

# **Internal and External Drivers in Voluntary and Coercive Adoption of Green Supply Chain Practices in the Maritime Industry**

**Candidate name:** Yoan Kardzhilov

**University of South-Eastern Norway**  
Faculty of Technology, Natural Sciences and Maritime Sciences

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## **Abstract**

### **Purpose**

The purpose of this study is to investigate the impact of external and internal factors in voluntary and coercive adoption of green supply chain (GSC) practices in the maritime industry.

### **Design/methodology/approach**

The research method of this study involves the formulation of a theoretical basis by use of maritime and green literature. The study is quantitative in nature, employing a survey to collect data from individual companies. The data collected from the respondents is then presented and analyzed, formulating a deductive approach.

### **Findings**

Due to the limited empirical evidence, the study pivots by only proposing support or rejection of the presented hypotheses by use of correlation. The propositions state that both top management proactivity and green culture have a positive association with voluntary adoption, as internal drivers. The external driver green trust is proposed to have a positive connection with voluntary adoption. Greenwashing is proposed to impact voluntary adoption negatively, while supplier opportunism shows no connection to any of the dependent constructs.

### **Originality/Value**

The study provides insights into factors which drive different types of adoption. Separating and using adoption strategies as dependent constructs is a new theme within maritime literature. The proposed findings can provide groundwork for future behavioral or interorganizational interaction studies.

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# 1. Introduction

## 1.1 Background

In today's world, environmental consciousness and pollution awareness have become cornerstones of every industry. Ever since industrialization began, humanity has gradually been increasing its CO<sub>2</sub> footprint, culminating with a massive rise since the late 1990s (Ritchie et al., 2020). Millions of yearly deaths globally are attributed to pollution, with the most notable effects being in air quality, drinkable water quality and food, among others (Fuller et al., 2022). As global pollution and population kept growing, newer generations began having environmental expectation out of functioning businesses. In line with stakeholder theory, stakeholders with a common ideal group together and influence organizations (Freeman, 1984). The exerted pressure is then facilitated, as businesses are dependent on their external stakeholder environment (Freeman, 1984). As a consequence of the extreme pollution, governments, international organizations and regulatory authorities gradually began increasing the strictness of pollution laws (Esty & Ivanova, 2004).

Seaborne business is no exception when it comes to the impact of environmental regulations, as shipping was responsible for roughly 2.89% of global carbon dioxide emissions in 2018 (*Greenhouse Gas Emissions*, n.d.). The maritime industry's significant contribution to environmental degradation and greenhouse gas emissions is vested in the domain's critical role in global trade (McKinnon et al., 2015). As the world becomes increasingly more aware of the negative impacts of shipping activities on the environment, there is growing pressure for the industry to adopt more sustainable practices.

In terms of regulatory increase, the International Maritime Organization (IMO) has continued to strengthen environmental regulations in the shipping industry, with a recent reduction in the sulfur oxide emissions limit from ships, which came into effect in January 2020 (*Review of Maritime Transport*, 2017). This entailed that the upper ceiling of Sulphur emissions (SO<sub>x</sub>) was to be reduced to a maximum of 0,5%, a significant decrease from the previous 3,5%. The regulatory agency's efforts to decrease global environmental footprints continued with a decarbonization timeline leading up to 2050. By 2030, the IMO hopes to see a reduction of 40% in greenhouse gas (GHG) emissions in the shipping domain, scaling up to 70% by 2050 (*IMO's Work to Cut GHG Emissions from Ships*, n.d.).

The SO<sub>x</sub> reduction was expected to have a significant impact on air quality and public health, as Sulphur oxide emissions have been linked to respiratory problems (*Cleaner Air in 2020: 0.5% Sulphur Cap for Ships Enters into Force Worldwide*, n.d.). However, while managing to reduce the Sulphur emissions, the 2020 SO<sub>x</sub> cap did not perform well for decarbonization. Research found that using a scrubber with heavy fuel oil (HFO), or marine gas oil (MGO) to reduce Sulphur emissions ended up having a 2% and 3% increase in carbon dioxide (CO<sub>2</sub>) respectively for each method (Zisi et al., 2021). Despite having an overall positive environmental impact, the Sulphur cap separated shipowners between the two methods due to their varying costs. Larger ships were found to have a better cost-benefit by using a scrubber with HFO, while smaller vessels were forced to switch to MGO (Zisi et al., 2021). Any business looking to generate profit, if presented with a choice in the face of existing regulations, will evaluate financial benefit as long as legal compliance is ensured. To that end, adoption of green supply chain (GSC) practices has been identified as one of the key ways for the maritime field to reduce its environmental impact and meet the demands of customers and stakeholders who are concerned about sustainability (Jasmi & Fernando, 2018).

In recent years, the incorporation of green supply chain practices in the maritime field has been on the rise, as companies become subject to environmental regulations, supply chain pressures, or adopt proactive approaches to sustainability. Observations show that the industry is on track to following the 2030 goals for 5% scalable zero-emission fuels (SZEF) set by the IMO (Baresic & Palmer, n.d.). Actors throughout extended maritime supply chains appear to be committed to the regulatory goals as financing bodies, technology developers, suppliers, investors, policy makers and civil society all display significant progress (Baresic & Palmer, n.d.). However, these statistics highlight only the environmental policies as driving forces of GSC adoption and provide no insight into intra-company stimuli.

## 1.2 Reasoning and Aim

Regulatory pressure conveys only a two-dimensional explanation as to why companies adopt GSC activities. This is largely due to the lack of choice businesses have with respect to adoption in the face of existing regulations. The implementation of green supply chain practices can then predominantly be either voluntary or coerced, and the choice between these two approaches can differ throughout maritime supply chain actors. This study will look into

the organizational elements of top management initiative and green culture as internal drivers of adoption. Externally, the focus will be placed on interorganizational interactions, namely supplier opportunism, greenwashing and trust. By addressing both internal and external factors in adoption, one can observe first-hand reasonings, organizational cultures, potential altruism, and supply chain partner interactions. Knowing the answers to questions such as “How and why do maritime firms adopt green practices?” can provide future groundwork for varying disciplines. Maritime companies and organizational theorists can narrow down on the types of firm cultures which promote voluntary green adoption. Policy makers can excel at promoting and incentivizing compliance to regulatory change, or proactive sustainable behavior.

To that end, the study will investigate the internal and external factors which fuel voluntary and coercive adoption. As such, a large part of the paper will focus on the interaction of these elements with implementation of GSC practices. With that in mind, the following research questions are formed:

1. Do the external factors: greenwashing, supplier opportunism and green trust affect the method of GSC adoption?
2. Do the internal factors: top management proactivity and green culture affect the method of GSC adoption?

### 1.3 Novelty

To the knowledge of the author, existing literature addresses drivers for adoption in the maritime industry as a whole, without providing any differentiation between the methods of adoption as a dependent criterion. As such, research does not exist which has quantitatively shown individual maritime supply chain firms’ method of GSC implementation. This paper will seek to fill that gap by showing first-hand adoption data provided by international maritime firms.

To achieve this purpose, the thesis will rely on a comprehensive literature review, as well as the gathered data from companies in the maritime industry that have adopted green supply chain practices. The literature review will be based on a wide range of scholarly articles pertaining to green adoption, adoption-specific drivers and maritime literary

contributions. The gathered data will involve participation from varying maritime actors, and serve to support or reject the built hypotheses.

## **2. Research Model and Hypotheses**

This chapter will aim to define green supply chains (GSC) and identify their increased implementation in the maritime industry based on existing literature. Thereon, the types of adoption in the form of environmental company strategies will be presented and discussed with the help of scholarly articles. Upon establishing the groundwork for the study, the later sections will present and establish the literature and maritime standing of the independent constructs. Each subsection will then conclude with a hypothesis aimed at the adoption constructs. The study will base its presentation and merits around the stakeholder theory.

The stakeholder theory is based around the identification of relevant company stakeholders and their interests, and doing one's utmost to satisfy them (Freeman, 1984). The proposition was made as a method of expanding organizational awareness to more than its direct shareholders, as other figures were also found to be influential over company actions and decisions. Additionally, Freeman (1984) introduces the notion of ethics and corporate social responsibility (CSR) as an argument that firms should act morally and beyond financial gain. All of these factors culminate in generating additional value for every stakeholder involved, while creating a long-lasting competitive advantage for the company.

Freeman's definition of the stakeholder and the specific actions they would take were rather vague. He characterized important stakeholders as being internal and external, while others have argued them to be groups with resources and influence (Pajunen, 2006), or simply too difficult to define due to heterogeneity (Wolfe & Putler, 2002). Regardless, stakeholder influence over companies has been linked to a possession of greater resources and a publicly recognized request (Easley & Lenox, 2006), as well as a formation of groups (Neville & Menguc, 2006). In terms of green performance and action, stakeholders will mobilize when they need to safeguard their identity as a group, such as Non-Governmental Organizations (NGOs) (Rowley & Moldoveanu, 2003), which target companies that negatively impact the environment (Hendry, 2006).

As an organization, avoiding stakeholder mobilization is grounded in winning their support. The way for firms to garner stakeholder support has been seen throughout literature



as a path of trust-building and opportunism reduction (Calton & Lad, 1995; Heugens et al., 2002). Within a green context, opportunism is noted when companies commit poorly or too intently toward a sustainable goal, often accompanied by greenwashing (Parguel et al., 2011). Consumers may then become skeptical, increasing green confusion and the perceived risk from the offerings of the company, while simultaneously diminishing trust (Y.-S. Chen & Chang, 2013). Given the background literature, the way for companies to establish stakeholder trust would be vested in their ability to be transparent about their environmental initiatives. Moreover, they would need to display the level of sustainable commitment which is required by their respective stakeholders.

