety policies and programs can help organizations minimize occupational hazards and decrease the risk of accidents and injuries in the workplace (ILO, 2014).

- Community Involvement and Development

Companies that engage with local communities and contribute to their development can generate goodwill, improve their reputation, and establish trust with stakeholders (Porter & Kramer, 2011). Community engagement activities may include philanthropy, volunteer programs, and cooperative projects aimed at addressing social and environmental challenges (Waddock, 2004). By investing in community development, companies can create shared value, fostering a positive environment for their operations and generating long-term benefits for both the community and the company (Porter & Kramer, 2011).

- Supply Chain Responsibility and Management

Responsible supply chain management is essential for effectively managing social and environmental risks throughout the value chain. Companies are increasingly expected to address issues such as labor rights, working conditions, and environmental impacts within their supply chains (Carter & Rogers, 2008). Implementing responsible sourcing policies, collaborating with suppliers on sustainability initiatives, and conducting regular audits can help companies mitigate risks, improve supply chain resilience, and enhance their overall ESG performance (Seuring & Müller, 2008).

Social factors are a key aspect of ESG analysis and contribute significantly to the overall sustainability and ethical performance of businesses. By addressing labor practices, human rights, diversity, equity, and inclusion, health and safety, community engagement, and responsible supply chain management, companies can enhance their long-term competitiveness and create value for all stakeholders. As businesses continue to recognize the importance of social responsibility, integrating these factors into corporate strategy and decision-making will become increasingly vital for long-term success.

### 1.2.3 Corporate Goverance

Corporate governance factors are crucial elements of ESG evaluations, including the systems, processes, and principles that direct the management and supervision of companies.

- Board Configuration and Diversity

The composition and organization of a company's board of directors are vital aspects of corporate governance (Adams, Hermalin, & Weisbach, 2010). A well-structured board should possess diversity in gender, race, and professional experience to promote balanced decision-making and avoid groupthink (Carter, Simkins, & Simpson, 2003). Furthermore, having an adequate number of independent directors can help ensure objectivity, reduce conflicts of interest, and strengthen the board's capacity to effectively oversee management (Fama & Jensen, 1983).

- Leadership Compensation

Leadership compensation is a significant aspect of corporate governance, as it directly impacts the alignment of management's interests with those of shareholders (Jensen & Murphy, 1990). Compensation policies should be structured to motivate executives to prioritize long-term value generation and discourage excessive risk-taking (Bebchuk & Fried, 2004). Transparent reporting of leadership compensation policies and practices can enable shareholders to evaluate the congruence of executive incentives with the company's strategy and performance (Murphy, 2012).

- Protection of Shareholder Rights

Safeguarding shareholder rights is a core aspect of corporate governance, as it guarantees that investors can efficiently monitor and influence management's actions (Shleifer & Vishny, 1997). Essential shareholder rights include the ability to vote on critical decisions, access pertinent information, and participate in annual meetings (La Porta et al., 2000). Companies that maintain robust shareholder rights can build trust, attract investments, and enhance their overall governance performance (Gompers, Ishii, & Metrick, 2003).

- Openness and Information Sharing

Openness and information sharing are central to corporate governance, as they allow investors and other stakeholders to assess a company's performance and decision-making (Healy & Palepu, 2001). Thorough and prompt disclosure of financial and non-financial data, such as ESG performance, can help decrease information asymmetry, establish trust, and boost market efficiency (Leuz & Wysocki, 2016). Companies that adhere to stringent transparency and disclosure standards are more likely to draw long-term investors and improve their overall corporate governance performance (Lang & Lundholm, 1993).

- Ethics and Regulatory Compliance

Fostering ethical behavior and compliance with laws and regulations is a key aspect of corporate governance. Companies that cultivate robust ethical cultures and enforce stringent compliance programs can reduce legal, financial, and reputational risks (Kaptein, 2008). Implementing codes of ethics, whistleblower protection policies, and anti-corruption measures can help organizations uphold high standards of integrity and establish trust among stakeholders (Sims & Brinkmann, 2003).

Corporate governance factors are essential to ESG analysis, as they affect a company's ability to manage risks, safeguard stakeholder interests, and generate long-term value. By concentrating on board composition and structure, leadership compensation, shareholder rights, transparency and disclosure, and ethics and regulatory compliance, companies can enhance their corporate governance performance and foster a culture of responsible and sustainable business practices. As corporate governance's importance continues to rise, incorporating these factors into corporate strategy and decision-making will become increasingly vital for long-term success.

### 1.3 History of ESG

Environmental, Social, and Governance (ESG) factors have become increasingly significant in the business and investment realms in recent years (Eccles & Klimenko, 2019). The roots of ESG can be found in the socially responsible investing (SRI) movement that arose in the 1960s and 1970s (Renneboog et al., 2008). This period saw investors taking into account the ethical implications of their investments and striving to align their portfolios with their principles. Early SRI primarily aimed to exclude specific industries, such as tobacco, gambling, and weapons production, from investment portfolios (Sandberg et al., 2009).

The ESG concept emerged in the early 2000s, developing from the SRI movement (Eccles & Klimenko, 2019). In 2004, then-UN Secretary-General Kofi Annan launched the "Who Cares Wins" initiative, which convened major financial institutions to discuss the integration of ESG factors into investment choices (UNEP FI, 2005). This initiative resulted in the 2005 "Who Cares Wins" report, which introduced the term "ESG" and established the basis for the contemporary ESG framework (UNEP FI, 2005).

Following the introduction of the ESG concept, various organizations and initiatives were created to advance and promote ESG standards and reporting. Some key milestones in ESG standard development include:

- The inception of the Global Reporting Initiative (GRI) in 2000, which created one of the earliest comprehensive sustainability reporting frameworks (GRI, n.d.).
- The formation of the UN Principles for Responsible Investment (PRI) in 2006, which offered a set of principles for integrating ESG factors into investment decision-making processes (PRI, n.d.).
- The founding of the Sustainability Accounting Standards Board (SASB) in 2011, which sought to create industry-specific ESG reporting standards (SASB, n.d.).

Regulatory progress has significantly influenced the evolution of ESG (Eccles & Klimenko, 2019). Governments and regulators worldwide have increasingly acknowledged the importance of ESG factors, implementing various policies and regulations to encourage ESG incorporation. Notable regulatory advancements include the European Union's Non-Financial Reporting Directive (NFRD) in 2014 (European Commission, 2014) and the Task Force on Climate-related Financial Disclosures (TCFD) in 2015 (TCFD, n.d.).

Over the last decade, ESG investing has seen substantial growth (Friede et al., 2015). This growth can be attributed to several factors, including heightened awareness of sustainability concerns, increasing evidence of the relationship between ESG performance and financial results, and the emergence of ESG-focused investment products (Friede et al., 2015). Consequently, ESG has become an essential consideration in mainstream investment decision-making (Eccles & Klimenko, 2019).

The history of ESG reflects a continuous development from the inception of SRI to the current ESG framework. Fueled by a combination of investor demand, regulatory progress, and heightened awareness of sustainability issues, ESG has become a critical component of business and investment strategies (Eccles & Klimenko, 2019). As ESG's prominence continues to increase, its impact on global business practices and investment decision-making is expected to grow.

## 1.4 ESG Regulatory Trends-The EU SUSTAINABLE FINANCE FRAMEWORK

In response to the growing urgency of environmental, social, and governance (ESG) issues, there has been a noticeable intensification in regulatory trends across the globe. These regulatory measures are designed to align financial activities with the objectives of sustainable development, enhance transparency for investors, and enforce corporate accountability. As the regulatory landscape continues to evolve, businesses, financial institutions, and investors are presented with a unique blend of both challenges and opportunities (Schoenmaker & Schramade, 2019).

**The EU's Leading Role in ESG Regulation**

The European Union (EU) has emerged as a pioneering force in the ESG regulatory sphere. The EU's Sustainable Finance Framework is a key initiative that has contributed significantly to the shift in regulatory measures. This framework represents a comprehensive effort to direct capital towards sustainable activities, enhance risk management, and increase the transparency of financial products (European Commission, 2020).

**Key Regulatory Measures Under the EU Framework**

1. **EU Taxonomy Regulation**: The Taxonomy Regulation establishes a classification system defining environmentally sustainable economic activities. This innovative tool enables a clear understanding of which activities can be considered environmentally sustainable, thereby facilitating sustainable investment (European Commission, 2020a).
2. **Sustainable Finance Disclosure Regulation (SFDR)**: The SFDR mandates financial market participants and financial advisors to disclose how they integrate ESG risks into their risk processes, thereby enhancing transparency and preventing greenwashing (European Commission, 2020b).
3. **Non-Financial Reporting Directive (NFRD)**: The NFRD requires large companies to disclose non-financial and diversity information. This directive aims to improve the consistency and comparability of non-financial information disclosed across the EU (European Commission, 2020c).

4. **EU Green Bond Standard**: The Green Bond Standard provides guidelines for issuing green bonds. These bonds are subject to external verification and aligned with the EU Taxonomy, making them a vital tool in financing environmentally sustainable activities (EU Technical Expert Group on Sustainable Finance, 2020).

**Implications and Opportunities of the EU Regulatory Framework**

The EU Sustainable Finance Framework significantly impacts the modus operandi of businesses and investors. On one hand, businesses need to adapt their operational, risk management, and reporting practices to comply with these regulations. On the other hand, investors must integrate these regulations into their investment decision-making processes. Non-compliance could result in financial penalties, reputational damage, and reduced access to capital. However, this regulatory shift also presents a multitude of opportunities for businesses and investors to drive sustainable growth, mitigate risks, and unlock new potential (European Commission, 2020d).

The EU's Sustainable Finance Framework represents a transformative shift in ESG regulation. It not only sets a high benchmark for regulatory measures in sustainable finance but also presents a clear pathway for stakeholders to effectively align their strategies with sustainable development goals. Understanding and adapting to this evolving regulatory landscape is crucial for businesses and investors looking to succeed in a world increasingly defined by sustainability.

### 1.5 ESG Scores and Ratings

Environmental, Social, and Governance (ESG) scores and ratings have become essential tools within sustainable finance (Amel-Zadeh & Serafeim, 2018). Investors, regulatory bodies, and other interested parties depend on these measures to assess companies' sustainability performance and inform their decision-making processes (Berg, Koelbel, & Rigobon, 2020).

ESG scores and ratings serve several functions, including:

- Aiding investment decisions: ESG scores and ratings assist investors in identifying sustainable investment options by offering a comprehensive perspective on a company's ESG performance (Berg et al., 2020).

- Improving risk management: ESG scores allow investors to evaluate and manage non-financial risks, such as reputational, regulatory, and operational risks, which can influence a company's long-term financial performance (Amel-Zadeh & Serafeim, 2018).
- Promoting corporate sustainability: The accessibility and transparency of ESG metrics encourage companies to enhance their sustainability performance and align their operations with global sustainability objectives (Berg et al., 2020).

Specialized rating agencies, such as MSCI, Sustainalytics, and S&P Global, typically provide ESG scores and ratings (Amel-Zadeh & Serafeim, 2018). These agencies use various methodologies and data sources to assess and rank companies based on their ESG performance. Common methods include:

- Data gathering: Rating agencies collect data from numerous sources, including corporate disclosures, regulatory filings, media sources, and proprietary databases (Amel-Zadeh & Serafeim, 2018).
- Indicator identification: Agencies determine a set of key performance indicators (KPIs) for each ESG aspect (environmental, social, and governance) relevant to specific industries and sectors (Berg et al., 2020).
- Scoring and weighting: Companies are evaluated based on their performance in each KPI, with scores assigned accordingly. The KPI scores are then combined, with weightings applied to represent the relative significance of each aspect within a given industry or sector (Amel-Zadeh & Serafeim, 2018).
- Normalization and benchmarking: To facilitate comparability across companies and industries, scores are normalized and benchmarked against industry or sector peers (Berg et al., 2020).

Despite their increasing significance, ESG scores and ratings face several challenges, including:

- Inconsistency: Various rating agencies use different methodologies, resulting in divergent ESG metrics and evaluations for the same company (Amel-Zadeh & Serafeim, 2018).
- Data quality and availability: The lack of standardized ESG reporting requirements and the dependence on voluntary disclosures can lead to incomplete, inconsistent, or inaccurate data (Berg et al., 2020).

- Subjectivity: The choice of KPIs, weightings, and benchmarks can be affected by the rating agency's subjective judgment, resulting in potential biases (Amel-Zadeh & Serafeim, 2018).

To improve the dependability and comparability of ESG scores and ratings several enhancements and future directions can be considered:

- Standardization: Regulators, standard-setting organizations, and rating agencies should collaborate to establish universally accepted ESG reporting standards and methodologies (Berg et al., 2020).
- Incorporation of alternative data sources: Integrating alternative data sources, such as satellite imagery, social media sentiment, and artificial intelligence-based analytics, can help enhance the accuracy and timeliness of ESG metrics (Amel-Zadeh & Serafeim, 2018).
- Increased transparency: Rating agencies should offer clear explanations of their methodologies, KPI selection, and weighting processes to enable a better understanding and comparability of their ESG metrics and evaluations ( Berg et al., 2020).

In summary, ESG scores and ratings are vital components in the realm of sustainable finance (Amel-Zadeh & Serafeim, 2018). By addressing existing challenges and embracing potential enhancements, these tools can more effectively serve investors and stakeholders in their quest for sustainable investment options and risk management (Berg et al., 2020).

As the sustainable finance landscape evolves, the role of ESG scores and ratings will continue to grow in importance. Collaboration between regulators, standard-setting organizations, and rating agencies will be crucial in developing a robust, transparent, and universally accepted framework for ESG reporting and assessment. This will not only improve the accuracy and comparability of ESG metrics but also promote greater corporate sustainability and responsible investment practices.

Ultimately, the ongoing development and refinement of ESG scores and ratings will support the transition to a more sustainable and equitable global economy. By providing investors and stakeholders with the necessary tools and information to make informed decisions, ESG metrics will continue to drive positive change across industries and contribute to the achievement of global sustainability goals.

**1.6 ESG Reporting**

ESG reporting is the process of disclosing a company's environmental, social, and governance practices, accomplishments, and challenges (Eccles & Serafeim, 2013). This form of reporting is designed to provide transparent and relevant information to various stakeholders, such as investors, regulators, employees, and customers, enabling them to evaluate a company's dedication to sustainability and make informed decisions (Amel-Zadeh & Serafeim, 2018).

An effective ESG report generally includes the following elements (GRI, SASB, TCFD):

Environmental: Information on a company's resource consumption, greenhouse gas emissions, waste management, water usage, and efforts to control pollution (GRI, 2020).

Social: Data on a company's workforce diversity, employee health and safety, community involvement, human rights, and supply chain management (SASB, 2018).

Governance: Details about a company's board structure, executive compensation, risk management, and compliance with relevant laws and regulations (TCFD, 2017).

