



# The attitude of the population towards company engagement in Public–Private Emergency Collaborations and its risk perception — A survey

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## ABSTRACT

Governmental actors benefit from collaboration with companies in emergencies. Even though there are good reasons for companies to support state disaster response, research on so-called Public–Private Emergency Collaborations (PPEC) is still rare. In particular, companies are currently unable to assess to what extent the population values their involvement in such PPECs. We characterize corporate social responsibility (CSR) concepts, emergency cooperation and risk perception from a structured literature research. A survey of 402 participants examines the perception of consumers to link CSR and the associated involvement in emergency cooperation with the economic success of the company. We find that companies' involvement in PPECs is in general highly valued. Nevertheless, the quality and quantity of corporate communication as well as the communication channel used and the communication strategy strongly affect the population's perception. In addition, we uncover a highly significant correlation between risk perception and approval of engagement in PPECs. We are contributing to the underexplored field of research by evaluating the involvement of companies in PPECs from the perspective of the population, to take account of the decision-makers in companies as to whether an involvement can be advantageous for them in the long term.

## 1. Introduction

Climate change and the accompanying increase in frequency and intensity of extreme events are leading to devastating effects in today's societies [1]. Even in countries like Germany that have, compared to other countries such as the United States, been rarely affected by large-scale natural disasters in the past, the intensity of disasters increases [2]. Events like heavy rainfalls in July 2021 which led to severe flooding with more than 180 deaths and economic damage of around 5 billion € are becoming a cause of concern for governments, companies, and the society at large [3]. The COVID-19 pandemic led to worldwide impacts on individuals, society, and the economy, highlighting the vulnerability of systems and structures [4].

These crises can lead to a shortage of supplies for the population due to the destruction of infrastructures [5]. We consider governmental actors and private companies as possible actors when solving this problem. Managing urgent threats to fundamental societal values and protecting the safety of citizens and property during emergencies, disasters, and extreme events are primarily

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the responsibility of a country's government [6,7]. In Germany, governmental authorities play an essential role in supplying the population in a crisis, especially in the event of a foreseeable shortage of supplies [8]. Private companies are mainly driven by profit-oriented motives and fulfilling the interests of their stakeholders [9]. However, the COVID-19 pandemic illustrates the ability of the private sector to provide solutions in times of crisis by developing new products or through the strategic use of existing resources that contribute to disaster preparedness and crisis development [10,11].

Crisis management systems vary greatly, depending on the country's development level and historic exposure to disasters. In Germany, governmental actors are obliged by law to help the suffering population, and companies are not required to do so [12]. However, there are several reasons for companies to provide support in crises. The available resources and know-how to manage threats as short-term supply and demand fluctuations, as well as disruptions in the supply chains (e.g., in the area of food production, transport, or the sale of products), are considered critical resources of the private sector at times of crisis [13]. As Izumi and Shaw [14] have already stated, besides possible altruistic reasons, companies are interested in protecting their value chain and those involved in it, as well as improving their reputation or the perception of stakeholders through good social engagement. A higher reputation may lead to higher sales in the long-run. These motivations have been conceptualized by Wiens et al. [13] in the form of a Public–Private Emergency Collaboration (see Section 2.1). This concept builds on the well-known public–private partnership model and applies the collaborative work of public and private actors to emergency management.

The expectation of improving their reputation, or stakeholder perception, through good corporate citizenship [14] is a critical factor for companies to get involved in crisis management. Similarly, Hamann and Strittmatter [15] and Swanson and Smith [16] argued that the private sector engages in the social sector (meaning areas such as education, care for the elderly or to fight poverty) to increase positive perception and, thereby, gain a long-term economic success. However, little is known so far about how the public perceives the emerging forms of public–private partnerships in emergency management [17,18].

Our approach is inspired by the work of Madsen and Rodgers [19], who used the concept of stakeholder theory and Maignan [20] who examined consumers' perceptions. Thereby, she managed to link Corporate Social Responsibility (CSR), the impact on consumers, if and how they react to it, and the related economic success on the company (see also [21]). We build upon these relationships within our survey. We argue that the possible crisis management relief of companies we are investigating is closely related to the concept of CSR, which is a better known concept and therefore offers possibilities for transferability. Therefore, we analyzed CSR and the population's perspective on CSR activities in Section 5. In addition, an adapted concept of risk perception from [22] was added to account for the specifics of a crisis like the COVID-19 pandemic for the consumers.

