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Postgraduate Dissertation

“Comparative analysis of ESG criteria and policies between Greek  
and German Supply Chains”

“Dimitrios Zachos”

Supervisor: “Petros Pallis”

Patras, Greece, June 2025

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# “Comparative analysis of ESG criteria and policies between Greek and German Supply Chains”

“Dimitrios Zachos”

## Supervising Committee

Supervisor:

Petros Pallis

Associate Professor, Hellenic Open  
University

Co-Supervisor:

Thomas Dasaklis

Associate Professor, Hellenic Open  
University

Patras, Greece, June 2025

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## **Abstract**

In the last decades, Environmental, Social and Governance (ESG) standards increased in importance for all stakeholders as they represent measurable facts for the performance of a company relating to the environment and society. The term “sustainability” becomes more and more important in a company’s culture and the decision-making process as society’s sensitivity on this matter and the expectations for adoption of relative policies increases. This becomes clearer by the guidelines given by large organizations e.g. the United Nations with the “2030 Agenda for Sustainable Development” or the European Commission with the “European Green Deal for neutral climate by 2050”. As it is obvious, the performance of Supply Chains has a significant contribution to this direction.

This thesis deals with the comparison of the integration of ESG standards in the supply chains of two European countries and especially those of Germany and Greece, two countries with significant differences in size and composition of their supply chains, their legal frameworks and culture as well. The research approach consists of a literature review regarding a brief presentation of ESG regulations and frameworks in both countries and a quantitative research regarding ESG implementation and barriers, so that a comparison is possible, in order to come to a conclusion or set the direction for further and deeper research.

## **Keywords**

ESG, ESG frameworks, supply chain, sustainability, ESG standards

## Περίληψη

Τις τελευταίες δεκαετίες, τα περιβαλλοντικά, κοινωνικά και εταιρικής διακυβέρνησης πρότυπα τυγχάνουν αυξανόμενης σημασίας για τους ενδιαφερόμενους, αφού αντιπροσωπεύουν μετρήσιμα δεδομένα για την απόδοσης μίας επιχείρησης σε σχέση με το περιβάλλον και την κοινωνία. Ο όρος “βιωσιμότητα” γίνεται ολοένα και πιο σημαντικός στην κουλτούρα των επιχειρήσεων και στη διαδικασία λήψης αποφάσεων όσο η ευαισθησία της κοινωνίας σε αυτό τον τομέα και οι προσδοκίες για υιοθέτηση σχετικών πολιτικών αυξάνεται. Αυτό γίνεται ακόμη πιο ξεκάθαρο από τις κατευθυντήριες γραμμές που δίνονται από μεγάλους οργανισμούς, π.χ. ΟΗΕ με την “Ατζέντα 2030 για Βιώσιμη Ανάπτυξη” ή την Ευρωπαϊκή Επιτροπή με την “Ευρωπαϊκή Πράσινη Συμφωνία για κλιματική ουδέτερης Ευρώπης έως το 2050”. Όπως είναι προφανές, η απόδοση των Εφοδιαστικών Αλυσίδων έχει σημαντική συνεισφορά προς αυτή την κατεύθυνση.

Η παρούσα μελέτη έχει ως αντικείμενο τη σύγκριση του βαθμού ενσωμάτωσης κριτηρίων ESG στις εφοδιαστικές αλυσίδες δύο χωρών και ιδιαίτερα της Γερμανίας και της Ελλάδος, δύο χώρες με αισθητές διαφορές στο μέγεθος και τη σύνθεση των εφοδιαστικών αλυσίδων τους, των νομικών πλαισίων όπως επίσης και στην κουλτούρας τους. Η έρευνα περιλαμβάνει βιβλιογραφική ανασκόπηση αναφορικά με μία σύντομη παρουσίαση των κανονιστικών και ρυθμιστικών πλαισίων για ESG στις δύο χώρες και ποσοτική έρευνα αναφορικά με την εφαρμογή και τα εμπόδια κριτηρίων ESG, έτσι ώστε να είναι εφικτή η σύγκριση και να εξαχθούν συμπεράσματα ή να δοθεί κατεύθυνση για περαιτέρω και βαθύτερη έρευνα.

### Λέξεις – Κλειδιά

Ορολογία κριτηρίων Περιβαλλοντικά – Κοινωνικά - Εταιρικής Διακυβέρνησης, Περιβαλλοντικά-Κοινωνικά-Εταιρικής Διακυβέρνησης ρυθμιστικά πλαίσια, εφοδιαστική αλυσίδα, βιωσιμότητα, Πρότυπα Περιβαλλοντικά-Κοινωνικά-Εταιρικής Διακυβέρνησης

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## List of Abbreviations & Acronyms

<b>CSR</b>	Corporate Social Responsibility
<b>CSRD</b>	Corporate Sustainability Reporting Directive
<b>EC</b>	European Commission
<b>ESG</b>	Environment, Social, Governance
<b>ESRS</b>	European Sustainability Reporting Standards
<b>EU</b>	European Union
<b>GHG</b>	Green House Gas
<b>GRI</b>	Global Reporting Initiative
<b>IFRS</b>	International Financial Reporting Standards
<b>ISSB</b>	International Sustainability Standards Board
<b>IMO</b>	International Maritime Organization
<b>NFRD</b>	Non-Financial Reporting Directive
<b>OECD</b>	Organization for Economic Co-operation and Development
<b>RES</b>	Renewable Energy Sources
<b>SASB</b>	Sustainability Accounting Standards Board
<b>SDG</b>	Sustainable Development Goals
<b>SFDR</b>	Sustainable Finance Disclosure Regulation
<b>SMEs</b>	Small and Medium-sized Enterprises
<b>TCFD</b>	Task Force on Climate-related Financial Disclosures
<b>UN</b>	United Nations

# 1. Introduction

Aim of the current thesis is to conduct a comparative analysis of ESG criteria and practices that are applied in the German and Greek supply chains. The acronym ESG stands for Environmental, Social and Governance, three terms or pillars that may refer to multiple criteria of each one and aim as a whole to evaluate the performance of a company and derives from the sector of socially responsibility investment (Richardson, 2009). The interpretation of the term ESG is possible in a variety of ways, so that investors and stakeholders with different expectations can receive the desired data (Pollmann,2022). All in all, ESG can be regarded as the evolution and improvement of CSR (Corporate Social Responsibility) to a more specific framework (Wan et al., 2023). The main difference between them, is that ESG represents a measurement tool of a company's performance on specific areas, e.g. Green House Emissions, labor conditions, board independence etc. while CSR covers a wider range of topics, including supply chain management, the commitment of the stakeholders and the development of society. In other words, ESG focuses on measuring and evaluating a holistic approach for integration of responsible practices in all aspects of business activities.

As mentioned above ESG represents three pillars and specifically:

- **Environmental** which refers to environmental impacts a company's procedures and operations have and can be measured by various indicators such Green House Gas Emissions, Fuel consumption, waste and water management etc. (Rajesh,2020).
- **Social** which refers to social impacts that a company's operation has and can be also evaluated by various criteria such as labor conditions, dealing with customers' problems/complaints etc. To sum up it refers to management's relationship to society e.g. employees, suppliers, customers, community etc. (J. Li & Wu, 2020).
- **Governance** which refers to the function of management inside the company and can be measured by criteria like sustainability reporting, variable pay, business ethics policy etc. (Cek & Eyupoglu, 2020).

In 2015, the United Nations presented the "2030 Agenda for Sustainable Development", which is a plan of action aiming at achieving 17 Sustainable

Development Goals (SDG's) by 2030. In order to achieve this, ESG dimensions have to be integrated in the action.

Similarly, the European Commission presented in 2019 the "European Green Deal", a plan for achieving neutral climate by 2050, which also depends on ESG dimensions.

As it is obvious, the importance of the term "Sustainability" is increasing through the last decades. Going back to 1987, the United Nations published a report with the title "Our common future" which focuses on sustainable development.

Purpose of this thesis is to explore the similarities and differences in ESG approach of German and Greek transport companies, two countries with common characteristics, e.g. both are members of the EU, so they are obligated to follow specific regulations and frameworks valid within the Union, many multinational companies from different sectors of supply chains are active in both countries etc., but also with major differences e.g. the corporate culture, the economic status and the implementation of stricter regulations within the country's border.

The methodology consists of quantitative analysis of primary data collected through questionnaires addressed to transport companies in both countries, focusing on the familiarity with ESG criteria and standards but also in barriers companies face in their effort to integrate ESG in their operation. The purpose is to provide a representative image of the situation in both countries and to clarify aspects that could be generalized not only in these two countries but also in others, so that the positive characteristics may be adopted by those who are in lack of them.

Basically, the results of the research are going to give answers to the following research questions:

1. What is the level of awareness of ESG criteria among transport and logistics companies in Germany and Greece?
2. What are the barriers in implementing ESG policies by German and Greek transport firms?

The thesis is structured as follows:

Chapter 1 - In this chapter the main research problem is stated and the research methodology and tools are briefly described.

Chapter 2 - In this point there will be a theoretical approach of the problem through literature review that provides a view of the current status in both supply chains regarding national and international regulations and frameworks.

Chapter 3 - Issues regarding the data origin and methodology used in the research are presented, through mentioning the data collection process and how this data is evaluated and analyzed.

Chapter 4 – In this chapter the results of the analysis are presented, followed by a discussion of the importance of the findings.

Chapter 5 - In this point a conclusion of the study is presents, summarizing the main findings.

Chapter 6 - The chapter refers to limitations of the study and includes suggestions for further research

## 2. Literature review

Throughout the 20<sup>th</sup> century, Environmental, Social and Governance (ESG) standards, have become significant pillars of corporate behavior and business governance for companies worldwide aiming at improved sustainability and responsibility. Simultaneously, risks are reduced as the implementation and evaluation of the above standards help identify and reduce risks for companies and stakeholders (e.g. shareholders, investors, employees, customers etc.). As a result, the consideration of ESG topics transformed from simple concerns into strategic imperatives for companies and organizations worldwide. This fact becomes more important for firms that are active in the supply chain sector as they have to deal with upstream and downstream partners in order to ensure a complete adoption of ESG norms.

Europe and the USA represent the forefront of the ESG implementation with some countries to lead this transition. Among them, Germany stands out in leading the legislative and regulatory charge. The main step towards this is the implementation of a legal framework known as the **Lieferkettensorgfaltspflichtengesetz (LkSG)** – German Supply Chain Due Diligence Act in 2023 that requires from large German companies to assess and assure human rights and minimize environmental risks through their complete supply network. This framework imposes on firms to apply procedures for compliance and transparency setting Germany as one of the top leaders of supply chain ESG enforcement. On the contrary, Greece's ESG environment is still evolving, although the country implements the main EU directives like the **Corporate Sustainability Reporting Directive (CSRD)** and **Non-Financial Reporting Directive (NFRD)**. However, the implementation of ESG standards in the supply chains is still on voluntary level and remains scattered. As a matter of fact, the Greek supply chain sector has to deal with weaker regulations and financial constraints combined with the lack of cultural adoption of ESG metrics.

The current literature review aims to compare the frameworks and policies affecting Greek and German supply chains by exploring structural and operational dynamics, as it is very significant to become aware of national specificities within the of broader goal of the EU to harmonize sustainable practices across its Member States. More specifically, as the importance of supply chains in terms of globalization increases, the understanding of contrasting ESG environments of two countries that have different local standards on this

specific sector provides critical insights for the involved parties (policy makers, managers, researchers etc.).

## **2.1 Conceptual Framework – Definition of ESG**

ESG is a term that includes three specific and important and decisive dimensions of sustainable corporate culture. Each dimension includes specific factors that deal with the impact of a firm's activity on each one:

- Environment (E): energy use, emissions, waste management, water use, climate impact etc.
- Social (S): human rights, workplace safety, labor rights, diversity and inclusion etc.
- Governance(G): compliance mechanisms, corporate ethics, anti-corruption policies, board diversity, shareholder rights etc.

Based on the above dimensions, firms and organizations form a framework in order to assess risks and opportunities promoting a sustainable development context. In the case of supply chains ESG compliance requires the combination of internal practices and intelligence regarding external partners, which is often spread across multiple authorities. In recent years, ESG (Environmental, Social, Governance) criteria have evolved into a key component of corporate strategy and sustainability assessment. A growing number of academic and industry studies focus on the relevance of ESG factors not only as ethical imperatives but also as strategic tools for risk mitigation, market positioning, and long-term value creation.

According to Zopounidis et al. (2024), companies with higher ESG scores tend to perform much better in financial resilience compared to their rivals with low or no ESG score, particularly during periods of market stress, due to better stakeholder relations and lower regulatory risk.

In addition, ESG integration correlates with improved risk management systems. Sotiriadou (2023) developed an ESG rating model based on Greek companies' practices and demonstrated that firms with comprehensive ESG frameworks had lower volatility in



earnings and better incident response mechanisms. This supports the view that ESG is not merely a compliance requirement but a key enabler of operational excellence.

Another key debate in literature is related to the use of ESG ratings and third-party assessments. While ratings by agencies like MSCI and Refinitiv have gained popularity, scholars like Berk et al. (2022) warn against overreliance on these tools due to methodological lack of transparency and regional bias. They argue for the development of national ESG indices and scoring systems that reflect local market conditions and stakeholder priorities, especially in emerging markets.

## 2.2 ESG and supply chains: A strategic connection

The following factors determine the sensitivity of supply chains to ESG pressures:

- **Regulatory Risk:** New legislation regarding due diligence (e.g. LkSG in Germany or Duty of Vigilance Law in France) impose that firms don't stay within internal policies for monitoring and correction of ESG risks through their supply base.
- **Scope of impact:** Any failures in ESG by suppliers may affect a buyer's reputation and legal situation.
- **Complexity and Visibility:** As supply chains consist of multiple levels, violations in ESG may become obscure (e.g. environmental pollution, child labor etc.).

According to literature, it can be said that ESG due diligence is no longer voluntarily but legally binding. This fact forces suppliers especially those based in low-compliance countries to align with ESG criteria so that they can retain market access.

## 2.3 ESG Norms in the EU

Within the European Union, several frameworks that are either voluntary or binding, form the ESG compliance of supply chains, e.g.

- **Corporate Sustainability Due Diligence Directive (CSDDD):** Instructs companies to identify and limit ESG risks in their value chains.

- **Non-Financial Reporting Directive (NFRD) and Corporate Sustainability Reporting Directive CSRD:** Obligate large firms to report ESG performance and risks.
- **Taxonomy Regulation:** Creates a common classification system for sustainable economic activities.

A significant topic in ESG literature is the increasing convergence of regulatory frameworks across countries and organizations, driven by global initiatives such as the United Nations Sustainable Development Goals (SDGs), the Paris Agreement, and the European Green Deal. The CSRD and CSDDD in Europe aim to make sustainability reporting as rigorous as financial reporting (Arnone et al., 2025). However, despite this fact, significant differences remain at the national level, especially between Western and Southern European countries. Germany moved beyond these directives with stricter national legislation (LkSG law), representing a mature enforcement environment. Greece on the contrary, lags behind in both legal mandates and corporate ESG adoption as it follows formally the EU norms but has observed lower compliance rates and weaker enforcement, as mentioned in studies by (Soras & Christopoulos, 2023) and (Papafloratos & Fragidis, 2025).

## 2.4 ESG reporting frameworks

In order to ensure reliable data about management effectiveness it is essential to have standardized metrics available and allow the comparability among companies. Various organizations (governmental and non-governmental) have developed reporting frameworks so that the implementation of ESG principles can be evaluated. Despite these advances, many companies struggle with inconsistent definitions, lack of harmonized indicators and the sheer complexity of ESG integration. Patsoulis & Demetriou (2024) highlight that economic freedom and institutional strength significantly influence ESG disclosure quality across countries. Their findings support the notion that policy context, national legal systems, and cultural attitudes toward transparency can affect the robustness of ESG implementation more than firm-level attributes alone.