## 2.1 Green Supply Chain Management

As a discipline, green supply chain management seeks to incorporate sustainable practices within existing supply chains (Srivastava, 2007). The integration of green practices must then affect the areas of purchasing, manufacturing, marketing, logistics, and information systems (Green et al., 2012). GSC's origins are rooted in customer demands for a reduction in environmentally harmful practices, such as emissions, solid and liquid waste, and toxic materials (Green et al., 2012; Sarkis et al., 2011; Srivastava, 2007). By utilizing GSC practices, companies can find themselves generating additional value for their products & services under the Resource-Based View while also appealing to environmentally-conscious audiences (Sarkis et al., 2011; Srivastava, 2007). As such, adopting green practices can strengthen a business' value propositions, generate a competitive advantage over its rivals, all the while addressing the triple bottom line and amassing more consumers.

Existing literature into maritime green supply chain management (MGSCM) adoption shows that a pivotal driver in implementation of GSC is top management, as they are the steering mechanism for an organization (Jasmi & Fernando, 2018). As such, even a resource-rich organization would not adopt if management support was missing. Thereon, the extent of maritime green performance has been linked to be dependent to the extent of internal green practices and level of cross-company collaboration (Yang et al., 2013). In the Taiwanese container segment it was noted that green performance was directly linked to firm competitiveness, while internal green practices held an indirect effect to competitiveness, highlighting the importance of GSC in a maritime context (Yang et al., 2013).

Coercive pressures are shown to impact internal green practices positively but not external green collaborations in the maritime container segment (Yang, 2018). On the practical side, the necessity for a transition to a stronger green collaboration between maritime partners and suppliers is underlined, in order to boost overall green performance (Yang, 2018; Yang et al., 2013). It is furthermore evidenced that MGSCM boosts company-wide green awareness as well as provide a guideline for regulatory compliance and strategy creation (Jasmi & Fernando, 2018).

Many metrics exist to address ambiguity and narrow organizational focus to areas needing improvement, with one of them being the International Organization for Standardization (ISO) (Gunasekaran et al., 2004; Hervani et al., 2005). ISO standards, being widely recognized by professionals across various industries, are moreover shown to incentivize further green proactivity and consciousness (Arimura et al., 2011). However, for GSC practices to take place, organizations must adopt them into their internal processes, business practices and company strategy. This is where the topic of adoption becomes more prominent.

There are two approaches that share universal names across literature, namely the proactive and reactive methods of implementation (Bentahar et al., 2023; Dey & Cheffi, 2013; Srivastava, 2007). The former reflects a company who understands sustainability as a social and managerial issue and seeks to lead and pioneer in its application. The latter depicts business entities only willing to comply with the bare minimum asked by the regulatory authorities, in order to stay afloat (Handfield et al., 1997). There is a third method, which involves the incorporation of GSC practices as a value-generating tool within the company's business strategy. It is aptly named as "value-seeking" by some and "receptive" by others (Bentahar et al., 2023; Srivastava, 2007). Despite their different natures, both the proactive and receptive adoption methods focus on leveraging sustainability to generate a competitive advantage (Bentahar et al., 2023; Handfield et al., 1997). To that end, this paper will only differentiate between proactive (voluntary) and reactive (coercive) adoption as a means of identifying the ambitions behind GSC application in maritime supply chain firms.

### 2.1.1 Voluntary Adoption of Green Supply Chain Practices

Voluntary adoption (VA), also known as a proactive approach or strategy in literature, is defined as initiating an organizational attempt to capitalize on green practices by aligning

company values and processes with sustainability (Bentahar et al., 2023; Mitra & Datta, 2014). Other definitions stress the consistency of the firm's environmental practices, which are not prompted by obligatory regulations (Sharma & Vredenburg, 1998). A Spanish study proposed four types of environmental company profiles, two of which deal with a proactive approach. The first type, named "Attention to Stakeholders Strategy", describes firms who not only comply with the asks of regulatory authorities, but also go the extra mile to satisfy stakeholder requirements (Murillo-Luna et al., 2008). The second profile – "Total Environmental Quality Strategy", represents companies who make the environment one of their core objectives (Murillo-Luna et al., 2008).

Displaying proactivity in a firm's environmental strategy and awareness has been linked to an increase in company resources and managerial capabilities, given that the initiative is significant (Clarkson et al., 2011). Compared to proactive organizations, reactive ones tend to experience the opposite effects, with declines in their Return on Assets (ROA) and cash flows (Clarkson et al., 2011). In the maritime industry, green information and communication systems (GICS), green value added logistic service (GVALS) and ship design and compliance (SDC) were shown to have a positive effect on environmental performance, with the first two providing economic benefit as well (Fernando et al., 2019). Shipping companies are shown to be more likely proactive and therefore exhibit better financial performance (Alexandrou et al., 2022). Despite the shown benefits with proactivity, it is noted that not all companies can take such initiative, as it is heavily dependent on their managerial capabilities and resources (Clarkson et al., 2011).

While not within the scope of this study, barriers exist, which can hinder voluntary adoption. The stage of economic development of a country plays a crucial role in the ability and awareness of organizations to adopt green supply chain practices (Hanna et al., 2021). Developing nations, as such, often prioritize profit over environment, making it less likely for them to adopt green practices voluntarily (Ben Brik et al., 2013; Hanna et al., 2021). Other barriers to a proactive environmental strategy include internal ones, such as: resource insufficiency, unfavorable company culture, lack of staffing, lack of understanding and implementation (Chan, 2008; Hillary, 2004). On the external side, the barriers include: institutional weakness, lack of support and guidance, cost of certification, insufficient drivers and benefits (Chan, 2008; Hillary, 2004).

This study will treat VA as a proactive effort showing either self-driven initiative, or a response to a speculation regarding strengthening of regulations or expected market demand.

To that end, it employs the same assumption as Sharma & Vredenburg's (1998) definition of proactivity.

### 2.1.2 Coercive Adoption of Green Supply Chain Practices

Coercive adoption (CA), known as a reactive approach or strategy in literature, is defined as a company's response to environmental performance regulations (Bentahar et al., 2023; Mitra & Datta, 2014). The reactive styles, based on the previous Spanish study are: "Passive strategy" and "Attention to legislation-strategy". The former describes organizations with no environmental perspective, while the latter – companies which only conform to regulations (Murillo-Luna et al., 2008).

While predominantly focusing on external elements such as *supply chain pressure* and *regulations*, internal elements like cost and top management can also be prone to facilitating a forced implementation (Ben Brik et al., 2013; Bentahar et al., 2023; Jasmi & Fernando, 2018; Mitra & Datta, 2014). The VA barriers discussed previously serve as catalysts for coercive adoption to take place. If organizations are reactive, but have integrated satisfactory green practices with respect to regulations, the inherent limitations barring a more proactive approach might be based in investment or technological costs (Murillo-Luna et al., 2011). On the other hand, if organizations are completely passive, the overarching reason might pertain to company culture (Bentahar et al., 2023; Chan, 2008).

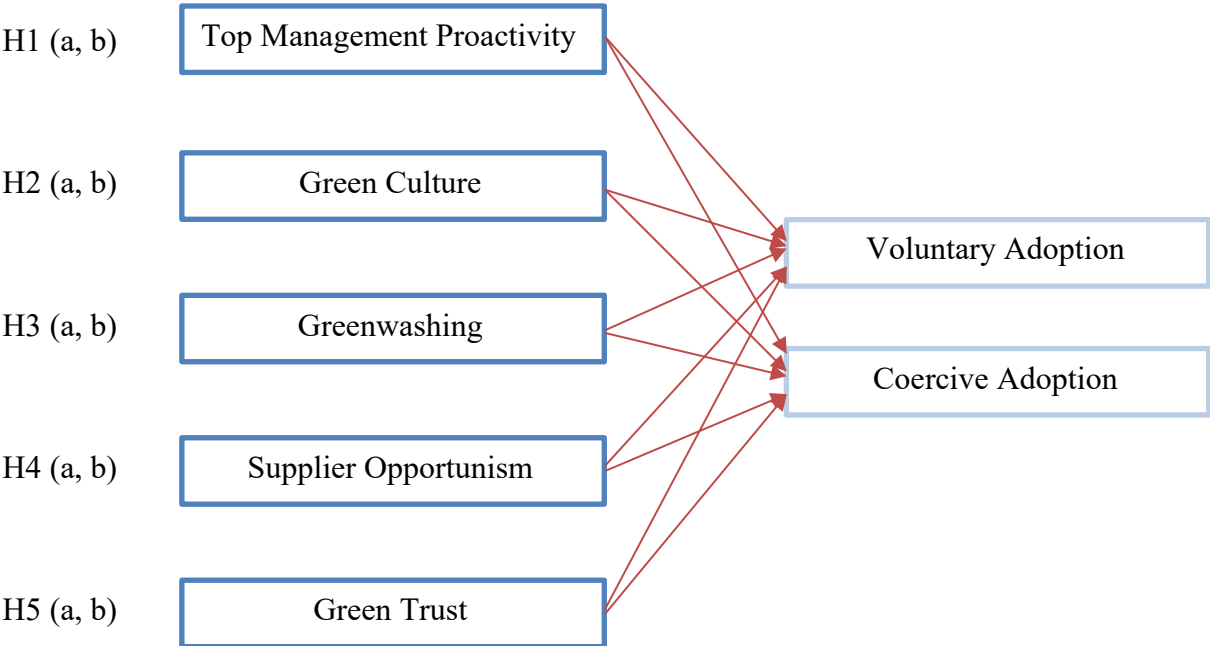
A significant difference found between firms adopting coercively versus voluntarily is the absence of green supply chain awareness within the employees (Bentahar et al., 2023). If green practices are not initially part of company strategy, a green culture is consequently not present in the working environment and workers receive no green training (Amrutha & Geetha, 2021; Bentahar et al., 2023). This is further exemplified by reactive company management believing that environmental responsiveness would hinder the organization's ability to satisfy shareholders (Sharma & Vredenburg, 1998).