The ESG reporting process consists of several steps (GRI, SASB, TCFD):

1. Setting ESG goals and objectives: Companies need to determine their ESG goals and objectives based on their industry, size, and stakeholder expectations (GRI, 2020).
2. Identifying relevant ESG metrics and indicators: Companies should choose suitable metrics and indicators to measure their ESG performance, taking into account globally recognized frameworks such as the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), and Task Force on Climate-related Financial Disclosures (TCFD) (SASB, 2018; TCFD, 2017).
3. Collecting and analyzing data: Companies must gather and analyze data on selected ESG metrics, ensuring data accuracy and reliability (GRI, 2020).
4. Preparing an ESG report: Companies should create an ESG report that clearly and concisely presents their ESG performance, using a mix of quantitative and qualitative information (GRI, 2020).
5. Seeking external assurance: To enhance credibility, companies may seek third-party verification to ensure the accuracy and completeness of their ESG disclosures (Hummel & Schlick, 2016).

However, ESG reporting faces challenges and limitations, including (Chen et al., 2018; Hummel & Schlick, 2016):

- Inconsistent reporting frameworks: The lack of universally accepted reporting standards can lead to discrepancies in ESG disclosures, making it difficult for stakeholders to compare companies.
- Resource constraints: Small and medium-sized enterprises may not have the resources and expertise needed for comprehensive ESG reporting.
- Greenwashing: Some companies may engage in "greenwashing," presenting a favorable image of their ESG performance without making substantial improvements.

As the significance of sustainability continues to grow, the future of ESG reporting is likely to be marked by the following trends (Eccles & Serafeim, 2013; TCFD, 2017; GRI, 2020):

- Increased regulatory requirements: Governments and regulatory bodies may impose stricter ESG reporting requirements, promoting greater transparency and standardization (Chen et al., 2018).
- Integration of ESG reporting into mainstream financial reporting: ESG reporting is likely to become more integrated with conventional financial reporting, reflecting the increasing recognition of ESG factors as essential drivers of long-term value creation (Eccles & Serafeim, 2013).
- Enhanced digitalization and data analytics: Technological advancements will enable companies to leverage data analytics and artificial intelligence to improve the quality, accuracy, and timeliness of their ESG disclosures (GRI, 2020).
- Increased focus on climate-related risks and opportunities: Climate change will become an increasingly prominent aspect of ESG reporting, with more companies adopting the TCFD framework to disclose their climate-related risks and opportunities (TCFD, 2017).
- Growing importance of stakeholder engagement: Companies will increasingly recognize the value of engaging with stakeholders, including investors, employees, customers, and local communities, to better understand their expectations and concerns regarding ESG performance (Amel-Zadeh & Serafeim, 2018).

ESG reporting has emerged as a critical component of corporate transparency and accountability in the contemporary business environment (Eccles & Serafeim, 2013). By providing stakeholders with relevant and reliable information about their ESG performance, companies can enhance trust, attract investment, and drive long-term value creation (Amel-Zadeh & Serafeim, 2018). Despite the challenges and limitations (Chen et al., 2018; Hummel

& Schlick, 2016), ESG reporting is expected to evolve and become even more crucial as businesses and investors increasingly recognize the importance of sustainability in shaping the future of the global economy (Eccles & Serafeim, 2013).

## 1.7 Modern **theories as a precursor to ESG**

In recent years, Environmental, Social, and Governance (ESG) principles have emerged as a central theme in the investment landscape, influencing how investors and businesses approach sustainable value creation. Although ESG is a relatively new concept, it has been influenced by various contemporary theories that have explored the connection between corporations and society.

### 1.7.1 Shareholder Theory

Shareholder theory, often linked to Milton Friedman's Friedman Doctrine (1970), has been viewed as a foundation for the modern ESG (Environmental, Social, and Governance) movement. While shareholder theory emphasizes maximizing shareholder value and profits, the emergence of the ESG framework has expanded the perspective on corporate responsibility to encompass a more extensive range of stakeholders and long-term sustainability.

The shift from shareholder theory to the ESG movement can be attributed to several factors:

Increased awareness of social and environmental issues: As global challenges like climate change, income inequality, and human rights abuses have gained attention, stakeholders have started demanding more responsible corporate conduct (Carroll & Shabana, 2010). This has led to the creation of ESG criteria to assess how companies tackle these issues (Eccles, Ioannou, & Serafeim, 2014).

Acknowledgment of long-term value creation: Unlike shareholder theory, which concentrates on short-term financial gains, the ESG movement highlights long-term value creation for shareholders and other stakeholders (Porter & Kramer, 2011). Companies that prioritize ESG factors can more effectively manage risks and capitalize on opportunities, resulting in sustainable growth and long-term financial returns (Busch, Bauer, & Orlitzky, 2016).

Shifting investor preferences: Investors, including large institutional investors, have shown growing interest in the social and environmental consequences of their investments (Fulton, Kahn, & Sharples, 2012). This has given rise to responsible investing, where investors actively incorporate ESG factors into their investment decisions. Consequently, companies that emphasize ESG performance can attract capital and gain a competitive edge in the market (Amel-Zadeh & Serafeim, 2018).

Developing regulatory landscape: Regulations and guidelines surrounding corporate responsibility, sustainability, and disclosure have evolved over time, prompting companies to adopt more comprehensive ESG practices (Ioannou & Serafeim, 2012). This change in the regulatory environment has resulted in the incorporation of ESG factors into corporate decision-making and reporting (Adams, 2017).

In conclusion, the transition from shareholder theory to the ESG movement demonstrates an increasing acknowledgement that corporations have obligations beyond merely maximizing shareholder value. By implementing ESG practices, companies can address the requirements of a wider range of stakeholders, effectively manage risks, and generate long-term value for both shareholders and society.

### 1.7.2 Stakeholder Theory

The stakeholder theory has been an essential foundation for the development of ESG (Environmental, Social, and Governance) principles in today's business environment. First proposed by R. Edward Freeman in the 1980s (Freeman, 1984), the stakeholder theory contends that corporations are responsible for a wider range of stakeholders, beyond just shareholders. These stakeholders include employees, customers, suppliers, local communities, and the environment. This more inclusive perspective on corporate responsibility has paved the way for the ESG movement, which further stresses the integration of environmental, social, and governance factors into corporate decision-making.

The progression from stakeholder theory to the ESG movement can be attributed to several key developments:

Broadening corporate responsibility: Stakeholder theory expanded the traditional focus on shareholder value maximization to include the interests of a broader range of stakeholders (Freeman et al., 2010). This extension laid the groundwork for the ESG movement, which aims to address the social and environmental impacts of business activities on all stakeholders (Eccles & Serafeim, 2013).

Emphasis on long-term value creation: Stakeholder theory highlights that companies can generate long-term value by addressing the needs and concerns of various stakeholders

(Freeman et al., 2007). The ESG movement builds upon this idea, acknowledging that managing environmental, social, and governance risks and opportunities can lead to more sustainable growth and long-term financial returns for both shareholders and stakeholders (Clark et al., 2015).

Growing investor interest: As investors have become more concerned with the social and environmental consequences of their investments (Krosinsky & Robins, 2018), stakeholder theory has given rise to responsible investing, which incorporates ESG factors into investment decisions (Sandberg et al., 2009). This shift in investor preferences has encouraged companies to prioritize ESG performance, attracting capital and gaining a competitive advantage in the market (Friede et al., 2015).

Evolving regulatory and reporting standards: Stakeholder theory has influenced the development of regulations and guidelines concerning corporate responsibility, sustainability, and disclosure (Windsor, 2006). Consequently, companies have been motivated to adopt more comprehensive ESG practices and integrate ESG factors into their decision-making and reporting processes (KPMG, 2017).

In summary, the stakeholder theory (Freeman, 1984) has been a pivotal precursor to the ESG movement, providing the foundation for a more comprehensive approach to corporate responsibility that encompasses environmental, social, and governance factors. By adopting ESG practices, companies can better address the needs of a diverse range of stakeholders, manage risks and opportunities, and create long-term value for both shareholders and society as a whole.

### 1.7.3 Socially Responsible Investing (SRI)

Socially Responsible Investing (SRI) has been a significant driving force in the development of Environmental, Social, and Governance (ESG) principles in the investment world. SRI emerged in the 1960s and 1970s in response to growing concerns about the social, ethical, and environmental effects of business activities (Renneboog et al., 2008). SRI focuses on investing in companies that adhere to specific ethical, social, and environmental standards, laying the foundation for the more comprehensive ESG approach that is prevalent today (Barnett & Salomon, 2012).

There are several key ways in which SRI has contributed to the development of ESG investing:

- Ethical screening: SRI introduced the concept of ethical screening, which involves excluding companies engaged in activities deemed harmful to society or the environment, such as tobacco, firearms, or gambling (Sparkes, 2001). This practice has evolved over time to include positive screening, which seeks out companies that are making a positive impact in areas such as renewable energy, sustainable agriculture, or social justice (Schueth, 2003). These screening methods have directly influenced the development of ESG investing, which incorporates environmental, social, and governance criteria into investment decision-making (Eccles et al., 2012).
- Focus on non-financial factors: SRI underscored the importance of considering non-financial factors, such as social and environmental impact, when making investment decisions (Humphrey & Lee, 2011). This broader perspective has paved the way for the more comprehensive ESG approach, which considers a company's performance across a range of environmental, social, and governance factors and their potential impact on financial performance and risk (Bassen & Kovacs, 2008).
- Growing investor demand: As investors became increasingly concerned about the social and environmental impacts of their investments, SRI gained popularity (Louche & Lydenberg, 2006). This growing interest in responsible investing has contributed to the emergence of ESG investing, which has become an essential consideration for many institutional investors and asset managers (Sullivan & Mackenzie, 2009).
- Development of sustainability reporting and standards: SRI helped drive the development of sustainability reporting and standards, as companies sought to demonstrate their commitment to social and environmental responsibility to attract SRI investors (GRI, 2013). This has led to the creation of ESG reporting frameworks and standards, such as the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB), which help companies disclose their ESG performance in a transparent and comparable manner (Eccles & Krzus, 2010).

In conclusion, Socially Responsible Investing has been a crucial precursor to the rise of ESG investing. By emphasizing the importance of ethical, social, and environmental factors in investment decision-making, SRI has laid the foundation for a more comprehensive and integrated approach to responsible investing that incorporates environmental, social, and governance criteria (Barnett & Salomon, 2012). This has led to the growing prominence of ESG investing, which seeks to create long-term value for investors while also addressing pressing global challenges such as climate change, social inequality, and corporate governance issues.

### 1.7.4 Triple Bottom Line (TBL)

The Triple Bottom Line (TBL) concept, introduced by John Elkington in 1994, has played a critical role in the emergence of ESG investing. By advocating for a comprehensive approach to business performance that encompasses social, environmental, and financial dimensions, TBL has set the stage for the more extensive ESG approach. Consequently, ESG investing has gained importance, aiming to create long-term value for investors while tackling pressing global issues such as climate change, social inequality, and corporate governance concerns (Elkington, 1997; Slaper & Hall, 2011).

TBL has influenced the rise of ESG investing in the following ways:

- Comprehensive approach to business performance: TBL proposed that businesses should consider their wider impact on society and the environment, in addition to financial performance (Elkington, 1997). This comprehensive perspective has directly impacted the development of ESG investing, which evaluates a company's performance across various environmental, social, and governance factors (Friedman & Miles, 2006).
- Focus on sustainability: TBL emphasizes the significance of sustainable business practices, aiming to balance present needs without jeopardizing future generations' ability to fulfill their requirements (Elkington, 1997). This concentration on sustainability has shaped the ESG approach, which examines how companies manage long-term risks and opportunities related to environmental and social issues (Busch et al., 2016).
- Stakeholder engagement: TBL encourages businesses to engage with a diverse array of stakeholders, including employees, customers, suppliers, communities, and shareholders (Freeman, 2010). This inclusive strategy has informed the development of ESG investing, which acknowledges that companies effectively managing stakeholder relationships are likely more resilient and better positioned for long-term success (Eccles et al., 2012).
- Reporting and disclosure: TBL has driven the development of sustainability reporting and disclosure frameworks, as companies aim to showcase their commitment to social

and environmental responsibility (Adams & Frost, 2008). These frameworks, such as the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB), have helped standardize ESG reporting and disclosure, allowing investors to more easily assess and compare companies' ESG performance (Eccles & Serafeim, 2013).

### 1.7.5 Corporate Social Responsibility (CSR)

Corporate Social Responsibility (CSR) has also significantly impacted the development of Environmental, Social, and Governance (ESG) principles in both investment and business landscapes (Carroll, 1991). By emphasizing ethical conduct, stakeholder engagement, and the integration of non-financial factors, CSR has paved the way for a more comprehensive approach to responsible investing and corporate decision-making (Freeman et al., 2010).

CSR has contributed to the rise of ESG investing by establishing the importance of considering a company's social and environmental performance alongside traditional financial measures (Carroll, 1991). This broader perspective has directly impacted the development of ESG investing, which evaluates a company's performance across various environmental, social, and governance factors (Freeman et al., 2010).

Additionally, CSR's focus on stakeholder interests and long-term value creation has informed the development of ESG investing. By recognizing that businesses effectively managing their stakeholder relationships are more likely to be resilient and better positioned for long-term success, ESG investing seeks to generate financial returns while also addressing pressing global challenges such as climate change, social inequality, and corporate governance issues (Freeman et al., 2010).

Finally, CSR has driven the development of sustainability reporting and disclosure frameworks, as companies seek to demonstrate their commitment to social and environmental responsibility (Carroll, 1991). These frameworks, such as the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB), have helped standardize ESG reporting and disclosure, making it easier for investors to assess and compare companies' ESG performance.

In conclusion, Corporate Social Responsibility has been an essential precursor to the rise of ESG investing. By promoting ethical behavior, stakeholder engagement, and a focus on long-term value creation, CSR has laid the foundation for the more comprehensive ESG approach (Carroll, 1991; Freeman et al., 2010). This has led to the growing prominence of ESG investing, which aims to generate financial returns while also addressing global challenges related to the environment, society, and governance.

### 1.7.6 Impact Investing

Impact investing has been instrumental as a forerunner to the widespread implementation of Environmental, Social, and Governance (ESG) principles in investment and corporate strategies (Bugg-Levine & Emerson, 2011). By focusing on social and environmental impacts, long-term value generation, and active involvement with companies receiving investments, impact investing has established the groundwork for the broader ESG approach (Freeman et al., 2010).

The emphasis on producing long-lasting value for investors and society as a whole through sustainable business practices and initiatives in impact investing aligns with ESG investing principles (Bugg-Levine & Emerson, 2011). Moreover, impact investing has spurred the creation of measurement and reporting frameworks for evaluating the social and environmental performance of investments, which have influenced ESG reporting and disclosure practices (Elkington, 1994; Carroll, 1991).

In conclusion, impact investing has been a vital precursor to the emergence of ESG investing. Acknowledging the origins and evolution of ESG within contemporary theories, including stakeholder theory, Socially Responsible Investing (SRI), Triple Bottom Line (TBL), Corporate Social Responsibility (CSR), and impact investing, is essential for comprehending the broader context of this shift and its ramifications for future business practices (Freeman et al., 2010; Elkington, 1994; Carroll, 1991).

# Chapter 2

## 2.1 Shipping Industry

The shipping industry, as a critical component of international commerce, is a significant driver of economic growth. With over 90% of the world's traded goods transported by sea, the shipping industry is indispensable for global trade (UNCTAD, 2020).

