

**Hidden climate change related risks for
the private sector**

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Abstract

Climate change related risks impact and challenge the private sector in many different ways. This also applies to risk drivers like a companies' reputation and a changing consumer behavior. Since significant risk drivers for companies differ just as much as companies themselves, a sector specific guideline to evaluate possible climate change related risk drivers is indispensable. Further, a sector specific analysis on these risk drivers can foster cross sectoral cooperation, innovation and learning processes with regard to climate change related risks.

Keywords: business sectors, CDP, climate change adaptation, climate change impacts, companies' reputation, consumer behavior, industry studies, risk drivers.

JEL-Classification: D12, L19, L20, L60, L70, L80, L90, Q40, Q51, Q54, Q59.

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1. Introduction

Climate change challenges companies all over the world, forcing them to take action in mitigation and adaptation to climate change risks. The need for action rises as risks become noticeable today already. Dealing with a multitude of consequences possibly affecting society in many different ways requires companies to engage with climate change issues and adapt to current and upcoming changes (Climate Service Center 2012, IPCC 2014).

Based on the fact, that companies' commitment to a healthy and sustainable environment not only causes costs, but at the same time prevents companies from possible future costs, arose an increased awareness of the need for action among politicians, managers and researchers. Nevertheless, companies still are very insecure when it comes to planning and implementing adaptation strategies. That's why it's not only a question of adapting to climate change as such, but also how to adapt and what factors to consider. One of the main reasons of this uncertainty how to act is that companies can be impacted by climate change issues in many different ways. Climate change related risk drivers can differ heavily between and within business sectors with regard to the risk drivers' likelihood, kind of influence as well as magnitude of impact (BSR 2014, CDP and Climate Service Center 2013, CDP and Climate Service Center 2014). Hence, every company is in need of a specific evaluation of relevant risk drivers.

The reasons for differences in the relevance and threat of specific risk drivers for each company are manifold. Climate change related impacts on companies are determined by the company's business, its location, its focus groups as well as its entire value-added chain characteristics. Climate change consequences can vary from an increase in the company's operational cost or a decrease in demand to the destruction of production facilities and the inability to do business (IPCC 2014). Further, companies exhibit specific vulnerabilities and capacities which determine the necessity of adaptation activities. To give consideration to these differences when it comes to climate change related risk drivers and its consequences, a

sector and company specific adaptation is indispensable (Heymann 2008, IPCC 2014). However, there often is a lack of experience and innovative solutions, that can help companies to develop and implement effective and sustainable adaptation strategies. This is amongst other reasons due to missing data on climate change activities in the private sector, impeding sector specific analyses (Mahammadzadeh et al. 2014).

2. Methodology

With the goal to offer companies an innovative way to compare, learn and improve by positioning themselves within and outside of their own sector with regard to specific risk drivers, data from 125 companies from the DACH-region (Germany, Austria and Switzerland) was analyzed. The analysis is based on CDP (formerly Carbon Disclosure Project) data from 2013, containing climate change related information on international and publicly traded companies.² Along with data on carbon emissions, reduction goals and activities, and perceived climate change opportunities, this database provides a detailed companies' perspective on climate change related risk drivers, comprising changes in regulation, changes in physical climate parameters and changes in other climate related developments (CDP 2014). In comparison to past studies on potential impacts of climate related risk drivers, the study is not only taking those risk drivers being named the most often by companies into consideration, but additionally measures the actual threat of specific risk drivers. The actual threat of a specific risk driver is measured by the simultaneous consideration of the magnitude of impact and the likelihood of occurrence for the company. By this it is possible to avoid distortion of results due to overestimation of above average frequently named risk drivers with low likelihoods and/or low magnitudes of impact, as well as distortion due to underestimation of below average frequently named risk drivers with high

² CDP is a global non-for-profit organization, providing a global natural capital disclosure system, including an annual questionnaire for the private sector. In this context 4.500 companies worldwide, representing over 50% of the world's market capitalization, report, share and take action on vital environmental information (CDP 2014).

likelihoods and/or high magnitudes of impact. For comparison, companies have been grouped in nine sectors based on the Industry Classification Benchmark (ICB), whereat Energy and Utilities were considered as one sector: Consumer Discretionary, Consumer Staples, Energy and Utilities, Financials, Health Care, Industrials, Information Technology, Materials, Telecommunication Service.

