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Climate Change Risk and Financial Performance in Cyprus: Management Perceptions

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Abstract
This study examines the perceptions and strategies of senior managers from 30 firms in Cyprus regarding climate change risks and their impact on financial performance. The research targets a diverse range of industries, with a significant representation of small and medium-sized enterprises (SMEs). The findings reveal that most firms exhibit a moderate understanding of climate change risks, with larger firms being more proactive in conducting formal assessments and integrating these risks into their strategic planning. Key risks identified include extreme weather conditions, increased energy costs, and regulatory changes.
The financial impact of climate change varies significantly across industries and firm sizes. Larger firms, such as those in manufacturing and retail, manage to stabilize profitability through technological upgrades and efficiency improvements. In contrast, financial services firms face substantial challenges due to increased insurance claims and regulatory costs. Smaller firms report adverse effects on profitability due to rising material costs, though investments in renewable energy provide some mitigation. The ability to adapt to regulatory changes and market demands also plays a critical role in sustaining profitability in the face of climate change. This study underscores the critical need for enhanced climate change risk awareness, strategic integration, and supportive measures to bolster resilience and profitability across all sectors in Cyprus, emphasizing the importance of proactive climate risk management as a cornerstone of sustainable business practices.

Keywords
Climate change risks, financial performance, strategic planning, small and medium-sized enterprises, mitigation strategies, and, regulatory compliance

Introduction

Climate change poses a significant risk to global economies, with far-reaching implications for financial performance across various sectors. This study examines the impact of climate change on financial performance within the context of Cyprus, a small island nation in the Eastern Mediterranean region. Cyprus is particularly vulnerable to climate change due to its geographic location, limited natural resources, and dependency on climate-sensitive industries such as tourism and agriculture.

Climate change risk refers to analyzing the effects, probabilities, and response to climate change impacts. According to the EDHEC -Risk Institute (2022), climate risk are the negative impacts of changes in the climate on entities.

The roots of climate change risk and its financial reporting is sustainability reporting. It all started with the goal of the World Commission on Environment and Development in 1987 (GSSB, 2016). The Global Reporting Initiative (GRI) provided Sustainability Reporting Standards in 2016. According to the GRI, "it envisions a sustainable future enabled by transparency and open dialogue about impacts. This is a future in which reporting on impacts is a common practice by all organizations around the world. As the provider of the world's most widely used sustainability disclosure standards, we are a catalyst for that change". (Globalreporting.org, 2022)

At the world government meeting concerning climate targets in Glasgow in 2021, it was decided to create an International Sustainability Standards Board (ISSB) and to release a new type of International Financial Reporting Standard (IFRS) named the IFRS Sustainability Disclosure Standard. One of the areas of the proposed standard was climate-related disclosures, as cited by Reinhard Dotzlaw, Global IFRS leader of KPMG (KPMG, 2022). In 2022, the IFRS Foundation issued an Exposure Draft IFRS S2 on Climate-related disclosures (IFRS Foundation, 2022). It should be mentioned that an exposure draft allows a discussion on the proposed standard before it officially becomes a standard.

EDHEC – Risk Institute (2022) states that there are two categories of climate risks. The first is the physical risks associated with the direct impact of climate change on the entity. These could include flooding, fires, and droughts, amongst others that are related to climate change effects.

The second category is transition risks. These are business-related risks that follow social and economic shifts towards a more climate-friendly future. These include, amongst others, the impact of policy changes on climate change, the impact on the reputation of the firm connected with climate change, and shifts in the market due to the move to be more responsive to client change risks.

According to Hösli and Weber (2021), climate change affects businesses significantly. They state that organizations are expected to consider the effects of climate change on their businesses and climate-related risks.

Climate risk is a part of environmental reporting. However, are accountants reflecting climate risks in their financial reports? According to Davidson and Schuwerk (2021), who carried out a study of 107 carbon-intensive firms, 70% of the sample failed to disclose the financial effects of climate risk. In addition, they found that 80% of auditors provided no evidence of assessing the impact of climate risks during their audits. This research implies that it may be overstating their financial performance since any possible impairment losses from climate-related risks may be ignored and not recognized by the firms' organizational performance.

Tsahuridu and Carnegie (2018) stated that professional accountants should seriously bear in mind the impacts of what accounting touches and changes (including the effect of climate risks). They add that the consequences, whether intended or not, should be seriously considered in the financial reports of entities. The relationship between climate change risk and financial performance has become a critical area of research in recent years. (Chovancova, 2020) With increasing awareness of the potential economic impacts of climate change, researchers have sought to understand how these risks affect financial performance in various sectors. This section reviews key findings from previous research on the topic, highlighting the impact of climate change risk on corporate financial performance, investor behavior, and market outcomes. The continuous development of industries causes various environmental burdens. That is why it is necessary to improve the processes within production, which is also pointed out by studies focused on Streamlining Benchmarking in the Sustainable Development of Industries by Bednárová (2024). The goal of this process should be the efficient use of resources, which would eliminate time-energy flows and reduce the carbon footprint of production.