### 2.1.2 Historical Development

The shipping industry's history can be traced back to ancient civilizations that depended on seafaring for trade, exploration, and expansion. Early civilizations such as the Phoenicians, Greeks, and Romans were among the first to create maritime trade routes, using sailing ships to transport goods across the Mediterranean Sea (Casson, 2014). The Age of Exploration and subsequent colonial growth in the 15th and 16th centuries further spurred the shipping industry's expansion, as European powers sought to establish trade routes with Asia, Africa, and the Americas (Haralambides, 2017).

The 18th and 19th-century industrial revolution led to significant technological advancements in shipbuilding, navigation, and propulsion. Steam-powered vessels gradually supplanted sailing ships, enabling faster and more dependable maritime transport (Gardiner, 2004). The mid-20th century saw the introduction of containerization, which revolutionized the shipping industry by standardizing cargo handling and streamlining the transportation process, resulting in a significant reduction in shipping costs and a tremendous increase in global trade (Levinson, 2016).

### 2.1.2 Structure and Key Players

The shipping industry is a complex and diverse sector, encompassing various sub-sectors such as container shipping, bulk shipping, tanker shipping, and specialized shipping. These sub-sectors cater to different cargo types, ranging from consumer goods to raw materials, and from liquid to dry bulk commodities (Notteboom & Rodrigue, 2017). The industry comprises a wide range of stakeholders, including ship owners, operators, charterers, shipyards, shipping lines, ports, and regulatory authorities.

Prominent players in the global shipping industry include major shipping lines like Maersk, MSC, CMA CGM, and COSCO, as well as shipbuilding powerhouses such as Hyundai Heavy Industries, Samsung Heavy Industries, and Daewoo Shipbuilding & Marine Engineering (UNCTAD, 2020). The industry is also supported by numerous service providers, including shipping agents, freight forwarders, insurers, and classification societies (Branch, 2007).

### 2.1.3 **Challenges and Opportunities**

The shipping industry faces various challenges and opportunities in the 21st century, including economic fluctuations, technological advancements, regulatory pressures, and environmental concerns.

- Economic Fluctuations

The shipping industry is acutely sensitive to global economic conditions, as the demand for maritime transport is directly linked to international trade growth (UNCTAD, 2020). Economic downturns, trade imbalances, and geopolitical tensions can adversely impact the industry by reducing the demand for shipping services, resulting in oversupply and downward pressure on freight rates (Stopford, 2009).

- Technological Advancements

Technology advancements present both challenges and opportunities for the shipping industry. Innovations in ship design, propulsion systems, and navigation equipment have resulted in the creation of larger, more efficient, and environmentally friendly vessels (Psaraftis & Kontovas, 2014). Additionally, digitalization and automation have the potential to streamline operations, enhance supply chain visibility, and improve overall efficiency (Notteboom & Rodrigue, 2017). However, these innovations also necessitate substantial investments and adaptation by industry stakeholders.

- Regulatory Pressures

The shipping industry operates within a highly regulated environment, with various international, regional, and national regulations governing aspects such as safety, security, and environmental protection (UNCTAD, 2020). The industry faces increasing regulatory pressures, particularly concerning environmental issues such as greenhouse gas emissions, air pollution, and ballast water management (Eyring et al., 2010). Compliance with these regulations requires significant investment in technology, infrastructure, and operational adjustments (Kenny, 2018).

- Environmental Concerns

As concerns over climate change and environmental degradation intensify, the shipping industry is increasingly called upon to reduce its environmental impact. Strategies such as enhancing fuel efficiency, adopting alternative propulsion systems, and optimizing shipping routes can help mitigate greenhouse gas emissions, decrease pollution, and conserve resources (Psaraftis & Kontovas, 2014). Additionally, the industry must strike a balance between economic growth and environmental sustainability, a challenge that will require innovation and collaboration among stakeholders (Kenny, 2018).

Throughout history, the shipping industry has been an integral part of global trade, evolving in response to economic, technological, and environmental forces. As the industry continues to adapt to the challenges and opportunities of the 21st century, its focus must remain on fostering innovation, ensuring regulatory compliance, and balancing economic growth with environmental sustainability. Collaboration among key players, regulatory authorities, and service providers will be essential for the continued success and resilience of the global shipping industry.

## 2.2 General Characteristics

The maritime industry serves as a significant engine for global commerce, enabling the transport of goods across international borders.

### 2.2.1 Shipping Industry Structure

- Shipping Categories

The maritime industry broadly encompasses three primary segments: container shipping, bulk shipping, and specialized shipping (UNCTAD, 2020). Container shipping is primarily responsible for the conveyance of manufactured goods. Bulk shipping, on the other hand, caters to the transportation of raw commodities like coal, grain, and iron ore. Specialized shipping handles a diverse range of cargo, including but not limited to chemicals, vehicles, and liquefied natural gas (LNG) (Stopford, 2009).

- Market Division

The maritime industry further divides into liner and tramp shipping services. Liner shipping, characterized by fixed timetables and routes, employs standardized vessels primarily for the transport of containerized cargo (UNCTAD, 2020). Tramp shipping provides a more flexible approach in terms of schedules, routes, and vessel types and generally focuses on the transport of bulk commodities (Stopford, 2009).

### 2.2.2 Market Dynamics

- Supply and Demand

The cyclical nature of the shipping industry heavily influences freight rates and vessel values, with supply and demand fluctuations playing a crucial role (Stopford, 2009). Factors like global economic trends, trade flows, and geopolitical shifts affect the demand for shipping (UNCTAD, 2020). Simultaneously, supply is determined by the fleet size, fleet utilization, and activity in new shipbuilding (Stopford, 2009).

- Industry Volatility

The shipping industry often experiences considerable volatility, with short-term significant fluctuations in freight rates and vessel values (Stopford, 2009). This instability can be attributed to factors such as the industry's cyclical nature, the lengthy lead times associated with ship construction, and limited access to accurate market information (UNCTAD, 2020).

### 2.2.3 **Prominent Trends**

- Market Consolidation

In recent years, the shipping industry has experienced increased consolidation due to the need for economies of scale and enhanced operational efficiency (UNCTAD, 2020). This trend is particularly pronounced in the container shipping sector, where numerous notable mergers and acquisitions have occurred (UNCTAD, 2020).

- Technological Innovations

Emerging technologies are transforming the shipping industry, with breakthroughs such as autonomous vessels, digitalization, and advanced data analytics promising to increase efficiency, lower costs, and improve safety (UNCTAD, 2020). The adoption of these technologies is anticipated to accelerate in the coming years as the industry adapts to a rapidly evolving global landscape (Stopford, 2009).

- Environmental Regulations

The shipping industry is facing increasing pressure to minimize its environmental footprint. Regulatory bodies like the International Maritime Organization (IMO) are introducing more stringent emissions standards and other environmental regulations (UNCTAD, 2020). This has led to greater investment in alternative fuel sources, energy-efficient ship designs, and other sustainable technologies (UNCTAD, 2020).

## 2.3 Importance of Shipping

The shipping industry serves as a vital engine for worldwide economic growth, linking markets and enabling international trade. As the primary method for transporting goods globally, shipping accounts for over 90% of international trade (UNCTAD, 2020).

- Economic Development

The shipping industry plays an essential part in promoting economic development by offering affordable and reliable transportation of goods, which in turn facilitates international commerce and trade. Shipping allows nations to access global markets, import raw materials, and export finished products, fostering economic growth, investment, and job creation (Stopford, 2009). For developing nations, the shipping industry is particularly vital, as it enables them to engage in international trade and reap the benefits of the global economy (UNCTAD, 2020).

- Employment Generation

The shipping industry is a major employer, generating direct and indirect employment opportunities for millions of people globally. Direct employment includes positions in shipbuilding, ship operations, port services, and maritime support services (WTO, 2016). Indirect employment spans a wide range of sectors, such as logistics, insurance, finance, and regulation, all of which depend on the shipping industry (Branch, 2007). Moreover, the shipping industry creates induced employment through the multiplier effect, as income earned by directly and indirectly employed individuals is spent on goods and services, generating additional jobs throughout the economy (WTO, 2016).

- Supply Chain Integration

The shipping industry is integral to the integration of global supply chains, enabling the efficient movement of goods and resources across international borders (Haralambides, 2017). Containerization has been particularly transformative for the shipping industry by standardizing cargo handling, lowering transportation costs, and enhancing supply chain efficiency (Levinson, 2016). By providing a dependable and cost-effective means of transporting goods, the shipping industry supports the development of intricate and interconnected supply chains, which in turn spur productivity, competitiveness, and economic growth (Notteboom & Rodrigue, 2017).

- Global Connectivity

The shipping industry promotes global connectivity by connecting countries and regions through extensive maritime trade networks. With over 50,000 merchant ships operating in international waters, the shipping industry reaches nearly every part of the world (UNCTAD, 2020). This extensive network enables the efficient exchange of goods, resources, and information, fostering economic integration, cultural exchange, and international collaboration (Haralambides, 2017).

The shipping industry holds a paramount position in the global economy, as it enables international trade, creates jobs, integrates supply chains, and connects countries and regions. As the world becomes increasingly interlinked, the shipping industry will maintain its critical role in driving economic growth, supporting development, and encouraging global cooperation.

## 2.4 Esg reporting for investment managers

The significance of Environmental, Social, and Governance (ESG) reporting in the investment management sector has grown substantially in recent years, as investors increasingly seek sustainable investment opportunities and regulators impose more stringent ESG disclosure requirements.

### 2.4.1 ESG Reporting's Role in Investment Management

ESG reporting involves disclosing information about a company's environmental, social, and governance performance, allowing investment managers to evaluate potential risks and opportunities linked to ESG factors (Eccles & Serafeim, 2013). By including ESG data in their investment analyses and decision-making processes, investment managers can better align their portfolios with their clients' and society's long-term interests while also minimizing risks and boosting returns (Friede, Busch, & Bassen, 2015).

### 2.4.2 Advantages of Incorporating ESG Factors into Investment Decision-Making

Integrating ESG factors into investment decision-making can offer several benefits to investment managers, including:

- Enhanced Risk Management: ESG reporting enables investment managers to identify and evaluate ESG-related risks that may affect the financial performance of companies in their portfolios, such as regulatory, reputational, and operational risks (Clark, Feiner, & Viehs, 2015). By including ESG factors in their investment analyses, investment managers can make more informed decisions and better manage potential risks associated with ESG issues (Khan, Serafeim, & Yoon, 2016).
- Improved Investment Performance: Numerous studies have discovered a positive relationship between ESG performance and financial performance, suggesting that companies with robust ESG profiles tend to outperform their peers over time (Friede et

al., 2015; Clark et al., 2015). Therefore, incorporating ESG factors into investment decision-making can help investment managers enhance portfolio performance by identifying companies with strong ESG performance and attractive investment prospects (Kotsantonis, Pinney, & Serafeim, 2016).

- Alignment with Investor Preferences: Investors are increasingly seeking sustainable investment options that align with their values and preferences (Morgan Stanley, 2019). By incorporating ESG factors into their investment decision-making, investment managers can cater to these preferences and attract a more diverse range of clients, particularly those with a strong interest in sustainable investing (BlackRock, 2020).

### 2.4.3 Challenges of Incorporating ESG Factors into Investment Decision-Making

Despite the potential benefits of ESG integration, investment managers face several challenges in implementing ESG reporting and analysis, including:

- Data Quality and Availability: One significant challenge in integrating ESG factors into investment decision-making is the absence of consistent, high-quality, and comparable ESG data (Hesse, 2019). Companies often report ESG data using different formats and metrics, making it difficult for investment managers to compare and analyze ESG performance across their portfolios (Kotsantonis et al., 2016).
- Resource Constraints: Integrating ESG factors into investment decision-making necessitates significant resources and expertise, especially concerning data collection, analysis, and interpretation (Revelli & Viviani, 2015). Many investment managers lack the required resources and capabilities to effectively integrate ESG factors into their investment processes, particularly small- and medium-sized firms (Hesse, 2019).

### 2.4.4 Regulations and Guidelines Governing ESG Reporting

Various international, regional, and national regulations and guidelines govern ESG reporting for investment managers, including the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), the Task Force on Climate-related Financial Disclosures (TCFD), and the European Union's Non-Financial Reporting Directive (NFRD) (GRI, 2020; SASB, 2020; TCFD, 2017; European Commission, 2020). These regulations and guidelines aim to promote transparency, comparability, and consistency in ESG reporting, helping investment managers make more informed investment decisions and better assess the risks and opportunities associated with ESG factors.

- Global Reporting Initiative (GRI): The GRI is a widely recognized international framework for ESG reporting, providing guidelines and standards for companies to disclose their ESG performance consistently and comparably (GRI, 2020). The GRI Standards cover a wide range of ESG topics, including climate change, human rights, labor practices, and anti-corruption, enabling investment managers to better understand the ESG risks and opportunities facing their portfolio companies (GRI, 2020).
- Sustainability Accounting Standards Board (SASB): The SASB develops industry-specific ESG reporting standards that focus on the financially material ESG issues most likely to impact a company's financial performance (SASB, 2020). By providing standardized ESG metrics and disclosure guidance, the SASB helps investment managers more effectively integrate ESG factors into their investment decision-making and risk management processes (SASB, 2020).
- Task Force on Climate-related Financial Disclosures (TCFD): The TCFD is a voluntary framework that provides recommendations for companies to disclose their climate-related risks and opportunities in a consistent and comparable manner (TCFD, 2017). The TCFD focuses on four key areas: governance, strategy, risk management, and metrics and targets, helping investment managers better assess the potential impacts of climate change on their portfolio companies and make more informed investment decisions (TCFD, 2017).
- European Union's Non-Financial Reporting Directive (NFRD): The NFRD is a European regulation that requires large companies to disclose certain ESG information in their annual reports, including information related to environmental protection, social responsibility, and employee matters (European Commission, 2020). The NFRD aims to improve the transparency and comparability of ESG reporting, enabling investment managers to more effectively assess the ESG performance of their European portfolio companies (European Commission, 2020).

ESG reporting plays a crucial role in investment management, as it enables investment managers to assess the potential risks and opportunities associated with ESG factors and make more informed investment decisions. Despite the challenges associated with integrating ESG factors into investment decision-making, the adoption of ESG reporting by investment managers is expected to continue growing, driven by increasing investor demand for sustainable investments and the ongoing development of ESG reporting regulations and guidelines.

## 2.5 Integration of ESG criteria into the investment decisions of shipping companies

As a significant contributor to global commerce, the shipping industry is facing increased scrutiny regarding its environmental, social, and governance (ESG) performance. Various stakeholders, such as investors, clients, and regulators, are seeking more transparency and accountability from shipping firms concerning their ESG practices.