Due to the global nature of the maritime industry, and it being subject to strict international regulations, most shipowners adopt a proactive approach (Alexandrou et al., 2022). Nevertheless, reactive shipping companies exist and display significantly lower financial earnings and GSC collaboration, making them vastly underperform compared to their proactive competitors (Alexandrou et al., 2022).

As such, this study will utilize the established literature definition of reactive adoption in the form of CA. The term will refer to company actions pertaining to environmental performance as a result of regulatory pressure.

Having established the dependent constructs, **Figure 1** presents the model and the directional relationships between the variables in the study. Each independent construct will have 2 respective hypotheses pertaining to each of the dependent ones. Lastly, **Table 1** presents a brief description of all the variables.

**Figure 1.** Proposed Model.



**Table 1.** Summarized Definition of Constructs.

Voluntary Adoption (VA)  Sharma & Vredenburg (1998)	When organizations proactively adopt and integrate GSC practices in their strategy, without the presence of regulatory supervision or repercussions.
Coercive Adoption (CA)  Bentahar et al. (2023), Mitra & Datta (2014)	A method of organizational adoption of GSC practices that implies integration as a result of regulations.
Top Management Proactivity (TMP)  Mintzberg (1973), Li et al. (2019)	The innate willingness for top management to display proactivity towards a VA method of GSC practice implementation. Their position of power within a company constitutes the possibility of adoption choice.
Green Culture (GC)  Wang (2019)	A chain of environmentally-centered values, beliefs and practices, that are present throughout the entirety of the organization.
Greenwashing (GW)  De Freitas Netto (2020)	The act of promoting one's environmental practices to a larger extent than what they actually are in reality.
Supplier Opportunism (SO)  Williamson (1985)	Sharing information with the intention of deceiving, fooling or confusing another company.
Green Trust (GT)  Cheng et al. (2008), Fawcett et al. (2012)	An accumulation of trust between supply chain partners, allowing for sharing of information and collaboration to take place.

## 2.2 Hypothesis Development

### 2.2.1 Top Management Proactivity

The role of top managers is often one associated with facilitating organizational change (Griffin et al., 2003), as well as creating an environment capable of adopting innovation and technology (Mintzberg, 1973). As stakeholders themselves, managers hold a direct and substantial influence on a firm's decision-making and internal processes. This is largely due to the standing management has within an organization. It is therefore paramount that they are capable of assessing stakeholder impact and steering their company in a direction, which satisfies those individuals or groups.

Organizational leaders' involvement in green initiatives and practices not only reflects the company's values and strategy, but also has a direct impact on employee behavior and environmental awareness (Amrutha & Geetha, 2021; Jasmi & Fernando, 2018; Li et al., 2019). As their actions and rationale constitute their firm's image, and thereby shape public perception, it is logical to believe that managers would implement green initiatives in order to strengthen their company's reputation (Fombrun et al., 2000).

Given their influential role, top managers have the possibility to promote and incentivize employee engagement in sustainable practices and to foster a sustainability-oriented organizational culture (Jasmi & Fernando, 2018). For instance, leaders can use their position to communicate the importance of environmental responsibility to workers and to encourage their participation in GSC initiatives (Li et al., 2019). Furthermore, top management's support and commitment to green practices can provide a clear signal to stakeholders, including employees, customers, and suppliers, of the company's commitment to sustainability (Li et al., 2019).

The implementation of GSC initiatives, however, requires resources, both in terms of time and finances, and requires a strategic approach. If top management perceives the potential benefits of sustainable practices, such as improved environmental performance and enhanced reputation, they may be more likely to allocate resources and incorporate GSC practices into their company strategy and operational processes (Li et al., 2019). On the other hand, a lack of awareness of perceived value of GSC may result in a more reactive approach

to adoption, where the company may only adopt green practices due to external pressures, such as government regulations or customer demands.

In literature, environmental leadership is shown to play a role in both proactive and reactive green innovations, meaning innovations whose origins come about from a proactive or reactive strategy (Y. Chen et al., 2012). The findings of the study showcase the responsibility of management in picking a path of GSC adoption. Additional remarks reflect that extrinsic pressures, such as regulations, only facilitate reactive green innovations and do little to help proactivity (Y. Chen et al., 2012). Therefore, given the perceived performance benefits of VA in the maritime industry, as well as top management proactivity (TMP) towards adoption of GSC practices, the following hypotheses are proposed:

**H1a.** Top management proactivity has a positive association with voluntary adoption of GSC practices.

**H1b.** Top management proactivity has a negative association with coercive adoption of GSC practices.

### 2.2.2 Green Culture

Possessing a green culture (GC) describes the ownership of an overarching system of environment-focused beliefs, values and practices that exist on all organizational levels (C.-H. Wang, 2019). In order to cultivate this ethic, top managers must do their utmost to ensure green values are conveyed on behalf of the company, while employees must deploy them on operational levels (Li et al., 2019). As such, the presence of a green culture is expected to be the catalyst of any proactive firm's drive toward incorporating GSC practices.

The importance of having a green culture lies in its ability to translate into green practices (environmental performance), while also encouraging a green workplace behavior (Amrutha & Geetha, 2021). Moreover, satisfaction with sustainable initiatives reinforces employees' workplace green behavior, creating a self-strengthening mechanism. In the upper echelons of firms, top managers can become more conscious of their resource and energy use, as well as waste production, thereby creating uniform awareness throughout the organization (C.-H. Wang, 2019). From a commercial standpoint, an organizational green culture serves as



a means of differentiation. As conducting company operations in a green fashion is ultimately more costly, competitive advantage is formed through the satisfaction of eco-centered stakeholders and the cultivation of the shared value between the parties (Li et al., 2019; C.-H. Wang, 2019).

Studies show that green culture is an equally important criterion for adopting a proactive method of green implementation as top management (Y. Chen et al., 2012; Li et al., 2019). To that end, management and employees must work in unison toward a common, well-established goal. If leadership is proactive in integrating green practices into the company strategy, a feasible method of establishing a green vision would be integrating employees into green strategy development or decision-making (Li et al., 2019). This will diminish resistance, provide workers with motivation, as well as a sense of ownership toward the change and company direction (Perron et al., 2006).

With respect to adoption, this paper assumes green culture to be a prerequisite to any proactive approach, while absent in reactive companies. Being an industry leader within green methods should be observable in the company workspace, and therefore translate into the firm's endeavors and environmental performance. To that end, the following hypotheses are proposed:

**H2a.** Green culture has a positive association with voluntary adoption of GSC practices.

**H2b.** Green culture has a negative association with coercive adoption of GSC practices.

### 2.2.3 Greenwashing

The topic of greenwashing (GW) is shown through literature as a two-pronged method of stakeholder deception on behalf of companies. In light of a firm's bad environmental performance, it chooses to contain and safeguard its lackluster eco-friendly practices, while promoting itself as the polar opposite to the public (De Freitas Netto et al., 2020). Literature shows that by exhibiting greenwashing behavior, companies increase green consumer confusion and green perceived risk, all the while lowering green trust (Y.-S. Chen & Chang, 2013). As such, consumers are prone to either having the inability to accurately gauge a

product/service's environmental impact, or they associate the offering's purchase with an environmental negative (Y.-S. Chen & Chang, 2013).

The deceptive strategy's inception is largely due to external pressures companies receive from regulations, competitors and non-market players (Lyon & Montgomery, 2015). Therefore, some companies opt to slightly alter the facts of their green behavior, thereby creating partial behavioral-claim greenwashing, such as Royal Caribbean in 2003 (De Jong et al., 2020). The cruise liner marketed their environmentally progressive behavior with respect to wastewater treatment systems, which they had only installed in 3 out of their 26 vessels at the time (De Jong et al., 2020). Regardless, the study found that half-lying companies generated the same reputational damage as fully-lying companies, consistent with other studies' results of diminishing dependability on greenwashing company offerings (Y.-S. Chen & Chang, 2013; De Jong et al., 2020).

Given the literature discussed so far, greenwashing facilitates a shortcut for companies to temporarily present themselves as more stakeholder-desirable entities, whilst circumventing regulatory pressures and mitigating the additional costs that would have been incurred had they become greener. The façade finally disappears when stakeholders get ahold of the true performance indicators. Literature stresses cases where whistleblowing within individual companies portrays a sign of employee awareness and disagreement with company practices (Lyon & Montgomery, 2015). As such, this study seeks to ask individual maritime players on their perception on potential greenwashing present within their business partners.

Therefore, this study believes that if a company is surrounded by greenwashing partners, which take the aforementioned shortcut, then the company in question would be more inclined to not adopt GSC practices proactively (voluntarily). The preferred route would then be reactive (coercive) adoption, where only the basic necessities are conformed to. As deceiving stakeholders via greenwashing would ultimately result in a reduction of trust (Y.-S. Chen & Chang, 2013), managers should strive for legitimate proclamations and offerings, in order gather support. Leaders who do not, are then believed to have not integrated an environmental awareness to their strategy. Given the discussed literature, two hypotheses are brought forward:

**H3a.** Greenwashing behavior has a negative association with voluntary adoption of GSC practices.

**H3b.** Greenwashing behavior has a positive association with coercive adoption of GSC practices.

#### 2.2.4 Supplier Opportunism

Opportunism (SO) is defined as the act of sharing incomplete or twisted information in a strategic manner, in order to perplex or fool others, while serving one's self-interest (Williamson, 1985). Opportunism may occur when the parties' goals aren't fully aligned and a chance is presented (Stump & Heide, 1996). Issues can arise as opportunism increases, due to the extensive costs needed to monitor and control the validity of information flow stemming from interfirm communications (Wathne & Heide, 2000). Another problem presents itself in the form of diminished trust, as companies would then dismiss potential deals with each other post-exploitation (Calfée & Rubin, 1993). To that end, it was shown that increasing the quantity of information shared would not diminish opportunism, however, increasing the quality would (Z. Wang et al., 2014).