To shed light on this underestimated topic, we first analyzed the concepts of CSR with regard to the population's perception towards company engagement, i.e. their positive attitude, and the population's risk perception by a structured literature review. In addition, we designed an empirical study to derive whether companies' involvement in crisis management with government authorities (thus engagement in a PPEC) received the respondents' positive attitude and to explore the extent to which the persons' characteristics, in particular risk perception, affects their positive attitude. The data covers 402 respondents in Germany surveyed by an online questionnaire between November 2020 and January 2021.

The main contribution of this paper can be summarized as follows. We empirically investigate how the population perceives company engagement in a partnership between public and private actors in a crisis context. We figured out that the population positively evaluates this kind of engagement and increases purchase intention. The information gained from the empirical survey helps to show reasons and recommendations for companies to engage in emergency collaborations with governmental actors and how the population should be informed about this engagement to consider it as trustworthy information.

The remainder of this paper is organized as follows. Section 2 provides an overview of the underlying concepts of the topics under investigation in our study. We then define our research question and derive the hypotheses from being tested in Section 3. In Section 4, we report our study design. In Section 5, we present the results of our study and evaluate the hypotheses. Discussion of the results and recommended actions for companies resulting from the study follow in Section 6. Section 7 first discusses the limitations of this work and possible future directions for research and concludes our findings.

## 2. Theoretical background

### 2.1. Concept of Public–Private Emergency Collaborations

As shown in Fig. 1, the process of disaster management characteristically involves four phases: Mitigation, Preparedness, Response, and Recovery [23]. Mitigation and preparedness phases include measures taken prior to a disaster to prevent, prepare, and detect future emergencies. A disaster requires specific predefined actions, including immediate communication and coordination of all involved. The recovery phase finally includes all efforts of reconstruction to ensure the return to normal conditions.

The German Federal Office of Civil Protection and Disaster Assistance (BBK) argues that one key focus should be placed on personal emergency preparedness and the self-sufficiency of the population [24]. This involves adequate stockpiling of water, food, and hygiene products in case of emergency [25]. Wiens et al. [13] describe one possible role of companies as part of crisis management within the concept of a PPEC. Companies are assigned a far more substantial role in the disaster management cycle compared to the current situation where companies are at best occasionally involved in relief operations. A PPEC essentially starts in the preparedness phase concerning the disaster management cycle. An attempt is made to create a long-term level of coordination between the authorities and the companies and, therefore, to react better in the response and recovery phase in an emergency. Possible collaboration between governmental actors and companies is particularly relevant with companies specializing in supplying essential goods and services such as water, food, and medicines [26,27]. Other possible areas of collaboration also extend to the supply of hygiene-, communication-, and security-related goods, as these goods are also essential during an emergency. PPECs can be integral in limiting epidemics, looting, and emotional suffering [28] and can be seen as a specific form of CSR. The financial and reputational benefits for companies from CSR will be discussed in the next Section 2.2.



Fig. 1. Disaster Management Cycle.

## 2.2. Positive attitude towards company engagement in crisis management

As we want to explore the population's attitude towards company engagement in crisis management, the already mentioned and closely linked concept of CSR will be introduced first.

Although research has been conducted over several years, there is, according to [29] and [30] still no consensus on a universally adopted definition of CSR. Commonly, the term CSR encompasses corporate actions which appear to serve some societal good and go beyond the interest of a company and legal requirements [29,31]. However, the most frequently applied and most comprising CSR definition goes back to Carroll's (1979) conceptualization of CSR [30]. Following Carroll [32], organizations have to meet four dimensions of responsibilities: economic, legal, ethical, and philanthropic. Whereas the economic dimension determines the responsibility for businesses to be profitable, the legal obligation refers to doing economic businesses within legal requirements. Ethical responsibility requires adherence to established ethical norms and principles. Philanthropic responsibilities, in turn, correspond to the overall assumptions of society concerning a decent citizenship role for organizations [32]. Proactivity can also be seen as an important factor [33]. Furthermore, according to [30] any discussion of CSR should necessarily include an environmental dimension. That is why he proposes the conceptualization of the CSR concept into the dimensions of environmental, social, economic, stakeholder and voluntariness.