Several studies have investigated the direct impact of climate change risk on the financial performance of firms. For example, Delmas and Montes-Sancho (2011) found that companies with higher GHG emissions face greater financial risks, including higher compliance costs and potential liabilities. This is consistent with the findings of Griffin and Jaffe (2018), who reported that firms with a significant carbon footprint often have lower financial returns due to increased operational and compliance costs. The study by Šimková (2023) states that suitable recycling technologies, which follow a suitable processing chain and, last but not least, circulars for waste disposal, can significantly contribute to the reduction of the carbon footprint in industries. In this case, it is possible to actively involve forms of the circular economy, which could be beneficial for the tourism industry.

Furthermore, Eccles, Ioannou, and Serafeim (2014) demonstrated that companies with robust environmental performance tend to outperform their peers financially. Their longitudinal study revealed that firms with strong sustainability practices, including proactive climate risk management, had higher stock returns and better accounting performance over time. This suggests that effective management of climate-related risks can improve financial performance by mitigating potential negative impacts.

The influence of climate change risk on investor behavior has also been a significant area of research. Krueger, Sautner, and Starks (2020) investigated how institutional investors respond to climate risk. They found that investors increasingly consider climate-related risks in their investment decisions, favoring companies with strong environmental practices. This shift is driven by the growing recognition that climate risks can affect long-term financial performance and investment returns.

Research has also delved into the broader market implications of climate change risk. Andersson, Bolton, and Samama (2016) examined the potential for climate risk to affect market stability, suggesting that widespread recognition of climate risks could lead to significant market revaluations. They proposed that markets might experience abrupt adjustments as investors reprice assets based on their climate risk exposures, leading to potential market volatility.

Additionally, Hong, Li, and Xu (2019) explored the relationship between climate risk and asset prices, finding that companies with higher exposure to climate risk tend to have lower market valuations. This is because investors demand a risk premium for holding stocks of firms that are more vulnerable to the adverse effects of climate change. These findings highlight the critical role of investor perceptions and behavior in shaping the financial performance of companies facing climate risks.

Moreover, studies by Liesen et al. (2017) emphasized the importance of climate disclosure in market outcomes. Their research indicated that transparent reporting of climate risks and mitigation strategies can positively influence market perceptions and valuations. Firms that provide comprehensive climate-related disclosures tend to enjoy better market performance, as transparency reduces information asymmetry and builds investor confidence.

Most businesses in Cyprus are small and medium-sized enterprises (SMEs). According to the European Commission (2022), in the year 2021, 99.8% of Cypriot businesses are SMEs. Further to this, they state that 82.1% of persons employed are from SMEs and that the value added by SMEs is 76.4% compared to 23.6% for larger enterprises.

Hence, based on this data, SMEs are a significant factor in Cyprus' economy. In addition, the European Commission (2022) states that 89 firms are considered large enterprises in Cyprus (as defined by employing more than 250 persons). Hence, a strong argument can be made that any climate risk disclosures in Cyprus should be based on taking SMEs into account.

Recent climate models predict that Cyprus will experience higher temperatures, reduced precipitation, and more frequent extreme weather events, including heatwaves and droughts. These changes are expected to exacerbate existing environmental stresses, posing considerable challenges to the country's economic stability and growth. Consequently, understanding the relationship between climate change risks and financial performance is critical for Cyprus policymakers, businesses, and investors.

This research aims to explore how climate change risk influences financial performance in Cyprus by analyzing sector-specific impacts, assessing the vulnerability of key economic activities, and identifying adaptive strategies employed by businesses. By doing so, the study seeks to provide insights into the economic repercussions of climate change and offer recommendations for enhancing resilience and sustainability in the face of increasing environmental risks.

Previous studies have extensively documented the adverse effects of climate change on financial markets globally, highlighting the importance of integrating climate risk into financial decision-making. However, a paucity of research focuses specifically on small island economies like Cyprus, where the interplay between climate change and financial performance may present unique challenges and opportunities. This study addresses this gap by comprehensively analyzing the climate-finance nexus in the Cypriot context.

Methods and Methodology

The main goal of our work will be to deal with processing the primary source of data from the Cyprus industry and identify the main dependencies between production and the impact of production on the living environment. Cyprus is a specific country because it is an island country, and the range of industries is focused primarily on tourism and agriculture, significantly affecting the living environment.