Opportunistic behavior is found to be present in green supply chains as well. A study from Taiwan showed that while a stronger interorganizational connection leads to an improved interaction between partners, opportunistic traits and dysfunctional partnerships can bring about negative consequences such as a lower strategy quality (J.-H. Cheng & Sheu, 2012). Additional findings from the study underline the popularity of self-beneficial relationships, as well as opportunistic behavior arising out of new, green business possibilities, which create organizational competition (J.-H. Cheng & Sheu, 2012).

Building on the notion of opportunistic behavior in a green business environment, Walley & Taylor (2002) propose a framework used to characterize green entrepreneurs. When entrepreneurs, affected by hard structural influences, such as regulations, are more profit-oriented rather than environmentally oriented, they are innovative opportunists. As such, their goal lies in exploiting niche green opportunities for profit (Walley & Taylor, 2002). This is consistent with the findings by Cheng & Sheu (2012), which were mentioned previously.

Given these preconditions, this study assumes that maritime actors can exhibit opportunistic behavior, especially so with respect to new opportunities laid about by the IMO future emission guidelines. As the race toward greener logistics continues, shipowners will inherently attempt to secure the best alternative fuel deals for themselves. Vessel design

requirements will change to accommodate the new needs, and the changes will be felt throughout the supply chains. As such, the paper proposes that opportunistic companies will deter others from having a proactive approach to adoption, due to the high investment costs in new opportunities. Therefore, they would adopt via a reactive method following strict regulations. Given the aforementioned, the following hypotheses are proposed:

**H4a.** Opportunism has a negative association with voluntary adoption of GSC practices.

**H4b.** Opportunism has a positive association with coercive adoption of GSC practices.

### 2.2.5 Green Trust

Green trust (GT) is defined as the act of placing one's trust in the environmental performance of the product or service in question, based on its credibility (Y.-S. Chen, 2010). However, this study uses GT to refer to organizational and interorganizational green supply chains trust based on information sharing, collaboration and honesty (J. Cheng et al., 2008; Fawcett et al., 2012). Trust is paramount as competition may emerge in green supply chains when new business opportunities arise, which need to be captured or when the parties want to protect their own knowledge (J. Cheng et al., 2008). This is consistent with the opportunistic findings mentioned earlier. Cheng et al. (2008) also find that trust has a positive effect on interorganizational knowledge sharing.

When trust is present, managerial ties significantly increase information sharing, however, the quality of the information is the determinant which reduces opportunism (Z. Wang et al., 2014). In practice, Honda have secured an increase in their supply chain trust by sharing engineering talent with its suppliers, which resulted in higher work quality through collaboration (Fawcett et al., 2012). These two studies are consistent with each other if one treats Honda's talent exchange as information sharing. On the other hand, a lack of interorganizational knowledge sharing creates a disadvantage for the supply chain as a whole in terms of its competitiveness, due to the diminishment of interorganizational capabilities (J. Cheng et al., 2008).

Keeping in mind the perceived benefits of knowledge sharing, the existence of trust, as well as the already established benefits of VA in maritime, companies can advise one another to be proactive adopters of GSC practices. If organizations display honesty and trust as collaborating partners, discussion on green initiatives which can enhance financial and environmental performance should then lead to an increase in VA. Conversely, when trust is absent between collaborators, companies can become uncertain whether their partner is actually an ally or a competitor (Powell et al., 1996), hinting at a bigger likelihood for CA. As such, the following hypotheses are proposed:

**H5a.** Green trust has a positive association with voluntary adoption of GSC practices.

**H5b.** Green trust has a negative association with coercive adoption of GSC practices.

### **3. Methodology**

The following chapter will delve into the preparation process of the instrument of data collection, the instrument itself, as well as the digital tools used to analyze the collected data. Focal topics will revolve around the constructs and their respective items, the demographics of the respondents, and the contents of the instrument of choice.

#### **3.1 Development of Survey**

Early development of the survey started by selecting relevant variables grounded in green adoption literature. The process delved into core intra-company factors such as management's role, supply chain pressures and regulations. The questionnaire gradually expanded to include inter-company elements from diverse studies, which would highlight not only firms' green commitments in action, but also the honesty and trust organizations exhibit. The choices of constructs as per **Table 2**, aimed to include variables from multiple studies so as to assess both the reasoning behind GSC adoption, as well as the practical extent of implementation. The questions have been hand-picked from relevant academic literature and augmented to fit GSC criteria. The questionnaire was then revised by scholars in the maritime

field, where the relevance of variables was confirmed, additional constructs were added and the wording of lengthy items was reduced as much as possible to avoid misunderstandings or ambiguity.

The survey was administered independently online by the use of e-mail. Respondents were contacted individually, using a pre-written introductory text explaining the premise and need for the study. Only one response was required from each company. A total of four reminder e-mails were sent as follow-ups to ensure involvement and a higher response rate. Prior to the final reminder, a revision was made to the first part of the survey. The changes included: no longer having an optional company name section, limiting revenues, employees and company age with predetermined intervals instead of being open-ended questions. Country of operation was added as an open-ended response and companies were no longer asked what they perceived to be the most important area for GSC implementation. After the changes were made and the final reminder was sent, only 3 additional responses were received.

Recipients to the survey were 550 maritime supply chain companies which are international in nature. The companies are of: Norwegian, Indian, Bangladeshi, Danish, Swedish, Greek, Italian, Japanese, Korean and American origin. An initial sample. Approximately 150 of these respondents were obtained from a list of members of the Norwegian *Rederiforbund* (Shipowners' Association). The list contains only ship-owning companies. The rest of the companies were found on public webpages using the Google search engine with keywords preceded by the names of randomly selected countries. The keywords consisted of the field of operation, as visualized in **Table 3**, followed up by *companies* (i.e.: Danish shipping companies). Companies were then selected from the resulting webpages on a random basis and their present-day existence and business were verified. As this study seeks to examine the difference in adoption throughout supply chain actors, extended players such as brokers, financing institutions and consultants were also included in the company pool. In total, 12 responses were received, making the response rate 2,1%. Upon concluding the data collection process, only the constructs shown in **Table 2** were chosen for use in the study.

## 3.2 Survey

The method of data collection for this thesis was chosen to be a two-part survey. The initial section deals with open-ended company details, specifying respondent demographics. Among them are: segment of operation, number of employees, company lifetime, and revenues for the previous year. Furthermore, possession of ISO certifications: 9001 (Quality Management Systems), 14001 (Environmental Management Systems), 45001 (Occupational Health and Safety Management System), and 26000 (Corporate Social Responsibility) were inquired into. Initially, the segment question was open-ended but was later amended to multiple choice. in order to encourage more responses and decrease vagueness. The latter part of the questionnaire contains questions grounded in a 5-point Likert scale format, based on the analyzed green adoption literature. The survey was based on the need for company-specific personal perceptions of adoption, use, reasoning and interactions grounded in GSC in the maritime industry. As the survey explores elements surrounding environmental company strategy, performance and perception, the responses needed to be from firm representatives familiar with the concepts. The organizational standing of the responding individual, as well as the country of origin for the companies were, however, omitted as questions from the first draft of the survey, but were added later on. Therefore, certain demographics are missing from a portion of the responses. Moreover, inquiries pertaining to revenues were marked as non-obligatory to answer, as to encourage responses and decrease recognizability. As such, the absence of certain demographics has been denoted as *unknown* in **Table 3**.

**Table 2. Constructs and Measurement Items**

<u>Constructs &amp; Sources</u>	<u>Items</u>
Top Management Proactivity  <u>Adapted from:</u> Li et al. (2019), Jasmi & Fernando (2018)	TM1: Our top managers completely support environmental management systems needed for GSC practices. TM2: Our top managers strongly implement GSC practices to develop our firm's green competitiveness TM3: Our top managers integrate GSC practices into our company's business strategies.
Voluntary Adoption of GSC practices  <u>Adapted from:</u> Mitra & Datta (2014), Jasmi & Fernando (2018), Bonson et al. (2009)	VA1: Our firm implements GSC practices voluntarily. VA2: Our firm implements GSC practices voluntarily in order to stay ahead of future eco-friendly laws. VA3: Our firm implements GSC practices voluntarily to improve our firm's market image. VA4: Our firm implements GSC practices voluntarily to help our relationship with the regulatory authorities. VA5: Our firm implements GSC practices voluntarily to benefit from its advantages.
Green Culture  <u>Adapted from:</u> Jasmi & Fernando (2018), Li et al. (2019)	GC1: Our firm believes that GSC practices can protect the planet. GC2: Our firm believes that GSC practices is the best method to achieve our business goals. GC3: Our firm believes that GSC practices compensate their costs.
Coercive Adoption of GSC practices  <u>Adapted from:</u> Mitra & Datta (2014), Chen et al. (2009), Jasmi & Fernando (2018)	CA1: Our firm implements GSC practices to comply with eco-friendly rules. CA2: Our firm implements GSC practices under the pressure of our customers. CA3: Our firm implements GSC practices because our current and future business is dependent on them.
Green Trust  <u>Adapted from:</u> Wang et al. (2014)	GT1: Our firm believes our business partner is sincere with us. GT2: Our firm believes our business partner usually keeps the promise it makes to our firm. GT3: Even when our business partner gives a rather doubtful explanation, we are sure that our partner is telling the truth. GT4: Whenever our business partner gives us advice on our business operations, we know that it is sharing its best judgement.
Greenwashing  <u>Adapted from:</u> Butt et al. (2021)	GW1: Our firm experiences that our supply chain partner conceals essential information to make its green claims sound better than they are. GW2: Our firm experiences that our supply chain partner exaggerates its competence to perform eco-friendly operations. GW3: Our firm experiences that our supply chain partner conceals important information to make its green claims sound better than they are.
Supplier Opportunism  <u>Adapted from:</u> Cheng et al. (2008), Wang et al. (2014)	SO1: Our firm considers that our supply chain partner purposefully alters the facts slightly to accomplish its own goals. SO2: Our firm considers that our supply chain partner purposefully promises to do things without actually doing them later. SO3: Our firm considers that our supply chain partner purposefully breaks informal agreements to maximize its own benefits. SO4: Our firm considers that our supply chain partner purposefully takes benefit of "holes" in the contract to increase its own interests. SO5: Our firm considers that our supply chain partner purposefully takes advantage of accidents to negotiate a better deal.