In the next step, to obtain an overview of the empirical research on corporate social responsibility with a specific focus on the population's attitude towards this engagement to date, we systematically reviewed the databases Web of Science and Scopus for suitable studies within this field. Since we were primarily interested in survey studies dealing with consumer's perception and attitudes towards socially engaged companies, the search string we employed was: *((“corporate social responsibility” OR “CSR” OR “engagement”) AND (“consumer awareness” OR “consumer attitude” OR “consumer perception” OR “consumer behavioral intentions” OR “purchasing criteria”) AND “survey”)*.

Our initial search resulted in 261 unique publications since 2000, which we further analyzed and refined based on their title and abstract. We excluded studies that were either not identified as research articles, not written in English, or did not turn out as empirically conducted survey studies. This resulted in a remaining set of 18 articles (Supplementary Material 8.2) that we used for further analysis.

Several of these studies have been carried out to investigate the general level of awareness towards socially responsible companies [20,34,35]. Mainly, these studies report a generally low level of awareness towards companies' engagement practices due to a lack of understanding and obtaining information on CSR initiatives of organizations [34–37]. As it has been shown that the awareness could be positively linked to supporting a company's CSR initiatives, a growing number of publications highlights the need for comprehensive communication programs, including tactics, strategies, or channels to raise the level of awareness [38].

Taking a closer look at consumers' support of socially responsible companies, both favorable and critical attitudes can be discerned. In this regard, it is frequently considered how consumers evaluate a company's ability to meet its stakeholders' expectations about corporate practices [20,39]. Consumers expect companies to fulfill different kinds of societal obligations, such as environmental protection [40], (local) community involvement [34] or disaster relief support [41]. However, most of the reviewed studies do not focus on the perception of a particular CSR activity. Instead, they apply the idea of Carroll [32] that companies

must meet four dimensions of obligations: economic, legal, ethical, and philanthropic. To examine consumers' evaluations of these responsibilities, Maignan [20] developed a detailed measurement concept that has been further used in numerous other empirical studies [36,39,42–44]. In particular, these studies highlight that the fulfillment of consumer expectations may result in positive attitudes. In contrast, consumers may evaluate a company's initiatives as unfavorable if its behavior violates social norms and individual economic or ethical expectations [45]. Additionally to expectations, the perception of corporate motives for engaging in CSR activities may influence the respondents' evaluation [36]. Whereas perceived value-driven motives are reported to induce positive attitudes among consumers, motives associated egoistic-driven and profit-generating may diminish these positive attitudes [36].

Overall, it was revealed that the adoption of CSR initiatives has a significant effect on consumer behavior. First, evidence has been found that CSR can enhance consumers' satisfaction and loyalty with companies and their brands through the consumers' perceived value of CSR [46–48]. Second, an even larger number of studies has revealed a positive relation between CSR and consumer's purchasing behavior [20,34,35,39,47,49]. If consumers feel good about an organization, they will be more inclined to buy and even willing to pay more for products or services of a socially or environmentally responsible company, which will, in turn, affect a company's revenue and financial performance [35,40,43,44]. All the literature above gives valuable input to the field of CSR and how it interacts with consumers. However, to the best of our knowledge, and despite our systematic literature search, there is currently no research about CSR in connection with emergency collaborations, which is the focus of this study.