This study's primary data source is a structured questionnaire given to senior managers of companies in Cyprus. The questionnaire aims to collect detailed information on how climate change risks are perceived and managed, their integration into business strategies, and their effects on financial performance. The data collection

tool is divided into seven sections, each addressing different aspects of climate change risk and financial performance. These sections are:

Section 1: General Information of the company and its participants.
Section 2: The awareness and perception of climate change risks and the identification of key risks
Section 3: The integration of climate risks into business strategy
Section 4: The relationship between financial performance and climate change
Section 5: Mitigation and adaptation Strategies
Section 6: Future outlook concerning climate change risks
Section 7: Additional Comments on climate change risks

Analytical Framework

The study's analytical framework involves quantitative and qualitative data analysis methods to provide a comprehensive understanding of the intersection between climate change risks and financial performance. It is analyzed in two ways:

Firstly, via thematic analysis. Under this approach, responses to open-ended questions are coded and analyzed to identify recurring themes and patterns. This analysis provides deeper insights into managerial perspectives, strategies adopted, and the challenges faced in addressing climate change risks.

Secondly, via content analysis, a systematic coding approach is used to quantify and analyze the presence of certain words, themes, or concepts within the qualitative data.

Sampling and Data Collection

A purposive sampling method is employed to select 30 senior managers from various industries in Cyprus. This ensures that the respondents have significant decision-making authority and are knowledgeable about their company's strategic and financial considerations concerning climate change. The questionnaire is administered online to facilitate broad participation and ease of response.

Validity and Reliability

To ensure the validity and reliability of the questionnaire, a pilot test was conducted with a small group of senior managers before the main data collection phase. Feedback from the pilot test was used to refine the questionnaire for clarity, relevance, and comprehensiveness. The final version of the questionnaire is designed to minimize bias and ensure that it accurately captures the intended information.

Ethical Considerations

Ethical considerations are strictly adhered to throughout the study. Informed consent is obtained from all participants, ensuring they understand the study's purpose, procedures, and their rights, including the right to withdraw at any time. Confidentiality and anonymity of the respondents are maintained, with data securely stored and used solely for academic purposes.

Limitations

The study acknowledges potential limitations, such as the reliance on self-reported data, which may be subject to respondent bias. The purposive sampling technique, while ensuring relevant respondents, may introduce selection bias. These limitations are considered when interpreting the findings and recommendations for future research, which include expanding the sample size and incorporating longitudinal data to enhance robustness.

This methodology provides a structured and comprehensive approach to exploring the critical interplay between climate change risks and financial performance among firms in Cyprus.

Research Design

This study employs a mixed-methods approach to examine the relationship between climate change risk and financial performance among firms in Cyprus. The primary data collection tool is a structured questionnaire administered to senior managers across various industries. The questionnaire is designed to capture both quantitative and qualitative data, providing a comprehensive understanding of how climate change risks are perceived, integrated into strategic planning, and their subsequent financial impacts.

Sample Selection

The target population for this study includes senior managers of 30 firms operating in Cyprus. A purposive sampling technique is utilized to ensure that respondents hold significant decision-making authority and possess substantial knowledge regarding their company's strategies and financial performance. The sample encompasses a diverse range of industries to capture sector-specific insights and enhance the generalizability of the findings.

Data Collection

Data collection was conducted through an online survey platform to ensure broad reach and convenience for participants. The questionnaire consists of the following sections:

General Information: Collects basic demographic and company information to contextualize responses.

Understanding of Climate Change Risks: Assesses respondents' awareness and perception of climate change risks.

Integration of Climate Risks into Business Strategy: Evaluate the extent to which climate change risks are incorporated into strategic planning processes.

Financial Performance and Climate Change: Investigate the financial impacts of climate change risks and related mitigation or adaptation efforts.

Mitigation and Adaptation Strategies: Explores the strategies adopted by firms to address climate change risks and the challenges faced in implementing these strategies.

Future Outlook: Gathers insights on future expectations and preparedness regarding climate change risks.

Additional Comments: Provides an opportunity for open-ended feedback to capture nuanced perspectives.

Data Analysis

Quantitative data from the closed-ended questions are analyzed using tabulated data to identify patterns and relationships between variables.

Qualitative data from open-ended questions are analyzed using thematic analysis. This involves coding responses to identify recurring themes and insights that provide a deeper understanding of managerial perspectives and strategies related to climate change risk management.

The analysis is based on questionnaire responses from firms in diverse industries, including financial services, retail, hospitality, property development, manufacturing, and technology.

Validity and Reliability

To ensure the validity and reliability of the questionnaire, a pilot test was conducted with a small group of senior managers prior to the main data collection phase. Feedback from the pilot test was used to refine the questionnaire for clarity, relevance, and comprehensiveness. Additionally, triangulation of quantitative and qualitative data enhances the robustness of the findings by corroborating results across different data sources.