In the process of estimating the model and creating the descriptive statistics, certain measurement items were removed as they either had low inter-item correlation or affected the validity and/or reliability of the model negatively. **Table 3** shows the removed items.

**Table 3.** Removed Items.

Note: The removed items are adapted from the same sources as the items in Table 1.

Constructs	Removed Items
Top Management Proactivity	TMP4: Our top managers completely support the implementation of GSC practices. TMP5: Our top managers willingly invest resources for applying GSC practices.
Green Culture	GC4: Our firm actively participates in environmental improvement activities.
Greenwashing	GW4: Our firm experiences that our supply chain partner presents itself as an environmentally conscious firm to improve its environmental reputation.
Coercive Adoption:	CA4: Our firm implements GSC practices under the pressure of rival firms.

### 3.3 Measures

Green and adoption literature was used to develop the topics of voluntary and coercive adoption, as well as possible respective drivers. In order to provide concrete measurements, the survey was split into two segments. The 5-point Likert scale implemented in the second part categorized respondents' agreement with the proposed sentences on adoption and green implementation. The respondents' answers ranged from 1, representing "not at all" to 5 – "very great extent". The initial part of the survey dealt with the respondents' demographics, as shown in **Table 4**. The measuring items were adapted from earlier literature, as depicted in **Table 2**.

### 3.4 Data Analysis

The software used to process the accumulated survey data were IBM SPSS Version 29, as well as SmartPLS 4. The former served to provide the descriptive statistics, while the latter was utilized to create the model and provide insight into construct validity and

reliability. **Table 1** fully encompasses the respondent profiles. What was found was that 50% of responding companies were ISO 9001 certified, 25% were ISO 14001 certified, 16% had an ISO 45001 certification and 8,3% had an ISO. 26000 one. Additionally, 33,3% had different green certifications than the specified ones and 41,6% had none of the above. As respondents were allowed to select multiple answers to this question, the maximum percentage exceeds 100%. Thereon, 50% of the responding companies have been operational in the maritime world for 25 or more years. The most represented segment in the survey was offshore oil & gas, with three (3) samples, comprising 25% of the total.

Prior to the survey revision, respondents were tasked with an optional question regarding their personal opinion on the maritime areas where successful GSC implementation would be most important. Out of the 8 which responded, 62,5% mentioned fuels or emissions, 12,5% addressed ports, 12,5% discussed transparent policies throughout the supply chains, and the last 12,5% chose the use of eco-friendly ship & offshore structure preservation products. Before the survey changes were made, companies were also asked to specify any other environmental certifications they had, as an optional question. Out of the four (4), which provided an answer: 25% said ISM and EU taxonomy, 25% answered EU Marine Equipment Directive (MED), 25% noted Miljøfyrtårn (Eco-Lighthouse), and the last 25% stated they would acquire ISO14001 and ISO45001 later on.

**Table 4.** Respondent Demographics.

Demographics	Categories	Overall	
		Frequency	Percent (%)
Certifications	ISO 9001 Quality Management System	6	50,0
	ISO 14001 Environmental Management System	3	25,0
	ISO 45001 Occupational Health and Safety Management System	2	16,0
	ISO 26000 Corporate Social Responsibility	1	8,3
	Any other national or international Environment-Friendly or Green maritime certification	4	33,3
	None	5	41,6
Segment	Port Authority	1	8,3
	Offshore Services	1	8,3
	Offshore Oil & Gas	3	25,0
	Shipping Liner	0	0
	Shipbroking	1	8,3
	Commercial Management	0	0
	Technical Management	0	0
	Shipping Agent	0	0
	Freight Forwarder	1	8,3
	Stevedore	0	0
	Ship Repair/Building	1	8,3
	Cargo/Container	2	16,6
	Warehousing	0	0
	Ship Chandler	0	0

	Haulage Company	0	0
	Other	2	16,6
Company Lifetime	≤5 years	2	16,6
	6-10 years	0	0
	11-25 years	3	25,0
	≥25 years	7	58,3
Employees	≤5	2	16,6
	5-30	3	25,0
	31-75	2	16,6
	76-200	1	8,3
	201-499	2	16,6
	≥500	2	16,6
Revenue (USD)	≤\$500 000	1	8,3
	\$500 001 - \$1 000 000	1	8,3
	\$1 000 001 - \$5 000 000	3	25,0
	\$5 000 001 - \$10 000 000	1	8,3
	≥\$10 000 001	4	33,3
	Unknown	2	16,6
Position	Director/VP/Chairman	0	0
	Deputy GM/GM	0	0
	Senior Manager/Admin Officer	1	8,3
	Manager	3	25,0
	Assistant/Deputy Manager	0	0
	Executive	0	0
	Other	0	0
	Unknown	8	66,6

## 4. Empirical Analysis & Findings

The following section in the study seeks to analyze the collected data and present the findings. Initial stages require for the constructs and their items to be subjected to reliability and validity tests, in order to prove the goodness of the model. Due to an incredibly limited data size (n=12), employment of a sophisticated method of data interpretation was not possible. As such, the study will create propositional support for the hypotheses by use of correlation.

### 4.1 Model Goodness

Firstly, the model was subjected to validity and reliability tests pertaining to the items describing its constructs. Indicator (item) loadings should generally be above the threshold of 0,70 (Hair et al., 2011), in order to establish construct validity. As **Table 5**, shows the model results, all but one item have loadings conforming to this rule. With respect to convergent validity, the average variance extracted (AVE) ranged from 0,565 to 0,903 for the 26 items present in the model, passing the >0,5 criterion. Then, composite reliability serves to measure the internal consistency of constructs, and should be above the 0,7 value (Hair et al., 2011). **Table 5** indicates that composite reliability ranged from 0,785 to 0,966, fulfilling the condition. Thereon, the Cronbach Alpha is another tool used in assessing consistency and reliability, meaning showing inter-connection between the items in the model. As such, the value should be above 0,70 and ideally below 0,90 (Tavakol & Dennick, 2011). **Table 4** shows that the alpha ranges from 0,585 to 0,957. **Table 6** builds onto the assessment by presenting the standard deviations (SD) and means of the constructs. In this case the ranges are 0,57443 to 1,04567 and 2,3000 to 3,7778, respectively. This study used the Fornell-Larcker criterion to assess discriminant validity. That is, taking the square root of the AVE for each given construct and comparing it to its correlation to the other constructs. If the square root of the AVE is larger, then discriminant validity is present, as shown in **Table 6**.

**Table 5.** Result of Measurement Model.

Variables	Items	Loadings	AVE	Composite Reliability	Cronbach Alpha
Voluntary Adoption (VA)	VA1	0.937	0.832	0.961	0.949
	VA2	0.930			
	VA3	0.884			
	VA4	0.936			
	VA5	0.871			
Coercive Adoption (CA)	CA1	0.908	0.565	0.785	0.585
	CA2	0.808			
	CA3	0.466			
Top Management Proactivity (TMP)	TMP1	0.912	0.809	0.927	0.882
	TMP2	0.909			
	TMP3	0.877			
Green Culture (GC)	GC1	0.929	0.804	0.925	0.878
	GC2	0.907			
	GC3	0.853			
Greenwashing (GW)	GW1	0.908	0.903	0.966	0.946
	GW2	0.972			
	GW3	0.970			
Supplier Opportunism (SO)	SO1	0.910	0.847	0.965	0.957
	SO2	0.927			
	SO3	0.930			
	SO4	0.968			
	SO5	0.862			
Green Trust (GT)	GT1	0.749	0.702	0.903	0.859
	GT2	0.811			
	GT3	0.957			
	GT4	0.823			

**Table 6.** Discriminant Validity of Constructs.

Note: The values in bold represents the square root of the average variance extracted (AVE). The other inputs are the inter-construct correlations.