Some widely used primary tools that are also used in Greece and Germany include:

- **SASB (Sustainability Accounting Standards Board)** providing metrics specifically on financial performance.
- **GRI (Global Reporting Initiative)** which represents the most widely used sustainability reporting standards with broader guidelines for ESG reporting
- **Refinitiv ESG scores (now LSEG)** which measures a company's performance based on data publicly reported.
- **MSCI (Morgan Stanley Capital International)** which focuses on measuring the resilience industry-specific sustainability risks and opportunities with a financial relevance.
- **TCFD (Task Force on Climate-related Financial Disclosures (TCFD))** which was established by the Financial Stability Board (FSB) and focuses on reporting climate-related financial information in order to guide organizations on the disclosure of climate-related governance, strategy, risk management, and metrics and targets.
- **Climate Disclosure Standards Board (CDSB)**, which is now integrated in the International Sustainability Standards Board (ISSB) and provides financial information that is climate change-related in order to help investors take their strategic decisions.
- The Sustainable Development Goals (SDGs)
- Custom indices like the **"CSR Z-score"** model (Pagkalou et al., 2024) suggesting a quantitative measurement of the corporate responsibility level of a company.

## 2.5 Sector-specific Dynamics

It is obvious, that it is not possible to apply ESG in every sector by the same way as there are different activities involved. It is also obvious that in every country the dominant industries where ESG is applied are different. In Germany the leading sector is the heavy industry that produces consumer and industrial products, especially in the automotive sector, with high expectations in supply chains, as raw materials have to be imported from abroad and end products shipped worldwide. On the contrary, Greece's "heavy" industry is comprised of the tourism and shipping sector. Especially Greek maritime companies show an increasing turn towards ESG alignment (Moschaki, 2023) and (Meimaris, 2024).

Several scholars argue for a sectoral approach in understanding ESG implications. For instance, Karagiannis et al. (2022) found that maritime companies often prioritize governance and environmental reporting due to international regulatory scrutiny, whereas land-based logistics firms focus more on social factors such as labor conditions. This is consistent with observations by Meimaris (2024), who studied ESG integration in Greek shipping companies and found a growing emphasis on digital monitoring tools and environmental compliance, particularly post-IMO 2020 regulations.

## **2.6 ESG Regulatory and Policy Frameworks**

Regulations represent the pillar of ESG implementation in supply chains. The level of implementation of ESG-related legislation in a country determines the policy of the domestic firms and their global partners or competitors.

### **2.6.1 German frameworks**

Although German firms initially implemented ESG practices voluntarily in the past, it has now become legally binding. Since 2023, companies, active in the supply chain sector with at least 3000 employees, have the obligation to avoid or minimize risks especially in the field of human rights and environmental sustainability. This obligation is stated in the Act on Corporate Due Diligence Obligations in Supply Chains (Lieferkettensorgfaltspflichtengesetz, LkSG) and according to BAFA (Federal Office for Economic Affairs and Export Control) includes the following obligations:

1. Establishing a risk management system
2. Designating a responsible person or persons within the company
3. Conducting regular risk analyses and issuing a policy statement
4. Laying down preventive measures
5. Taking remedial action and establishing a complaints procedure
6. Documenting and reporting

From January 1<sup>st</sup>, 2024, the implementation expanded to the companies with at least 1000 employees.

As mentioned by Samardžić and Velic (2024), the above law has transformed ESG from being a reputational tool into an obligation for compliance, which is monitored by German authorities. If non-compliance is discovered, then there will be penalties up to 8 million Euros or 2% of global revenue.

Within supply chains, ESG diffusion is often driven by lead firms and market access incentives. Heuker (2025) observed that Dutch and German companies require from Asian suppliers to adopt ESG practices as a prerequisite for contracts. This supplier-driven ESG compliance mechanism is increasingly observed in relationships within the European Union, with German firms exerting similar influence over their Southern European partners.

As it becomes clear, German companies have to imply ESG internally but also have to ensure that their suppliers, especially those abroad, comply to the due diligence requirements. As a result, Greek companies who supply German firms are also under pressure (indirect) to comply with stricter ESG standards or run the risk of losing contracts otherwise.

### **2.6.2 Greek frameworks**

Although Greece has no specific domestic legislation like Germany, legislations are primarily following the EU directives. The most important domestic legislation is represented by the Law 4548/2018, which is the implementation of the Non-Financial Reporting Directive (NFRD) of the EU and obligates large companies to reveal information about their operation and their handling regarding social and environmental issues.

Regarding the monitoring of compliance, according to Markopoulos et al. (2023) and Gerolymos (2024), the mechanisms for enforcement within the country are inadequate resulting in non-compliance by a majority of companies. Moreover, most companies in Greece are SMEs, so that there is no reporting obligation. The fact that there are no national ESG regulators, strengthens the lack of interest for compliance as it is considered only as a reputation tool.

Finally, the role of education and institutional capacity building in promoting ESG awareness must be taken into account. Stamelos (2022) addresses the need for academic programs, executive training, and public-private collaboration to build ESG literacy, especially in lagging regions like Greece and parts of the Balkans. His findings suggest that

without a robust knowledge base and institutional support, even the best-designed policies may fail to achieve desired outcomes.

## 2.7 ESG and Agenda 2030

The integration of ESG principles within supply chains does not exist in isolation, it is fundamentally connected to broader global efforts (EU, UN etc.) toward sustainable development. Today, the most influential global frameworks guiding this transition is the United Nations Agenda 2030, adopted in 2015 and structured around 17 Sustainable Development Goals (SDGs). These goals provide a universal roadmap for eradicating poverty, protecting the environment, and promoting prosperity through responsible governance and economic models.

ESG compliance and Agenda 2030 are strategically aligned. Many ESG practices directly contribute to specific SDGs, especially those related to responsible production, climate action, labor rights, and gender equality. In this way, the incorporation of ESG in supply chain operations, particularly within the regulatory landscapes of Germany and Greece, supports both corporate performance and societal progress.

### ESG-SDG Linkages in Supply Chains

Several SDGs are closely connected to ESG dimensions, particularly within complex supply chains. The list below contains the SDGs with the number mentioned in Agenda 2030:

**SDG 8 – Decent Work and Economic Growth:** ESG labor standards aim to ensure safe working conditions, fair wages, and human rights protections, directly supporting decent work across supply networks.

**SDG 12 – Responsible Consumption and Production:** The environmental component of ESG forces more sustainable resource use, waste management and emissions control, which aligns with goals for sustainable industrial practices.

**SDG 13 – Climate Action:** ESG-driven climate disclosures (e.g., TCFD reporting) and CO<sub>2</sub> reduction strategies in logistics align with urgent actions to combat climate change.

**SDG 16 – Peace, Justice, and Strong Institutions:** Governance-focused ESG frameworks, especially those addressing corruption, transparency, and accountability, reinforce the development of robust institutional practices.

**SDG 17 – Partnerships for the Goals:** ESG implementation in global supply chains promotes cross-border cooperation and joint standards, which are critical for collective action on sustainability.

### **Germany's Role as an ESG-SDG Conduit**

Germany's legal commitment to ESG through the **LkSG** positions it as a key enabler of Agenda 2030 at national and EU levels. By mandating due diligence across entire supply chains, including foreign suppliers, Germany indirectly pressures other economies (like Greece) to align with SDG targets, even if their domestic ESG regulations remain weak. In this way, ESG becomes not only a corporate responsibility but a mechanism for international SDG enforcement. Moreover, the structured nature of Germany's ESG obligations (such as risk analysis, preventive measures, and public reporting) provides concrete pathways for companies to demonstrate SDG alignment, particularly in their supply chain strategies.

### **Challenges and Opportunities for Greece**

Greece, while formally supportive of Agenda 2030, faces structural and institutional barriers to full ESG-SDG integration. Weak enforcement of ESG laws, limited reporting by SMEs and the absence of a national ESG supervisory body reduce the country's ability to translate its SDG aspirations into measurable outcomes.

However, market-driven pressure, especially from Germany and EU-based customers, creates an indirect incentive for Greek firms to adopt ESG practices that also support SDG achievement. This dynamic opens a strategic opportunity for Greek companies to improve competitiveness, attract international partnerships, and contribute to sustainable development by embedding SDG-aligned ESG practices within their operations.

### **ESG as an Implementation Tool for Agenda 2030**

To sum up, the operationalization of ESG within European supply chains is deeply connected with the goals of Agenda 2030. ESG provides the tools, metrics, and accountability structures necessary for translating the SDGs from high-level commitments into practical corporate actions. By aligning national frameworks (such as Germany's LkSG) and EU directives (like the CSRD and CSDDD) with the SDGs, the ESG agenda serves as a

bridge between policy and practice, driving sustainability forward across sectors and borders.

As countries and companies move toward 2030, the strength of their ESG frameworks will likely determine not only their resilience and ethical standing but also their contribution to a more sustainable and inclusive global economy.



## 3.Methodology

### 3.1 Introduction

In order to come to a conclusion for a theory or hypothesis, research has to be conducted. The methodology for such research consists of theoretical and systematic analysis of methods in a specific field of study (Howell, 2013). The basic concept is the collection of information from real conditions and the analysis of them. In this chapter there will be a brief presentation of research philosophies, approaches, data sources, research methods. Furthermore, the research design that has been used in the current case study will be presented, including the instruments and the research objectives.

### 3.2 Research design and research philosophies

The term “research design” describes the procedure or investigation that aims to conduct a research project (Heppner et al., 1992). Some more definitions are: “A framework indicating the philosophies, methods, procedures and strategies to conduct a research” or “The arrangement of conditions for the compilation and analysis of data” (Bryman et al., 2011). (Saunders et al., 2007) in the “Research Onion” depict the different decisions that can be taken according to the aim of the study.

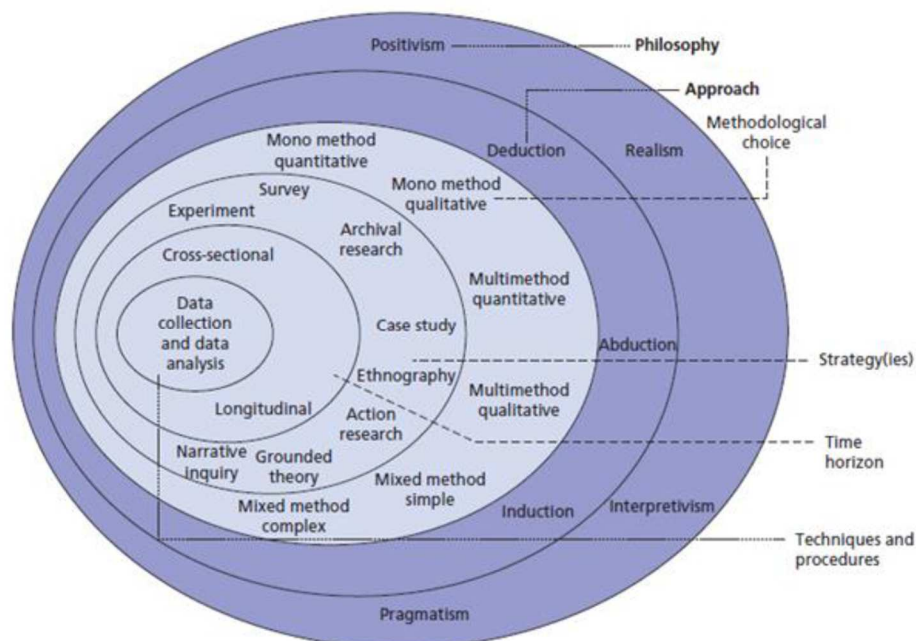


Figure 3.1: The Research 'Onion'

According to (Saunders et al., 2012), the terms that refer more accurately to the research philosophy are “Ontology” and “Epistemology”. The first describes “what things are” and the second describes “the way we know things”. Furthermore, Burrell and Morgan (1979), state that research philosophy is regarded a method of assumptions for the improvement of knowledge. In the research world there are five philosophical positions available:

- Positivism
- Interpretivism
- Postmodernism
- Critical realism
- Pragmatism

Positivism states that science is the way to learn the truth and is based on the assumption that knowledge gained through observation is reliable. As mentioned by Saunders et al. (2007), positivism is the epistemological situation that promotes work with an observable social reality, where the researcher collects and explains the data objectively and independent. Findings in such studies are usually perceptible and quantifiable. The core of this philosophical position are statistical analyses that result from quantifiable observations. Moreover, it is the philosophy that adheres to the assumption that knowledge derives from human experience (Collins,2010). “It has an atomistic, ontological view of the world as comprising discrete, observable elements and events that interact in an observable, determined and regular manner” (Collins, 2010:38). Besides that, the researcher is independent without indications for human interests within the study.

Interpretivism on the other hand, refers to the comprehension of elements of the study by the researcher. As in the previous case, indications for human interests are absent. Thus, researchers of this philosophy state that only through social constructions like common meanings, instruments, language (Myers, 2008) reality is accessible. Compared to positivism, the emphasis is given in qualitative over quantitative analysis.

The key in this case is to comprehend differences between people (Saunders et al.,2012), as a result relative studies focus on meaning and the effort to reproduce diverse aspects of a subject. Thus, data collection is based on naturalistic methods e.g. observations or interviews. In this study, the suitable approach is that of positivism as the results will be based on observations and quantitative research.

	Positivism	Interpretivism
<b>Ontology</b>		
Nature of 'being'/nature of the world	Direct access to the real world	No direct access to the real world
Reality	Single external reality	No single external reality
<b>Epistemology</b>		
'Grounds' of knowledge/relationship between reality and research	Obtain hard, secure objective knowledge	Understood through 'perceived' knowledge
	Focus on generalization and abstraction	Focus on specific and concrete
	Governed by hypotheses and stated theories	Seeking to understand specific context
<b>Methodology</b>		
Focus of research	Concentration on description and explanation	Concentration on understanding and interpretation
Role of researcher	Detached, external observer	Attached, internal observer
	Clear distinction between reason and feeling	Actions governed by feeling and reason
	Aim to discover external reality	Aim to create what is studied, the meaning of the phenomenon
	Rational, consistent, logical approach	Pre-understanding is important
	Distinction between science and personal experience	Acceptance of influence from both science and personal experience
Techniques used by researcher	Formalised statistical and mathematical methods predominant	Primarily non-quantitative

Figure 3.2: Positivism and Interpretivism Research Philosophies

Source: (Carson et al., 2001)

### 3.3. Collection of data (Primary vs. Secondary)

The term data collection refers to the procedure of gathering information from sources relevant to the study, aiming at evaluating results, examining hypotheses and finally finding answers to the research problem. There are two categories of data to collect and evaluate: primary data and secondary data.

Primary data is the information collected for the first time by a researcher and usually represents first-hand experience relevant to the research topic. The sum of this data can be comprised of various collection methods, e.g. questionnaires, surveys, observations, interviews etc. (Steward and Kamins, 1993).

Secondary data describes the information that has been collected in a previous time period by others for a purpose that may have nothing related to the aimed research. This kind of information is instantly available from a variety of sources e.g. books, journals, government

publications, websites, internal records of organizations, reports etc. (Steward and Kamins, 1993).

In the current study, the primary data will be followed as there hasn't been a public research in the past regarding the topic.

### 3.4 Types of Research Approach (Deductive vs Inductive)

In a deductive approach, hypotheses based on existing theory and research strategies in order to confirm them are developed (Wilson, 2010). In the beginning of the research, a set of hypotheses is set and then researchers choose the appropriate method to prove the correctness of the hypotheses.

In an inductive approach, researchers start with observations and related theories. After the evaluation, the results are presented (Goddard and Melville, 2004). Moreover, Bernard (2011) states that this kind of research combines search from observation and theories in order to result in patterns through series of hypotheses. It is obvious that in studies with this approach, theories or hypotheses may not apply, the researcher may alter the direction of the study when the research process has been completed. Aim of this approach is the exploitation of the collected data in order to build a theory.

In the current study, the inductive approach is more suitable, as there is no available data beforehand and so the result of the research cannot be predicted.

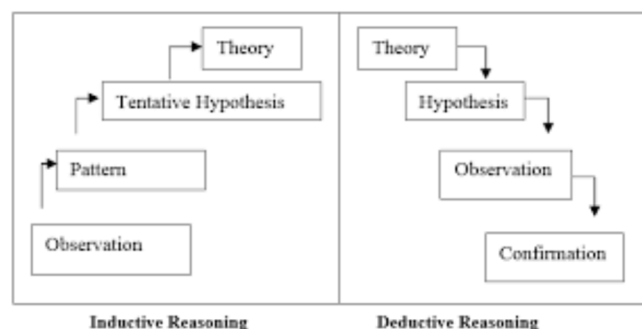


Figure 3.3: Deductive and Inductive Research Approach

Source: (Trochim, 2006)

### 3.5 Research Methods (Quantitative vs Qualitative)

According to Bryman (2011), a research method describes the technique for the collection and evaluation of data in order to answer the questions of an investigation. The sum of these methods is represented by two categories: quantitative and qualitative data analysis. Quantitative data analysis transforms raw numbers into data with meaning by applying reasonable and critical thinking. The data is turned into objective and quantifiable elements that can be processed and evaluated by calculating frequencies, differences, relations etc. among the variables. All in all, quantitative research is the implementation of mathematical calculations and statistical estimations (Harlow, 2015).