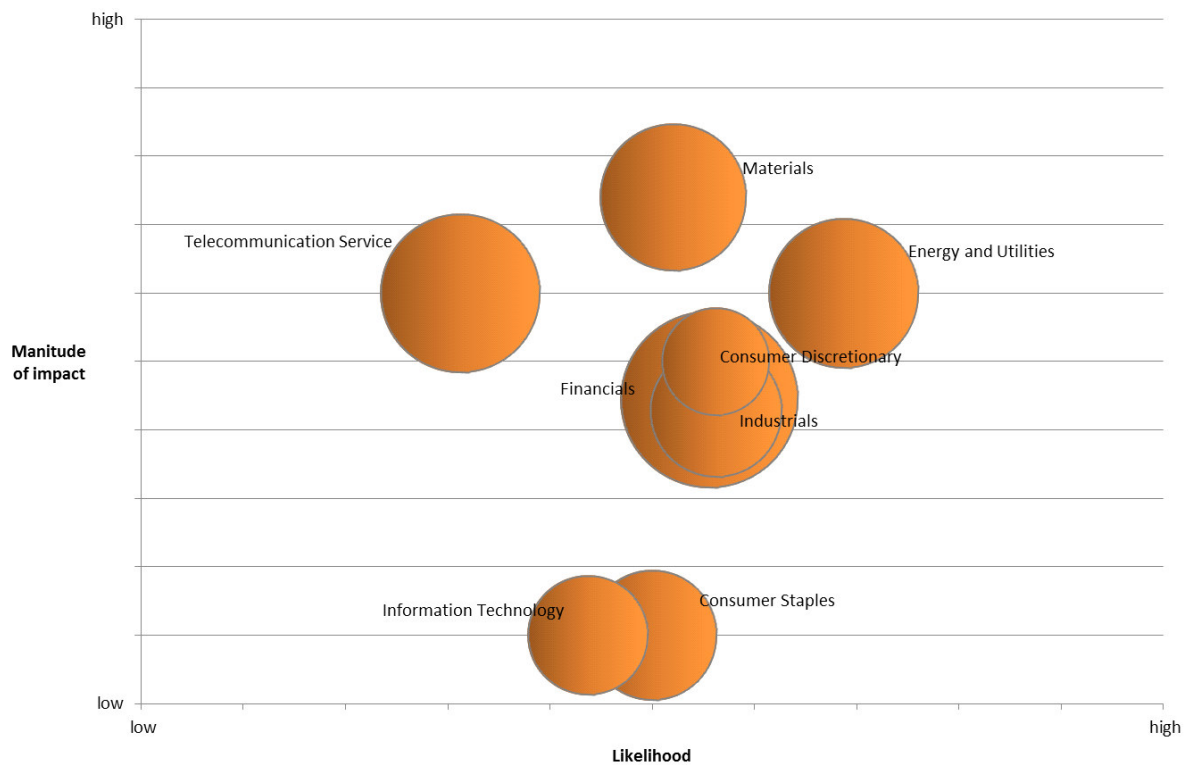
3. Results

All sectors have been increasingly concerned with current and future climate change risks that have the potential to generate a substantive change in their business operations, revenue and/or expenditure. While changes in physical climate parameters and changes in regulation have been the focus of plenty of studies, climate change related risk drivers such as a company's reputation, a changing consumer behavior, as well as the perceived uncertainty in market signals have been neglected. Nevertheless, these risk drivers are perceived just as important and threatening when it comes to climate change adaptation and mitigation from a company's perspective and have been a focus of the study on climate-related risk drivers companies currently face.

With regard to the consequences of consumers' perception of companies' exposure to climate change, companies fear substantial impacts on their business. While the main consequence of risk drivers due to changes in physical climate parameters as well as the consequence of risk drivers due to changes in regulation is an increase of operational and capital cost, the mainly named consequences of climate-related risk drivers are a reduced demand for products and services and the companies' inability to do business in the future. This kind of substantial consequence force companies to react immediately to consumers' choice for or against the companies' goods to remain capable of competing – a process which is both tedious and costly.