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	Mean	SD	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
Voluntary Adoption (1)	3.7333	.72027	<b>0.912</b>						
Coercive Adoption (2)	3.0556	.72242	0.369	<b>0.751</b>					
Top Management Proactivity (3)	3.7778	.57443	0.869	0.325	<b>0.899</b>				
Green Culture (4)	3.4722	.90407	0.741	-0.44	0.571	<b>0.897</b>			
Greenwashing (5)	2.7500	1.04567	-0.644	-0.074	-0.572	-0.473	<b>0.950</b>		
Supplier Opportunism (6)	2.3000	.98535	-0.287	0.238	-0.428	-0.221	0.809	<b>0.920</b>	
Green Trust (7)	3.7292	.65243	0.548	0.340	0.371	0.506	-0.519	-0.223	<b>0.838</b>

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## 4.2 Statistical Significance

Firstly, the means of the used items from **Table 2** were compiled together using IBM SPSS, and thereon, a Pearson correlation matrix was created using the new variables. The test is one-tailed, as the given hypotheses explore directional relationships between dependent and independent variables. The results of the matrix, portrayed in **Table 7**, show the correlations between the means of all constructs. TMP has a strong, positive correlation with VA (.869) at the 0,01 level, but no significant correlation to CA. The same is observed to be the case with GC and VA, with a correlation of .741 at the 0,01 level, but no significant connection to CA. GW is shown to have a significant negative association with VA (-.644) at the 0,05 level, and none with CA. SO displays no significant correlation with any of the dependent constructs. GT is shown to have a strong correlation with VA at the 0,05 level (.548), but none with CA. CA does not share any significant correlation with the independent constructs.

Given the presented correlations between the constructs in **Table 7**, this section will address the support of the established hypotheses in a propositional manner. As the collected sample size is too small for sophisticated means of data analysis, the study will only propose that the relationships are supported or not based on correlation. **Table 8** shows the hypotheses and the proposed effects. Future studies can hopefully build onto, or supplement the postulations made here.



**Table 7.** Construct Correlations.

Note: \*\*. Correlation is significant at the 0.01 level (1-tailed)

\*. Correlation is significant at the 0.05 level (1-tailed)

		Voluntary Adoption	Coercive Adoption	Top Management Proactivity	Green Culture	Greenwashing	Supplier Opportunism	Green Trust
Voluntary Adoption	Pearson Correlation Sig. (1-tailed) N	1						
Coercive Adoption	Pearson Correlation Sig. (1-tailed) N	.369 .119 12	1					
Top Management Proactivity	Pearson Correlation Sig. (1-tailed) N	.869** <.001 12	.325 .152 12	1				
Green Culture	Pearson Correlation Sig. (1-tailed) N	.741** .003 12	-.044 .446 12	.571* .026 12	1			
Greenwashing	Pearson Correlation Sig. (1-tailed) N	-.644* .012 12	-.074 .410 12	-.572 .026 12	-.473 .060 12	1		
Supplier Opportunism	Pearson Correlation Sig. (1-tailed) N	-.287 .183 12	.238 .228 12	-.428 .082 12	-.221 .245 12	.809** <.001 12	1	
Green Trust	Pearson Correlation Sig. (1-tailed) N	.548* .033 12	.340 .140 12	.371 .118 12	.506* .047 12	-.519* .042 12	-.223 .243 12	1

**Table 8.** Proposed Support for Established Hypotheses.

	Hypotheses	Correlation	Sig.	Proposed Effect
H1a	TMP has a positive association with VA	.869	<.001	Yes
H1b	TMP has a negative association with CA	.325	.152	No
H2a	GC has a positive association with VA	.741	.003	Yes
H2b	GC has a negative association with CA	-.044	.446	No
H3a	GW has a negative association with VA	-.644	.012	Yes
H3b	GW has a positive association with CA	-.074	.410	No
H4a	SO has a negative association with VA	-.287	.183	No
H4b	SO has a positive association with CA	.238	.228	No
H5a	GT has a positive association with VA	.548	.033	Yes
H5b	GT has a negative association with CA	.340	.140	No

## 5. Discussion

### 5.1 Theoretical Contribution

This study set out to find how internal organizational factors and external organizational relationships affect the method of GSC adoption among maritime companies. With a VA mean of 3.73, our data shows that most of the responding maritime companies adopt voluntarily, in line with Alexandrou et al. (2022). This study, however, included more than shipping companies, showcasing how the regulatory effect on shipowners affects other supply chain links (Alexandrou et al., 2022).

TMP was proposed to have a positive association to VA, which would be in line with the findings of Jasmi & Fernando (2018). Given the significant correlation between TMP and VA, I propose that there is a positive effect between the two. Granted this proposition, top management initiative is shown to be paramount for green proactive adoption. While the correlation between TMP and CA was not significant, it was also observed to not be negative, potentially supporting the study of Chen et al. (2012) and their conclusion that management is present in both proactive and reactive green innovations. Regardless, management initiative is paramount when discussing drivers of VA, as they are the ones that encapsulate a firm's values and beliefs. Upon those organizational traits, leaders then steer their companies in the direction they see fit.

GC was hypothesized to have a positive connection to VA. The findings propose that the two constructs share a positive association, in line with the findings of Chen et al. (2012). Both CG and TMP are prerequisites to green proactivity adoption. The presence of TMP in the form of green initiatives creates a standard for the organization to follow. Values and norms are constructed by leadership and are then adopted by employees on lower levels. Thereon, CG does not share any significant correlation with CA, resulting in a lack of support for their respective hypothesis.

Hypotheses 3a and b pertain to GW's connection to VA and CA, respectively. Given that GW and VA share a significant, negative correlation, I propose that there is a negative effect between the two. This entails that companies with partners that exhibit GW behavior tend to steer away from VA. When GW functions as an observable process, companies will

tend to mimic the behavior of their GW partners if deemed as a successful model. Thereon, companies with supply chain partners who show signs of GW tend to show a low VA. On the other hand, no significant correlation was found between GW and CA, rejecting the proposition that GW and CA share a positive association.

Given the small sample size, this study did not manage to find any significant correlation or association between SO and the two dependent constructs – VA and CA. Therefore, both hypotheses pertaining to SO are proposed to be rejected.

The final two hypotheses explore the connection between GT and VA, and GT and CA. The correlations taken from **Table 7** show a positive correlation between GT and VA, so I propose that there is a positive effect between the two. As reflected in Alexandrou et al. (2022), shipping companies are mostly proactive in their environmental endeavors, due to the global presence of the industry and the strict, international regulations. Additionally, the study showed that greener shipping companies were more profitable. I have also discussed how an increase in trust and information-sharing not only decreases opportunism, but also increases competitive performance. As the items pertaining to GT dealt with supply chain honesty, sincerity, trust, and advice, I propose that maritime companies which exhibit the aforementioned traits are likely to advise their partners toward VA, given its merits.

Despite being out of the scope of this study, these final segments will examine the correlations between the independent constructs as supplementary material. GC was found to have a significant, positive correlation with TMP, in line the notion that proactive green leadership is associated with the presence of a green organizational culture (Jasmi & Fernando, 2018; Li et al., 2019). Moreover, it coincides with the findings of Chen et al. (2012), where green culture and leadership are necessary prerequisites to facilitate proactive green innovations.

SO was found to have a significant, positive correlation with GW, based on the data provided by the respondents. This could hint that companies, who experience that their supply chain partners are opportunistic, also perceive that they greenwash. It could also propose that companies, which display traits specific to opportunism such as misleading and lying, also greenwash. The connection between the two would be grounded in the fact that both SO and GW manipulate facts and state incomplete truths, in order to benefit in some way (De Freitas Netto et al., 2020; Williamson, 1985).

Lastly, GT displays a significant, negative correlation with SO, and a positive one with GC. GT and SO's correlation can be explained with trust being the medium, which facilitates higher quality information sharing, leading to a reduction in opportunistic behavior (J. Cheng et al., 2008; Fawcett et al., 2012). Summarized, trust and opportunism are polar opposites. Pertaining to GT and GC's positive correlation, I propose that companies with a positive outlook to GC tend to hold more trust towards their business partners. This is due to the GC items analyzing the company in question's perception of green culture, while GT items ask the company in question for their trust level in their partner.

## 5.2 Managerial Implications

A driving force for any firm seeking to adopt GSC practices proactively is a management that takes initiative. This entails leadership which actively seeks to improve upon their firm's green competitiveness. Top managers need to be committed to the idea of GSC integration by use of select standards or environmental management systems, which provide the groundwork for what is required of the company. A transformational leadership style would, in theory, be better suited for firms looking to adopt proactively and to change the organizational culture.

As addressed earlier in this study, top leaders must be aware of relevant stakeholders, in order to know the norms to which their company must adhere. Based on the discussion from the previous subchapter, maritime management, as a pivotal role in the company, must strive toward voluntary adoption of GSC and creation of green firm values. As proactive MGSCM has been shown to have a positive effect on earnings, organizational leaders should be thorough in their integration of green practices within company strategy. By creating a clear company vision and accompanying values, the beliefs will be spread throughout all organizational levels, creating a green culture.

In order to eliminate barriers hindering VA, managers need to be careful in the selection of their supply chain partners. Based on the propositions made in this study, leaders should strive for supply chain transparency and thereon avoid greenwashing or opportunistic companies. As such, management should build trust with their partners by sharing high-quality information. As trust is built between supply chain partners, competitive advantage will rise. Upon having established trust, collaborators can advise each other on best operational practices, leading to a higher likelihood for VA.

### 5.3 Limitations and Future Research

The largest limitation of this study is its small sample size. Any subsequent limitations arise out of a lack of data. Due to the sample size, superior methods of data analysis were not able to be used. As sophisticated methods were impossible to implement, the study was unable to use firm size, firm lifetime, and revenues as control variables. The construct CA had a smaller than desirable Cronbach alpha, and had a low loading on one of its items. The item was kept regardless, due to CA being a dependent variable, thereby it being more optimal to have a minimum of three (3) measurement items.

Future research can contribute to the basis laid out by this study by amassing a larger data set for hypothesis testing. The links between GW and VA, and GT and VA are yet unexplored within a maritime context and would benefit from academic consideration. While SO had no significant correlation to any of the two dependent constructs, a larger sample size would perhaps find linkages between the concepts. Additionally, a relevant field to explore when considering the above-mentioned variables would be company nationality. GW may be more prominent in countries with lower economic contributions and higher gaps in social classes. Another consideration to make would be to place focus on the GSC adoption of upstream maritime supply chain actors, as literature is mostly preoccupied with shippers.