On the contrary, qualitative data analysis, doesn't deal with numeric information and their processing at all but focus on elements that cannot be quantified e.g. feelings, colors, emotions, words, sounds etc.

	QUALITATIVE	QUANTITATIVE
Type of Data	Verbal, conceptual	Numerical
Purpose	Exploration: Researchers are not sure what they are looking for	Confirmation: Researchers know what they are looking for
Question Types	Open ended "what," "how," and "why" questions	Closed ended "how many," "how often," "how much" questions
Number of Participants	Few, but in-depth conversations	Many, to produce reliable results
Typical Methods	Focus groups, in-depth interviews, ethnographies	Surveys

Figure 3.4: Qualitative and Quantitative Research Methods

Source: (Harlow, 2015)

### **3.6 Research Population**

According to Saunders et al. (2012) the term “population” in statistics refers to the group of similar items that is the subject for observation.

The population of the current study are companies active in the German and Greek supply chains and especially in the transport sector. It is obvious that the number of companies in this study represents just a small sample compared to the total number of active companies and exceeds the capabilities of the current study.

### **3.7 Data Collection**

In order to collect data for the research, questionnaires have been sent to companies in both countries through a link in “google forms”. The persons to whom the questionnaires were addressed to, are persons who are directly or indirectly involved in the procedure of ESG implementation. They were located either from references in the corporate websites, their professional profiles on the LINKEDIN platform, communities in social media like FACEBOOK, by my professional network and finally through mailing the company directly and asking for forwarding the questionnaire to the sustainability or ESG manager. The responses were anonymous, so that there won't be any conflict between the responder and his employer.

The response rate was relatively low (28.5%) with 83 responses to the 291 sent questionnaires.

The questionnaire consisted of four blocks of questions:

- The first block includes questions about general characteristics of the firms, regarding the location, the firm-size and the sector of activity.
- The second block includes questions regarding the level of ESG awareness in each firm
- The questions of the third block includes questions regarding barriers that a firm deals with in the attempt to implement ESG standards
- In the fourth block, companies are asked to select the indicators they focus on

### **3.8 Research Questions and variables**

For a comparative analysis, the following research questions have to be answered:

- 1) What is the level of awareness of ESG criteria among transport and logistics companies in Germany and Greece?
- 2) What are the barriers in implementing ESG policies by German and Greek transport firms?

In order to answer the above questions, the following Research Hypotheses will be tested:

H1: The level of ESG awareness is higher in German transport companies than in Greek transport companies

H2: Companies that have a designated ESG officer or department have higher levels of ESG implementation

H3: Greek transport companies are more sensitive to Cost-related barriers

### **3.9 Statistical Approach**

In order to present the results, a summary statistic has to be presented that describes quantitatively the features of the collected information (Mann, 1995). Once the data has been collected, it has to be presented in such a way that information and conclusions are provided with clear and appropriate tools e.g. tables, charts etc. (Jewell, 2001).

In this study, primary data has been collected with questionnaires, processed and analyzed. Statistical tools have been used for the analysis and interpretation included in Microsoft Excel software.

Initially descriptive statistics tools have been applied in order to present the main characteristics of the companies that responded.

### **3.10 Limitations of the Study**

As in every research, there are factors that influence and restrict the procedure within limits. In this case the following limitations have to be considered:

- The sample size was limited
- The size of the company varies and this fact may influence the adaptation of ESG standards
- The companies that responded are active in different sectors, that may also influence the degree of adaptation of ESG standards
- Responders may not be willing to answer honestly in the fear of revealing company details

### **3.11 Validity and Reliability**

It is obvious that a serious study has to be reliable and valid and these two concepts have to be assured.

The term “validity” describes how good a test measures the desired variables (Baker, 1988; Litwin, 1995). The key factor in such a research is the integrity of the respondent, as his responses will form the final outcome.

The term “Reliability” refers to the degree to which the used assessment tools produce stable and consistent results (Babbie, 1989; Litwin, 1995).

### **3.12 Ethical Issues**

The term “Ethics” describes the importance of transparency for publishing findings, without plagiarism and/or falsifying the work of others (Resnik, 2015). As mentioned, the data has been collected through anonymous questionnaires and the responses will remain confidentially and used only for the purposes of this research. Although there was an optional field for entering an e-mail address in order to receive the results of the study, the addresses won’t be used for other purposes. This fact (Bryman, 2016) was stated in the introductive section of the questionnaire.



## 4 Results and discussion

### 4.1 Descriptive Statistics

After the completion of the survey, information regarding general facts about the firms was gathered, aiming to provide a pattern and examine their impact on the final results.

#### 4.1.1 Profile of the firm Entities:

In the first section we have the General Characteristics of the firms (Questions 1-3) that responded.

Regarding the country of activity, we observe that 49.4% (41 in total) of the companies are active in Greece, 47% (39 in total) are active in Germany and 3.6% (3 in total) are active in both countries.

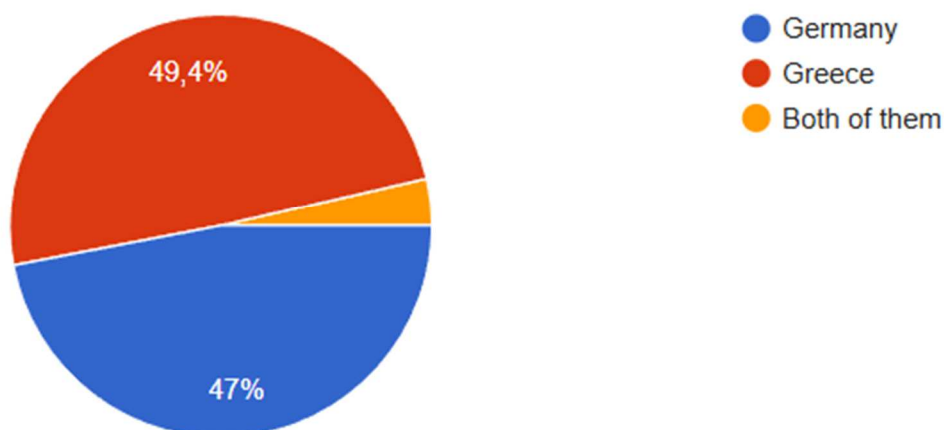


Figure 4.1: Country of firm's activity

Regarding the size of the firms, we observe that 15,7% (13) have less than 10 employees, 30.1% (25) have between 11-50 employees, 27.7%(23) have 51-250 employees and 26.5%(22) exceed the number of 250 employees.

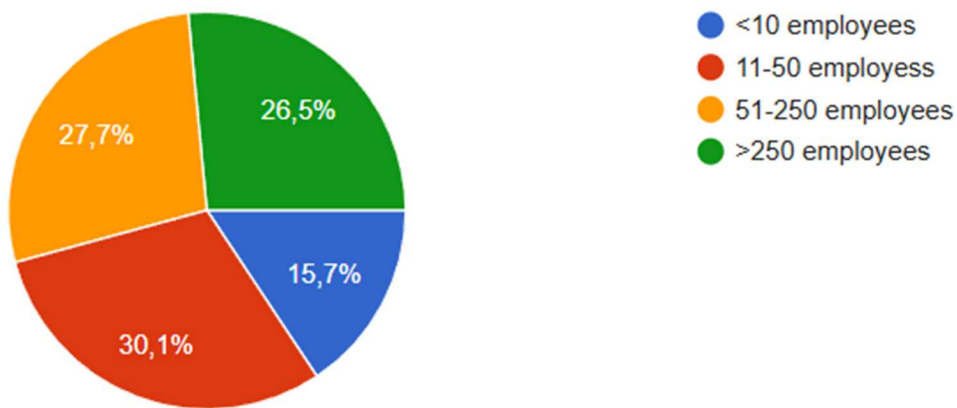


Figure 4.2 : Size of the firms

Regarding the sector of activity, we observe that the majority 61.4%(51) of the firms are active in the road transport sector, followed by multimodal transport 28.9% (24), 4.8%(4) are active in the maritime sector, 3.6%(2) are active in the air transport sector and 1.2%(1) is active in the rail transport sector.

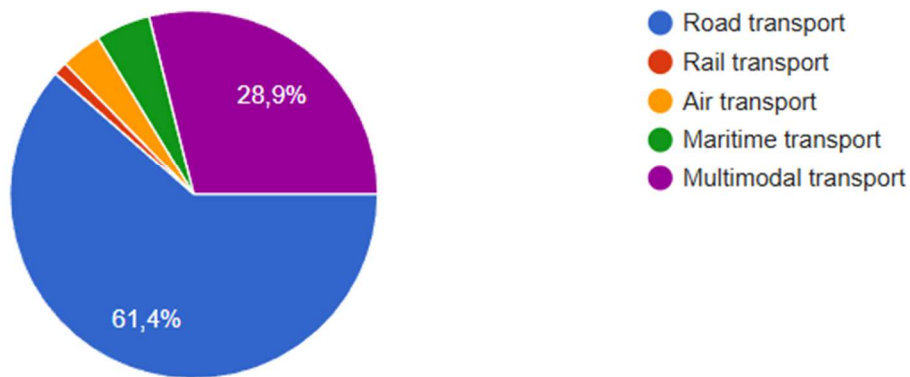


Figure 4.3: Sector of activity

#### 4.1.2 ESG awareness in Transport and Logistics Companies:

In the second section (Questions 4-14), the level of ESG awareness of the companies that responded is examined.

Regarding the existence of an assigned ESG officer or department (Question 4) we observe that:

In Germany 36%(14 in total) responded with Yes, 10%(4 in total) responded with No and 54%(21 in total) responded that it is in development.

In Greece 15% (6 in total) responded with Yes, 66%(27 in total) responded with No and 19%(8 in total) responded that it is in development.

Regarding the companies that are active in both countries we observe that 67%(2 in total) responded with Yes and 33%(1 in total) responded with No.

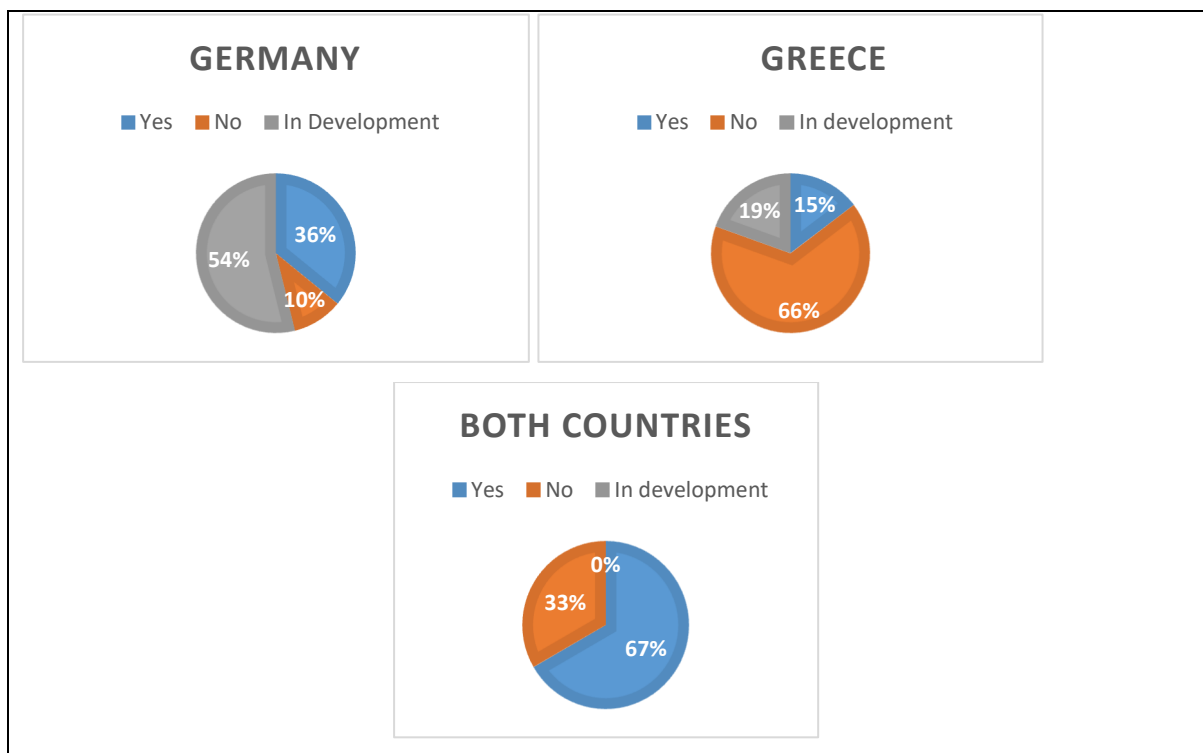


Figure 4.4: Existence of ESG officer or department

Regarding the ESG status of the companies (Question:5) we observe that:

In Germany 44%(17 in total) responded that they have an established ESG policy in place and 56% (22 in total) responded that they partially implement ESG standards.

In Greece 14%(6 in total) responded that they have an established ESG policy in place, 54% (22 in total) responded that they partially implement ESG standards and 32%(13 in total) that they don't implement ESG standards at all.

Regarding the companies that are active in both countries we observe that 67%(2 in total) responded that they have an established ESG policy in place and 33%(1 in total) responded that they partially implement ESG standards.

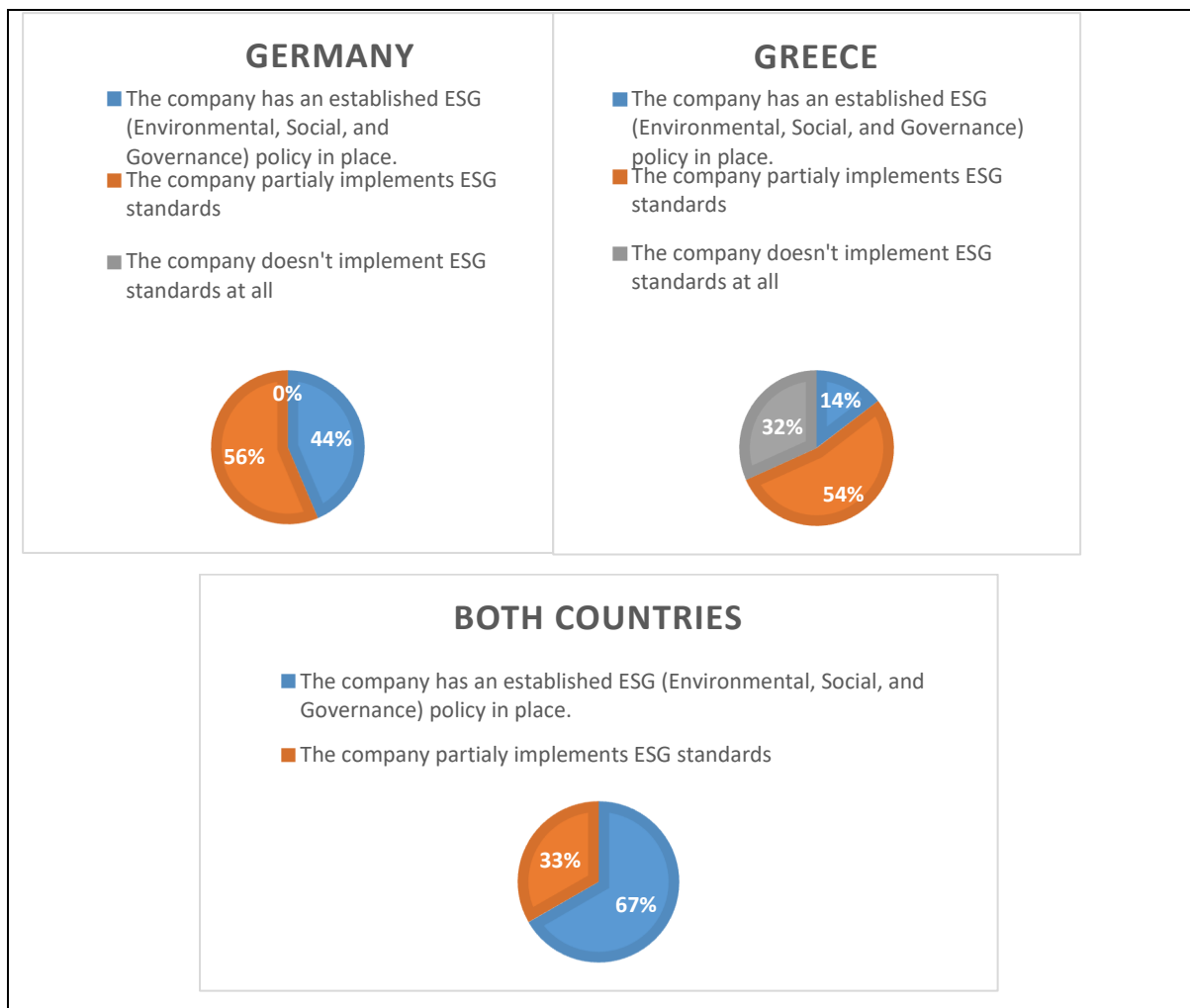
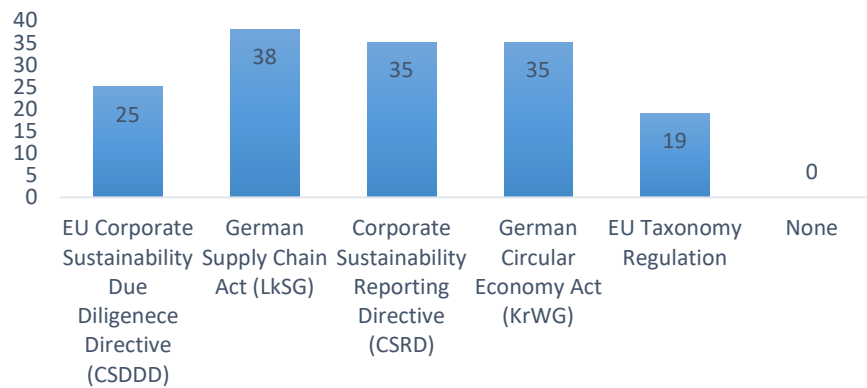