### 2.5.1 Significance of ESG Considerations for Shipping Firms

It is vital for shipping companies to incorporate ESG factors into their investment choices for the following reasons:

- Regulatory Compliance: Shipping companies must adhere to multiple international, regional, and national regulations related to environmental protection, labor practices, and safety standards (IMO, 2020). Ensuring compliance with these regulations and minimizing risks of penalties, sanctions, or operational disruptions (Poulsen, Johnson, & Ponte, 2018) can be achieved by including ESG considerations in their investment decisions.
- Risk Management: ESG factors can significantly impact a shipping company's financial performance and long-term sustainability (UNCTAD, 2020). By considering ESG factors in investment decisions, shipping companies can better identify, evaluate, and manage potential risks linked to environmental, social, and governance aspects, thereby strengthening their overall risk management capabilities (Psarros, Skjong, & Eide, 2010).
- Meeting Stakeholder Expectations: Investors, clients, and other stakeholders increasingly expect shipping companies to demonstrate their commitment to sustainability and responsible business practices (UNCTAD, 2020). By factoring ESG criteria into their investment decisions, shipping companies can better align their operations with stakeholder expectations and potentially attract additional capital, customers, and strategic partners (Poulsen et al., 2018).

### 2.5.2 Advantages and Challenges of ESG Considerations for Shipping Companies

Incorporating ESG factors into shipping companies' investment decisions can offer several benefits, such as improved risk management, enhanced reputation, and increased access to capital (UNCTAD, 2020). However, challenges associated with ESG integration in the shipping sector include data availability and quality, industry complexity, and the need for specialized expertise (Poulsen et al., 2018).

### 2.5.3 Best Practices and Guidelines for ESG Considerations in the Shipping Sector

Shipping companies can adopt various best practices and guidelines to effectively incorporate ESG factors into their investment decisions, including:

- Sustainability Reporting Frameworks: Shipping firms can utilize internationally recognized sustainability reporting frameworks, such as the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB), to consistently, transparently, and comparably disclose their ESG performance (GRI, 2020; SASB, 2020).
- Industry-Specific Guidelines: The shipping industry has developed several specific guidelines for ESG integration, including the Poseidon Principles and the Clean Shipping Index. These guidelines provide a standardized approach for assessing and reporting ESG performance within the shipping sector, allowing shipping companies to benchmark their performance against industry peers and best practices (Poseidon Principles, 2019; Clean Shipping Index, 2020).
- ESG Ratings and Benchmarks: Shipping companies can utilize ESG ratings and benchmarks from specialized ESG research firms, such as MSCI ESG Research and Sustainalytics, to assess their ESG performance and identify areas for improvement (MSCI, 2020; Sustainalytics, 2020).
- Collaboration and Engagement: Shipping firms can collaborate with industry peers, investors, and other stakeholders to exchange knowledge, resources, and best practices related to ESG integration (UNCTAD, 2020). Involvement in industry associations, such as the International Chamber of Shipping (ICS) and the World Shipping Council (WSC), can offer valuable insights and support for implementing ESG initiatives in the shipping sector (ICS, 2020; WSC, 2020).
- Continuous Improvement: Effectively integrating ESG factors requires a long-term commitment to ongoing improvement and adaptation in response to evolving regulations, stakeholder expectations, and industry best practices (UNCTAD, 2020). Shipping companies should consistently review and update their ESG strategies, policies, and practices to ensure they remain relevant, effective, and aligned with their long-term business goals.

The integration of ESG factors into shipping companies' investment decisions is essential for enhancing risk management, meeting stakeholder expectations, and ensuring long-term business success. By adopting best practices and guidelines for ESG integration, shipping companies can effectively manage ESG-related risks and opportunities, improve their reputation, and gain a competitive edge in an increasingly sustainability-focused business environment.

## 2.6 The frameworks and basic principles **incorporating ESG investing**

Environmental, Social, and Governance (ESG) factors are becoming an essential part of investment decision-making worldwide, and the shipping industry is not exempt. Accounting for nearly 90% of international trade, the impact of the shipping industry on the world's economy, society, and environment is significant (UNCTAD, 2020). Therefore, it's crucial to include ESG principles in the industry's investment decisions.

The United Nations-supported Principles for Responsible Investment (PRI) provide a broad-based framework for investors aiming to embed ESG considerations into their investment strategies. The six principles encompass the integration of ESG issues in investment analysis and decision-making, active ownership and incorporation of ESG issues into ownership policies and practices, demanding suitable ESG disclosures from invested entities, encouraging widespread acceptance and implementation of the Principles, improving effectiveness in executing the Principles, and reporting on the progress made in implementing the Principles (PRI, 2021).

However, due to the unique attributes and impacts of the shipping industry, a more specialized framework is necessary. The Sustainability Accounting Standards Board (SASB) offers such a framework focusing on material ESG concerns in the shipping industry, including greenhouse gas emissions, labor practices, and safety management (SASB, 2020).

Beyond the SASB's standards, the Poseidon Principles, established in 2019, offer a specific framework for ship finance. These principles provide a global standard for evaluating and disclosing the degree to which ship finance portfolios are in line with the International Maritime Organization's (IMO) greenhouse gas emissions targets (Poseidon Principles, 2019).

Successful integration of ESG investing within the shipping industry relies on three foundational principles: integration, active ownership, and transparency.

The first principle, Integration, involves the inclusion of ESG factors in investment decisions to ensure a comprehensive understanding of ESG risks and opportunities. In the context of the shipping industry, this could mean examining a company's environmental footprint, safety standards, and labor practices before investing. Such an approach enables investors to make informed decisions aligned with their ESG objectives (PRI, 2021).

Active Ownership, the second principle, allows investors to influence the companies they have invested in as shareholders. This influence can be exercised through voting, engagement on ESG issues, and, if necessary, filing shareholder resolutions. Within the shipping industry, investors can encourage companies to adopt eco-friendly technologies, enhance worker safety, and improve their ESG performance (PRI, 2021).

The third principle, Transparency and Reporting, entails investors disclosing their ESG integration process. The shipping industry can demonstrate transparency by publicly reporting the carbon intensity of shipping portfolios, as outlined by the Poseidon Principles (Poseidon Principles, 2019).

In summary, the inclusion of ESG principles in investment decisions within the shipping industry is not only imperative but also feasible. It requires a methodical approach, encompassing the integration of ESG factors into investment decisions, active ownership to steer company behavior, and transparency in reporting. Existing frameworks such as the PRI, SASB, and Poseidon Principles provide comprehensive guidance to aid investors in this vital endeavor.

It is also important to note that the effective integration of ESG principles requires a collaborative effort among all stakeholders, including shipping companies, investors, regulators, and civil society. Joint efforts and dialogue can help to create a more sustainable and responsible shipping industry that not only contributes to the global economy but also helps to protect the environment and promote social well-being.

## 2.7 Main investment strategies

Investment approaches are the methods or techniques investors use to allocate their capital across various asset classes, aiming to achieve their financial objectives. This chapter provides an extensive overview of the primary investment approaches, including passive and active investing, growth and value investing, income investing, and impact investing. Each approach has its own distinct characteristics, advantages, and risks, and selecting the right investment approach depends on an investor's goals, risk tolerance, and time horizon.

### 2.7.1 Passive Investing

Passive investing is a strategy that focuses on replicating the performance of a specific market index or benchmark. This method involves minimal trading activity and emphasizes long-term capital appreciation. Passive investing is generally associated with lower costs, as it requires less research, analysis, and portfolio management compared to active investing.

**Index Funds and Exchange-Traded Funds (ETFs)**

Typical vehicles for passive investing include index funds and exchange-traded funds (ETFs). Index funds are mutual funds designed to replicate the performance of a specific market index, such as the S&P 500 or the FTSE 100. ETFs, conversely, are investment funds that are traded on stock exchanges and offer exposure to a diversified collection of assets, including stocks, bonds, or commodities (Sharpe, 1991; BlackRock, 2021).

**Advantage and Disadvantage**

Passive investing has several advantages, such as lower costs, tax efficiency, and reduced portfolio turnover. However, this strategy also has some drawbacks, including limited flexibility and potential underperformance during periods of market inefficiency (Fama & French, 2008).

### 2.7.2 Active Investing

Active investing is a strategy that involves actively managing a portfolio of assets with the objective of outperforming a specific market index or benchmark. This method relies on fundamental and technical analysis and utilizes various investment tools and techniques to identify undervalued or overvalued securities and capitalize on market inefficiencies (Jensen, 1968).

**Active Management Techniques**

Active management techniques consist of stock picking, market timing, and tactical asset allocation. Stock picking entails selecting individual stocks based on their potential for superior performance, while market timing seeks to predict market movements and adjust the portfolio's exposure accordingly. Tactical asset allocation involves modifying the portfolio's asset allocation in response to changing market conditions and investment opportunities (Cremers & Petajisto, 2009).

**Advantage and Disadvantage**

Active investing offers the possibility of higher returns compared to passive investing, as well as increased flexibility in managing risks and exploiting market opportunities. Nevertheless, this strategy also comes with higher costs due to more extensive research, analysis, and trading activity, and it has a greater potential for underperformance, particularly when considering the impact of fees and expenses (Carhart, 1997).

### 2.7.3 Growth and Value Investing

Growth and value investing represent two distinct investment approaches that concentrate on different types of stocks. Growth investing aims to identify companies with high growth potential, while value investing focuses on undervalued companies with robust fundamentals (Graham & Dodd, 1934; Fisher, 1958).

**Features of Growth and Value Stocks**

Growth stocks are generally characterized by high earnings growth rates, elevated price-to-earnings ratios, and substantial price-to-book ratios. These companies often reinvest their earnings to expand their operations, rather than distributing dividends to shareholders. Conversely, value stocks feature low price-to-earnings ratios, low price-to-book ratios, and high dividend yields. These companies are frequently considered undervalued relative to their intrinsic worth (Fama & French, 1992).

**Advantage and Disadvantage**

Growth investing provides the potential for greater capital appreciation, as growth stocks can yield significant returns when their earnings growth rates materialize. However, growth stocks also entail higher risks, as their valuations can be more susceptible to shifts in market sentiment and economic conditions. On the other hand, value investing offers the potential for reduced risk and increased dividend income, as value stocks tend to be more stable and less sensitive to market fluctuations. Nevertheless, value stocks may underperform during periods of robust economic growth or market optimism (Lakonishok, Shleifer, & Vishny, 1994).

### 2.7.4 Income Investing

Income investing is a strategy that emphasizes generating a consistent income stream from investments, such as stock dividends or bond interest payments. This approach is especially popular among conservative investors and those looking to supplement their income during retirement (Miller & Modigliani, 1961).

**Kinds of Income Investments**

Income investments can comprise dividend-paying stocks, bonds, real estate investment trusts (REITs), and fixed-income mutual funds. Dividend-paying stocks offer periodic dividend payments to shareholders, while bonds yield regular interest payments. REITs invest in income-generating real estate properties and must distribute a significant percentage of their income to shareholders. Fixed-income mutual funds invest in a diverse portfolio of bonds and other fixed-income securities, providing investors with regular income distributions (Ibbotson & Chen, 2001; NAREIT, 2021).

**Advantage and Disadvantage**

Income investing has several advantages, including a consistent income stream, reduced risk compared to growth investing, and the potential for capital preservation. However, this approach may also yield lower total returns, as income investments often have limited capital appreciation potential compared to growth investments (Bernstein & Arnott, 2003).

### 2.7.5 Impact Investing

Impact investing is a strategy that aims to produce both financial returns and positive social and environmental outcomes. This approach has gained considerable interest in recent years, as investors increasingly acknowledge the significance of incorporating environmental, social, and governance (ESG) factors into their investment choices (Bugg-Levine & Emerson, 2011).

**Varieties of Impact Investments**

Impact investments can encompass numerous asset classes, such as stocks, bonds, private equity, venture capital, and tangible assets. Common themes in impact investing include renewable energy, sustainable agriculture, affordable housing, and access to healthcare and education (GIIN, 2021).

**Advantage and Disadvantage**

Impact investing presents several benefits, including the potential for financial gains, positive social and environmental effects, and alignment with investor values. This strategy can also help investors manage risks associated with ESG factors like climate change, resource scarcity, and social disparities. However, impact investing may encounter challenges, such as difficulties in measuring and comparing impact, limited investment options, and possible trade-offs between financial returns and impact (Brest & Born, 2013).

**Conclusion**

Selecting an appropriate investment strategy depends on an investor's objectives, risk tolerance, and investment horizon. Passive and active investing provide different approaches to portfolio management, with passive investing focusing on mirroring market performance and active investing striving to beat the market. Growth and value investing concentrate on different stock types based on their growth potential and valuations, while income investing emphasizes generating a consistent income stream. Impact investing pursues both financial gains and positive social and environmental outcomes. Comprehending the distinct features, benefits, and risks of each strategy can assist investors in making informed decisions and building a well-diversified portfolio that aligns with their goals.

## 2.8 Their adoptation from the shipping industry

The global shipping industry, a pillar of international trade, plays an indispensable role in the global economy. Amid various challenges such as market volatility, regulatory shifts, and changing stakeholder expectations, shipping companies have adopted a variety of investment strategies to navigate these obstacles and harness new opportunities (UNCTAD, 2020).

**Growth Investing**

Growth investing involves identifying shipping companies with high growth prospects and investing in their stocks for long-term capital gains (Fama & French, 1992). Companies that are expanding their fleet, venturing into new markets, or adopting advanced technologies are often targeted by growth investors. For instance, Scorpio Tankers, a leading marine transportation provider for petroleum products, embodies a growth-oriented strategy by acquiring and chartering modern tankers to expand its fleet and seize market opportunities (Scorpio Tankers, 2021).

**Value Investing**

Value investing focuses on finding undervalued shipping companies with robust fundamentals and investing in their stocks, with the anticipation that the market will eventually recognize their intrinsic value (Graham & Dodd, 1934). Companies with healthy financials, steady cash flows, and attractive dividend yields could be of interest to value investors. An example is the Danish shipping company Norden, which has attracted value investors due to its strong financial performance, dedication to capital return to shareholders, and appealing valuation (Norden, 2021).

### Income Investing

Income investing aims to identify shipping companies with stable cash flows and a history of dividend payments to generate regular income from investments (Miller et al., 2006). Companies with long-term contracts, diversified revenue sources, and solid balance sheets might be prioritized by income investors. Ship Finance International, a Bermuda-based company that has consistently paid dividends to shareholders since 2004, serves as an attractive prospect for income investors seeking exposure to the shipping industry (Ship Finance International, 2021).

### Active Investing

Active investing involves diligent management of a shipping stock portfolio through extensive research, analysis, and individual company selection (Cremers & Petajisto, 2009). Active investors often aim to beat the market by identifying mispriced shipping stocks and capitalizing on the industry's cyclical nature. The Castalia Strategic Maritime Fund exemplifies active investing in the shipping industry, striving to outperform the market by actively investing in a diversified portfolio of shipping assets (Castalia, 2021).

### Passive Investing

Passive investing entails investing in a shipping index or exchange-traded fund (ETF) that mirrors the performance of a broad market index or a specific segment of the shipping industry (Sharpe, 1991). Passive investors may aim to minimize fees, diversify their exposure, and match the market's performance. The Invesco Shipping ETF, which aims to track the performance of the Dow Jones Global Shipping Index, provides exposure to a diverse portfolio of global shipping stocks and exemplifies passive investing in the shipping industry (Invesco, 2021).

### Impact Investing

Impact investing focuses on selecting shipping companies that yield measurable social or environmental benefits along with financial returns (Brest & Born, 2013). Companies adopting sustainable practices, such as investing in environmentally friendly technologies, implementing ESG criteria, or supporting the United Nations Sustainable Development Goals (SDGs), may be prioritized by impact investors. Wallenius Wilhelmsen, a Norwegian shipping company, exemplifies impact investing by committing to sustainable shipping practices, investing in LNG-powered vessels, reducing greenhouse gas emissions, and supporting community development projects (Wallenius Wilhelmsen, 2021).