## 6. Conclusion

This study set out to find how external and internal variables pertaining to maritime companies affected voluntary and coercive adoption of GSC practices. To that end, two research questions were proposed. The first one asked if the internal factors TMP and GC had an effect on the method of GSC adoption. The second one inquired if the external factors GW, SO and GT impacted the method of adoption. Two-sided hypotheses were proposed for each independent variable with set directional relationships towards the dependent constructs, and a model was provided. Despite the large population of maritime companies who received the questionnaire, only twelve (12) out of 550 responded, making the response rate 2,1%. Given the small sample size, the best practice was to assess the goodness of the proposed model, using SmartPLS, and then provide correlation-based, propositional support for the hypotheses using IBM SPSS. My propositions state that TMP and GC both have a positive association with VA and none with CA. Regarding external drivers, GT and GW have a positive and a negative association with VA, respectively. GT, GW were proposed to have no connection to CA, while SO was proposed to have no connection to any of the dependent constructs. The managerial implications arising from this study propose that since TMP and GC have a positive connection to VA, leaders should establish a green vision and goals that will resonate with their organizations. As proactive adoption of GSC has been linked to better financial performance, management will have an incentive to employ VA, but must be thorough in its application in order to satisfy stakeholders. Transparency within supply chains is also required to assess the potential of GW, with its negative effect on VA, and establish GT which can fuel VA and provide an advantage via collaboration.

## References

- Alexandrou, S. E., Panayides, P. M., Tsouknidis, D. A., & Alexandrou, A. E. (2022). Green supply chain management strategy and financial performance in the shipping industry. *Maritime Policy & Management*, 49(3), 376–395.  
<https://doi.org/10.1080/03088839.2021.1883141>
- Amrutha, V. N., & Geetha, S. N. (2021). Linking organizational green training and voluntary workplace green behavior: Mediating role of green supporting climate and employees' green satisfaction. *Journal of Cleaner Production*, 290, 125876.  
<https://doi.org/10.1016/j.jclepro.2021.125876>
- Arimura, T. H., Darnall, N., & Katayama, H. (2011). Is ISO 14001 a gateway to more advanced voluntary action? The case of green supply chain management. *Journal of Environmental Economics and Management*, 61(2), 170–182.  
<https://doi.org/10.1016/j.jeem.2010.11.003>
- Baresic, D., & Palmer, K. (n.d.). *CLIMATE ACTION IN SHIPPING Progress towards Shipping's 2030 Breakthrough*. [https://climatechampions.unfccc.int/wp-content/uploads/2022/09/GTZ\\_ClimateActionInShipping.pdf](https://climatechampions.unfccc.int/wp-content/uploads/2022/09/GTZ_ClimateActionInShipping.pdf)
- Ben Brik, A., Mellahi, K., & Rettab, B. (2013). Drivers of Green Supply Chain in Emerging Economies. *Thunderbird International Business Review*, 55(2), 123–136.  
<https://doi.org/10.1002/tie.21531>
- Bentahar, O., Benzidia, S., & Bourlakis, M. (2023). A green supply chain taxonomy in healthcare: Critical factors for a proactive approach. *The International Journal of Logistics Management*, 34(1), 60–83. <https://doi.org/10.1108/IJLM-04-2021-0240>



- Bonson, E., Cortijo, V., & Escobar, T. (2009). A Delphi Investigation to Explain the Voluntary Adoption of XBRL. *The International Journal of Digital Accounting Research*, 9. [https://doi.org/10.4192/1577-8517-v9\\_7](https://doi.org/10.4192/1577-8517-v9_7)
- Butt, A., Khan, S. N., Zakir, M. M., Rana, W., & Laila, A. (2021). *Firms greenwashing practices and consumers' perception: Role of marketing and non-marketing external stake holders in firms greenwashing practices.*
- Calfee, J. E., & Rubin, P. H. (1993). Nontransactional Data in Managerial Economics and Marketing. *Managerial and Decision Economics*, 14(2), 163–173.
- Calton, J. M., & Lad, L. J. (1995). Social Contracting as a Trust-Building Process of Network Governance. *Business Ethics Quarterly*, 5(2), 271–295.  
<https://doi.org/10.2307/3857357>
- Chan, E. S. W. (2008). Barriers to EMS in the hotel industry. *International Journal of Hospitality Management*, 27(2), 187–196. <https://doi.org/10.1016/j.ijhm.2007.07.011>
- Chen, A. J., Watson, R. T., Boudreau, M.-C., & Karahanna, E. (2009). Organizational Adoption of Green IS & IT: An Institutional Perspective. *Green Information Technology*, 18.
- Chen, Y., Chang, C., & Wu, F. (2012). Origins of green innovations: The differences between proactive and reactive green innovations. *Management Decision*, 50(3), 368–398.  
<https://doi.org/10.1108/00251741211216197>
- Chen, Y.-S. (2010). The Drivers of Green Brand Equity: Green Brand Image, Green Satisfaction, and Green Trust. *Journal of Business Ethics*, 93(2), 307–319.  
<https://doi.org/10.1007/s10551-009-0223-9>
- Chen, Y.-S., & Chang, C.-H. (2013). Greenwash and Green Trust: The Mediation Effects of Green Consumer Confusion and Green Perceived Risk. *Journal of Business Ethics*, 114(3), 489–500. <https://doi.org/10.1007/s10551-012-1360-0>

- Cheng, J., Yeh, C., & Tu, C. (2008). Trust and knowledge sharing in green supply chains. *Supply Chain Management: An International Journal*, 13(4), 283–295.  
<https://doi.org/10.1108/13598540810882170>
- Cheng, J.-H., & Sheu, J.-B. (2012). Inter-organizational relationships and strategy quality in green supply chains—Moderated by opportunistic behavior and dysfunctional conflict. *Industrial Marketing Management*, 41(4), 563–572.  
<https://doi.org/10.1016/j.indmarman.2012.04.003>
- Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2011). Does it really pay to be green? Determinants and consequences of proactive environmental strategies. *Journal of Accounting and Public Policy*, 30(2), 122–144.  
<https://doi.org/10.1016/j.jaccpubpol.2010.09.013>
- Cleaner Air in 2020: 0.5% sulphur cap for ships enters into force worldwide*. (n.d.). European Commission. Retrieved 7 February 2023, from  
[https://transport.ec.europa.eu/news/cleaner-air-2020-05-sulphur-cap-ships-enters-force-worldwide-2020-01-09\\_en](https://transport.ec.europa.eu/news/cleaner-air-2020-05-sulphur-cap-ships-enters-force-worldwide-2020-01-09_en)
- De Freitas Netto, S. V., Sobral, M. F. F., Ribeiro, A. R. B., & Soares, G. R. D. L. (2020). Concepts and forms of greenwashing: A systematic review. *Environmental Sciences Europe*, 32(1), 19. <https://doi.org/10.1186/s12302-020-0300-3>
- De Jong, M. D. T., Huluba, G., & Beldad, A. D. (2020). Different Shades of Greenwashing: Consumers' Reactions to Environmental Lies, Half-Lies, and Organizations Taking Credit for Following Legal Obligations. *Journal of Business and Technical Communication*, 34(1), 38–76. <https://doi.org/10.1177/1050651919874105>
- Dey, P. K., & Cheffi, W. (2013). Green supply chain performance measurement using the analytic hierarchy process: A comparative analysis of manufacturing organisations.

- Production Planning & Control*, 24(8–9), 702–720.  
<https://doi.org/10.1080/09537287.2012.666859>
- Eesley, C., & Lenox, M. J. (2006). Firm responses to secondary stakeholder action. *Strategic Management Journal*, 27(8), 765–781. <https://doi.org/10.1002/smj.536>
- Esty, D. C., & Ivanova, M. H. (2004). *Globalization and environmental protection: A global governance perspective*. Citeseer.
- Fawcett, S. E., Jones, S. L., & Fawcett, A. M. (2012). Supply chain trust: The catalyst for collaborative innovation. *Business Horizons*, 55(2), 163–178.  
<https://doi.org/10.1016/j.bushor.2011.11.004>
- Fernando, Y., Jasmi, M. F. A., & Shaharudin, M. S. (2019). Maritime green supply chain management: Its light and shadow on the bottom line dimensions of sustainable business performance. *International Journal of Shipping and Transport Logistics*, 11(1), 60. <https://doi.org/10.1504/IJSTL.2019.096872>
- Fombrun, C. J., Gardberg, N. A., & Sever, J. M. (2000). The Reputation Quotient<sup>SM</sup>: A multi-stakeholder measure of corporate reputation. *Journal of Brand Management*, 7(4), 241–255. <https://doi.org/10.1057/bm.2000.10>
- Freeman, R. (1984). *Strategic Management: A Stakeholder's Approach*. Pitman.
- Fuller, R., Landrigan, P. J., Balakrishnan, K., Bathan, G., Bose-O'Reilly, S., Brauer, M., Caravanos, J., Chiles, T., Cohen, A., Corra, L., Cropper, M., Ferraro, G., Hanna, J., Hanrahan, D., Hu, H., Hunter, D., Janata, G., Kupka, R., Lanphear, B., ... Yan, C. (2022). Pollution and health: A progress update. *The Lancet Planetary Health*, 6(6), e535–e547. [https://doi.org/10.1016/S2542-5196\(22\)00090-0](https://doi.org/10.1016/S2542-5196(22)00090-0)
- Green, K. W., Zelbst, P. J., Meacham, J., & Bhadauria, V. S. (2012). Green supply chain management practices: Impact on performance. *Supply Chain Management: An International Journal*, 17(3), 290–305. <https://doi.org/10.1108/13598541211227126>