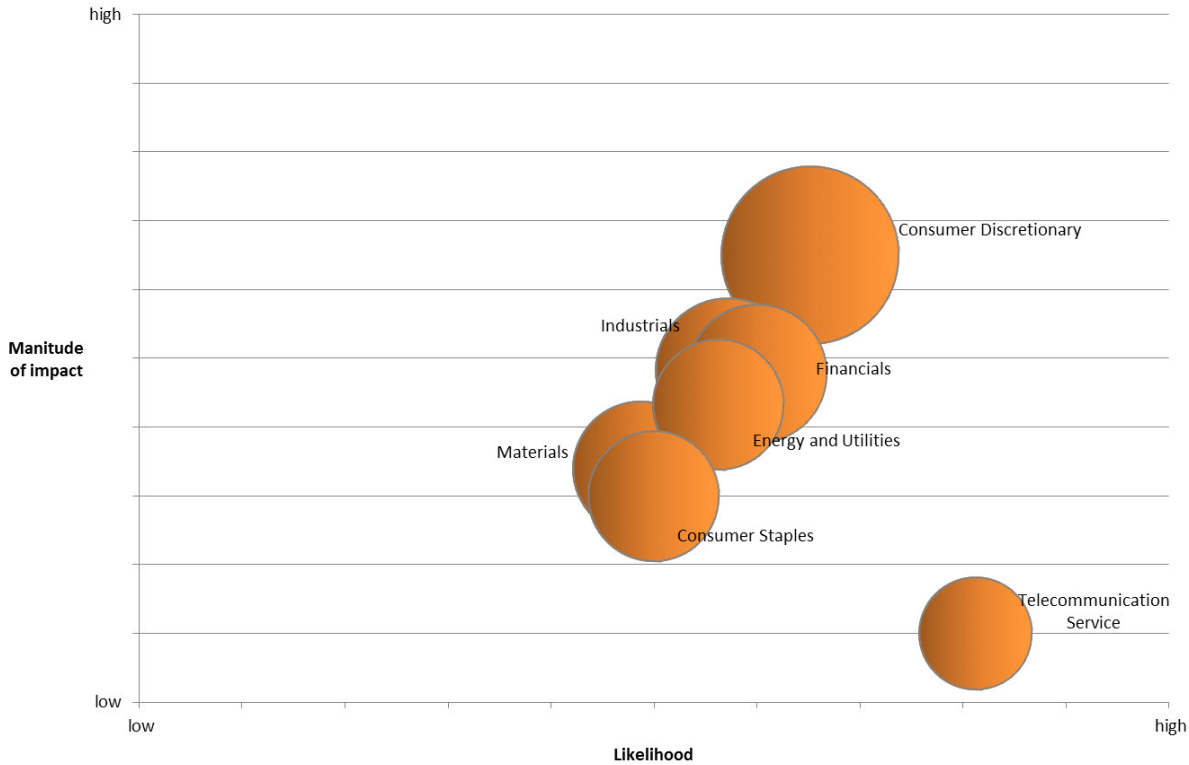
One of the main factors within this process of remaining capable of competing is the company's reputation. There is no doubt that a good reputation can positively influence a company's performance. However, with a rising awareness of climate change issues by the public, reputation is influenced by new aspects. Companies do not only have to perform, but also communicate their contribution to protect the changing environment (Chen 2008). There are potential impacts associated with negative perceptions experienced by the public (including lobby groups) as well as suppliers and customers around an organization's corporate social responsibility. Even though corporate social responsibility implies actions taken by the company on a voluntary basis, it becomes more and more an overall term for activities regarding current concerns of the public. The reason for this change has been the increasing indispensability to satisfy relevant focus groups (CDP 2014, Rusinko 2007).

Looking at the figure below, it becomes obvious, that from a companies' perspective reputation as a strong part of a company's capital is very vulnerable to negative perceptions by focus groups when it comes to the evaluation of companies' climate change adaptation and mitigation activities.