Ethical Considerations

Ethical considerations are paramount in this study. Informed consent was obtained from all participants, ensuring they were aware of the study's purpose and their rights, including the right to withdraw at any time. Confidentiality and anonymity of the respondents are strictly maintained, with data securely stored and used solely for academic purposes.

Limitations

While the study aims to provide valuable insights, several limitations must be acknowledged. The purposive sampling technique, while ensuring relevant respondents, may introduce selection bias. Additionally, the reliance on self-reported data may be subject to respondent bias or inaccuracies. Future research could address these limitations by incorporating longitudinal data and expanding the sample size.

This methodological approach provides a robust framework for understanding the interplay between climate change risks and financial performance, offering valuable implications for both academia and industry stakeholders.

Results

Demographics

The target population for this study includes senior managers of 30 firms operating in Cyprus. The industry distribution indicates a diverse representation of sectors, with the Retail sector being the most represented (23.3%) and Technology companies the least (10%) (See Table 1). This is in line with the population of firms in Cyprus.

Table 1. Industry sector

Industry Sector	Number of Companies
Financial Sector	**4**
Retail Sector	**7**
Hotels and Tourism	**6**
Manufacturing	**5**
Property Development	**5**
Technology Companies	**3**
Total	**30**

A majority (56.7%) of the companies surveyed are small enterprises with fewer than 10 employees, suggesting that climate change risk perceptions and financial performance are heavily influenced by smaller companies in Cyprus (See Table 2).

Table 2. Number of Employees

Number of Employees	Number of Companies
Below 10 employees	**17**
11-50 employees	**8**
Above 50 employees	**5**
Total	**30**

Most senior management participants have been with their companies for 6-10 years (40%), indicating that the insights on climate change risks and financial performance come from fairly experienced individuals in their respective firms (See Table 3).

Table 3. Years with the Company

Years with the Company	Number of Participants
Up to 5 years	**8**
6-10 years	**12**
More than 10 years	**10**
Total	**30**

A significant portion (60%) of the companies have an annual turnover of up to 5 million Euros. This suggests that smaller revenue companies are more prevalent in the survey, which might influence the findings related to financial performance and climate change risks (See Table 4). This is in line with the population in Cyprus, where most businesses are small firms.

Table 4. Company Size (Revenue), Annual Turnover

Annual Turnover (Million Euros)	Number of Companies
Up to 5	**18**
5-10	**6**
Above 10	**6**
Total	**30**

In accordance with Table 5, the results indicate a mix of both relatively new and well-established companies, providing a balanced view of climate change risk perceptions over different operational periods.

Table 5. Years in Operation

Years in Operation	Number of Companies
Up to 10 years	**10**
10-30 years	**14**
More than 30 years	**6**
Total	**30**

The demographic analysis reveals a broad representation across various industry sectors, company sizes, and years of operation. The predominance of small-sized companies with fewer than 10 employees and annual turnovers of up to 5 million Euros highlights the significant presence of small and medium-sized firms (SMEs) in the survey.

Additionally, the tenure of senior management suggests that the insights on climate change risk and financial performance are from experienced professionals, predominantly from firms with diverse operational histories. This diversity in demographics is crucial for understanding the comprehensive impact of climate change on financial performance across different business contexts in Cyprus.

Awareness and Understanding of Climate Change Risks

The awareness and understanding of climate change risks among the surveyed firms varied, indicating differing levels of engagement and knowledge across sectors. Table 6 summarises the responses regarding their understanding of climate change risks impacting their industry.

Table 6. Understanding of Climate Change Risks Impacting Industry

Understanding Level	Number of Firms
Very Low	**3**
Low	**7**
Moderate	**12**
High	**3**
Very High	**5**
Total	**30**

The majority of firms (40%) reported a moderate understanding of climate change risks. A smaller percentage (10%) rated their understanding as very high, suggesting that while there is a baseline level of awareness, a significant number of firms still have low to moderate comprehension of how climate change may impact their industry (See Table 6).

The responses revealed a notable divide between smaller and larger firms regarding the conduction of formal assessments of climate change risks. Most smaller firms in the sample have not conducted any formal assessments or studies on climate change risks. Conversely, all larger firms have undertaken such evaluations.

Examples from specific sectors include:

Financial Sector: Firms have analyzed the impact of climate change on loans, investment portfolios, and insurance claims.

Large Retailers: The effects of climate change on energy consumption, supply chain logistics, and customer behavior have been considered.

Manufacturers: The impact of increased temperatures and regulatory changes related to climate change are key areas of focus.

The identification of key risks associated with climate change varied significantly across different industries. However, several common themes emerged, as summarised in Table 7.