### 2.3. Risk perception

In this Section, we present the concept of risk perception as this is expected to have driving influence on perceived attitude of collaboration for disaster response. In general, it refers to people's views, judgment, and evaluations associated with a particular hazard to which they are or may be exposed [50]. Considering the emergence of risk perception, two approaches have been commonly applied: a socio-cultural and psychometric approach [22]. According to cultural theory, social structure embeds individuals, thus shaping individual risk perceptions by beliefs and values of their social context [51]. In contrast, the psychometric approach understands the perception of risk as a multidimensional construct, based on the combination of several subjective, qualitative perceived characteristics of a hazard [22]. Fischhoff et al. [52] first introduced an approach to systematically examine and differentiate between these various perceived risk characteristics, called *psychometric paradigm*. In line with the paradigm, non-experts individually judge the riskiness of a threat on various assorted perceived risk attributes such as controllability, severity, personal impact, or dread of a risk [22]. Using statistical analysis and scaling techniques, quantitative representations or cognitive maps of risk attitudes and perceptions can be created to classify and understand the individual risk perceptions of various hazards [22].

Next, we employed a systematic literature approach to understand the current state of previous research on population's risk perception. Accordingly, we again searched the Scopus and Web of Science databases for relevant empirical studies using the search term (“*risk perception*” AND “*population survey*” AND (“*emergency*” OR “*crisis*” OR “*disaster*” OR “*natural disaster*” OR “*flood*” OR “*wildfire*” OR “*pandemic*” OR “*nuclear energy*” OR “*climate change*”). To confine the results, we only focused on the research field *Business Economics*. The initial search resulted in 35 publications since 2000, which were further limited based on their title, abstract and full-text. We again prioritized empirical English-language publications, resulting in a remaining set of 11 relevant articles (Supplementary Material 8.3).

Within the reviewed risk perception literature, studies have surveyed a broad set of hazardous occurrences, including technological hazards such as nuclear power plants and nuclear energy [53], environmental threats related to climate change, and global warming [54–56] as well as natural hazards like floods [57], wildfire risks [58], epidemics and pandemics [59]. Overall, these studies are primarily concerned with investigating factors influencing the adoption of precautionary measures to prepare for disasters. Besides sociodemographic characteristics, risk perception is thereby found to be an important determinant of adjustment and disaster mitigation behavior [55,57,59–61]. According to the psychometric approach, most of these research studies demonstrate that the perception of risks varies regarding sociodemographic, psychological, and cognitive factors of the perceiver of a certain risk. Regarding cognition, for example, personal experience is a significant predictor of risk perception. Akerlof et al. [54] and Champ et al. [58] provide empirical evidence that having both personally experienced global warming [54] and having previously experienced wildfires [58] result in higher risk perceptions, which in turn led to taking more action to reduce risk. In addition, Becker [62] seeks to find if gendered differences in risk perception automatically lead to differences in women and men ranking hazards for their community and finds no significant differences in terms of gender. However, several other, particularly sociodemographic parameters (e.g., level of education, livelihoods), were found to relate to the ranking of hazards. As a result, targeted communication with as many people as possible in the risk reduction process is crucial [62]. Gerhold et al. [63] who find that within Germany, the risk perception of a supply shortage is not macrosocial, but differs on individual perceptions, reach a similar conclusion. To assess the individual levels of risk perception, the authors apply the psychometric paradigm of Slovic [22]. To the best of our knowledge, there is currently no risk perception research output in the context of PPECs.

## 3. Research questions and hypotheses

### 3.1. Research questions

PPECs are an innovative approach to deal with emergencies. So far, PPECs have not been studied along the lines of attitude and risk perception of the population. Educating companies particularly about this issue represents a significant contribution to

promoting PPECs. Since, from the point of view of the companies, the population represents the potential buyer group for their products, the perception of this engagement on the part of the population is of essential importance for the companies. To this end, we analyzed the following research questions (RQ):

- **RQ1:** With which attitude does the population perceive company activities in the context of PPECs?
- **RQ2:** What is the influence of people's characteristics, in particular risk perception of the population and how does it relate to their attitude in the context of the COVID-19 pandemic?

### 3.2. Hypotheses

Our approach is inspired by the work of Maignan [20]. As already indicated in Section 2.2, she analyzed how consumers perceive CSR activities and revealed that there are economic, legal, ethical, and philanthropic responsibilities a company needs to fulfill. Guzmán and Davis [41] built on this approach by examining the extent to which consumers respond to companies' CSR activities and how they affect brand equity. Thereupon, we extended and applied this approach by implicitly integrating disaster relief into the research design as a social cause. We asked our participants about the perception, interest, meaningfulness, and effectiveness of PPECs based on these findings. To answer RQ1, we formulate our first hypothesis:

- **H1:** The engagement of a company in a crisis management collaboration with governmental actors (PPEC) is rated with a **positive attitude**.