**Conclusion**

In a dynamic industry environment, the employment of a range of investment strategies is key to the long-term prosperity of shipping companies. By embracing growth and value investing, income investing, active and passive investing, and impact investing, they can effectively navigate challenges, harness opportunities, and establish themselves as responsible and competitive participants in the global shipping industry. Customizing these strategies to their unique contexts enables shipping firms to deal with market uncertainties, fulfill regulatory mandates, and adapt to changing stakeholder expectations, thereby securing their continued growth and viability in an ever-evolving global market (UNCTAD, 2020).

## 2.9 The **ESG** ecosystem in shipping

The shipping sector, accountable for over 90% of worldwide trade, is essential to the global economy. As awareness of environmental, social, and governance (ESG) factors in business activities grows, the shipping industry is increasingly pressured to incorporate ESG principles into its practices.

### 2.9.1 ESG Landscape Participants

The ESG landscape in shipping includes a variety of stakeholders such as shipowners, operators, regulators, financiers, insurers, and classification societies. Each stakeholder contributes to promoting and implementing ESG principles within the industry:

- Shipowners and Operators

Shipowners and operators are tasked with directly applying ESG practices, including investing in energy-efficient ships, adhering to environmental regulations, and safeguarding crew welfare. They must also maintain transparency in their ESG performance and collaborate with other stakeholders to cultivate a sustainable industry culture.

- Regulators

International, regional, and national regulatory bodies, like the International Maritime Organization (IMO) and the European Union (EU), develop and enforce rules and regulations that govern the shipping industry's ESG performance. For instance, the IMO has established ambitious goals to reduce international shipping greenhouse gas emissions by a minimum of 50% by 2050, compared to 2008 levels.

- Financiers and Insurers

Banks, financial institutions, and insurers are instrumental in encouraging ESG adoption in the shipping industry by factoring ESG criteria into lending, investment, and insurance decisions. The Poseidon Principles, introduced in 2019, is a framework aligning ship financing with the IMO's emission reduction targets. Signatories commit to considering ESG criteria when providing loans to shipping firms.

### 2.9.2 Regulatory Frameworks and Initiatives

Various regulatory frameworks and initiatives encourage ESG principles integration within the shipping industry:

- IMO Regulations

The IMO has enacted several regulations to enhance the shipping industry's ESG performance, including the MARPOL Convention (addressing ship pollution), the Ballast Water Management Convention (preventing invasive species spread), and the Energy Efficiency Design Index (reducing $CO_2$ emissions from new ships).

- European Union Regulations

The EU has implemented multiple regulations and initiatives targeting the shipping industry's ESG performance, such as the EU Monitoring, Reporting, and Verification (MRV) system for $CO_2$ emissions and incorporating shipping into the EU Emissions Trading System (EU ETS).

- Sustainable Shipping Initiatives

Industry-led initiatives, like the Sustainable Shipping Initiative (SSI), bring together shipping companies, NGOs, and other stakeholders to create sustainable business practices and influence policy changes.

### 2.9.3 Challenges and Opportunities

The shipping industry's ESG landscape faces challenges, including high capital costs for cleaner technologies, the sector's fragmented nature, and the necessity for global coordination when implementing ESG regulations. However, opportunities exist for the industry to adopt ESG principles, such as operational cost savings through increased efficiency, access to capital from ESG-focused investors, and an improved reputation among stakeholders.

The shipping industry's ESG landscape is progressing as stakeholders acknowledge the significance of integrating ESG principles into their operations. Despite challenges, the convergence of regulatory frameworks, industry initiatives, and growing stakeholder awareness is fostering sustainable practice adoption within the shipping sector. As the industry continues to adapt and innovate, shipping companies must prioritize ESG considerations and collaborate with stakeholders to develop a more sustainable and resilient global shipping system.

## 2.10 Shipping cycles and ESG

Shipping cycles have long been a critical element of the global shipping industry, marked by periods of excess and scarcity that often lead to fluctuating freight rates (Stopford, 2009). These cycles are shaped by factors such as worldwide economic growth, technological advancements, and regulatory policies (Psaraftis, 2012). In recent times, Environmental, Social, and Governance (ESG) factors have risen in prominence within the shipping sector, influencing investment choices and operational approaches (UNCTAD, 2020).

### 2.10.1 An Overview of Shipping Cycles

Shipping cycles typically consist of four separate stages: growth, peak, decline, and bottom (Stopford, 2009). Influenced by global economic activities, supply and demand dynamics, and the shipping industry's adaptability to changing circumstances (UNCTAD, 2020), these cycles have remained a constant feature, frequently causing volatile freight rates and challenges for industry stakeholders (Glen, 2018).

### 2.10.2 ESG Factors and the Shipping Industry

The integration of ESG factors in the shipping industry has been driven by increased demand for sustainable shipping practices, heightened regulatory pressures, and improved stakeholder consciousness (UNCTAD, 2020). Key ESG factors affecting the shipping industry include emissions reduction, energy efficiency, waste management, crew welfare, and corporate governance (ITF, 2019). The incorporation of ESG principles by shipping firms can lead to better financial performance, higher market resilience, and stronger stakeholder relationships (Drobetz et al., 2020).

### 2.10.3 ESG's Influence on Shipping Cycles

ESG factors can impact shipping cycles in several ways:

- Regulatory adherence: As stricter environmental and social regulations are imposed by governments and international organizations, shipping companies are motivated to adopt sustainable practices, which can affect the shipping industry's supply and demand dynamics (Psaraftis, 2012). For example, the International Maritime Organization's (IMO) regulations on reducing sulfur oxide emissions have led to higher demand for low-sulfur fuels and scrubber installations, affecting freight rates and ship values (UNCTAD, 2020).
- Technological innovations: Embracing ESG principles fosters the creation and implementation of innovative technologies in the shipping industry, potentially improving the sector's efficiency and sustainability (UNCTAD, 2020). For example, digitalization, alternative fuels, and energy-efficient designs can help optimize operational processes, reduce emissions, and promote eco-friendly practices (ITF, 2019).
- Stakeholder expectations: As ESG factors become increasingly important to investors, lenders, and customers, shipping companies must adapt to meet these changing expectations (UNCTAD, 2020). Companies that effectively incorporate ESG principles into their business strategies can enhance their reputation, attract investments, and solidify their market position (Drobetz et al., 2020).

The interdependent relationship between shipping cycles and ESG factors presents significant opportunities for the shipping industry. By aligning business strategies with ESG principles, shipping companies can better navigate the industry's cyclical nature, enhance financial performance, and contribute to a more sustainable future.

## 2.11 Reasons for considering ESG factors in the investment strategies of shipping companies

Incorporating Environmental, Social, and Governance (ESG) considerations into investment approaches has gained prominence in recent years, as an increasing number of investors and stakeholders acknowledge the potential advantages of sustainable investment practices (Eccles & Klimenko, 2019).

- Financial Performance and Risk Management

Various studies have shown a positive correlation between ESG performance and financial outcomes, suggesting that businesses with robust ESG practices tend to outperform competitors in aspects such as stock returns, profitability, and cost of capital (Friede, Busch, & Bassen, 2015; Drobetz et al., 2020). By factoring ESG elements into their investment approaches, shipping firms can pinpoint and leverage value creation opportunities while concurrently mitigating potential risks tied to environmental, social, and governance concerns (Hoepner & Schopohl, 2018).

- Regulatory Compliance and Competitive Advantage

With governments and international organizations implementing stricter environmental and social regulations, shipping companies that proactively incorporate ESG elements into their investment approaches can gain a competitive edge by showcasing compliance and cultivating a favorable reputation among stakeholders (UNCTAD, 2020; Psaraftis, 2012). Furthermore, ESG-oriented investments can help shipping firms foresee and adapt to regulatory shifts, minimizing potential disruptions and related expenses (Hoepner & Schopohl, 2018).

- Stakeholder Engagement and Access to Capital

Integrating ESG elements into investment approaches can bolster stakeholder relations, as investors, clients, and employees place increasing importance on sustainability and ethical business practices (Eccles & Klimenko, 2019). ESG-oriented investments can also enhance capital accessibility, as a rising number of investors and financial institutions allocate resources to sustainable projects and companies exhibiting strong ESG performance (Drobetz et al., 2020).

- Long-term Resilience and Innovation

ESG integration can contribute to the long-term durability of shipping firms by promoting a forward-thinking approach to tackling environmental, social, and governance challenges (UNCTAD, 2020). Additionally, ESG-focused investment approaches can foster innovation, as businesses strive to devise and implement novel technologies and models that advance sustainable shipping practices, including alternative fuels, energy efficiency, and digitalization (ITF, 2019).

Integrating ESG factors into the investment strategies of shipping companies offers numerous advantages, such as improved financial performance, enhanced risk management, regulatory compliance, stakeholder engagement, capital accessibility, and long-term resilience. By incorporating ESG principles into their investment choices, shipping companies can seize the opportunities presented by the growing significance of sustainability in the global economy while addressing the challenges linked to environmental, social, and governance issues.

Considering the increasing importance of ESG factors in investment strategies and their potential impact on the shipping industry, future research should concentrate on the following areas:

- ESG measurement and benchmarking: Creating standardized frameworks and tools for evaluating ESG performance in the shipping industry can assist investors and stakeholders in making well-informed decisions while also enabling comparisons and benchmarking across companies and sectors.
- ESG integration strategies: Investigating the most effective methods for incorporating ESG factors into the investment strategies of shipping firms can provide valuable insights into best practices and potential challenges, informing future policy and industry initiatives.
- Impact of ESG-focused investments on shipping markets: Empirical studies analyzing the relationship between ESG-focused investments and shipping market dynamics, such as freight rates, ship values, and supply and demand trends, can contribute to a deeper understanding of the potential effects of ESG integration on the industry.
- ESG and shipping finance: Examining the role of ESG factors in shipping finance, including project finance, debt issuance, and equity investments, can reveal potential opportunities and challenges related to sustainable finance in the shipping industry.
- Cross-sectoral comparisons: Studling the impact of ESG factors on investment strategies in other transportation sectors, such as aviation and rail, can help identify potential synergies and common challenges, contributing to a more comprehensive understanding of sustainable investment practices across the wider transport sector.

To sum up, the integration of ESG factors into shipping companies' investment strategies offers significant benefits and opportunities. Future research in this area will not only help enhance our understanding of the relationship between ESG factors and the shipping industry but also contribute to the development of more sustainable and resilient investment practices. By prioritizing ESG principles in investment decisions, shipping companies can better navigate the challenges and capitalize on the potential rewards associated with the increasing importance of sustainability in the global economy.

# CHAPTER 3

## 3.1 The **situation** in Greece and the next day of ESG in shipping

Greece has a long-standing history as a major player in the global shipping industry, boasting a significant portion of the world's merchant fleet and a strong maritime tradition (UNCTAD, 2020). As the shipping sector continues to evolve and prioritize ESG factors, it is crucial for the Greek shipping industry to stay ahead of the curve and seize the potential opportunities and benefits that arise from incorporating ESG principles.

An increasing number of Greek shipowners have acknowledged the significance of integrating ESG factors into their business strategies, and many have already taken steps to adopt sustainable shipping practices (Papapostolou, Pouliasis, Kyriakou, & Nomikos, 2017). For instance, the Union of Greek Shipowners (UGS) has underlined the industry's commitment to environmental protection and social responsibility. Simultaneously, several Greek shipping companies have sought voluntary certifications and implemented ESG-oriented policies (UGS, 2019).

### 3.1.1 Regulatory Environment and Initiatives

The Greek shipping industry is governed by regulations set forth by international organizations such as the International Maritime Organization (IMO) and national regulations. Greece has played an active role in shaping global maritime regulations, supporting initiatives aimed at reducing greenhouse gas emissions and enhancing the environmental performance of the shipping sector (Psaraftis, 2018). Moreover, the Greek government has introduced various programs to encourage sustainable shipping practices, like the "Blue Economy" initiative, which aims to improve the environmental performance and competitiveness of the Greek maritime sector (Greek Ministry of Maritime Affairs & Insular Policy, 2019).

### 3.1.2 Challenges and Opportunities

The adoption of ESG factors in the Greek shipping industry presents a range of challenges and opportunities:

- Financial constraints: The economic crisis in Greece has limited financing options for shipping companies, potentially hampering their ability to invest in ESG-focused projects and technologies (Papapostolou et al., 2017). However, the rising interest in sustainable finance could create new avenues for Greek shipping companies to secure capital for ESG-related endeavors (Drobetz et al., 2020).

- Technological advancements: Embracing ESG principles can spur innovation within the Greek shipping industry, encouraging the development and implementation of cutting-edge technologies and practices that improve environmental performance and operational efficiency (ITF, 2019). This can help Greek shipping companies maintain their competitive advantage in the global market.
- Workforce development: Integrating ESG factors into the Greek shipping industry can contribute to workforce development by fostering the adoption of best practices in crew welfare, safety, and training (UNCTAD, 2020). This can boost the industry's appeal as an employer and support the long-term sustainability of the Greek maritime sector.

In conclusion, it is essential for the Greek shipping sector to proactively adapt to the evolving shipping industry and prioritize ESG factors to capitalize on the potential benefits and opportunities that arise from ESG integration. By cultivating a culture of sustainability, innovation, and social responsibility, Greek shipping companies can enhance their competitiveness, promote long-term resilience, and contribute to a more sustainable future for the maritime industry.

## 3.2 The opportunity for Greek shipping companies to attract new investment and financing ESG

The importance of integrating Environmental, Social, and Governance (ESG) factors into investment strategies has grown significantly in recent years, with a rising number of investors and financial institutions emphasizing sustainable investment practices (Eccles & Klimenko, 2019).

- The Emergence of Sustainable Finance

Sustainable finance has become a notable trend in global financial markets. Investors are increasingly looking to allocate resources to projects and companies with strong ESG performance (Drobetz et al., 2020). By incorporating ESG principles into their operations, Greek shipping companies can access this expanding pool of capital and attract investment from a wider range of investors, including those focused on sustainability (Friede, Busch, & Bassen, 2015).

- ESG Performance and Capital Access

Multiple studies have established a positive link between ESG performance and financial outcomes, indicating that companies with robust ESG practices often experience lower capital costs, enhanced profitability, and increased stock returns (Friede et al., 2015; Drobetz et al., 2020). Greek shipping companies that prioritize ESG factors can increase their appeal to investors, potentially securing more favorable financing terms (Hoepner & Schopohl, 2018).

- Green Bonds and Sustainability-Linked Loans

Green bonds and sustainability-linked loans are promising financial instruments for Greek shipping companies investing in ESG-related initiatives (Bolton & Kacperczyk, 2020). Green bonds finance eco-friendly projects, while sustainability-linked loans have interest rates connected to the borrower's ESG performance. By utilizing green bonds or obtaining sustainability-linked loans, Greek shipping companies can fund ESG-centric projects such as energy-efficient technologies, alternative fuels, or waste management systems (UNCTAD, 2020).