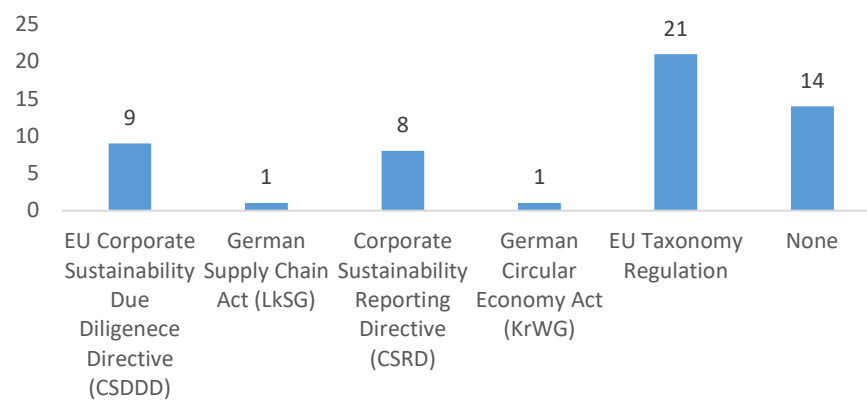
Figure 4.5: Status of ESG implementation

Regarding the familiarity with ESG regulations (Question:7) we get the following results:

### Familiarity with ESG regulations in German companies



### Familiarity with ESG regulations in Greek companies



### Familiarity with ESG regulations in companies active in both countries

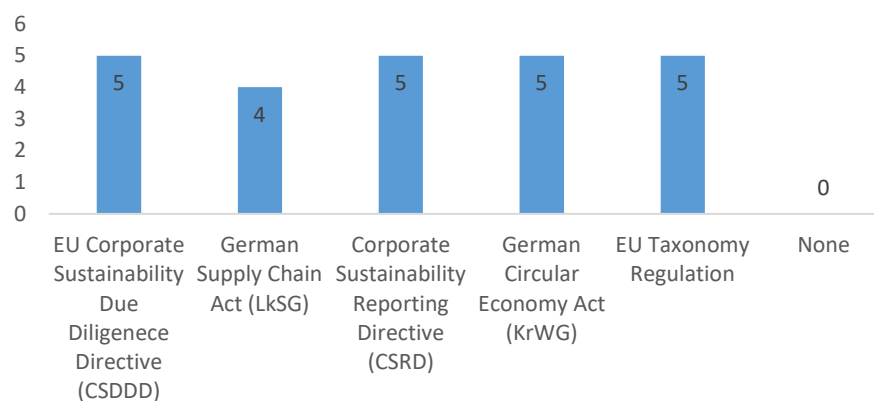


Figure 4.6: Familiarity with ESG regulations

In the above charts (figure 4.6) the familiarity of companies with the five most known ESG regulations is depicted. As it can be observed, German companies show higher awareness across most regulations, particularly the Corporate Sustainability Reporting Directive (CSRD) and the EU Corporate Sustainability Due Diligence Directive (CSDDD). Almost all of them (38 out of 39) are familiar with the German Supply Chain Act (LkSG). This fact may be explained, as it is a national regulation, so it has spread in all levels of German Supply Chains (production, transport, storage, distribution etc.). In contrast, Greek companies are less familiar, especially with national German regulations like LkSG and KrWG. The regulation with the higher percentage is EU Taxonomy (21 out of 41). Firms active in both countries show moderate awareness, with only a handful reporting knowledge across different frameworks.

In the following charts (figure 4.7) the awareness of international ESG frameworks such as SASB, GRI, CDSB, and ISO 14001/45001 is depicted. German companies are significantly more familiar with ISO (34 out of 39) and SASB (30 out 39), while Greek firms report slightly better awareness of ISO framework (27 out of 41). Companies operating in both countries show minimal but evenly spread familiarity across the four frameworks. As it is observed, the most known framework is ISO 14001/45001. This may be explained due to the fact that many companies seek for ISO certifications, either as an obligation imposed by suppliers or customers or just for increasing the prestige of the organization itself.

Regarding the familiarity with ESG frameworks (Question:8) we observe:

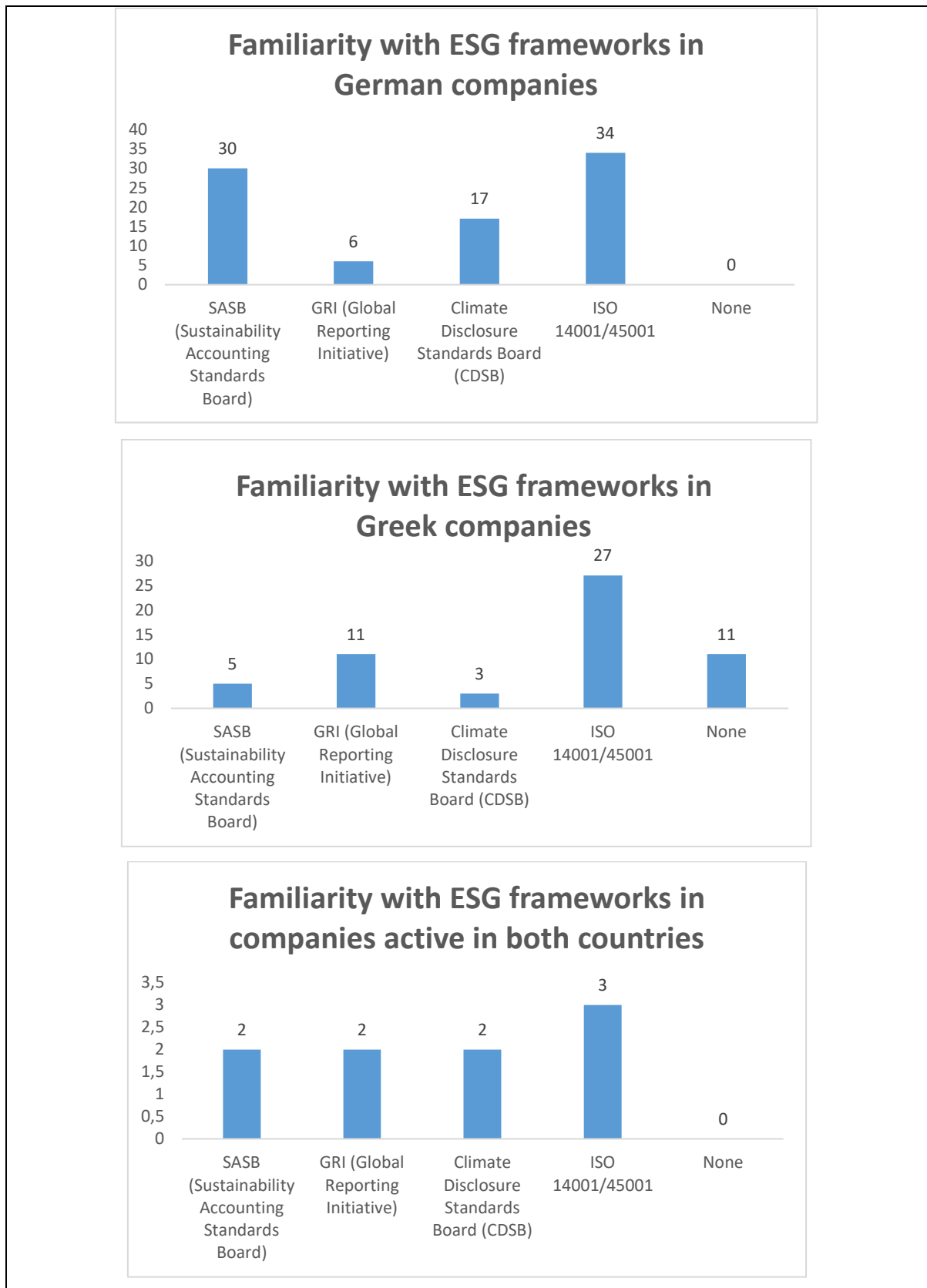


Figure 4.7: Familiarity with ESG frameworks

Regarding the inclusion of ESG in strategic planning (Question:9) we observe:



Figure 4.8: ESG as part of company's strategic planning



In the above charts (figure 4.8) the level of integration of ESG into the strategic planning can be observed. It can be clearly seen that German companies show a higher level of integration, as all of the responders refer to occasionally (18 out of 39) or regularly integration (21 out of 39). Although the sample size is small, it can be assumed that German transport companies tend to have aligned ESG integration with strategic planning.

On the contrary, almost half of the responses (21 of 41) refer that Greek transport companies rarely integrate ESG in their strategic planning. Only 25% (10 out of 41) responded that they integrate regularly ESG in their planning and 14.6% (6 out of 41) occasionally. It has also to be mentioned that there are four companies that responded “never”.

Regarding companies active in both countries, there are indications that there is a strong commitment to ESG integration in their strategic planning.

In the following charts (figure 4.9) regarding the offer of ESG training, the responses of German companies, show that the majority (32 out of 39) of them have integrated ESG training in their company culture, as they responded with regularly or occasionally.

On the contrary Greek companies seem to have low integration of ESG training as the majority responded with rarely or never (32 out of 41).

Regarding companies active in both countries, there are only few and controversial responses.

Regarding the implementation of ESG-related training (Question:11) we observe:

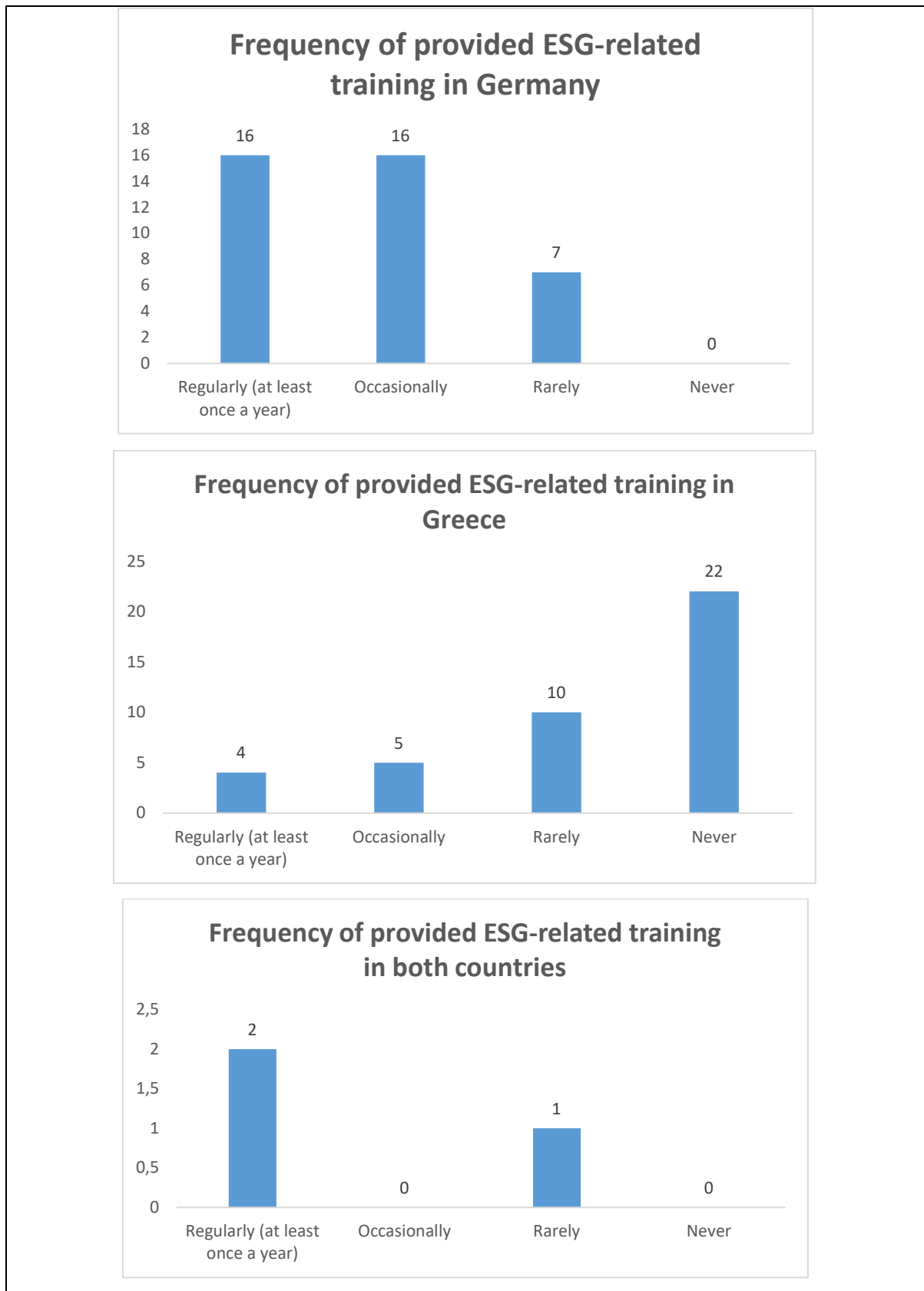


Figure 4.9: Frequency of ESG-related training

Regarding the frequency of requested ESG compliance by customers (Question:12) we observe:

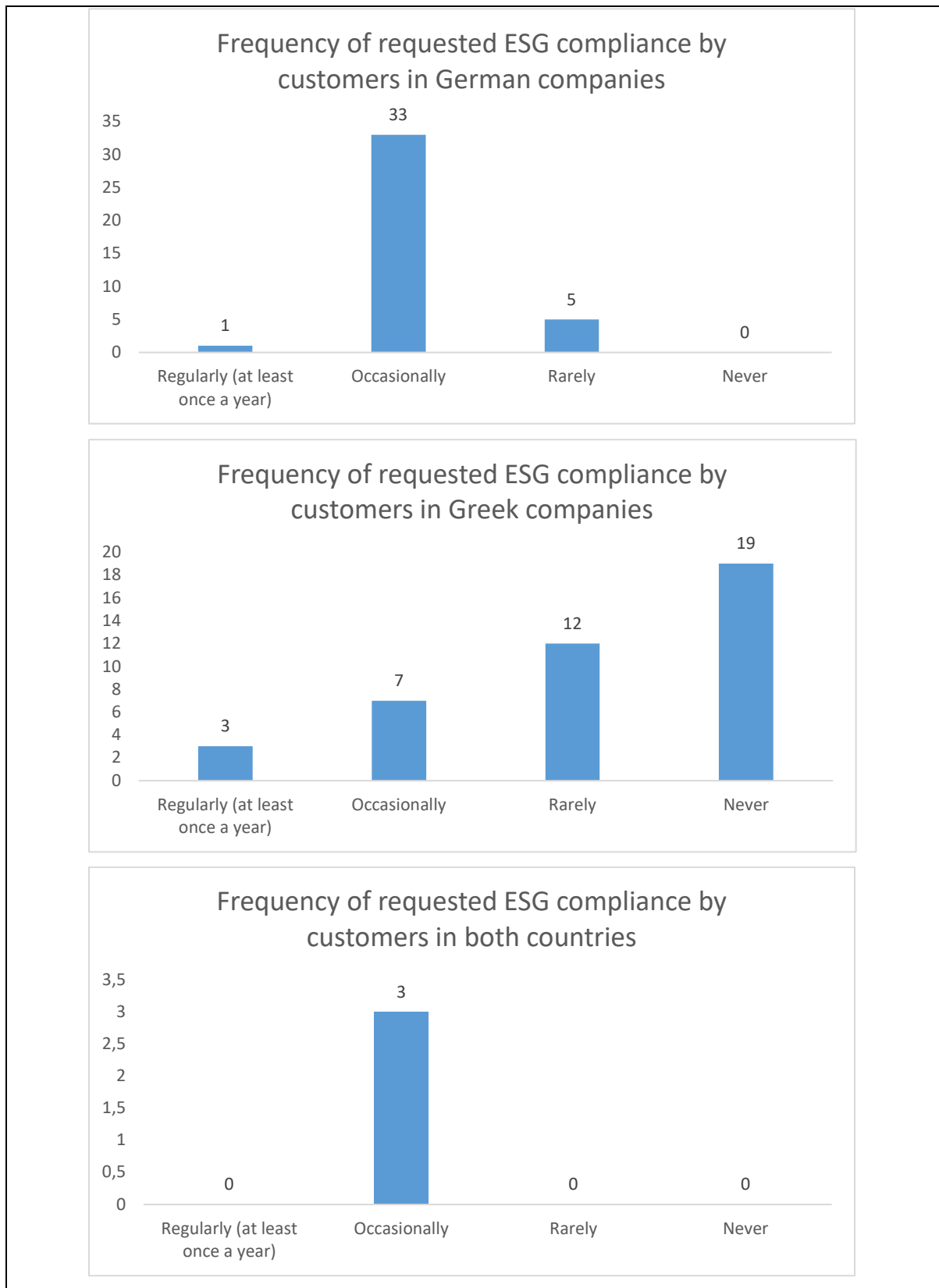


Figure 4.10: Frequency of requested ESG compliance by customers

The above charts (figure 4.10) depict the frequency of requested ESG compliance by customers.

The majority of German companies 86.8% (33 out of 39) responded that occasionally customers require ESG compliance from them.

On the contrary, almost a small portion of Greek companies 25% (10 out of 41) stated that their customers require ESG compliance from them. The majority 75% (31 out 41) responded that their customers do not have related requirements.

Regarding companies active in both countries, all of them responded that occasionally they have requirements from their customers for ESG compliance.

Similarly, the following charts (figure 4.11) depict the frequency of requested ESG compliance by suppliers.

As previously the majority of German companies 76.9% (30 out of 39) responded that their suppliers occasionally request ESG compliance from them.

On the contrary, about 50% (21 out of 41) of Greek companies stated that they never receive such a demand from their suppliers.

Regarding companies active in both countries, the responses show minimal requests from their suppliers.

Regarding the frequency of requested ESG compliance by suppliers (Question:13) we observe:

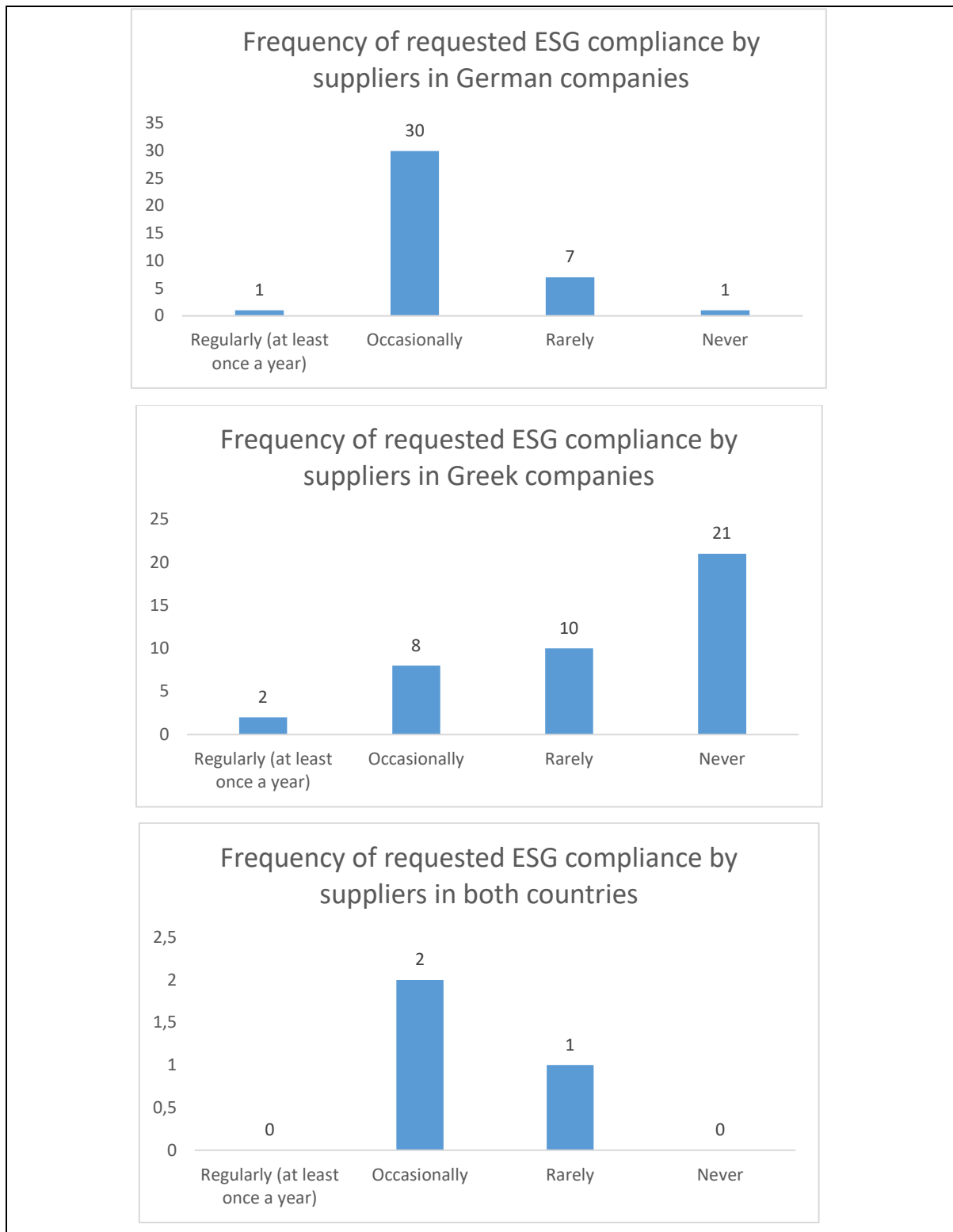


Figure 4.11: Frequency of requested ESG compliance by suppliers

Regarding the awareness of ESG in a company (Question:14) we observe:

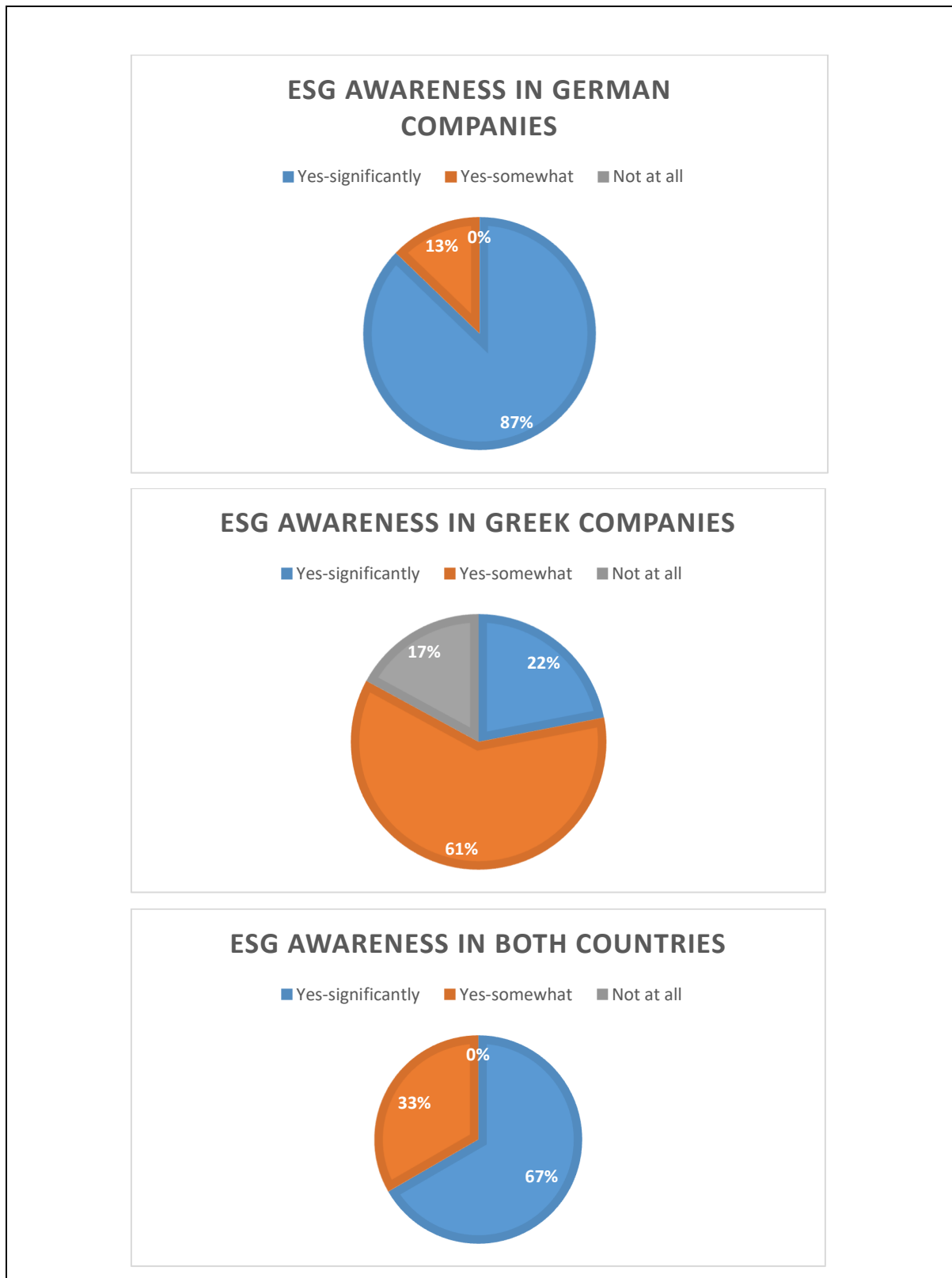


Figure 4.12: Change in ESG awareness

As it can be seen (figure 4.12), German companies at 87% stated that there is a significant increase in ESG awareness. Greek companies state only at 22% that there is a significant increase but 61% that there is slight improvement on the topic.

Firms active in both countries show a positive trend that can be read as a middle situation compared to the two countries.

In the following charts (figure 4.13) the situation about the willingness of suppliers to comply with ESG standards is depicted.

German companies stated at high percentage 71.7% (28 out of 39) that they rarely face resistance in ESG compliance by their suppliers and 28.3% (11 out of 39) refer occasional incidents.

Similarly, the majority of Greek companies 80.5% (33 out of 41) state that they occasionally or rarely face resistance, although there are some companies that state that there is resistance 12.2% (5 out of 41)

Firms active in both countries report minimal resistance.

Regarding the resistance of suppliers to comply with ESG standards (Question:17) we observe:

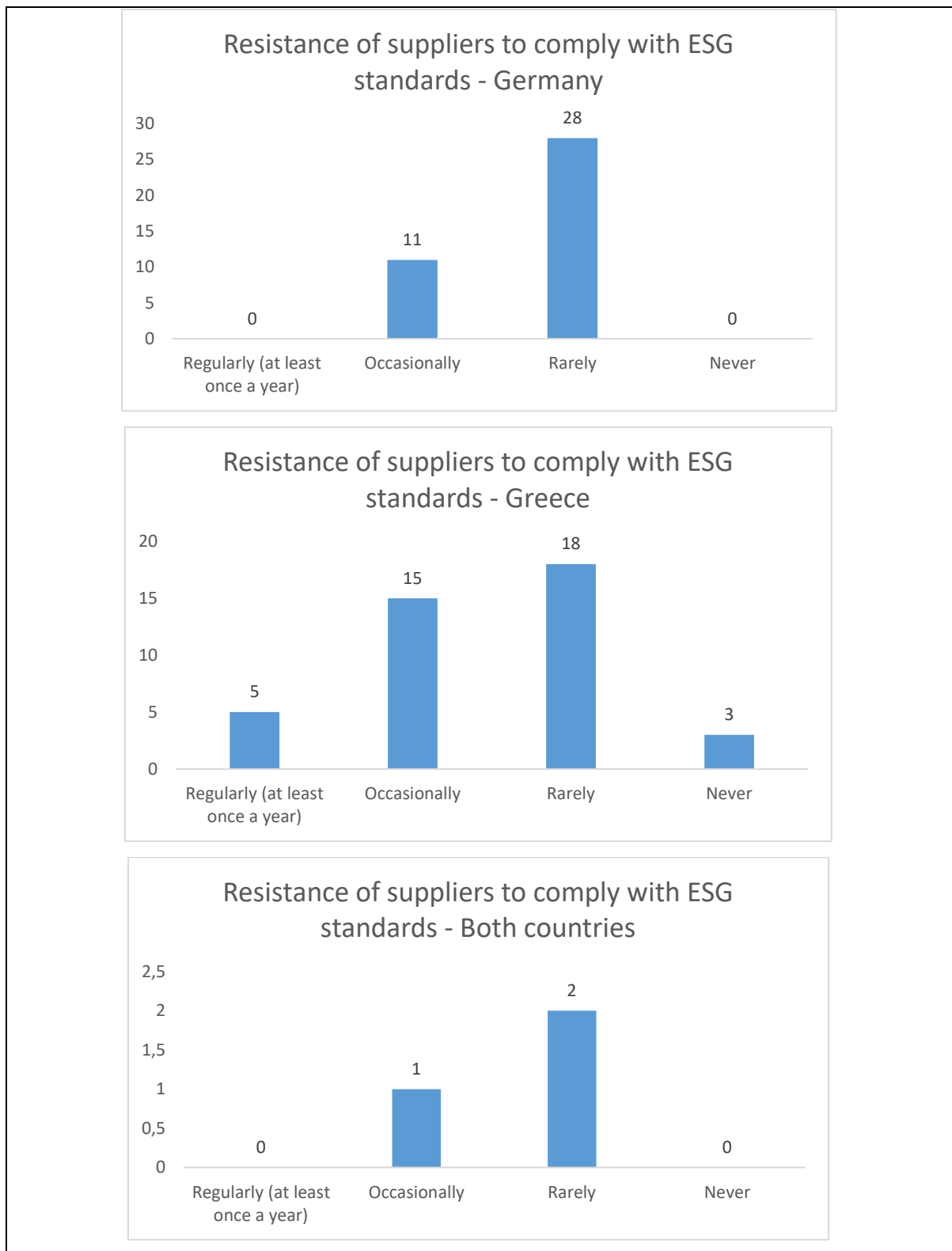


Figure 4.13: Resistance of suppliers to comply with ESG standards



Regarding the barriers companies face in ESG compliance (Question:18) we observe the percentage of the companies that chose each factor:

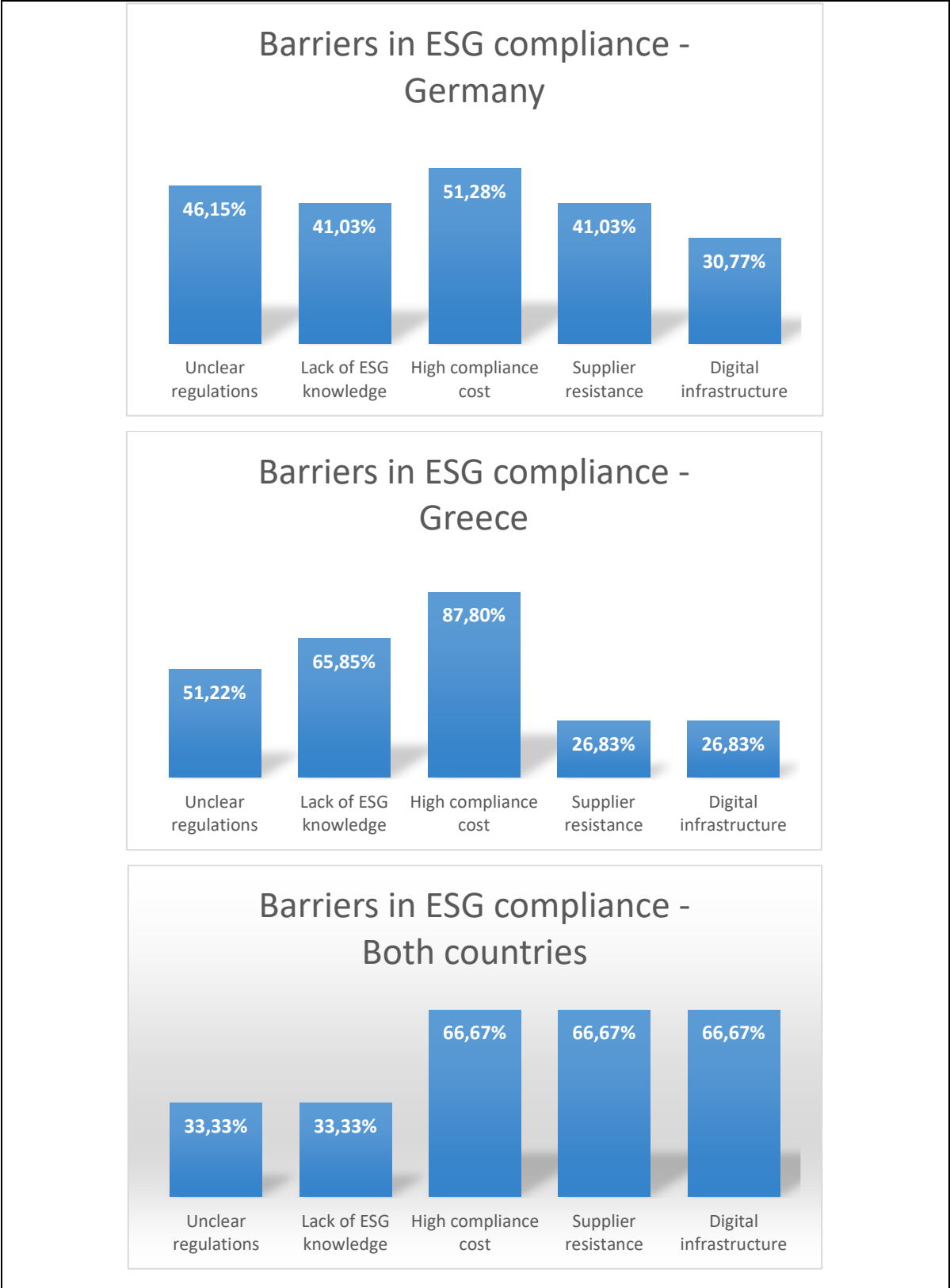


Figure 4.14: Barriers for ESG compliance

The above charts (figure 4.14) outlines major obstacles to ESG compliance.

In both countries the major obstacle for ESG compliance is represented by its cost. Although high for German companies (51.28%), for Greek companies it represents the main barrier (87.8%). Firms active in both countries gave also a 66.67%.

Regarding the other barriers, German firms show an almost equal anticipation to them, with around 40% of the companies choosing them.

Regarding Greece there is a higher percentage in “Unclear regulations” and “Lack of ESG knowledge” with over 50% of the firms choosing them.

Regarding firms active in both countries, the main choices after “cost” referred to “Supplier Resistance” and “Digital Infrastructure”.

The following charts (figure 4.15) depict the statement companies made regarding how they evaluate the level of difficulty in understanding of ESG regulations, as a barrier.

Regarding German companies, the majority 71.7% (28 out of 39) refer a moderate difficulty (score 3).

Greek firms show a wider spread, with some extreme difficulties (score 5).

Regarding the challenges companies anticipate in the implementation of ESG practices (Question :16) the following data has been collected:

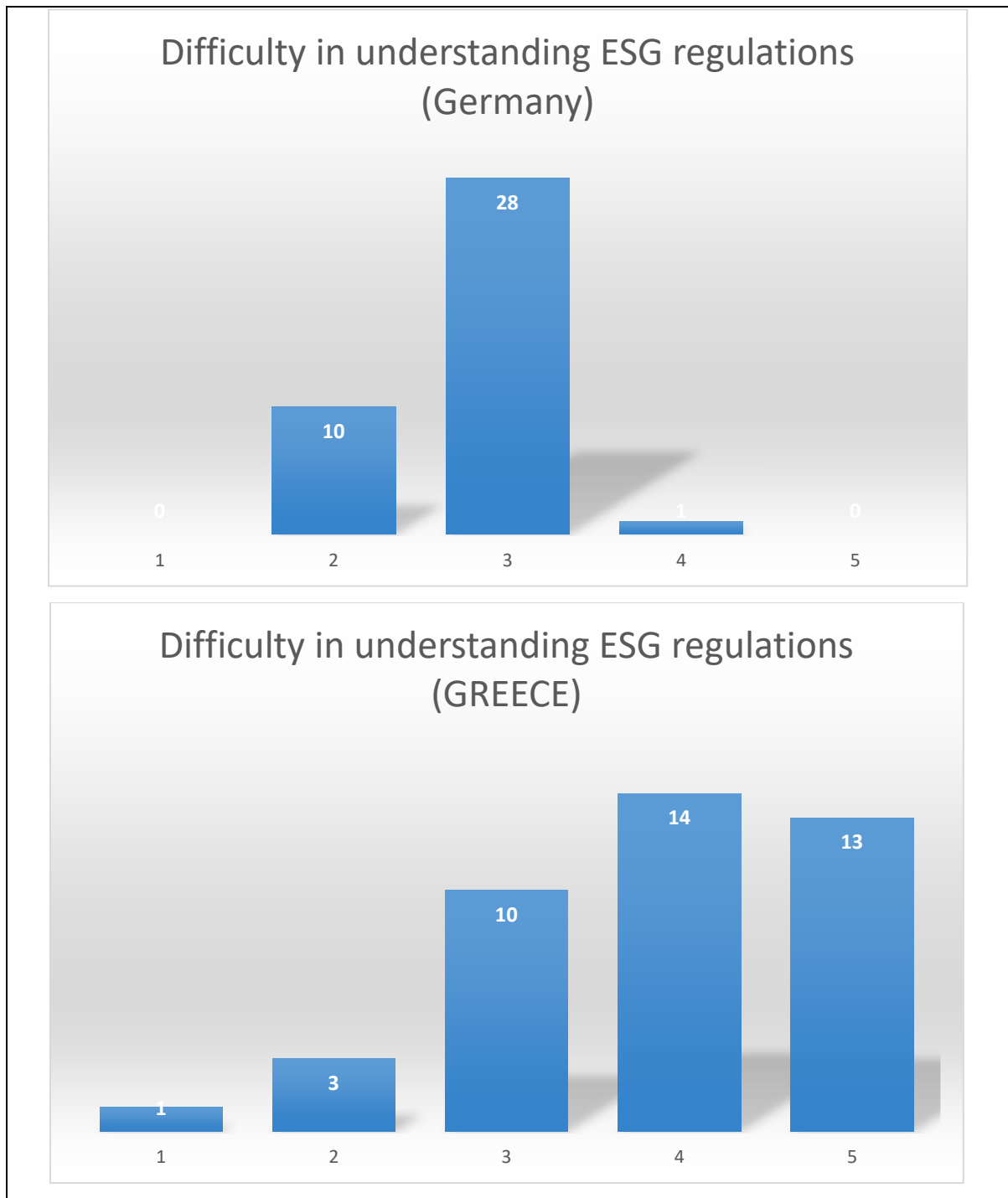


Figure 4.15: Difficulty in understanding ESG regulations

Regarding the challenges companies anticipate in the implementation of ESG practices (Question :19) the following data has been collected:

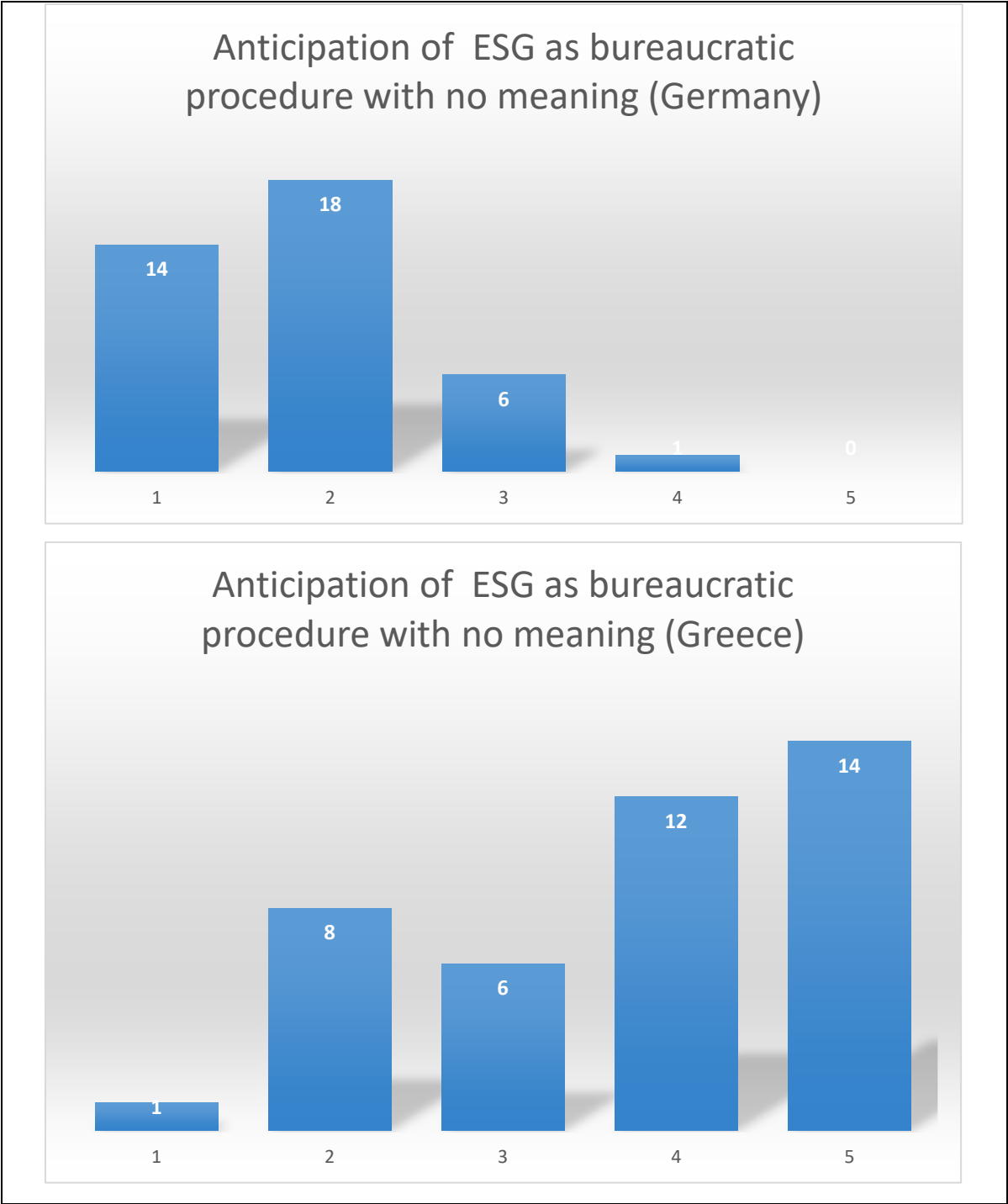


Figure 4.16: Anticipation of ESG as bureaucratic procedure with no meaning

The above charts (figure 4.16) show the anticipation of the assumption that ESG is a bureaucratic procedure with no meaning.

All the responses of German companies are in the range (1-3) showing that they are skeptic or disagree with the assumption.

Greek firms show a wider spread, with some strongly agreeing (score 5) that ESG is bureaucratic and with no meaning at all.

The following charts (figure 4.17) show the anticipation for the lack of technical expertise as a barrier.

All the responses of German companies are in the range (1-3) showing that they are skeptic or disagree with the assumption.

Greek firms show a wider spread, with a trend to agreement but half of the responses refer to score 3, indicating skepticism.

Regarding how companies consider the lack of technical expertise in ESG a barrier (Question :21) the following data has been collected:

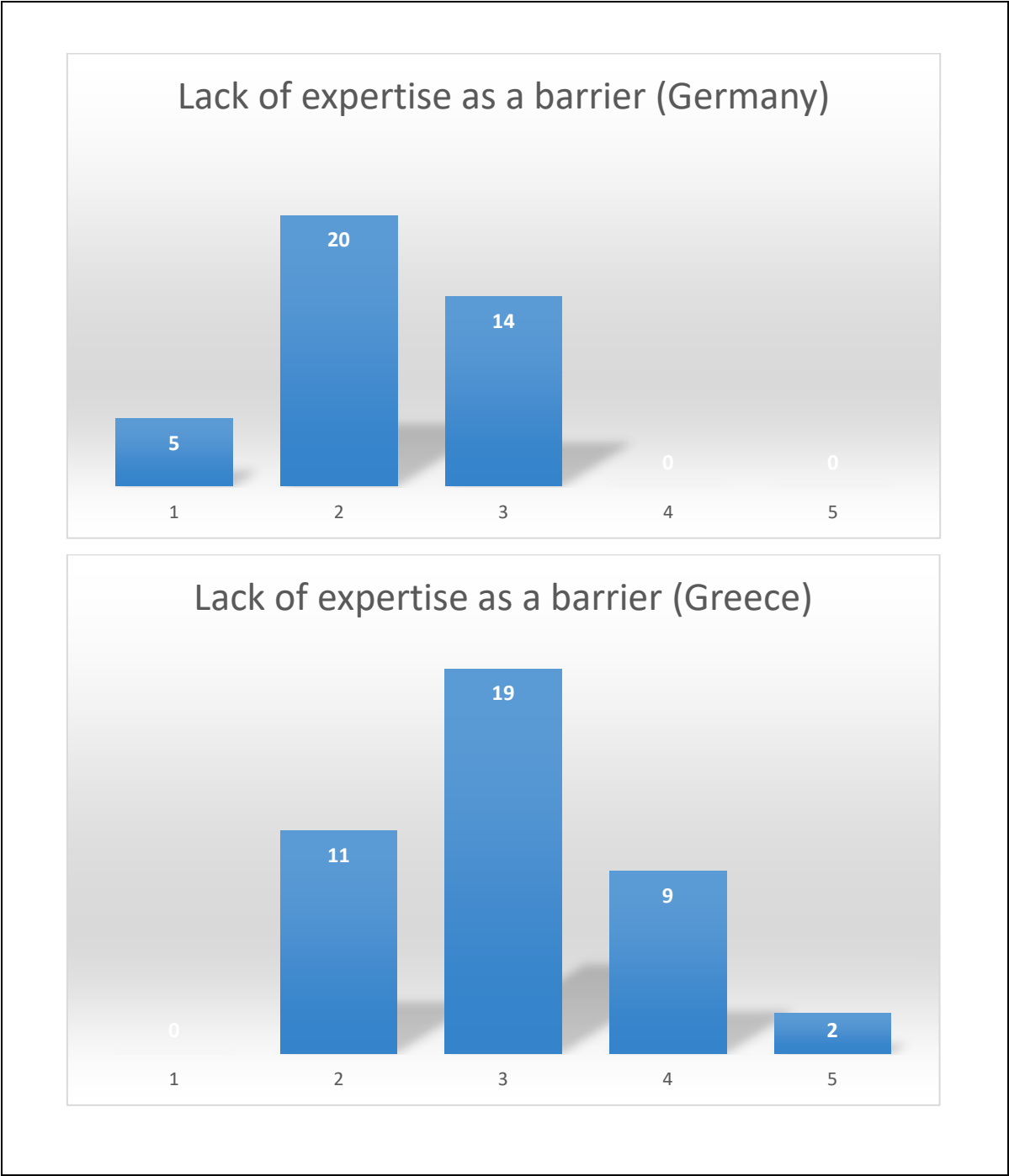


Figure 4.17: Lack of expertise as a barrier

The following charts illustrate the extent of companies' focus on ESG indicators.