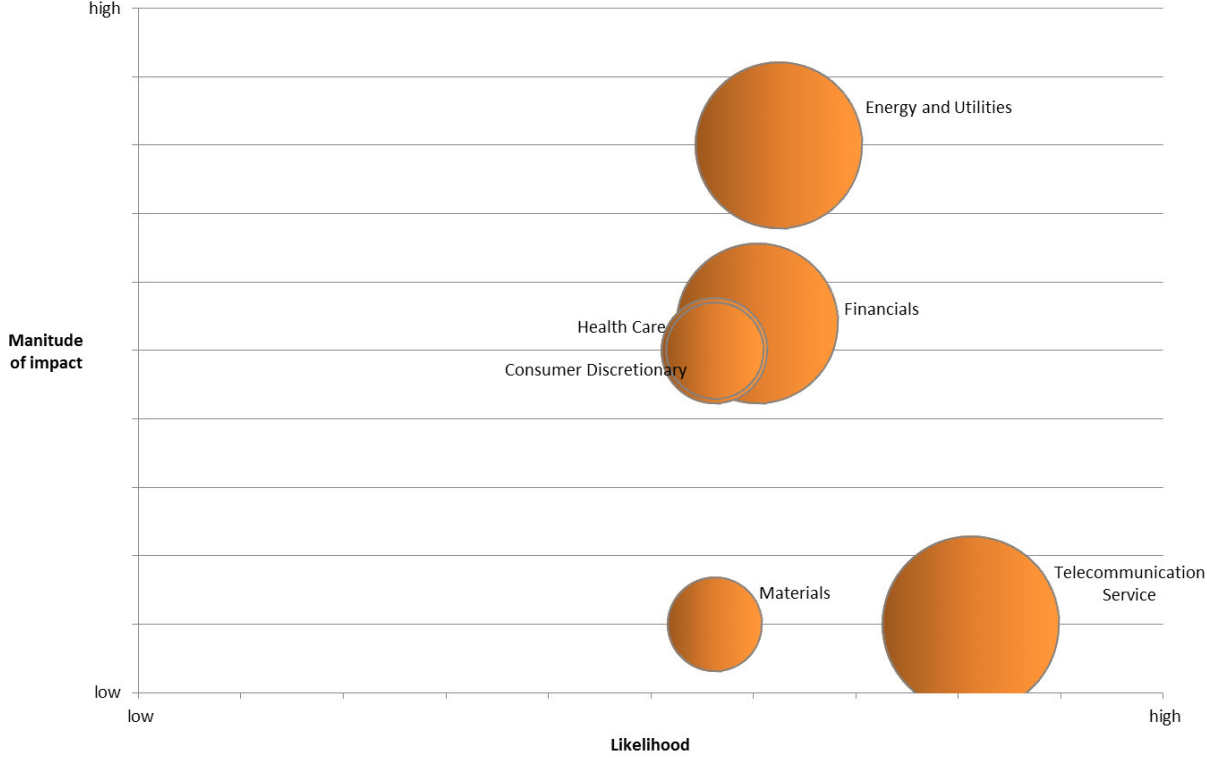
Further, climate change can induce changes in customer preferences for products and services, forcing companies to react. This can apply to preferences for products as such, as well as to preferences for components or manufacturing processes. If it comes to a changing preference for a product as such, like the trend from fossil fuels to renewable energy or the trend from chemical to green cosmetics, consumption still is a matter of price and availability (Haytko and Matulich 2008, Rawat and Garga 2012). Nevertheless, a changing consumer behavior within the energy and utility sector is already visible. Further, companies are concerned of a changing consumer behavior due to their perception of climate change issues when it comes to single components of their products. There has been empirical evidence that products out of sustainable and fair traded materials which are certified as such are preferred by customers (Laroche, Bergeron and Barbaro-Forleo 2001). An example is furniture out of wood from environmentally sustainable forests. Research has shown that consumers do not only prefer a certified piece of furniture, but additionally be willing to pay a higher price for it (Cai and Aguilar 2013). Another issue the private sector is concerned of when it comes to a

changing consumer behavior due to climate change perceptions of customers is the process of manufacturing and distribution. Looking for examples at the distribution of products there has been a trend to green logistics, keeping distances between the location of manufacturing and distribution as small as possible. This trend is based on the consumers' preference for regionally produced goods to avoid additional carbon emissions (Dangelico and Pujari 2010). As shown in the figure below, the likelihood of a changing consumer behavior due to climate change impacting the private sector varies from medium to high. Especially with regard to the magnitude of impact there are major differences between sectors. However, it becomes clear that changing consumer behavior is a very important factor when it comes to the perception of climate change related risk drivers from a companies' perspective.



As markets respond to climate change impacts and predictions, volatility can be induced. That for, uncertainty in market signals has to be taken into consideration, when it comes to the evaluation of climate-related risk drivers. As stated above, there is empirical evidence that consumers are willing to pay more for products from a sustainable manufacturing process. However, there is little knowledge on consumers' perception of sustainability. Further, buying

intention and buying choice can differ a lot. The potential threat of the uncertainty of market signals when it comes to climate change issues is shown in the figure below. In contrast to reputation and changing consumer behavior, all sectors stated a surprisingly high likelihood.



4. Conclusion

It appears that the sector specific analysis above offers companies a basis to position oneself within its own sector. By doing so, companies are given the opportunity to become aware of risk drivers they might be facing now or in the future as well as evaluate their current risk management regarding climate change risks. Hence, the results facilitate a comparison of risk drivers between and within sectors for risk drivers that have not been paid much attention to in research. They can assess their competitive advantages and disadvantages as well as prioritize risk drivers they have to deal with by evaluating their own position within the sector-specific analysis. Further, the given results foster knowledge exchange between sectors. Regarding specific threats companies are facing, they can profit from other companies' experience, good practices and innovative solutions from companies out of a

different sector – companies they would have not taken into consideration before, aiming for an efficient and effective adaptation to climate change.

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