We further developed Slovic's (1987) concept of the individual's risk perception (see Section 2.3). We applied it to the area of crisis management within the COVID-19 pandemic, which was ongoing at that time. Therefore, we asked participants about their fear of the pandemic, the severity of the consequences of infection, and the general uncertainty caused by the pandemic. We used the answers to these questions to explore and form a COVID-19 related *risk perception index*. Gerhold [64] argues that there are two ways for individuals to cope with risk, a problem-focused approach that involves objectively dissecting the risk factors and an emotion-focused approach that seeks to mitigate the risk based on one's feelings. Our questions concerning risk perception include both approaches. To answer RQ2, we propose 2 hypotheses, H2 and H3. Based on the former mentioned *positive attitude index*, the *risk perception index* as well as demographic characteristics (age, gender), we formed our second hypothesis:

- **H2:** The respondent's positive attitude towards the engagement of a company in a PPEC **significantly** correlates with the perceived risk, age and gender.

Madsen and Rodgers [19] argued that according to stakeholder theory there should be a relationship between CSR and corporate financial performance (CFP) which the authors elaborated on through a mediation variable Stakeholder Attention that was measured through newspaper mentions and applied the whole model to the corporate disaster relief CSR context. Cho et al. [65] studied 191 sample firms listed on the Korea Exchange and found a positive correlation between CSR engagement and CFP of these firms. Therefore, we propose our third hypothesis:

- **H3:** The respondents' positive attitude towards the engagement of a company in a PPEC with governmental actors has a **significant** correlation on their purchase intention towards products of a company engaged in a PPEC.

## 4. Study design

We conducted an online survey with two primary foci to attain our research objective. One focus is on people's attitudes towards company engagement in crisis management, and the other is on the implications of an individual's risk perception. Since to the best of our knowledge our study is the first which systematically explores these issues, we designed a questionnaire applying and adapting already existing concepts and measurement scales. The questionnaire consisted of 22 questions (including demographic characteristics) divided into three parts. Mainly, we used closed questions with a predefined number of answer options. In three cases, the participants were allowed to provide additional comments. Most of the questions were asked on a 5-point Likert scale format (dependent on the type of question, we asked for probabilities or agreement). The complete questionnaire was subsequently implemented and published using the online application *LimeSurvey*. The study population is aimed to be a representative sample of the overall population of Germany. Therefore, individuals aged 16 or older with web-access were recruited as sample using active and passive techniques. In combination with a cover letter containing an introduction and information on the purpose, duration, and anonymity of the survey data collection, the link to the questionnaire was actively distributed via the authors' private network, as well as disseminated on social networks to solicit widespread online responses. No (financial) incentives were given for participation in this questionnaire.

In the introduction of the questionnaire, individuals were presented with a hypothetically constructed scenario, which we described as:

*Natural disasters, financial crashes or fuel shortages — any of these scenarios could lead to a shortage of essential goods such as drinking water or food. To cope with such crises, it is conceivable that private-sector, such as retailers, freight forwarders, or manufacturers, become active and support. [...] contributions can be spontaneous or planned; they can be initiated by the company itself or in close coordination and collaboration with the state civil defense authorities. We would now like to know your opinion on the deployment of private-sector companies in crises. We are particularly interested in whether and under what conditions you view them positively or rather critically.*

Based on this hypothetical scenario, we asked the subjects attitudinal questions to determine whether they regard these company engagements as positive. First, we asked for the general perceived likelihood of such a crisis and the respondents' awareness and personal experience with socially committed companies during crises. Furthermore, the degree of agreement to various statements regarding the interest, perception, expectations, meaningfulness, and effectiveness of PPECs have been set up inspired by previous work of Arli and Tjiptono [42], Guzmán and Davis [41], Hsieh [49], Kolkailah et al. [36], Lee and Shin [34], Maignan [20], Ramasamy and Yeung [43], Shukla et al. [44]. These items were all measured using Likert-scaled questions ranging from 1 ("strongly disagree") to 5 ("strongly agree").