Table 7. Key Climate Change Risks Identified by Firms

Key Risk Area	Examples
Extreme Weather Conditions	Business disruption due to hurricanes, floods, heatwaves
Increased Energy Costs	Higher operational costs due to increased temperatures
Changes in Consumer Demand	The shift in consumer behavior towards more sustainable products
Regulatory Changes	Compliance with new regulations aimed at mitigating climate change
Increased Costs of Agricultural Products	Higher costs due to climate impacts on agriculture
Inflation Effects	General rise in costs associated with climate change
Investments in Non-Current Assets	Investments in energy-saving technologies and infrastructure improvements

These areas indicate a broad spectrum of climate change-related risks that firms are considering, from direct operational impacts to broader economic and regulatory changes. The diversity in identified risks underscores the multifaceted nature of climate change and its pervasive influence across different aspects of business operations. The analysis of awareness and perception of climate change risks among firms in Cyprus highlights varying levels of understanding and preparedness. While larger firms have undertaken formal assessments and identified specific risks, smaller firms appear less engaged in this area. This suggests a need for increased support and resources to enhance climate change risk management across all sectors, particularly for smaller enterprises.

Integration of Climate Risks into Strategic Planning

Table 8 below provides insights into how firms are incorporating climate change risks into their strategic planning. The extent of integration varies among the surveyed firms, indicating different levels of commitment and readiness to address climate change within their strategic frameworks.

Table 8. Integration of Climate Change Risks into Strategic Planning

Extent Level	Number of Firms
Slightly	**8**
Moderately	**10**
Very much	**5**
Fully integrated	**5**
Total	**30**

8 firms reported that climate change risks are only slightly integrated into their strategic planning. This suggests a minimal level of consideration, likely indicating initial stages of awareness or resource constraints limiting deeper integration. 10 firms have moderately integrated climate change risks into their strategic plans. These firms likely acknowledge the importance of climate risks but may still be developing comprehensive strategies to address them fully. 5 firms reported a high level of integration of climate change risks into their strategic planning. These firms are likely more proactive in addressing climate-related challenges and have dedicated more resources towards mitigating these risks. Another 5 firms have fully integrated climate change risks into their strategic planning, indicating a thorough and systematic approach. These firms are probably leaders in sustainability and risk management, aligning their business strategies closely with climate considerations.

The varying levels of integration suggest that while some firms are leading the way in incorporating climate change risks into their strategic planning, others are still in the early stages. This disparity highlights a need for increased awareness, resources, and support to help more firms recognize the importance of strategic integration of climate risks. It also suggests potential benefits from sharing best practices among industries and sectors to elevate overall preparedness and resilience.

The analysis of Table 8 reveals a diverse approach to the integration of climate change risks into strategic planning among firms in Cyprus. With approximately one-third of firms moderately integrating these risks and a notable number achieving full integration, there is evidence of significant strides toward strategic climate risk management. However, the fact that over a quarter of firms have only slightly integrated climate change risks underscores the ongoing challenge of embedding comprehensive climate strategies across all business sectors. This suggests an opportunity for policymakers and industry leaders to provide more targeted support and resources to help firms at all levels improve their climate risk integration.

Financial Performance and Climate Change

The financial impact of climate change on companies in Cyprus varies widely based on industry, size, and the strategies employed to mitigate these effects. The analysis below considers the responses provided, focusing on how climate change affects profitability.

It was found that for larger businesses, such as aluminum manufacturers, the impact of climate change on profitability is moderate. It was found that both direct and indirect costs are managed through mitigation strategies, suggesting that while there are costs associated with climate change, the company has implemented effective measures to manage these, possibly through technological upgrades and efficiency improvements. The management has concluded that these strategies help stabilize profitability despite climate-related challenges.

Similarly, it was found that a larger business that operates hypermarkets also experiences a moderate impact. It was claimed that adopting energy-efficient practices and possibly investing in renewable energy sources like solar panels will result in the business controlling energy costs, thereby helping maintain profitability. Additionally, they claimed that supply chain optimizations and inventory management are perceived to play key roles in mitigating climate-related impacts.

The firms in the financial services sector are perceived to face significant impacts from climate change. This impact includes both direct costs related to physical impacts, such as increased insurance claims due to extreme weather events, and indirect costs related to changing regulatory environments and market conditions. The implication of these significant impacts is that they provide substantial challenges for these businesses in maintaining profitability. Some perceived direct physical impacts are likely to require increased insurance payouts, while indirect regulatory and market changes will likely necessitate costly compliance measures and strategic shifts. These firms might need to diversify their portfolios and invest in climate-resilient assets to mitigate these impacts.