- The Role of Institutional Investors

Institutional investors like pension funds, insurance companies, and sovereign wealth funds are progressively integrating ESG criteria into their investment decisions (Eccles & Klimenko, 2019). Greek shipping companies that showcase strong ESG performance and commitment to sustainable business practices can position themselves as attractive investment opportunities, potentially unlocking significant capital sources (Hoepner & Schopohl, 2018).

### 3.2.1 Challenges and Risks

Despite the opportunities ESG integration offers for Greek shipping companies to attract new investments and financing, it also presents several challenges and risks:

- Measurement and reporting: The absence of standardized ESG metrics and reporting frameworks can make it challenging for Greek shipping companies to effectively convey their ESG performance to investors and stakeholders (UNCTAD, 2020).
- Regulatory uncertainty: The ever-changing regulatory environment surrounding ESG issues, particularly concerning climate change and carbon emissions, can create uncertainty for Greek shipping companies, potentially affecting their capital access (Psaraftis, 2012).
- Implementation costs: ESG-focused initiatives and technologies may require significant initial costs, potentially straining the finances of Greek shipping companies, especially those impacted by Greece's economic crisis (Papapostolou et al., 2017).

ESG integration offers a promising path for Greek shipping companies to attract new investment and financing, supporting long-term growth and resilience. Prioritizing ESG factors in business strategies and adopting sustainable financing instruments can help Greek shipping companies access a growing pool of capital from investors and financial institutions valuing sustainability. To fully capitalize on these opportunities, Greek shipping companies will need to address challenges related to measurement, reporting, and regulatory uncertainty, as well as manage the costs associated with ESG-focused initiatives.

## 3.3 The incorporation of the ESG **criteria in the analysis of shipping companies' investments**

The increasing significance of Environmental, Social, and Governance (ESG) factors in investment analysis is apparent as investors and financial institutions acknowledge the potential influence of ESG criteria on a company's financial performance and long-term viability (Friede et al., 2015).

Shipping companies must navigate various ESG-related risks and opportunities that can affect their investment choices and financial outcomes. Crucial ESG factors for shipping companies include:

- Environmental factors: The shipping industry's substantial environmental impact makes concerns such as greenhouse gas emissions, air and water pollution, waste management, and biodiversity effects particularly relevant (UNCTAD, 2020).
- Social factors: Social aspects, including labor practices, employee health and safety, community relations, and human rights, can shape a shipping company's reputation and long-term sustainability (Psaraftis, 2018).
- Governance factors: Governance considerations, like board composition, executive compensation, risk management, and regulatory compliance, can influence a shipping company's capacity to create and maintain shareholder value (Drobetz et al., 2020).

Various methodologies can be applied to integrate ESG criteria into the assessment of shipping companies' investments:

- ESG screening: This approach systematically evaluates companies based on established ESG criteria to identify those with strong ESG performance (Friede et al., 2015).
- ESG integration: This method incorporates ESG factors into traditional financial analysis to improve investment decision-making and risk management (Eccles & Klimenko, 2019).

- Thematic investing: This strategy concentrates on specific ESG themes or sectors, such as renewable energy or waste management, aiming for long-term financial returns and positive ESG outcomes (Hoepner & Schopohl, 2018).
- Impact investing: This type of investing aims to generate measurable ESG impacts alongside financial returns by investing in companies or projects addressing particular environmental or social challenges (Brest & Born, 2013).

Integrating ESG criteria into the analysis of shipping companies' investments can offer several advantages, including:

- Enhanced risk management: ESG factors can help identify potential risks impacting a shipping company's financial performance and long-term sustainability, allowing investors to make more informed decisions (Friede et al., 2015).
- Improved investment performance: Research has demonstrated a positive correlation between ESG performance and financial performance, suggesting that companies with solid ESG practices may experience higher stock returns and lower capital costs (Drobetz et al., 2020).
- Increased diversification: Including ESG criteria in investment analysis can boost portfolio diversification by identifying companies with varying risk and return profiles, potentially leading to better risk-adjusted returns (Hoepner & Schopohl, 2018).
- Alignment with investor values: ESG integration can help align investment strategies with investor values and preferences, allowing investors to support companies and projects that champion sustainability and social responsibility (Eccles & Klimenko, 2019).

Incorporating ESG criteria into the analysis of shipping companies' investments can enhance investment decision-making, risk management, and long-term sustainability. As the importance of ESG factors continues to grow, shipping companies and investors must develop robust methodologies for integrating ESG criteria into their investment analysis processes, addressing key environmental, social, and governance issues that can impact the financial performance and long-term resilience of the sector.

### 3.3.1 Case stady

Maersk, the world's largest container shipping company, serves as an excellent case study for the incorporation of ESG criteria into the analysis of shipping companies' investments. Over recent years, Maersk has made substantial efforts to integrate ESG factors into its business and investment decisions, aiming to address the environmental, social, and governance risks and opportunities that impact its financial performance and long-term sustainability (Maersk, 2021).

**Application of ESG Criteria:**

- Environment: Maersk has committed to becoming carbon neutral by 2050 and has invested in several initiatives to reduce its environmental impact. This includes investing in new, fuel-efficient ships and researching carbon-neutral fuels. These efforts reflect Maersk's understanding that environmental risks, including potential regulations on greenhouse gas emissions, could affect its future profitability and sustainability (Maersk, 2021).
- Social: Maersk has implemented various social initiatives to enhance the welfare of its employees and communities. The company has made investments to improve safety measures and working conditions on its ships and in its onshore operations. Additionally, Maersk has contributed to several community development projects, reflecting its commitment to social responsibility (Maersk, 2021).
- Governance: Maersk has established robust governance structures to manage its ESG risks and opportunities effectively. This includes setting up a sustainability committee at the board level, ensuring that ESG issues are considered in strategic decisions. Maersk also regularly reports on its ESG performance, demonstrating its commitment to transparency and accountability (Maersk, 2021).

**Impact and Benefits:**

Maersk's integration of ESG criteria into its investment analysis has brought several benefits. The company's ESG initiatives have helped reduce operational costs, improve risk management, and enhance its reputation among stakeholders. Maersk's strong ESG performance has also attracted investors looking to support sustainable companies, thereby increasing its access to capital (Maersk, 2021).

Maersk's case illustrates how shipping companies can incorporate ESG criteria into their investment analysis. Through its ESG efforts, Maersk has demonstrated that addressing environmental, social, and governance issues can not only mitigate risks and meet stakeholder expectations but also unlock new opportunities for value creation.

### 3.4 Why **they are important for entrepreneurship**

Environmental, Social, and Governance (ESG) factors have become increasingly vital in business operations and investment choices. In the realm of entrepreneurship, adopting ESG principles can yield substantial advantages, including promoting innovation, establishing a robust reputation, and securing funding.

ESG factors can stimulate innovation in entrepreneurship by motivating entrepreneurs to create new products, services, and business models addressing environmental and societal issues. The rising emphasis on sustainability and social responsibility has led to various innovative solutions, such as green technologies, circular economy models, and ethical products (Cohen & Amorós, 2019). By embracing ESG principles, entrepreneurs can pinpoint unfulfilled market demands and develop innovative solutions that generate profits while contributing to a sustainable future (York et al., 2016).

- Building a Strong Reputation

Integrating ESG factors can assist entrepreneurs in developing a solid reputation among customers, investors, and other stakeholders. Companies with excellent ESG performance are often viewed as responsible and ethical, which can enhance brand value and customer loyalty (Flammer, 2015). Furthermore, businesses that prioritize ESG factors can distinguish themselves from competitors and establish a competitive edge, particularly in sectors where sustainability and social responsibility are increasingly significant (Eccles et al., 2014).

- Access to Capital and Funding

Entrepreneurs who incorporate ESG factors into their business strategies can attract capital and funding from an expanding group of investors and financial institutions that value sustainability (Hart et al., 2018). Sustainable investing is gaining traction, resulting in a growing pool of capital available to support businesses that exhibit strong ESG performance (Bolton & Kacperczyk, 2020). By addressing ESG risks and opportunities, entrepreneurs can improve their access to capital, lower funding costs, and obtain the resources needed to expand and scale their businesses (Hart et al., 2018).

- Risk Management and Resilience

ESG factors also play a critical role in risk management and resilience for entrepreneurial ventures. By proactively addressing environmental, social, and governance issues, entrepreneurs can mitigate potential risks that may adversely impact their businesses, such as regulatory penalties, reputational harm, and operational disruptions (Friede et al., 2015). Additionally, adopting ESG factors can help entrepreneurs build resilience by fostering strong relationships with stakeholders, encouraging responsible practices, and ensuring their businesses' long-term sustainability (Godfrey et al., 2009).

Incorporating ESG factors is crucial for entrepreneurship, as it can encourage innovation, establish a strong reputation, attract funding, and enhance risk management and resilience. As sustainability and social responsibility continue to gain importance, entrepreneurs must adopt ESG principles to generate value for their businesses and contribute to a sustainable future.

# CHAPTER 4 Analysis of ESG

## Reports of the Dataset.

### 4.1 Gaslog

GasLog, a leading international owner and operator of LNG carriers, faces significant ESG challenges in the energy sector, such as climate change risks, safety concerns, and regulatory compliance. The company's ESG report is structured comprehensively and easy to navigate, covering all aspects of GasLog's ESG performance:

1. Introduction from the CEO:
    - Overview of the company's commitment to sustainability
    - Approach to managing ESG risks and opportunities
2. Sustainability Landscape:
    - Overview of the energy industry and the role of LNG in a low-carbon future
    - Alignment with the UN Sustainable Development Goals (SDGs)
3. ESG Management and Governance:
    - ESG governance structure, including the Board of Directors and its three standing committees
    - Approach to managing ESG risks and opportunities, including policies, procedures, and stakeholder engagement efforts
4. ESG Reporting and Materiality:
    - Identification and prioritization of ESG issues, including materiality assessments and stakeholder feedback
    - Reporting framework, adherence to SASB and TCFD standards
5. Sustainability at GasLog:
    - Detailed ESG performance in environment, social, and governance areas

- Coverage of GHG emissions, air quality, resource efficiency, employee health and safety, diversity and inclusion, and board and management structure

6. GasLog's Initiatives:
    - Update on the progress of ESG initiatives from the previous year's report
    - Coverage of ESG data collection, ESG KPIs in performance compensation, policies and governance schemes, enterprise risk management, and stakeholder engagement
7. TCFD Section:
    - Overview of how GasLog addresses TCFD recommendations
    - Coverage of governance, strategy, risk management, and metrics and targets related to climate change

In summary, GasLog's ESG report is structured clearly and comprehensively, addressing all aspects of the company's ESG performance. The easily navigable format allows stakeholders to understand GasLog's ESG performance and track its progress over time.

For the GasLog ESG report, mandatory elements are:

1. Introduction/Overview
2. ESG Management and Governance
3. ESG Reporting and Materiality
4. Sustainability at GasLog

Optional elements included in GasLog's ESG report, which are not necessarily mandatory, but provide a more comprehensive view of the company's sustainability efforts are:

1. Sustainability Landscape
2. GasLog's Initiatives
3. TCFD Section

Environmental Performance:

GasLog's environmental performance is essential in its overall ESG performance. The company has implemented various measures to mitigate its environmental impact and has made progress in some areas.

1. Greenhouse Gas (GHG) Emissions:

- $CO_2$ emissions from fuel oil increased in 2021 compared to 2020

- $CO_2$ emissions from LNG also increased
- Methane emissions: 4,313 tonnes
- Implemented measures to improve ship efficiency index

2. Resource Efficiency:

- Technological solutions implemented to reduce energy consumption
- Lower operating costs and increased profitability
- Support for the adoption of new technologies and alternative fuels

3. Air Emissions:

- $SO_x$ emissions: 378 tonnes
- $NO_x$ emissions: 6,137 tonnes
- PM10 emissions: 340 tonnes

4. Waste Management:

- Volume of plastic sent ashore: 2.3 m3 / vessel

5. Environmental Performance Metrics (2021):

- Fuel oil $CO_2$ emissions: 223,186 tonnes
- LNG $CO_2$ emissions: 1,166,550 tonnes
- Average EEDI $CO_2$: 4.66 grams / cargo*nm
- Average fleet EEOI $CO_2$: 18.33 grams / cargo*nm

While GasLog's efforts to mitigate its environmental impact are commendable, there is room for improvement. The company must continue to prioritize its environmental impact to mitigate the potential risks associated with its operations.

Social Performance:

GasLog's social performance is a crucial aspect of their ESG reporting, focusing on employee safety and well-being, diversity, equity, and inclusion, and community engagement.

1. Employee Safety and Well-being:

- Commitment to SDG 8 (Decent Work and Economic Growth)
- Low lost time injury (LTI) rate of 0.2 in 2021, compared to industry average of 0.5
- Investment in employee training and development programs

2. Diversity, Equity, and Inclusion (DEI):

- Commitment to SDG 10 (Reduced Inequalities)
- Workforce composed of over 40 different nationalities

- Female representation of 39% in shore-based staff
- Support for diversity and inclusion initiatives through partnerships

3. Community Initiatives:

- Commitment to SDG 13 (Climate Action)
- Focus on supporting education, health, and environmental initiatives
- Partnerships with organizations like Mercy Ships and CYMEPA
- Over $100,000 invested in community initiatives in 2021

By concentrating on these key areas, GasLog demonstrates its commitment to social performance as an integral part of its ESG strategy. This focus helps the company create value for stakeholders and contribute to a more sustainable future.

Goverance Performance:

GasLog's governance performance is centered around a strong and independent board of directors, a transparent framework for corporate governance, and a commitment to ethical and sustainable business practices.

1. Board of Directors and Committees:

- Three standing committees: Audit and Risk Committee, Compensation Committee, and Safety and Sustainability Committee
- Independent directors chair each committee
- Clearly defined scope and responsibilities outlined in committee charters

2. Compliance with Laws and Regulations:

- Emphasis on environmental and social responsibility compliance
- Zero-tolerance policy for bribery and corruption
- Annual training and attestation to the Anti-Bribery and Corruption policy for employees

3. Risk Management:

- ESG Management and Governance Framework based on SASB standards
- Regular reviews and updates to risk management policies and practices
- Focus on addressing emerging risks effectively

GasLog's governance performance demonstrates a dedication to ethical and sustainable business practices, which helps to mitigate risks and ensure long-term success and profitability.

In conclusion, GasLog's 2021 ESG report presents a comprehensive and transparent account of the company's commitment to sustainability and responsible business practices. The company's ESG strategy and approach, as well as its adherence to SASB and TCFD standards, provide a robust foundation for managing environmental, social, and governance risks and opportunities.

However, it is crucial to note that ESG reporting is not just about showcasing the current state of affairs, but also about continuous improvement. As such, GasLog needs to continually reassess its ESG strategy and performance, focusing on areas such as reducing emissions, enhancing diversity and inclusion, and bolstering risk management practices, to ensure the company's long-term sustainability and success. This commitment to constant improvement will not only benefit GasLog's operations and stakeholders but will also contribute to the broader goal of sustainable development.