In addition to the scenario-specific components, the second part of the survey investigated participants' risk perception. Following the psychometric approach of Slovic [22], we have adopted the psychometric paradigm as the measurement concept for this purpose. To consider the specifics of a crisis for the participants, we applied selected risk characteristics of the concept to the COVID-19 pandemic. Respondents were again asked to indicate their agreement on a 5-point Likert scale with a series of statements regarding their perceived risk. In this Section, we also asked about their knowledge of an own COVID-19 infection, as well as whether anyone in their social network had been infected with COVID-19. Moreover, we assessed the respondents' purchase intention towards goods from a company engaged in a PPEC by asking whether they were more likely to purchase from an engaged company. In addition, we asked the participants whether they were also willing to take a detour to purchase from the dynamic company.

The last part of the questionnaire asked for the respondents' demographic characteristics, including gender, age, educational level, household characteristics, occupation, and residential area.

## 5. Results

We carried out the online survey between November 29, 2020, and January 09, 2021. In total, 877 respondents started the survey. We excluded 475 missing data questionnaires from further analysis of these submitted responses. Thus, our final data sample consisted of a total number of 402 valid responses. The average time required to complete the questionnaire was 16.46 min. To test the research hypotheses, descriptive analysis procedures and correlation and regression analyses have been employed. The survey results were analyzed using IBM SPSS 25 statistical software and are presented below.

### 5.1. Demographic characteristics of the respondents

The demographics of the sampled respondents are shown in Table 1. In terms of gender, slightly more females (53.73%) participated in the survey than males (44.28%). Age-wise, it can be observed that the sample comprises most participants in the age group of 16 – 25. However, the age groups between 26 and 65 contain almost the same number of participants. Regarding the level of education, the majority of the respondents have either graduated from high school (22.64%) or received a master's degree or similar (22.89%). Postgraduate degree holders accounted for 2.24% of the total sample. In addition, we asked respondents about their residential area. The share of participants from rural areas (population  $\leq 10,000$ ) was slightly above the proportion of those who lived in urban areas (population  $> 10,000$ ).

### 5.2. Testing of hypotheses

In order to test **H1**, we started by deriving the positive attitude index. To measure the attitude, we asked respondents to indicate their agreement with 10 statements on a 5-point Likert scale (Table 2).

Of the 349 respondents who have responded to all 10 items regarding the attitude towards company engagement in crises, a general interest in whether companies are involved in such collaborations with state authorities was indicated by 231 respondents (66.19%). In the case of collaboration, 76.79% of respondents reported they would consider a company's activities as a demonstration of social responsibility concerning the perception of the engagement. 278 people (79.66%) agreed that their company's perception would improve. Nevertheless, some respondents also showed concerns, with 50 individuals (14.33%) being apprehensive that the company merely wants to enrich at the expense of the suffering population. Even more respondents (34.96%) agreed to perceive the engagement as tactical calculus to enhance the company's image. Regarding the meaningfulness of the engagement, the majority of the respondents (86.53%) agreed that companies would provide useful support to government crisis management. Additionally, according to 266 people (76.22%), government crisis management could better accomplish its tasks through the supportive involvement of private companies. Most respondents (85.96%) believe that crisis management could succeed more efficiently through private companies' involvement.

Next, exploratory factor analysis was conducted to explore a sound index to examine whether the measurement items correlate. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.810, thus above the recommended value of 0.6, and Bartlett's test of sphericity was significant ( $\chi^2(45) = 795.833, p = 0.000$ ) [66]. Given the results of these indicators, the sample was considered adequate, and all 10 items suitable for factor analysis. Thus, all 10 items relating to the attitude towards company engagement in a PPEC were analyzed through exploratory factor analysis using principal axis factoring and varimax rotation in order to estimate new commonalities that replace the old commonality estimates to the moment the convergence criterion for extraction is satisfied [66]. According to the statistical results of factor analysis presented in Table 2, the analysis yielded two factors explaining a cumulative sum of 37.861% of variance for the complete set of variables. Factor 1, explaining 28.149% of the variance, included seven items with factor loadings from 0.476 to 0.698.