For many small firms, climate change is perceived to have a negative effect on profitability due to increased material costs, particularly for food. Many small firms report increased costs associated with materials, exacerbated by temperature fluctuations affecting food prices. However, some have managed to mitigate energy costs through the use of solar panels. The increased material costs directly reduce profitability for small firms. However, adopting solar panels and other energy-saving measures offsets these expenses partially, improving the bottom line. However, it should be mentioned that investments in solar panels increase capital expenditure and

depreciation expense. This highlights the importance of renewable energy investments in maintaining profitability amidst rising operational costs due to climate change.

Companies that invest in energy-efficient technologies and renewable energy sources like solar panels claim they significantly reduce operational costs. This is especially important in regions with high temperatures where cooling costs can be substantial. Reducing energy costs improves profitability directly by lowering overhead expenses.

It was perceived by some participants that adapting to new regulations requires upfront investment but can provide long-term savings and stability. Firms that proactively address regulatory changes are perceived to avoid penalties and benefit from incentives for sustainable practices. While compliance costs can be high initially, long-term savings and avoidance of fines support sustainable profitability.

Shifts in consumer preferences towards sustainable products have been perceived to affect profitability. Firms that align their offerings with these trends are perceived to gain a competitive edge. Adapting to market demands for sustainable products can open new revenue streams and enhance brand loyalty, positively impacting profitability.

The financial impact of climate change on companies in Cyprus shows a diverse range of effects on profitability. Firms that effectively manage direct and indirect costs through mitigation strategies, such as energy efficiency and renewable energy adoption, tend to maintain or even improve profitability. However, significant challenges remain, particularly for financial services firms facing comprehensive costs and small firms dealing with increased material expenses. The ability to adapt to regulatory changes and market demands also plays a critical role in sustaining profitability in the face of climate change.

The question of whether companies in Cyprus have observed any direct financial impacts, that is, either costs or savings related to climate change adaptation or mitigation efforts, reveals diverse experiences across different sectors and company sizes. The responses indicate that while initial costs are associated with adaptation and mitigation efforts, these are often offset by subsequent savings and benefits.

Several companies reported costs associated with upgrading their production facilities to be more energy-efficient. These initial investments include the installation of energy-efficient machinery, retrofitting buildings, and implementing advanced technologies to reduce energy consumption. However, these costs have been substantially offset by the savings in energy costs and the improved process efficiencies that result from these upgrades. Companies that have undertaken such initiatives find that the long-term financial benefits, such as reduced utility bills and increased production efficiency, outweigh the upfront expenditures. This suggests a positive net financial impact from these adaptation efforts, reinforcing the economic viability of investing in energy efficiency.

Another set of companies reported costs related to upgrading their energy systems and enhancing supply chain resilience. These upgrades include adopting renewable energy sources, such as solar panels, and implementing robust supply chain strategies to withstand climate-related disruptions. The financial impact of these efforts is twofold: while there are significant initial costs, they are offset by savings in energy consumption and increased customer loyalty due to sustainability initiatives. Companies note that customers increasingly value sustainability, leading to greater brand loyalty and potentially higher sales. The strategic alignment with sustainability trends thus translates into long-term financial gains, further justifying the initial expenditures.

In the financial services sector, companies have conducted formal assessments to evaluate the potential impact of climate change on their investment portfolios, insurance claims, and physical assets, including branch locations. These assessments entail costs related to data collection, analysis, and the implementation of new risk management frameworks. Despite these costs, the proactive identification and mitigation of climate-related risks are crucial for maintaining financial stability and resilience. By anticipating and preparing for potential climate impacts, these firms can safeguard their assets and ensure continuity of operations, which ultimately supports sustained profitability.

For many small businesses, the financial impact of climate change adaptation and mitigation efforts is perceived as moderate. These businesses have not yet observed direct financial impacts, primarily due to limited resources and lower levels of engagement in comprehensive climate strategies. Small firms may lack the capital to invest in significant upgrades or the capacity to conduct detailed assessments. As a result, the financial effects of climate change are less pronounced in their immediate financial statements. However, as climate change progresses, these businesses are likely to face increasing indirect impacts, such as rising material costs and regulatory pressures, which could necessitate future investments in adaptation and mitigation.

The analysis of direct financial impacts related to climate change adaptation and mitigation efforts among companies in Cyprus reveals a nuanced landscape. Larger firms and those in resource-intensive sectors report initial costs that are offset by substantial long-term savings and benefits. Investments in energy efficiency, renewable energy, and supply chain resilience not only reduce operational costs but also enhance customer loyalty and brand value. In contrast, smaller businesses have yet to observe significant direct financial impacts, highlighting a gap in resource availability and engagement. As the climate continues to change, it is crucial for all

firms, regardless of size, to recognize the long-term financial benefits of proactive adaptation and mitigation strategies.