- Greenhouse Gas Emissions*. (n.d.). IMO. Retrieved 6 February 2023, from <https://www.imo.org/en/OurWork/Environment/Pages/GHG-Emissions.aspx>
- Griffin, M. A., Rafferty, A. E., & Mason, C. M. (2003). Who Started This? Investigating Different Sources of Organizational Change. *Journal of Business and Psychology*, 18(4), 555–570. <https://doi.org/10.1023/B:JOBU.0000028451.22685.a4>
- Gunasekaran, A., Patel, C., & McGaughey, R. E. (2004). A framework for supply chain performance measurement. *International Journal of Production Economics*, 87(3), 333–347. <https://doi.org/10.1016/j.ijpe.2003.08.003>
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *Journal of Marketing Theory and Practice*, 19(2), 139–152. <https://doi.org/10.2753/MTP1069-6679190202>
- Handfield, R. B., Walton, S. V., Seegers, L. K., & Melnyk, S. A. (1997). ‘Green’ value chain practices in the furniture industry. *Journal of Operations Management*, 15(4), 293–315. [https://doi.org/10.1016/S0272-6963\(97\)00004-1](https://doi.org/10.1016/S0272-6963(97)00004-1)
- Hanna, H., Xirouchakis, P., Rentizelas, A., & Elbarky, S. (2021). Integrated Green Supply Chain (GSC) Adoption Model, MENA Developing countries Empirical Study. *International Journal of Social Science and Human Research*, 04(05). <https://doi.org/10.47191/ijsshr/v4-i5-11>
- Hendry, J. R. (2006). Taking Aim at Business: What Factors Lead Environmental Non-Governmental Organizations to Target Particular Firms? *Business & Society*, 45(1), 47–86. <https://doi.org/10.1177/0007650305281849>
- Hervani, A. A., Helms, M. M., & Sarkis, J. (2005). Performance measurement for green supply chain management. *Benchmarking: An International Journal*, 12(4), 330–353. <https://doi.org/10.1108/14635770510609015>

- Heugens, P. P., Van Den Bosch, F. A., & Van Riel, C. B. (2002). Stakeholder integration: Building mutually enforcing relationships. *Business & Society*, 41(1), 36–60.
- Hillary, R. (2004). Environmental management systems and the smaller enterprise. *Journal of Cleaner Production*, 12(6), 561–569. <https://doi.org/10.1016/j.jclepro.2003.08.006>
- IMO's work to cut GHG emissions from ships. (n.d.). Retrieved 7 February 2023, from <https://www.imo.org/en/MediaCentre/HotTopics/Pages/Cutting-GHG-emissions.aspx>
- Jasmi, M. F. A., & Fernando, Y. (2018). Drivers of maritime green supply chain management. *Sustainable Cities and Society*, 43, 366–383. <https://doi.org/10.1016/j.scs.2018.09.001>
- Li, Y., Ye, F., Dai, J., Zhao, X., & Sheu, C. (2019). The adoption of green practices by Chinese firms: Assessing the determinants and effects of top management championship. *International Journal of Operations & Production Management*, 39(4), 550–572. <https://doi.org/10.1108/IJOPM-12-2017-0753>
- Lyon, T. P., & Montgomery, A. W. (2015). The Means and End of Greenwash. *Organization & Environment*, 28(2), 223–249. <https://doi.org/10.1177/1086026615575332>
- McKinnon, A., Browne, M., Whiteing, A., & Piecyk, M. (2015). *Green logistics: Improving the environmental sustainability of logistics*. Kogan Page Publishers.
- Mintzberg, H. (1973). *Nature of managerial work*.
- Mitra, S., & Datta, P. P. (2014). Adoption of green supply chain management practices and their impact on performance: An exploratory study of Indian manufacturing firms. *International Journal of Production Research*, 52(7), 2085–2107. <https://doi.org/10.1080/00207543.2013.849014>
- Murillo-Luna, J. L., Garcés-Ayerbe, C., & Rivera-Torres, P. (2008). Why do patterns of environmental response differ? A stakeholders' pressure approach. *Strategic Management Journal*, 29(11), 1225–1240. <https://doi.org/10.1002/smj.711>

- Murillo-Luna, J. L., Garcés-Ayerbe, C., & Rivera-Torres, P. (2011). Barriers to the adoption of proactive environmental strategies. *Journal of Cleaner Production*, *19*(13), 1417–1425. <https://doi.org/10.1016/j.jclepro.2011.05.005>
- Neville, B. A., & Menguc, B. (2006). Stakeholder Multiplicity: Toward an Understanding of the Interactions between Stakeholders. *Journal of Business Ethics*, *66*(4), 377–391. <https://doi.org/10.1007/s10551-006-0015-4>
- Pajunen, K. (2006). Stakeholder Influences in Organizational Survival. *Journal of Management Studies*, *43*(6), 1261–1288. <https://doi.org/10.1111/j.1467-6486.2006.00624.x>
- Parguel, B., Benoît-Moreau, F., & Larceneux, F. (2011). How Sustainability Ratings Might Deter ‘Greenwashing’: A Closer Look at Ethical Corporate Communication. *Journal of Business Ethics*, *102*(1), 15–28. <https://doi.org/10.1007/s10551-011-0901-2>
- Perron, G. M., Côté, R. P., & Duffy, J. F. (2006). Improving environmental awareness training in business. *Journal of Cleaner Production*, *14*(6–7), 551–562. <https://doi.org/10.1016/j.jclepro.2005.07.006>
- Powell, W. W., Koput, K. W., & Smith-Doerr, L. (1996). Interorganizational Collaboration and the Locus of Innovation: Networks of Learning in Biotechnology. *Administrative Science Quarterly*, *41*(1), 116. <https://doi.org/10.2307/2393988>
- Review of Maritime Transport*. (2017). United Nations Conference on Trade and Development, New York. [https://unctad.org/system/files/official-document/rmt2017\\_en.pdf](https://unctad.org/system/files/official-document/rmt2017_en.pdf)
- Ritchie, H., Roser, M., & Rosado, P. (2020). *CO<sub>2</sub> and Greenhouse Gas Emissions*. <https://ourworldindata.org/co2-and-greenhouse-gas-emissions>

- Rowley, T. J., & Moldoveanu, M. (2003). When Will Stakeholder Groups Act? An Interest- and Identity-Based Model of Stakeholder Group Mobilization. *The Academy of Management Review*, 28(2), 204. <https://doi.org/10.2307/30040709>
- Sarkis, J., Zhu, Q., & Lai, K. (2011). An organizational theoretic review of green supply chain management literature. *International Journal of Production Economics*, 130(1), 1–15. <https://doi.org/10.1016/j.ijpe.2010.11.010>
- Sharma, S., & Vredenburg, H. (1998). Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities. *Strategic Management Journal*, 19(8), 729–753. [https://doi.org/10.1002/\(SICI\)1097-0266\(199808\)19:8<729::AID-SMJ967>3.0.CO;2-4](https://doi.org/10.1002/(SICI)1097-0266(199808)19:8<729::AID-SMJ967>3.0.CO;2-4)
- Srivastava, S. K. (2007). Green supply-chain management: A state-of-the-art literature review. *International Journal of Management Reviews*, 9(1), 53–80. <https://doi.org/10.1111/j.1468-2370.2007.00202.x>
- Stump, R. L., & Heide, J. B. (1996). Controlling Supplier Opportunism in Industrial Relationships. *Journal of Marketing Research*, 33(4), 431–441. <https://doi.org/10.1177/002224379603300405>
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53–55. <https://doi.org/10.5116/ijme.4dfb.8dfd>
- Walley, E. E., & Taylor, D. W. (2002). Opportunists, champions, mavericks...? A typology of green entrepreneurs. *Greener Management International*, 38, 31–43.
- Wang, C.-H. (2019). How organizational green culture influences green performance and competitive advantage: The mediating role of green innovation. *Journal of Manufacturing Technology Management*, 30(4), 666–683. <https://doi.org/10.1108/JMTM-09-2018-0314>

- Wang, Z., Ye, F., & Tan, K. H. (2014). Effects of managerial ties and trust on supply chain information sharing and supplier opportunism. *International Journal of Production Research*, 52(23), 7046–7061. <https://doi.org/10.1080/00207543.2014.932931>
- Wathne, K. H., & Heide, J. B. (2000). Opportunism in interfirm relationships: Forms, outcomes, and solutions. *Journal of Marketing*, 64(4), 36–51.
- Williamson, O. E. (1985). *The economic institutions of capitalism*. New York: Free Press.
- Wolfe, R. A., & Putler, D. S. (2002). How Tight Are the Ties that Bind Stakeholder Groups? *Organization Science*, 13(1), 64–80. <https://doi.org/10.1287/orsc.13.1.64.544>
- Yang, C.-S. (2018). An analysis of institutional pressures, green supply chain management, and green performance in the container shipping context. *Transportation Research Part D: Transport and Environment*, 61, 246–260. <https://doi.org/10.1016/j.trd.2017.07.005>
- Yang, C.-S., Lu, C.-S., Haider, J. J., & Marlow, P. B. (2013). The effect of green supply chain management on green performance and firm competitiveness in the context of container shipping in Taiwan. *Transportation Research Part E: Logistics and Transportation Review*, 55, 55–73. <https://doi.org/10.1016/j.tre.2013.03.005>
- Zisi, V., Psaraftis, H. N., & Zis, T. (2021). The impact of the 2020 global sulfur cap on maritime CO<sub>2</sub> emissions. *Maritime Business Review*, 6(4), 339–357. <https://doi.org/10.1108/MABR-12-2020-0069>