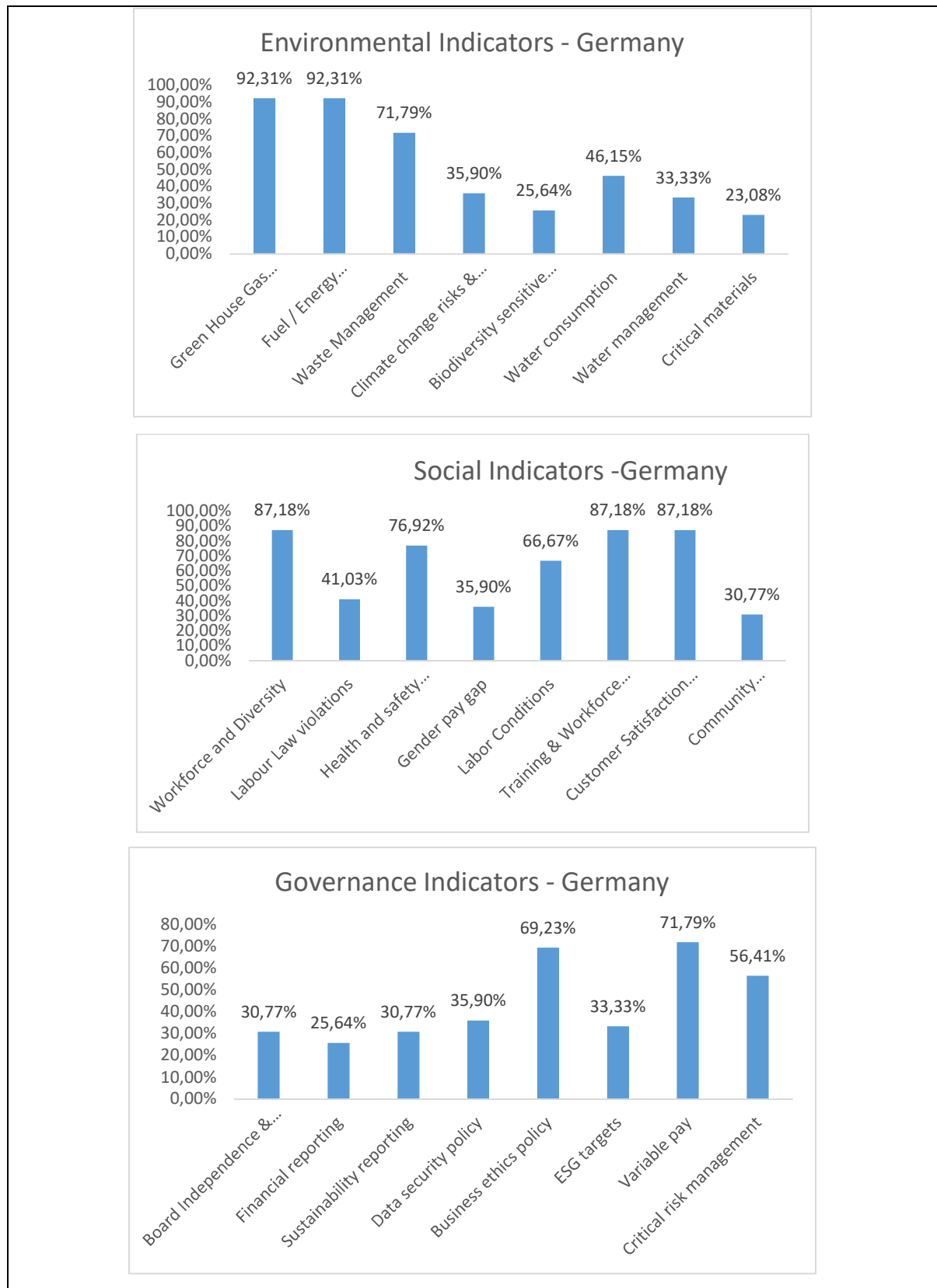


Figure 4.18: German companies' focus on ESG indicators

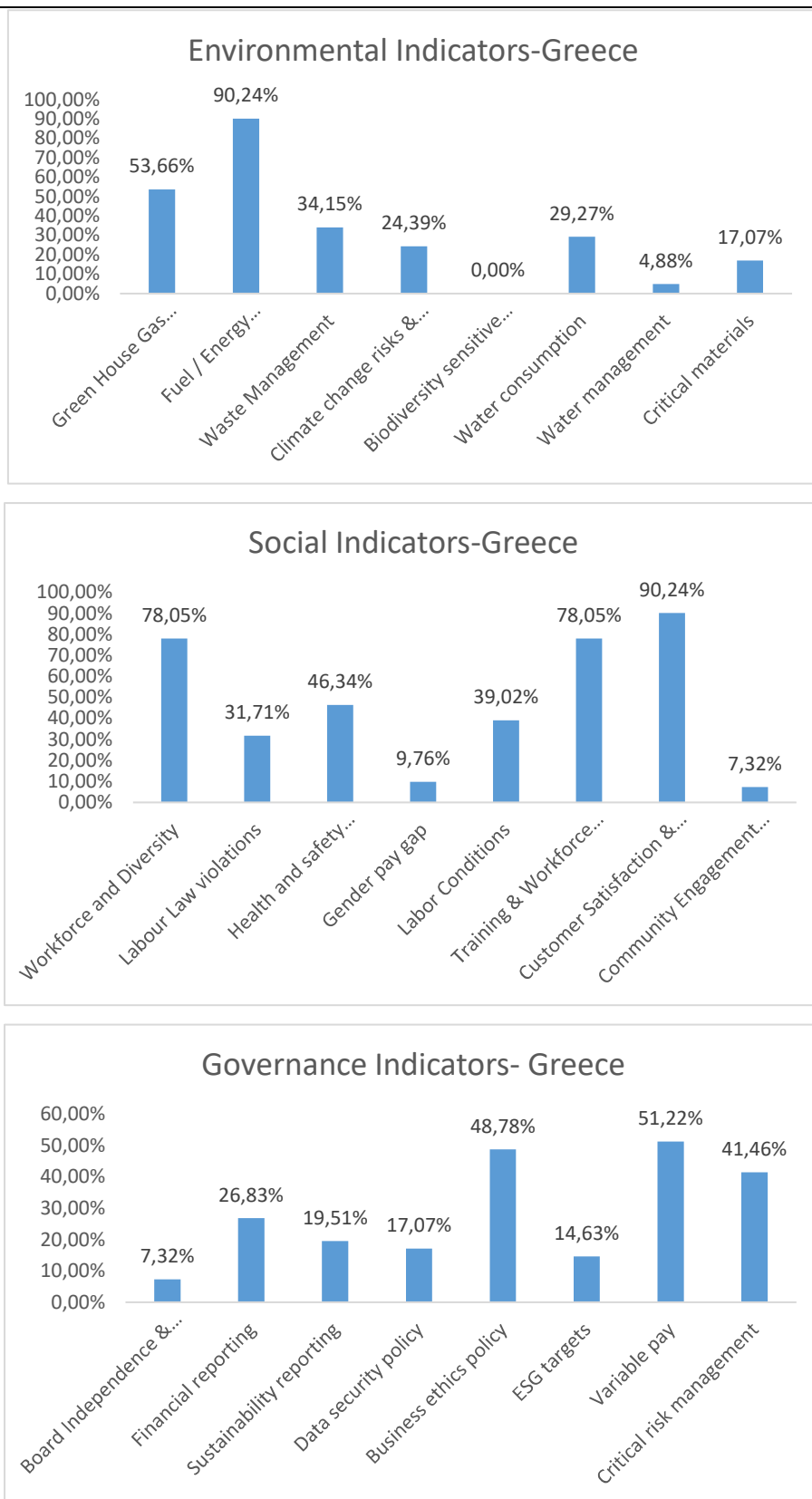


Figure 4.19: Greek companies' focus on ESG indicators



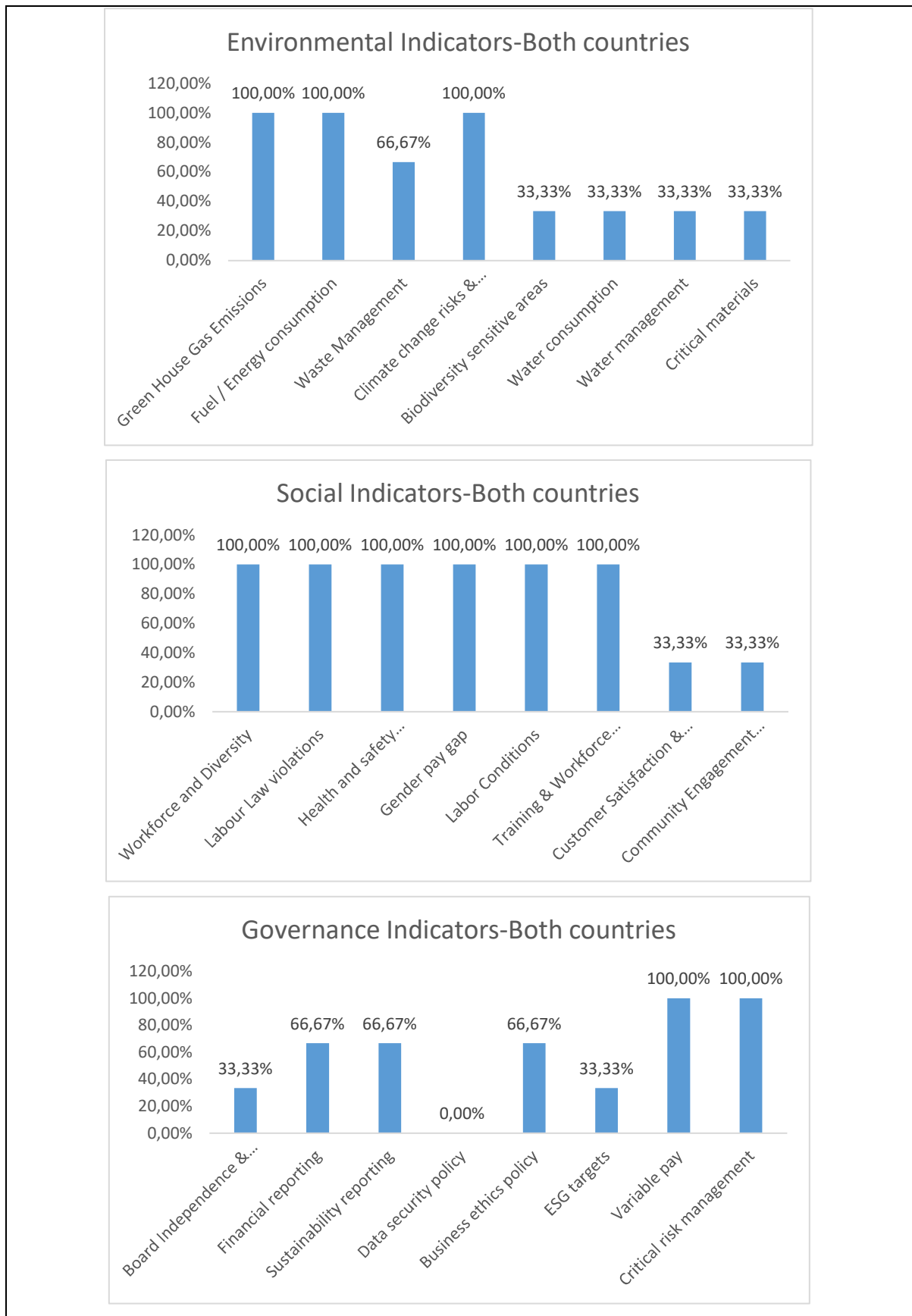


Figure 4.20: Companies' focus on ESG indicators of firms active in both countries

Regarding the previous charts (figure 4.18-4.20), the responses indicate the factors that companies prioritize more or less.

German companies, focus mainly on Green House Emissions and Fuel consumption, workforce and diversity, training and workforce development, customer satisfaction, business ethics policy and variable pay. The other areas receive less focus.

Greek companies similarly, focus on Fuel consumption, workforce and diversity, training and workforce development, customer satisfaction, but show less focus on governance indicators.

Companies active in both countries state a 100% focus on several ESG indicators but also show inconsistency, due to the small sample size.

## 4.2 Hypotheses testing

### ➤ ESG awareness

In this case we have the following hypotheses:

*H<sub>0</sub>: There is no difference in ESG awareness between German and Greek transport companies*

*H<sub>1</sub>: The level of ESG awareness is higher in German transport companies than in Greek transport companies*

In order to test the hypothesis, the responses for familiarity (question 6) will be used and understanding (question 10). Since we have two groups of each value (one for Germany and one for Greece), the aim is to test whether the difference of their means is statistically significant. In order to test this, a **two-sample t-test** (as we have two groups) in excel will be used in order to calculate the p-value for awareness and familiarity.

At first, we calculate the variance of the values by using the function var.s in excel and get the following results:

	<b>Familiarity</b>	<b>Understanding</b>
<b>Greece</b>	0,96	0,74
<b>Germany</b>	0,26	0,3

As it can be seen there is great variance of the responses in Greek companies compared to the German companies.

After applying the T.TEST function in excel with the following syntax (T.TEST(array1;array2;2;3), we get the following results:

	<b>Familiarity</b>	<b>Understanding</b>
<b>p-value</b>	5,82227E-14	6,32003E-14

As it is obvious the p-value for Familiarity and Understanding are <0.05, thus the H<sub>0</sub> has to be rejected and H<sub>1</sub> to be accepted.

➤ **Existence of a designated ESG officer and its impact on the level of ESG implementation**

In this case we can use the responses about the existence of an ESG officer or department (question 4) as an independent variable and the responses about the ESG status (question 5) as a dependent variable, in order to check how the ESG status is affected.

In order to analyze the responses quantitatively, the following mapping was performed:

ESG Status Text	Score
Doesn't implement at all	0
Partially implements ESG standards	1
Has an established ESG strategy/policy in place	2

In both case the hypotheses are:

*H<sub>0</sub>: There is no difference of the level of ESG implementation when the company has a designated ESG officer or department*

*H<sub>2</sub>: The existence of a designated ESG officer or department affects the ESG implementation*

At first a table with the separated score was created for each country:

1)Germany

Yes	No	In development
2	1	2
2	1	1
2	1	1
2	1	1
2		1
2		1
2		1
2		1
2		2
2		1
2		1
2		1
2		1
2		1
		1
		1
		1
		2
		1
		1
		1

Table 1: Results of the existence of ESG officer/department (Germany)

Then ANOVA:Single factor in EXCEL was applied with following results:

Anova: Single Factor (GERMANY)						
SUMMARY						
Groups	Count	Sum	Average	Variance		
Yes	14	28	2	0		
No	4	4	1	0		
In development	21	24	1,142857	0,128571		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	7,018315	2	3,509158	49,12821	5,14E-11	3,259446
Within Groups	2,571429	36	0,071429			
Total	9,589744	38				

As it can be seen the p-value is <0.05, thus it can be said that German companies with a designated officer or department are more likely to have a greater ESG implementation level compared to those companies who don't have. "In development" companies are in a between position.