**Table 1**  
Demographic characteristics of the respondents.

Variable	Sample population <sup>a</sup>	
	Number	Percentage (%)
<i>Gender</i>		
Female	216	53.73
Male	178	44.28
Diverse	3	0.75
No answer	5	1.24
<i>Age</i>		
< 16	–	–
16–25	101	25.12
26–35	75	18.66
36–45	66	16.42
46–55	78	19.40
56–65	68	16.92
> 65	14	3.48
No answer	–	–
<i>Education</i>		
Secondary General School	2	0.50
Secondary School	39	9.70
High School Diploma	91	22.64
Apprenticeship	78	19.40
Bachelor's degree	86	21.39
Master's degree	92	22.89
Doctorate Degree	9	2.24
No answer/No degree	5	1.24
<i>Residential Area</i>		
Rural Area (Population ≤ 10,000)	217	53.98
Urban Area (Population > 10,000)	185	46.02
No answer	–	–

<sup>a</sup>Total sample size  $n = 402$ .

**Table 2**  
Results of factor analysis for *positive attitude index*.

Item	Agreement Rate <sup>a</sup> (%)	Mean	SD	Factor Loadings	
				Factor 1	Factor 2
The state crisis management can better fulfill its tasks through the supportive participation of private companies.	76.22	4.03	0.901	0.698	0.193
Then crisis management can succeed more efficiently.	85.96	4.26	0.771	0.644	0.087
I see such actions as a sign of social responsibility on the part of this company.	76.79	4.07	0.976	0.607	–0.001
Companies can provide useful support for state crisis management.	86.53	4.26	0.837	0.540	0.144
Is this an opportunity for the company to take social responsibility.	85.67	4.26	0.819	0.517	0.088
My perception of this company is improving.	79.66	4.06	0.911	0.508	0.182
I am interested in whether companies engage in collaboration with state authorities.	66.19	3.81	1.000	0.476	0.133
I fear that this company only wants to enrich itself at the expense of the suffering population.	34.96 <sup>b</sup>	3.70 <sup>c</sup>	1.149	0.178	0.786
I see it as a tactical calculation to strengthen the image.	14.33 <sup>b</sup>	2.97 <sup>c</sup>	1.190	0.000	0.642
For me, this is a form of “privatisation” of emergency care, which I fundamentally reject.	10.89 <sup>b</sup>	3.90 <sup>c</sup>	1.091	0.305	0.439

$n = 349$ .

<sup>a</sup>The values 4 and 5 on the 5-point Likert scale count as ‘Agreement’.

<sup>b</sup>The values 1 and 2 on the 5-point Likert scale count as ‘Agreement’.

<sup>c</sup>Item values recorded for factor analysis.

To test the reliability of the composite items, Cronbach's  $\alpha$  was computed. A resulting value of 0.778 for all seven items ( $n = 349$ ) demonstrates that the measurement scale meets a satisfactory level of composite reliability [67]. Exclusion of one of the items leads to a reduction of Cronbach's  $\alpha$ , so we keep all seven items in the index (see table 6 in the Supplementary Material Section for a detailed overview). These seven items were used for an index formation which we called *positive attitude index*. Using these seven items is consistent as they cover the categories of interest, perception, meaningfulness, and effectiveness. These are the various necessary areas that require serious support of this topic.

The remaining set of three items assigned to the second factor, given by the explorative factor analysis, is not investigated anymore as a meaningful factor after further evaluation with Cronbach's  $\alpha$  leads to a value of 0.663.

**Table 3**  
Results of factor analysis for risk perception index.

Item	Agreement rate <sup>a</sup> (%)	Mean	SD	Factor loadings	
				Factor 1	Factor 2
I am afraid of the pandemic and a possible infection with the virus.	38.07	2.99	1.259	0.937	0.021
I feel unsettled by the COVID-19 pandemic.	39.41	3.08	1.226	0.623	0.044
I consider the consequences of a possible infection to be serious/severe.	64.88	3.84	1.096	0.600	0.003
I believe that workers in the low-wage sector are particularly affected by the COVID-19 pandemic due to economic losses.	90.08	4.57	0.765	0.117	0.762
I believe that the consequences of the government's COVID-19 measures will weigh heavily on future generations.	76.68	4.18	1.008	-0.019	0.405
I believe that the COVID-19 pandemic will hit the urban population harder than the rural population.	60.59	3.56	1.268	0.000	0.181

$n = 373$ .