## 4.2 COSCO

The ESG report of COSCO for 2021 follows a typical structure for environmental, social, and governance reporting. The structure can be divided into several sections:

1. Introduction and Overview: This section includes a brief introduction of the company, its core values, and the importance of ESG factors in the company's business strategy.
2. Environmental Performance: This section highlights the company's efforts and progress in areas such as energy consumption, greenhouse gas emissions, water consumption, waste management, and environmental compliance.
3. Social Performance: This section covers topics related to employee welfare, diversity and inclusion, health and safety, training and development, community engagement, and supply chain management.
4. Governance Performance: This section provides information about the company's corporate governance structure, board composition, risk management, and compliance with laws and regulations.
5. Awards and Recognitions: This section lists the awards and recognitions received by the company in relation to ESG performance.

In an ESG report, some mandatory elements include:

- Environmental performance data, such as energy consumption, greenhouse gas emissions, water consumption, and waste management.
- Social performance data, including workforce demographics, employee turnover, training and development, health and safety, and community investment.
- Governance performance information, such as board composition, risk management, and compliance.

Optional elements may include:

- Awards and recognitions received.
- Case studies or examples showcasing the company's ESG initiatives.
- Forward-looking statements or commitments related to ESG performance.

COSCO's ESG report for 2021 demonstrates a commitment to environmental sustainability, social responsibility, and strong corporate governance.

Environmental performance

COSCO's 2021 ESG report provides detailed information on the company's environmental performance, which can be analyzed across several key areas.

1. Energy Consumption: COSCO's indirect energy consumption, which is primarily electricity usage, increased from 6,409,646 kWh in 2020 to 6,647,174 kWh in 2021. However, when comparing energy intensity, COSCO showed improvement with a decrease in electricity consumption intensity per employee from 7,694.65 kWh/employee in 2020 to 7,847.90 kWh/employee in 2021. This indicates that while the overall electricity usage increased, the company's efficiency improved on a per-employee basis. Direct energy consumption, comprising diesel, petrol, and natural gas usage, witnessed mixed trends. Diesel consumption slightly decreased from 66,620 liters in 2020 to 66,545 liters in 2021. Petrol consumption increased from 26,060 liters in 2020 to 27,082 liters in 2021. Natural gas consumption, however, decreased significantly from 213,273 cubic meters in 2020 to 163,606 cubic meters in 2021.
2. Water Consumption: Total water consumption increased slightly from 41,463 metric tonnes in 2020 to 41,806 metric tonnes in 2021. Water consumption intensity remained stable at 1.14 metric tonnes/m2.

3. Waste Management: COSCO reported an increase in hazardous solid waste from 1,439 metric tonnes in 2020 to 1,464 metric tonnes in 2021. Non-hazardous solid waste also increased from 246.4 metric tonnes in 2020 to 261.4 metric tonnes in 2021.
4. Wastewater and Waste Gas Emissions: Wastewater generation decreased from 23,726 metric tonnes in 2020 to 21,520 metric tonnes in 2021. Regarding waste gas emissions, VOCs and Benzene emissions increased from 3.91 metric tonnes in 2020 to 3.98 metric tonnes in 2021. Toluene and xylene emissions decreased in 2021, while particulate matter emissions reduced significantly from 2.31 metric tonnes in 2020 to 0.14 metric tonnes in 2021.
5. Packaging Materials: COSCO reported an increase in coating package materials consumption from 5,442 metric tonnes in 2020 to 6,902 metric tonnes in 2021, which can be attributed to the increase in production volume at the Jinshan plant.

In summary, COSCO's environmental performance in 2021 reflects a mixed picture, with improvements in certain areas such as energy efficiency, wastewater generation, and waste gas emissions. However, there is still room for progress in reducing waste generation and managing resource consumption more effectively. To enhance its environmental performance, COSCO should consider implementing energy efficiency measures, exploring renewable energy sources, optimizing resource consumption, and reducing waste generation across its operations. By doing so, the company can minimize its environmental impact, contribute to global sustainability goals, and strengthen its position as a responsible corporate citizen.

Social Performance:

COSCO's social performance is also an important aspect of its ESG performance.

1. Employee Diversity and Inclusion: COSCO's social performance includes a focus on promoting diversity and inclusion within the workforce. The company provides employment opportunities to a diverse group of individuals, with a majority of employees coming from Mainland China, but also including those from Hong Kong and overseas. Additionally, the company has a relatively even split of male and female employees.
2. Employee Development and Training: COSCO has a strong focus on employee development and training. The company provided over 11,000 hours of training to employees in 2021, with the majority of employees receiving training in middle-level management and general employee categories. The company also has a strong focus on

gender equality in training, with a higher percentage of female employees receiving training compared to males.

3. Employee Turnover: The turnover rate of COSCO's employees decreased to 9% in 2021, compared to 12% in 2020. The turnover rate was higher for female employees, indicating that the company may need to further focus on retention strategies for female workers. Additionally, turnover rates were higher for employees aged 30 or younger, indicating the need for more effective training and career development programs for younger workers.
4. Supply Chain Management: COSCO has over 1,600 suppliers, primarily located in Mainland China, Hong Kong, and other countries. The company does not provide information on the sustainability of its supply chain or any actions taken to ensure that suppliers meet sustainability standards. It is recommended that the company further evaluate and report on the sustainability of its supply chain in the future.
5. Community Investment: COSCO's social performance includes a focus on community investment, particularly in the areas of education and disadvantaged assistance. The company has donated over HKD 263,000 to various charitable organizations and participated in volunteer activities to support the community. Additionally, the company provided educational support to underprivileged students in Hong Kong and Mainland China.

Overall, COSCO's social performance highlights a strong commitment to employee development and training, diversity and inclusion, and community investment. However, the company may need to further evaluate and report on the sustainability of its supply chain, particularly regarding the implementation of sustainability standards among suppliers. Additionally, the company may need to further focus on retention strategies for female and younger workers to reduce turnover rates.

Goverance Performance

COSCO's ESG report showcases a strong governance performance, which is an essential aspect of the company's overall sustainability. The report covers various aspects of governance, including management structure, business ethics, risk management, and stakeholder engagement.

1. Management Structure:

- Clear organizational hierarchy promoting transparency and accountability

- Board of directors overseeing the management team
- Establishment of various committees (e.g., audit, remuneration, and risk management)

2. Business Ethics:

- Code of Conduct outlining the commitment to ethical business practices and compliance with relevant laws and regulations
- Commitment to human rights, labor standards, and environmental protection

3. Risk Management:

- Established risk management framework for identifying, assessing, and mitigating potential risks
- Details on risk management processes and continuous improvement efforts provided in the ESG report

4. Stakeholder Engagement:

- Recognition of the importance of engaging with stakeholders (e.g., employees, customers, investors, and communities)
- Examples of stakeholder engagement activities, such as industry association participation and partnerships with local NGOs

In summary, COSCO's governance performance is strong, with a clear organizational structure, commitment to ethical business practices, effective risk management processes, and focus on stakeholder engagement. These practices help ensure that the company operates transparently and accountably, which is crucial for building trust and maintaining long-term sustainability.

### 4.3 Latsco Shipping

The report is structured in a coherent and systematic manner, utilizing clear headings and subheadings to guide readers through various sections pertaining to the company's sustainability performance. The report encompasses a variety of topics, such as health and safety, environmental impact, waste and water management, and social responsibility.

1. Introduction The report begins with an introduction that highlights the company's dedication to sustainability and its methodology for reporting on sustainability-related issues.
2. Health and Safety Following the introduction, a section on health and safety offers an overview of the company's safety performance, including its safety record and approach to managing safety risks.

3. Environmental Impact The subsequent section concentrates on the environmental impact, addressing subjects like energy efficiency, emissions management, and marine oil spill prevention.
4. Waste and Water Management The report proceeds to waste and water management, supplying information on the quantity of waste generated on-board and the measures the company is taking to minimize its environmental footprint.
5. Social Responsibility: Lastly, the report delves into the company's social responsibility initiatives, encompassing philanthropic activities, support for youth in shipping, and promotion of blood donation.

Mandatory sections in such reports typically require companies to disclose their environmental, social, and governance (ESG) performance, as well as financial performance. This report encompasses all these sections, emphasizing the company's initiatives and performance in areas like waste and water management, community engagement, and risk management.

Optinal Sections: Although not always obligatory, many companies opt to include information on their philanthropic activities and other non-financial metrics, as demonstrated in this report. Furthermore, the report contains a section on the company's adherence to ethical principles and compliance with applicable laws and regulations, which is growing increasingly significant for stakeholders.

Environmental Performance :

Latsco Shipping Limited's annual report showcases the company's strong commitment to environmental sustainability. The report provides detailed information on various metrics and initiatives related to their environmental performance.

1. Energy Efficiency:

- Implemented ISO 14001:2015 and ISO 50001:2018 standards
- Established an Energy and Environmental Policy and an Environmental Management System (EMS)
- Continuously improved the energy performance of vessels and minimized air pollution
- Monitored fleet's energy efficiency using IMO's Energy Efficiency Operational Indicator (EEOI), Energy Efficiency Design Index (EEDI), and Annual Efficiency Ratio (AER)
- Fleet average EEOI increased slightly from 13.88 in 2020 to 14.7 in 2021

2. Emissions Management:

- Monitored and reported $CO_2$, $SO_x$, $NO_x$, and particulate matter (PM) emissions
- Limited the increase in fuel consumption to maintain similar $CO_2$ emissions in 2021 compared to 2020
- $SO_x$ emissions increased by approximately 2% due to new LNG carriers and higher vessel speeds
- $NO_x$, PM2.5, and PM10 emissions increased by 12% compared to 2020 due to fleet size increase

3. Waste & Water Management:

- Monitored garbage generated onboard and implemented "Ship's Garbage Management Plan"
- Generated 531.45 $m^3$ of plastic garbage waste, 3,637 $m^3$ of bilge, and 3,673 $m^3$ of sludge in 2021
- Reduced single-use plastic bottle consumption by 52% in 2021 by installing Infinity reverse osmosis systems on 27 vessels

4. Biodiversity:

- Complied with the IMO BWM Convention through ballast water management program
- Installed BWTS on all newbuilding vessels since 2012
- Fitted 86% of the fleet with BWTS in 2021, with seven more scheduled for fitting by Q4 2023

In conclusion, Latsco Shipping Limited's sustainability report demonstrates their robust commitment to environmental sustainability through a series of initiatives aimed at reducing environmental impact. Although they've made significant strides in energy efficiency and waste management, certain metrics, such as the slight uptick in average EEOI and increased $SO_x$, $NO_x$, and PM emissions, indicate room for ongoing enhancements. The company will need to continue to focus on these areas in order to maintain its commitment to environmental sustainability.

Social Performance:

The Latsco Shipping Limited Sustainability Report showcases the company's strong social performance across various areas. Their commitment to community involvement, philanthropic activities, and social responsibility initiatives is evident.

1. Philanthropic Activities:

- Active contributions to non-profit and social welfare organizations, such as the John S. Latsis Public Benefit Foundation, the Neraida Floating Museum, and the Greek Shipowners' Social Welfare Company 'SYN-ENOSIS'
- Support for families in need, particularly those with children suffering from neoplastic diseases, through partnership with Floga
- Contributions to "ELEPAP" and "Save a Greek Stray" for animal welfare protection and promotion

2. Supporting Youth in Shipping:

- Organization of business days in collaboration with various universities to offer networking opportunities and industry insight to students and recent graduates
- Participation in the Yes Forum, a platform for open dialogue between companies and university students in the Greek shipping industry
- Provision of scholarships to the University of Aegean and a 6-month fully paid job placement for a top-performing graduate

3. Employee Engagement and Support:

- Encouragement of employee blood donation on a quarterly basis
- Support for employee participation in shipping and career forums to highlight career paths and responsibilities across different departments.

In summarizing their social performance, Latsco Shipping Limited exhibits a deep commitment to social responsibility. Their extensive philanthropic activities, initiatives to support youth in shipping, and focus on employee engagement highlight their dedication to improving the communities in which they operate. Moving forward, it will be important for the company to continue these efforts and seek new opportunities to foster social development.

Goverance Performance:

Latsco Shipping Limited places a strong emphasis on corporate governance, promoting a culture of equity, integrity, teamwork, transparency, and trust to drive long-term, sustainable value creation. The company's commitment to ethical principles and responsible business conduct is evident in various aspects.

1. Board of Directors and Strategy:

- The Board plays a significant role in driving sustainability and growth strategy
- Responsible for developing company policies
- Risk Management and Internal Control:

- Implementation of a dynamic risk management system
- Establishment of an internal control framework to effectively manage global business risks

2. Ethical Principles and Reporting:

- Promotion of honest and ethical business conduct
- Encouragement of employees and third parties to report concerns through whistleblowing hotlines
- Assurance of proper handling, confidentiality, and appropriate action for all complaints and reports

3. Code of Conduct and Ethics:

- Fosters a value-driven employee culture supporting the company's commitment to integrity

4. Policies Anchored to Values and Ethical Principles:

- Compliance with applicable laws, rules, and regulations
- Avoidance of conflicts of interest
- Gift policy and anti-bribery measures
- Protection and proper use of company resources and assets
- Protection of confidentiality and privacy
- Diversity and inclusion
- Open communication and information sharing
- Equal opportunity and impartiality
- Safe and healthy working environment

5. Work Environment:

- Focus on creating an inclusive, safe, and secure work environment
- Zero tolerance for discrimination, harassment, and inappropriate, hostile, or insulting behavior.

In regard to governance performance, Latsco Shipping Limited showcases a strong emphasis on ethical business conduct and responsible corporate governance. With their Board's active role in strategy, comprehensive risk management system, and commitment to ethical principles, the company is well-positioned to drive sustainable value creation. As they move forward, maintaining this focus on ethical and responsible business conduct will be critical to their long-term success.

## 4.4 Tsakos Shipping

The Tsakos ESG report is structured according to various sections, which can be broadly categorized as follows:

1. Introduction and Corporate Profile
2. Governance
3. Environment
4. Social Responsibility
5. SASB Index and GRI Index

Here's a brief analysis of the mandatory and non-mandatory issues included in the report:

Mandatory issues:

1. Governance: The report includes information about the company's corporate governance structure, management approach, and risk management. These are mandatory as they provide stakeholders with an understanding of how the company is managed and how it addresses potential risks.
2. Environment: The report covers the company's environmental impact, such as emissions, energy consumption, and waste management. These are mandatory because they help stakeholders understand the company's environmental footprint and efforts to minimize its impact on the environment.
3. Social Responsibility: The report discusses the company's approach to employee health and safety, human rights, and community engagement. These are mandatory because they demonstrate the company's commitment to ethical practices and its impact on society.

Non-mandatory issues:

1. Introduction and Corporate Profile: While it is helpful to provide an overview of the company and its operations, this section is not strictly mandatory for an ESG report. However, it helps give context to the rest of the report.
2. SASB Index and GRI Index: Including the SASB and GRI indexes is not mandatory, but it demonstrates the company's commitment to transparency and adherence to internationally recognized reporting standards.

In summary, the Tsakos ESG report covers both mandatory and non-mandatory issues, providing a comprehensive view of the company's sustainability and ESG performance. The mandatory issues, such as governance, environment, and social responsibility, are crucial for stakeholders to evaluate the company's commitment to sustainable practices. Including non-mandatory sections like the SASB and GRI indexes enhances the credibility and transparency of the report.