Concerning the extent to which investors or stakeholders influence the firm's approach to climate change risk management, there is evidence that the larger firms in the sample are generally highly influenced in that investors demand transparency regarding sustainability with an emphasis on environmental impact reporting and risk management strategies. However, evidence is also provided that investor and stakeholder influence regarding the smaller firms in the sample is mixed and depends on the type of industry. It was found that in sectors such as high technology and the travel sector, the influence was high, but in contrast, the opposite was found in sectors such as food retail and car services.

Mitigation and adaptation strategies

Concerning what strategies firms in the sample have adopted to mitigate climate change risks, the common strategies adopted by firms are generally: enhancing infrastructure resilience, improving energy efficiency, and sourcing sustainable materials. However, it was found that the strategy was differentiated according to the sector. For example, it was found that firms in the hospitality sector adopted strategies of water conservation and energy use; firms in property development adopted strategies of green building practices; investment firms considered sustainability criteria in their investment decisions; insurance firms developed products specifically designed to cover climate-related risks, manufacturing firms considered water reduction and recycling initiatives and, technology firms considered eco-friendly product design.

Evidence was provided that larger firms strongly aligned climate change risks into their business objectives. Large firms generally integrate sustainability practices into their core business strategies. However, the opposite was the case for the smaller firms in the sample.

It was found that the main barriers and challenges faced by firms in addressing climate change risks effectively were: the high costs of infrastructure upgrades, the regulatory uncertainty and changing requirements, and the lack of expertise in the area.

Evidence was provided that in addressing these challenges, some firms would take the following action: collaboration with experts in the area of climate change risks, phased investments to tackle the issue of climate change risks, and active participation in industry discussions to stay ahead of regulatory changes.

Future outlook

Concerning the question of how Cyprus firms believe climate change risks will impact their firms in the next 5-10 years, it was found that many large firms anticipate increased regulatory pressures and higher operational costs. By implication, this will have a negative effect on financial performance. It was found that the smaller firms did not expect climate-related risks to impact financial performance significantly.

Concerning future planning, the larger firms in the sample aim to invest in renewable energy, expand sustainable product lines, and enhance stakeholder engagement. Smaller firms aim to improve energy efficiency, explore sustainable supply options ad, and seek support from business associations.

Additional comments

The main general comments provided by participants are, firstly, that there will be future opportunities for introducing sustainable products and services to the Cyprus market. Another comment made by some small firms in the sample is that more resources and guidance need to be provided to small and medium-sized enterprises to manage climate risk.

Discussion

The results of this study provide a comprehensive understanding of how firms in Cyprus perceive and manage climate change risks, particularly in relation to their financial performance. The demographics of the surveyed companies reveal a significant representation of small enterprises and a diverse range of industry sectors, reflecting the broader business landscape in Cyprus. This diversity is crucial for a nuanced analysis of climate change impacts and mitigation strategies across different business contexts.

Climate Change Risks and Financial Performance

The awareness and understanding of climate change risks among the surveyed firms show a broad spectrum, from very low to very high levels of comprehension. Most firms report a moderate understanding, indicating a baseline level of awareness but also highlighting the need for enhanced education and resources, particularly for smaller firms. Larger firms tend to have a more sophisticated grasp of climate change risks, often conducting formal assessments and integrating these risks into their strategic planning. This proactive approach likely stems

from greater access to resources and higher regulatory scrutiny, which compel larger firms to prioritize climate risk management.

For example, firms in the financial services sector face significant impacts from climate change, including direct costs related to physical damage from extreme weather events and indirect costs from evolving regulatory environments. These firms have conducted formal assessments to evaluate climate risks and have implemented strategies to mitigate these impacts, such as diversifying portfolios and investing in climate-resilient assets. The significant financial burden underscores the need for comprehensive risk management frameworks to maintain profitability amidst increasing climate-related challenges.

Conversely, smaller firms, particularly those in retail and manufacturing, report moderate impacts on profitability due to climate change. These firms have adopted energy-efficient practices and renewable energy sources like solar panels to control energy costs, which helps maintain profitability. However, they also face challenges such as increased material costs, especially for food, due to temperature fluctuations. This highlights the importance of renewable energy investments and efficient resource management in mitigating the adverse effects of climate change on smaller businesses.

Integration of Climate Risks into Strategic Planning

The extent to which firms integrate climate change risks into their strategic planning varies widely. Approximately one-third of firms report moderate integration, acknowledging the importance of climate risks but still developing comprehensive strategies. Another third have either fully or significantly integrated climate risks, indicating a systematic approach to addressing climate challenges. These firms likely lead in sustainability and risk management, aligning their business strategies closely with climate considerations.