## 2) Greece

Yes	No	In development
2	0	1
2	0	1
2	0	1
2	0	1
2	0	1
1	0	1
	0	1
	0	2
	0	
	0	
	0	
	0	
	0	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

	1	
	1	
	1	
	1	
	1	

Table 2: Results of the existence of ESG officer/department (Greece)

Then ANOVA:Single factor in EXCEL was applied with following results:

Anova: Single factor (Greece)						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Yes	6	11	1,833333	0,166667		
No	27	14	0,518519	0,259259		
In development	8	9	1,125	0,125		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	9,355804	2	4,677902	21,03902	7,07E-07	3,244818
Within Groups	8,449074	38	0,222344			
Total	17,80488	40				

As it can be seen the p-value is <0.05, thus it can be said that Greek companies with a designated officer or department are also more likely to have a greater ESG implementation level.

Although the sample size is small, there is indication that regardless the country, companies with structured ESG function within the company, are more likely to have a higher level of ESG implementation.

➤ **Sensitivity to Cost-related barriers**

In this case we have the following hypotheses:

*H<sub>0</sub>: There is no difference in sensitivity to Cost-related barriers for German and Greek transport companies*

*H<sub>3</sub>: Greek transport companies are more sensitive to Cost-related barriers*

In order to test the hypothesis, the responses for Cost as a barrier (question 15) will be used. Since we have two groups of each value (one for Germany and one for Greece), the aim is to test whether the difference of their means is statistically significant. In order to test this, a **two-sample t-test** (as we have two groups) in excel will be used in order to calculate the p-value for the sensitivity to Cost-related barriers.

At first, we calculate the variance of the values by using the function var.s in excel and get the following results:

	<b>Cost as barrier</b>
<b>Greece</b>	0.79
<b>Germany</b>	0.46

As it can be seen there is great variance of the responses in Greek companies compared to the German companies.

After applying the T.TEST function in excel with the following syntax (T.TEST(array1;array2;2;3), we get the following results:

	<b>Cost as barrier</b>
<b>p-value</b>	3,71204E-14

As it is obvious the p-value for cost as barrier is <0.05, thus the H<sub>0</sub> has to be rejected and H<sub>3</sub> to be accepted.

## 5 Findings

In the previous chapter a detailed analysis of the empirical findings was conducted, providing a clear picture of how Environmental, Social, and Governance (ESG) principles are perceived, implemented, and integrated by logistics and transportation companies across Germany, Greece, and those operating in both countries. The chapter was structured into two main sections: **descriptive statistics** and **statistical hypothesis testing**, providing a holistic view of ESG practices within the sector.

### 5.1 ESG Awareness and Knowledge differences

Figures 4.6 and 4.7 reveal a notable discrepancy in ESG awareness between German and Greek companies. German firms show a high level of familiarity with relevant ESG legislation, particularly with key regulations such as the EU Taxonomy Regulation and the German Supply Chain Act. This familiarity likely results from Germany's proactive ESG policy landscape, where companies are subject to both EU and national-level, show a clear mandate for corporate responsibility and compliance.

In contrast, Greek firms show significantly less awareness, suggesting limited engagement with ESG-related resources or institutional frameworks. The gap may reflect differing levels of regulatory enforcement or ESG integration within national policy agendas. With Greece facing fewer regulatory incentives or sanctions, many firms appear to operate without the pressure or motivation to engage meaningfully with ESG issues.

### 5.2 Strategic Commitment and Gaps in Training

Figure 4.8 illustrates that ESG principles are more commonly incorporated into strategic planning among German firms than their Greek counterparts. While ESG is regularly or occasionally included in German companies' decision-making frameworks, most Greek firms seldom engage with it in a structured way. This suggests a reactive rather than strategic stance on ESG, particularly in Greece.

Additionally, ESG-related training remains underdeveloped in Greek firms. According to Figure 4.9, over half of Greek firms never offer ESG training, significantly impeding their



internal capacity to operationalize ESG effectively. German companies, on the contrary, show more balanced training efforts, contributing to stronger implementation and a more informed workforce. The data emphasizes the importance of continuous learning and institutional commitment in embedding ESG values.

### **5.3 Suppliers/customers Influence and External Pressures**

The role of external stakeholders in ESG adoption is shown in Figures 4.10 and 4.11. German companies report more frequent ESG demands from customers and suppliers compared to Greek firms. This external pressure suggests a broader cultural and regulatory environment in Germany that favors ESG-conscious business practices.

Interestingly, while Germany leads in stakeholder-driven ESG momentum, even there, ESG demands from partners are not yet the rule. This highlights a broader opportunity across both markets for supporting groups, investors, and consumers to play a more active role in driving corporate ESG commitments.

### **5.4 Growing Awareness of ESG Issues**

Despite differences, Figure 4.12 indicates a positive trend in rising ESG awareness across both countries. German companies report substantial or moderate increases in awareness, while Greek firms, although behind, are also improving. This trend points to a growing ESG consciousness, potentially influenced by EU policy frameworks, international standards, and pressure within the industry.

### **5.5 Barriers to Implementation: Costs, Culture, and Capacity**

Figures 4.13 to 4.16 focus on the challenges companies face in implementing ESG. Surprisingly, supplier resistance (Figure 4.13) is minimal, possibly signaling a lack of strict enforcement rather than true compliance. More pressing barriers include high compliance costs and a lack of ESG-related knowledge, especially in Greek firms (Figure 4.14). These structural constraints hinder severe ESG implementation.

Perceptions also matter. Figure 4.16 reveals that many Greek firms view ESG requirements as bureaucratic and of little practical value. This cultural resistance poses a significant obstacle, limiting both the adoption and the strategic benefit of ESG initiatives.

## 5.6 Hypothesis Testing: Statistical Validation of Key Findings

The second half of the chapter rigorously tests three core hypotheses:

**Hypothesis 1** confirms a statistically significant difference in ESG awareness between German and Greek firms. The low p-values reinforce earlier findings, underscoring the depth of this knowledge gap.

**Hypothesis 2** examines whether the presence of a dedicated ESG officer correlates with better ESG implementation. ANOVA analysis supports this, revealing higher implementation scores among companies, German and Greek alike, with an ESG officer in place. This confirms the critical role of internal governance structures in ESG success.

**Hypothesis 3** explores cost sensitivity as a barrier. The results show that Greek firms are significantly more likely to cite cost as a constraint, again confirmed by a statistically strong p-value. These findings suggest a need for policy interventions like subsidies or financial support to help smaller or resource-constrained firms meet ESG goals.

## 5.7 ESG Indicators in Practice

Figures 4.18 to 4.20 offer a picture of how firms operationalize ESG indicators. German companies apply a broad, balanced approach to social and environmental metrics, including labor rights, CO<sub>2</sub> emissions, and waste management. In contrast, Greek firms show more interest in social dimensions but overlook environmental and governance metrics.

Firms operating in both markets show high, but inconsistent, engagement across indicators. This may be due to related variables such as regional regulations, stakeholder expectations or business model variations.

## 5.8 Conclusions and Implications

To sum up: German firms are ahead in ESG awareness, training, and integration, while Greek companies face significant barriers: financial, educational, and cultural, that limit their ESG development. Key enablers of ESG success include regulatory clarity, stakeholder pressure, and dedicated internal roles (e.g., ESG officers).

For **policymakers**, the findings underscore the need for harmonized EU-wide ESG standards, financial support mechanisms, and targeted educational campaigns. For **companies**, ESG must evolve from a compliance burden into a strategic opportunity. Bridging the ESG gap between Greece and Germany will be decisive for achieving a unified, sustainable European logistics sector.

## 6 Limitations and Future research

### 6.1 Limitations

While this study offers important insights into ESG practices among logistics companies in Germany and Greece, it also has some limitations that should be carefully considered. These limitations define the significance of the findings and how far they can be generalized or suggestions for future research can be made. In this case, we have the following limitations:

- Size of the sample

The current research was based on a limited sample of companies. Although comparative analysis could be conducted, the final outcome may not reflect the real situation of ESG implementation. The research was limited in a specific sector and in only two countries, so the findings cannot be generalized in all sectors and in all countries.

- Validity of the responses

As the data was collected by anonymous questionnaires, it cannot be known who exactly responded (unknown position in the company) and how honest they were, as they may wanted to present a better picture of their company that may not reflect reality.

- Time-Bound Snapshot

The findings of this research reflects the current period. As the political and economical environment is dynamic and changes due to new regulations or circumstances, the findings may soon not be valid.

- Limited Qualitative Context

While the study provides strong quantitative results, there are only few qualitative insights (e.g., interviews or case studies) that could have explained why certain trends exist or how firms perceive ESG challenges on a more personal or sectoral level.

In conclusion, literature represents a picture of ESG implementation in Europe, where regulatory ambition often collides with institutional activity. Germany represents a high-compliance, high-capacity model, while Greece reflects the challenges of aligning market behavior with EU-level sustainability goals. As ESG awareness continues to evolve, future research should explore hybrid regulatory models, sector-specific KPIs and the role of digital technologies in enhancing both compliance and performance. Comparative studies like this thesis are essential in identifying scalable solutions, highlighting policy gaps, and fostering cross-border ESG alignment in the context of an integrated European supply chain.

## **6.2 Directions for Future Research**

By addressing the following areas, future research can build a more detailed and accurate, understanding of ESG practices, not just in logistics but across different sectors of the supply chains and regions (countries or specific regions). This will ultimately support better policy decisions and more effective ESG strategies in business. Some suggestions for future trends could be:

- Increasing the number of countries/regions

Including more countries can help identify if the findings of the current research can be generalized and check if ESG regulations/frameworks have the same impact or have to be adjusted locally.

- Conduct research in different sectors of the Supply Chain

Logistics is just a part of the supply chain. Future studies might focus either on logistics sub-sectors (e.g., maritime logistics, last-mile delivery, rail freight) or on other sectors of the supply chain (e.g. manufacturing) in order to understand better sector-specific ESG challenges and strengths. This approach would offer more tailored recommendations for policymakers and companies.

- Long-Term research

Future research should research how ESG implementation changes over time. A longitudinal study (e.g., repeating this research every 2–3 years) could reveal whether ESG awareness, strategy, and training efforts are improving or stagnating, especially in regions currently lagging behind.

The digital transformation of ESG is another critical area for deeper research. Tools such as blockchain, AI-based compliance systems and data analytics platforms are increasingly adopted to enhance traceability and reliability in ESG reporting (Stroumpoulis et al., 2024). These technologies are not only reducing the burden of compliance but also facilitating real-time decision-making based on ESG metrics. Filograsso (2024) proposed a multicriteria approach for ESG evaluation in SMEs, demonstrating how digital tools can democratize ESG adoption even in resource-constrained environments.

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## Appendix A: “Questionnaires”

### A comparative analysis of ESG criteria and practices in German and Greek Supply chains

This questionnaire was created as part of my thesis for the completion of a Master's degree in Supply Chain Management (SCM) at the Hellenic Open University.

The purpose of the questionnaire is to compare the implementation of ESG principles in German and Greek transport and logistics companies.

All responses are anonymous and confidential and will be used solely for the purposes of this thesis.

The required time to complete the questionnaire does not exceed 5-6 minutes.

Thank you in advance for your time and participation in the research.



## General Information

1) In which country is your company active? \*

- ☐ Germany
- ☐ Greece
- ☐ Both of them

2) What is the size of your company? \*

- ☐ <10 employees
- ☐ 11-50 employees
- ☐ 51-250 employees
- ☐ >250 employees

3) What is the sector of activity of your company? \*

- ☐ Road transport
- ☐ Rail transport
- ☐ Air transport
- ☐ Maritime transport
- ☐ Multimodal transport

# 1 ESG awareness in Transport and Logistics Companies

4) Does your company have an assigned ESG officer or department? \*

- ☐ Yes
- ☐ No
- ☐ In development

5) What is the ESG status of the company? \*

- ☐ The company has an established ESG (Environmental, Social, and Governance) policy in place.
- ☐ The company partially implements ESG standards
- ☐ The company doesn't implement ESG standards at all

6) How familiar are you with the term ESG (Environmental, Social, Governance)?

1    2    3    4    5

---

Not ☐ ☐ ☐ ☐ ☐ Fully familiar

7) Which of the following ESG regulations are you familiar with? \*

- ☐ EU Corporate Sustainability Due Diligence Directive (CSDDD)
- ☐ German Supply Chain Act (LkSG)
- ☐ Corporate Sustainability Reporting Directive (CSRD)
- ☐ German Circular Economy Act (KrWG)
- ☐ EU Taxonomy Regulation

8) Which of the following ESG frameworks are you familiar with? \*

- ☐ Sustainable Development Goals (SDG's)
- ☐ SASB (Sustainability Accounting Standards Board)
- ☐ GRI (Global Reporting Initiative)
- ☐ Climate Disclosure Standards Board (CDSB)
- ☐ ISO 14001/45001
- ☐ None

9) Is ESG part of the company's strategic planning? \*

- ☐ Regularly (at least once a year)
- ☐ Occasionally
- ☐ Rarely
- ☐ Never

10) How would you evaluate your own understanding of ESG concepts?

	1	2	3	4	5	
	<hr/>					
Non	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Excellent

11) How often does your company provide ESG-related training? \*

- ☐ Regularly (at least once a year)
- ☐ Occasionally
- ☐ Rarely
- ☐ Never

12)Is ESG compliance requested by your customers (e.g. reports)?

- ☐ Regularly
- ☐ Occasionally
- ☐ Rarely
- ☐ Never

13)Does your company request ESG compliance by your suppliers?

- ☐ Regularly
- ☐ Occasionally
- ☐ Rarely
- ☐ Never

14)Is ESG awareness increasing in your company in the last years?

- ☐ Yes-significantly
- ☐ Yes-Somewhat
- ☐ Not at all

## 2 Barriers to ESG implementation

15) How does cost act as barrier to ESG implementation in your company?

1      2      3      4      5

---

☒ It is not a barrier at all    ☐ It is a significant barrier

16) How difficult is it to understand ESG regulations?

1      2      3      4      5

---

☒ It is not a barrier at all    ☐ It is a significant barrier

17) Do your suppliers resist to comply with ESG standards?

- ☐ Regularly
- ☐ Occassionally
- ☐ Rarely
- ☐ Never

18) Which of the following do you consider as the top barriers your company faces in ESG compliance?

- ☐ Unclear regulations
- ☐ Lack of ESG knowledge
- ☐ High compliance cost
- ☐ Supplier resistance
- ☐ Digital infrastructure

19) Do you consider ESG as bureaucratic procedure with no meaning?

1    2    3    4    5

Stro ☐ ☐ ☐ ☐ ☐ Strongly agree

20) Do you consider the pressure for ESG compliance by customers as a barrier?

1    2    3    4    5

Stro ☐ ☐ ☐ ☐ ☐ Strongly agree

21) Do you consider the lack of technical expertise as a barrier?

1    2    3    4    5

Stro ☐ ☐ ☐ ☐ ☐ Strongly agree



### 3 ESG indicators in Transport and Logistics

Which of the following ESG indicators does your company primarily focus on?

22. Environmental Indicators \*

- ☐ Green House Gas Emissions
- ☐ Fuel / Energy consumption
- ☐ Waste Management
- ☐ Climate change risks & opportunities
- ☐ Biodiversity sensitive areas
- ☐ Water consumption
- ☐ Water management
- ☐ Critical materials

23. Social Indicators \*

- ☐ Workforce and Diversity
- ☐ Labour Law violations
- ☐ Health and safety performance
- ☐ Gender pay gap
- ☐ Labor Conditions
- ☐ Training & Workforce Development
- ☐ Customer Satisfaction & Complaints
- ☐ Community Engagement Programs

24. Governance Indicators \*

- ☐ Board Independence & Diversity
- ☐ Financial reporting
- ☐ Sustainability reporting
- ☐ Data security policy
- ☐ Business ethics policy
- ☐ ESG targets
- ☐ Variable pay
- ☐ Critical risk management

## 4 Optional contact details

25. If you wish to receive the results of the research, please enter your email address.

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Author's Statement:

I hereby expressly declare that, according to the article 8 of Law 1559/1986, this dissertation is solely the product of my personal work, does not infringe any intellectual property, personality and personal data rights of third parties, does not contain works/contributions from third parties for which the permission of the authors/beneficiaries is required, is not the product of partial or total plagiarism, and that the sources used are limited to the literature references alone and meet the rules of scientific citations.