Environmental Performance

The Tsakos ESG report addresses the company's environmental performance across various aspects, including emissions, energy consumption, waste management, and environmental initiatives. Here is an analysis of the environmental performance based on the information provided in the report:

1. Emissions:
- The report mentions the company's efforts to reduce greenhouse gas (GHG) emissions by using energy-efficient technologies and complying with the IMO 2020 Sulphur Cap regulation.
- They have implemented a fleet modernization program that includes eco-friendly vessels with reduced emissions and fuel consumption.
- The company is transparent about its emissions data, including $CO_2$, $SO_x$, and $NO_x$ emissions.
2. Energy Consumption:
- Tsakos focuses on optimizing energy efficiency through various measures, such as hull and propeller maintenance, voyage optimization, and the use of energy-saving devices.
- The company monitors its energy consumption, with a particular focus on fuel consumption, as it is the primary source of energy for its operations.
3. Waste Management:
- The report highlights the company's commitment to minimizing waste generation and ensuring proper waste disposal.
- Tsakos has implemented a waste management plan that adheres to the MARPOL Convention and other relevant regulations.
- The company encourages waste segregation on its vessels and ensures the proper disposal of hazardous waste.
4. Environmental Initiatives:
- Tsakos has set up an Environmental Management System (EMS) aligned with the ISO 14001 standard to ensure continuous improvement in its environmental performance.

- The company actively participates in environmental initiatives, such as coastal cleanups, to raise awareness and contribute to environmental protection.
- Tsakos supports environmental organizations and works in collaboration with the Maria Tsakos Foundation to promote environmental consciousness.

Overall, the Tsakos ESG report demonstrates the company's commitment to minimizing its environmental impact and improving its environmental performance. The report provides data on emissions, energy consumption, and waste management, along with details about the environmental initiatives and measures undertaken to enhance sustainability. The company's transparency and adherence to international regulations and standards showcase its dedication to responsible environmental practices.

Social Performance

The Tsakos ESG report outlines the company's social performance, which focuses on various aspects, including employee well-being, diversity and inclusion, community engagement, and education initiatives. Here is an analysis of the social performance based on the information provided in the report:

1. Employee Well-being:

- Tsakos prioritizes the safety, health, and well-being of its employees both ashore and onboard its vessels.
- The company has implemented a Health and Safety Management System (HSMS) aligned with the ISO 45001 standard to ensure a safe working environment.
- Tsakos provides continuous training and development opportunities for its employees to improve their skills and competencies.

2. Diversity and Inclusion:

- The report highlights the company's commitment to promoting diversity and equal opportunities for all employees.
- Tsakos values a diverse workforce, which is evident in its inclusive recruitment and promotion practices.
- The company also supports gender equality and female empowerment, as demonstrated by its membership in the Women's International Shipping and Trading Association (WISTA).

3. Community Engagement:

- Tsakos actively engages with local communities and supports various social initiatives, such as volunteering and blood donation drives.
- The company has a strong focus on supporting fire-affected areas, particularly on the island of Chios, through donations of essential items.
- Tsakos also promotes environmental awareness by participating in coastal cleanup initiatives.

4. Education Initiatives:

- The Maria Tsakos Public Benefit Foundation, founded by the Tsakos family, plays a crucial role in promoting maritime education and tradition.
- The foundation supports various educational initiatives, such as "Maritime Career Days" and the "Adopt a Ship" program, which aim to inspire young Greeks to pursue careers in the maritime industry.
- Tsakos has established the Tsakos Enhanced Education - Nautical School (TEENS), the first-ever private non-profit nautical school in Greece, to provide high-quality maritime education.

Overall, the Tsakos ESG report demonstrates the company's commitment to fostering a positive social impact through its focus on employee well-being, diversity and inclusion, community engagement, and education initiatives. By investing in its people and communities, Tsakos is creating a sustainable future for the maritime industry and society at large.

Goverance Performance

The Tsakos ESG report highlights the company's commitment to strong corporate governance, which is essential for maintaining trust, transparency, and accountability. An analysis of Tsakos' governance performance reveals the following key aspects:

1. Board Structure:

- Tsakos has a diverse and experienced Board of Directors, which provides strategic guidance and oversees the company's operations.
- The Board comprises a mix of independent and non-independent directors, ensuring a balance of perspectives and effective decision-making.
- The Board committees, including the Audit Committee, the Compensation Committee, and the Nominating and Corporate Governance Committee, play crucial roles in overseeing various aspects of the company's governance.

2. Risk Management:

- Tsakos places significant importance on identifying, assessing, and managing risks related to its operations.
- The company has implemented a risk management framework, which includes regular risk assessments and the development of mitigation strategies.
- The Board of Directors, along with the management team, is actively involved in the risk management process, ensuring that risks are managed effectively and in line with the company's objectives.

3. Compliance and Ethics:

- Tsakos is committed to maintaining high ethical standards and complying with all applicable laws and regulations.
- The company has established a Code of Business Conduct and Ethics, which outlines the principles and guidelines that all employees, officers, and directors must follow.
- Tsakos also fosters a culture of compliance and ethics through training and communication programs, ensuring that all employees are aware of their responsibilities and obligations.

4. Transparency and Accountability:

- Tsakos is dedicated to maintaining transparency and accountability in its operations and communications.
- The company's ESG report is a testament to its commitment to disclose relevant information to stakeholders, including investors, employees, customers, and the wider community.
- Tsakos also engages with various stakeholders through channels such as annual general meetings and investor relations activities, ensuring open and constructive dialogue.

In summary, the Tsakos ESG report demonstrates the company's robust governance performance, characterized by a diverse and experienced Board of Directors, effective risk management, a strong commitment to compliance and ethics, and a focus on transparency and accountability. These aspects of Tsakos' governance performance contribute to the company's long-term sustainability and its ability to create value for all stakeholders.

## 4.5 Diana Shipping

The report of Diana Shipping s a sustainability report, which typically includes information about a company's environmental, social, and governance (ESG) performance. While there is no strict, universally accepted format for sustainability reporting, there are widely recognized standards and guidelines, such as the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB).

In ESG Report of Diana Shipping are included:

1. Environmental performance data (e.g., emissions, energy consumption, ecological impacts, spills, and releases)
2. Social performance data (e.g., employee health and safety, diversity, gender and age distribution)
3. Governance data (e.g., business ethics, corruption, facilitation payments, fines, and sanctions)
4. Operational performance data (e.g., number of personnel, distance traveled by assets, operating days, deadweight tonnage, number of assets in fleet, number of vessel port calls, etc.)

Mandatory elements:

1. Environmental performance data: Companies are expected to disclose their environmental impact, including emissions, energy consumption, waste management, and ecological impacts, to align with regulatory requirements and stakeholder expectations.
2. Social performance data: Disclosure of employee health and safety metrics, diversity, and human rights practices are crucial for demonstrating a company's commitment to its workforce and society.
3. Governance data: Information on business ethics, corruption, and legal compliance is essential for investors and other stakeholders to assess a company's governance practices and risk management.

Non-mandatory elements (although often expected or recommended):

1. Detailed breakdowns of gender and age distribution: While diversity information is important, specific breakdowns of gender and age distribution might not be strictly mandatory. However, they help provide a more comprehensive view of the company's diversity and inclusion efforts.
2. Operational performance data: Some operational metrics might not be strictly mandatory but can provide context for understanding the company's sustainability performance in relation to its operations.

In summary, while not all elements of the report may be strictly mandatory, they provide a comprehensive view of a company's sustainability performance, allowing stakeholders to make informed decisions about the organization. Including both mandatory and non-mandatory elements demonstrates a commitment to transparency and accountability in sustainability reporting.

Environment performance :

1. Air Quality and Emissions:

- NOx (excluding N2O) emissions: The company reported NOx emissions of 17,439 metric tons in 2021. Data for 2019 and 2020 was not available.
- SOx emissions: Diana Shipping reported SOx emissions of 2,145 metric tons in 2021. Data for 2019 and 2020 was not available.
- Particulate matter emissions: The company reported particulate matter emissions of 330 metric tons in 2021. Data for 2019 and 2020 was not available.

2. Ecological Impacts:

- Shipping duration in marine protected areas or areas of protected conservation status: Diana Shipping reported 2,980 travel days in such areas in 2021. Data for 2019 and 2020 was not available.
- Implemented ballast water management: The company reported a 73% exchange rate and a 63% treatment rate in 2021, compared to 90% and 55% in 2020, respectively. In 2019, the exchange rate was 100%, while the treatment rate was 29%.

3. Spills and Releases to the Environment:

- Number of spills: Diana Shipping reported one spill incident in 2021, compared to none in 2020 and two in 2019.
- Aggregate volume: The company reported an aggregate spill volume of 0.05 cubic meters (lubricating oil) in 2021, compared to zero in 2020 and 0.16 cubic meters in 2019.

4. Carbon Intensity:

- The report provided information on fuel consumption, distance traveled, and deadweight tonnage (DWT), which can be used to calculate the Average Efficiency Ratio (AER) as an estimate of the company's carbon intensity.

5. Energy Consumption:

- The report mentioned that energy consumption calculations are based on tonnes of oil equivalents (toe), using DEFRA conversion factors to calculate energy consumed in gigajoules (GJ). However, the actual energy consumption figures were not provided in the report.

In conclusion, Diana Shipping's environmental performance data for 2021 shows some improvements, such as a reduction in the number of spills and an increase in ballast water treatment rate. However, the report lacks historical data for some metrics, making it difficult to assess the company's progress over time. Additionally, the report does not provide information on the company's energy consumption, which is an important aspect of environmental performance. To gain a more comprehensive understanding of Diana Shipping's environmental performance, more data and historical context would be necessary.

Social Performance :

1. Employee Health & Safety:

- Lost Time Incident Rate (LTIR): The company reported an LTIR of 1.76 in 2021, a decrease from 3.06 in 2020 and 2.30 in 2019. This improvement indicates better safety performance and a reduction in workplace injuries.
- Lost Time Incident Frequency (LTIF): The LTIF decreased to 0.74 in 2021 from 1.21 in 2020 and 0.95 in 2019, reflecting a safer working environment for employees.

2. Accident & Safety Management:

- Marine Casualties: Diana Shipping reported three marine incidents in 2021, a decrease from four incidents in 2020 and nine in 2019. The reduction in incidents indicates an improvement in safety management.
- Conditions of Class or Recommendations: The company reported 26 conditions of class or recommendations in 2021, an increase from 13 in 2020 and 18 in 2019. This increase suggests that there may be room for improvement in maintaining compliance with safety and operational standards.
- Port State Control: The deficiency rate in 2021 was 0.73, an increase from 0.59 in 2020 but lower than 1.04 in 2019. The company reported zero detentions in 2021, an improvement from two detentions in both 2020 and 2019.

3. Diversity:

- Gender Diversity: The proportion of female employees remained low, with 1% of shipboard employees and around 30-35% of onshore employees being female in 2019-2021. In governance bodies, 10-11% of individuals were female during the same period.
- Age Diversity: There was a relatively even distribution of employees across different age groups, both onboard and onshore. In governance bodies, however, a majority of individuals (78-89%) were in the > 50 years old category, indicating limited age diversity in leadership positions.

In conclusion, Diana Shipping's social performance shows improvement in employee health and safety, a reduction in marine casualties, and a commitment to ethical business practices. However, the company could improve its performance in the areas of diversity, particularly gender diversity on board ships and age diversity in governance bodies, as well as in maintaining compliance with safety and operational standards.

1. Goverance Performance:

- Governance Structure:
- In the governance bodies, the gender diversity remained relatively low, with 89-90% of individuals being male and 10-11% being female from 2019 to 2021. This indicates that there is room for improvement in promoting gender diversity at the highest levels of the organization.
- Age diversity in governance bodies was also limited, as a majority of individuals (78-89%) were in the > 50 years old category from 2019 to 2021. This suggests a lack of representation from younger age groups in the organization's leadership.

2. Business Ethics:

- Corruption: The company reported a decrease in the number of port calls in countries with the 20 lowest rankings in Transparency International's Corruption Perception Index, from 70 in 2020 to 38 in 2021. The company reported no monetary losses resulting from legal proceedings associated with bribery or corruption.
- Facilitation Payments: Diana Shipping reported zero incidents of bribes being requested in 2021.
- Fines and Sanctions: The company reported no fines or non-monetary sanctions for non-compliance with laws and regulations in 2021.

3. Compliance and Transparency:

- Diana Shipping adheres to the Sustainability Accounting Standards Board (SASB) framework for reporting sustainability metrics, which demonstrates a commitment to transparency and adherence to established reporting guidelines.
- The company has provided comprehensive data on various governance, social, and environmental aspects, showcasing its commitment to transparency and allowing stakeholders to better understand and assess its sustainability performance.

In summary, Diana Shipping's governance performance displays a commitment to ethical business practices and transparency in reporting. However, there is room for improvement in the areas of diversity within governance bodies, particularly in terms of gender and age representation. By addressing these areas and continuing to uphold strong ethical standards, the company can further strengthen its governance performance.

## CONCLUTION

In conclusion, the thesis "The Integration of ESG Criteria and Their Role in the Investment Decisions of Shipping Companies" has explored the importance of incorporating Environmental, Social, and Governance (ESG) criteria into the investment strategies and decision-making processes of shipping companies. The study has investigated the concept and history of ESG, its regulatory trends, the significance of ESG scores and ratings, as well as the challenges and limitations of ESG reporting. It has also discussed the role of modern theories as precursors to ESG, including Shareholder Theory, Stakeholder Theory, Socially Responsible Investing (SRI), Triple Bottom Line (TBL), Corporate Social Responsibility (CSR), and Impact Investing.

The thesis has examined the shipping industry's general characteristics and importance, the benefits of integrating ESG factors into investment decisions, and the ESG investing-embedded framework and principles. It has also investigated the main ESG investment strategies, their worldwide adoption by the shipping industry, the ESG ecosystem in shipping, and the impact of ESG on shipping cycles.

Furthermore, the study has analyzed the situation in Greece and the future prospects for ESG in the Greek shipping industry. It has discussed the regulatory landscape, initiatives, challenges, and opportunities for Greek shipping companies, as well as the potential for attracting new investments and financing through improved ESG performance.

Lastly, the thesis has presented an analysis of the ESG reports of GasLog, COSCO, Latsco, Tsakos, and Diana Shipping, highlighting the ESG performance and trends of these companies.

The results of the thesis indicate that the integration of ESG criteria into the investment strategies and decision-making processes of shipping companies can lead to improved financial performance, reduced risk exposure, and increased access to capital through green bonds and sustainability loans. Furthermore, it can enhance the companies' reputation and contribute to long-term value creation. In addition, the study has shown that Greek shipping companies have the opportunity to capitalize on the growing importance of ESG factors in investment decisions by adopting best practices, improving their ESG performance, and attracting the interest of institutional investors.

In summary, the integration of ESG criteria into the investment decisions of shipping companies is crucial for promoting sustainable development, enhancing financial performance, and ensuring the long-term viability of the industry. The thesis has provided valuable insights into the role of ESG in the shipping industry, highlighting the need for continued efforts towards the integration of ESG factors in the investment strategies and decision-making processes of shipping companies worldwide.

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