However, over a quarter of firms report only a slight integration of climate risks, suggesting minimal consideration and possible resource constraints. This disparity in integration levels underscores the need for increased awareness and support, particularly for smaller firms, to help them recognize the importance of embedding climate risks into their strategic frameworks. Sharing best practices and providing targeted resources could elevate overall preparedness and resilience across all business sectors in Cyprus.

Observed Financial Impacts of Adaptation and Mitigation Efforts

The financial impacts of climate change adaptation and mitigation efforts show a nuanced landscape. Larger firms, particularly those in resource-intensive sectors, report initial costs for upgrading facilities and systems but also significant long-term savings and benefits. Investments in energy efficiency, renewable energy, and supply chain resilience reduce operational costs and enhance customer loyalty, translating into long-term financial gains. In contrast, smaller firms have yet to observe significant direct financial impacts from adaptation efforts. Limited resources and lower engagement in comprehensive climate strategies result in less pronounced effects on their financial statements. However, as climate change progresses, these firms may face increasing indirect impacts, necessitating future investments in adaptation and mitigation.

Future Outlook and Recommendations

Looking ahead, larger firms anticipate increased regulatory pressures and higher operational costs due to climate change, which could negatively affect financial performance. These firms plan to invest in renewable energy, expand sustainable product lines, and enhance stakeholder engagement to mitigate future risks. Smaller firms aim to improve energy efficiency, explore sustainable supply options, and seek support from business associations.

The study highlights several barriers and challenges in addressing climate change risks, including high costs of infrastructure upgrades, regulatory uncertainty, and lack of expertise. Firms can overcome these challenges by collaborating with experts, making phased investments, and actively participating in industry discussions to stay ahead of regulatory changes.

Conclusions

This study provides an in-depth analysis of the perceptions and strategies of senior managers from 30 firms in Cyprus regarding climate change risks and their impact on financial performance. The demographic diversity of the surveyed firms, primarily small enterprises with fewer than 10 employees and annual turnovers of up to 5 million Euros, underscores the significant presence of small and medium-sized enterprises (SMEs) in the sample. The tenure of senior management, typically with 6-10 years of experience, suggests that insights are drawn from seasoned professionals across a range of industries.

The findings reveal varying levels of awareness and understanding of climate change risks, with a majority of firms exhibiting only moderate comprehension. This disparity is particularly pronounced between smaller firms,

which largely lack formal assessments of climate risks, and larger firms that have proactively identified and addressed these risks. Key climate change risks identified include extreme weather conditions, increased energy costs, and regulatory changes, reflecting the multifaceted nature of climate impacts on business operations.

Management perceptions of climate change risks in Cyprus are fundamental to understanding how organizations will respond to the challenges and opportunities posed by climate change. As awareness grows, these perceptions increasingly shape corporate strategies, regulatory compliance, investor relations, and overall financial performance.

Integration of climate change risks into strategic planning varies significantly among firms. While some have fully embedded these risks into their strategies, others are still in the nascent stages. This suggests an ongoing need for increased awareness, resources, and support to enhance strategic climate risk management, particularly for smaller enterprises.

The financial performance analysis indicates that the impact of climate change is industry-specific and closely tied to the mitigation strategies employed. Larger firms, such as those in manufacturing and retail, manage to stabilize profitability through technological upgrades and efficiency improvements. Conversely, financial services firms face substantial challenges due to increased insurance claims and regulatory costs. Smaller firms are more adversely affected by rising material costs but find some relief through renewable energy investments.

Mitigation and adaptation strategies vary by sector, with larger firms more likely to integrate sustainability into their core business strategies. Common barriers to effective climate risk management include high infrastructure upgrade costs, regulatory uncertainty, and lack of expertise. Addressing these challenges requires collaboration with experts, phased investments, and active industry engagement.

Looking ahead, larger firms anticipate increased regulatory pressures and higher operational costs, potentially impacting financial performance negatively. Smaller firms, while less concerned about immediate financial impacts, recognize the need for improved energy efficiency and sustainable supply options. The consensus among participants points to future opportunities in sustainable products and services, alongside a call for more resources and guidance for SMEs to manage climate risks effectively.

In conclusion, the study highlights the critical need for enhanced climate change risk awareness, strategic integration, and supportive measures to bolster resilience and profitability across all sectors in Cyprus. The findings underscore the importance of proactive climate risk management as a pivotal component of sustainable business practices.

The findings indicate that while firms in Cyprus are increasingly aware of climate change risks, there is a significant variation in their understanding, preparedness, and integration of these risks into strategic planning. Larger firms tend to be more proactive and have more resources to manage climate risks effectively, while smaller firms face greater challenges and require more support. Policymakers and industry leaders should focus on providing targeted resources and guidance to help all firms, particularly SMEs, enhance their climate risk management capabilities. This will ensure a more resilient and sustainable business environment in Cyprus, capable of withstanding the multifaceted impacts of climate change.

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