<sup>a</sup>The values 4 and 5 on the 5-point Likert scale count as 'Agreement'.

Overall, the Agreement Rate of the *positive attitude index* was 79.57% and the mean level was 4.1064 ( $n = 349$ ,  $SD = 0.58353$ ). Based on these findings, the hypothesis that the engagement of a company in a crisis management collaboration with governmental actors (PPEC) is rated with a **positive attitude** cannot be rejected.

With regard to H2 we analyzed how the individual's risk perception correlates with the previously considered attitude. As mentioned, we were inspired by the work of Slovic [22] as well as [63,64] to assess respondents' risk perceptions. Considering the then ongoing COVID-19 pandemic, we asked respondents to indicate their level of agreement on a 5-point Likert scale to six items shown in Table 3. Again, we assumed that a response of values 4 and 5 counts as agreement on an item.

Among the items set up to measure risk perception, we first asked respondents about their fear and uncertainty towards the COVID-19 pandemic. Of the 373 individuals who have responded to the entire six items, 142 (38.07%) stated they were afraid of the pandemic and possible virus infection. Additionally, 147 respondents (39.41%) felt unsettled by the pandemic. Considerably more people (242; 64.88%) regarded the consequences of possible virus infection as severe. In terms of geographical distribution, more than half of the respondents (60.59%) agreed that the COVID-19 pandemic would affect the urban population worse than the rural population. Concerning the distribution between different labor sectors, 90.08%, thus the majority believes that employees in the low-wage sector (e.g., in the hotel industry gastronomy) are particularly affected by the COVID-19 pandemic economic losses. Moreover, 286 people (76.68%) believed that the consequences of government policies (e.g., contraction of dept, lock-down) would weigh heavily on future generations.

Once again, to examine whether the measurement items correlate, exploratory factor analysis was conducted to explore a sound index. To confirm the application, the Kaiser–Meyer–Olkin (KMO) criteria was 0.614, and Bartlett's test of sphericity was significant ( $\chi^2(15) = 356.865$ ,  $p = 0.001$ ) [66]. According to the results of these indicators, the sample was considered adequate, and all six items suitable for conducting an exploratory factor analysis.

The statistical results of the exploratory factor analysis using principal axis factoring and varimax rotation are presented in Table 3. For the complete set of items, the calculation of factor analysis yielded two factors explaining a cumulative sum of 40.327% of variance. Factor 1, comprising the items of 'Fear of the pandemic and virus infection', 'Uncertainty due to the pandemic' and 'Perceived severe consequences of a possible infection', explained 27.646% of the variance with factor loadings from 0.937 to 0.600. For all three items, Cronbach's  $\alpha$  value of 0.756 ( $n = 373$ ) was obtained and is demonstrating that the measurement scale is reliable overall [67].

Using these three items, which cover the categories of fear, uncertainty, and consequences, and thus the various necessary areas required to illustrate the characteristics of risk perception is meaningful related to the content validity of the index.

The remaining set of three items assigned to the second factor, given by the explorative factor analysis, is not investigated anymore as a meaningful factor after further evaluation with Cronbach's  $\alpha$  leads to a value of 0.322 ( $n = 373$ ). Even if the item with the lowest loading (related to the urban population) is excluded, the other two items still lead to an unsatisfactory reliability level (Spearman–Brown Coefficient  $\rho = 0.477$ ,  $n = 373$ ).

Overall, the Agreement Rate of the *risk perception index* was 47.45% and the mean level was 3.3029 ( $n = 373$ ,  $SD = 0.98023$ ).

After exploring the *risk perception index*, we examined whether there is a correlation between the *risk perception index* and the *positive attitude index*. The intention is to examine the coping strategy of the respondents, following the work of Gerhold [64]. We aimed to determine a relationship between heightened risk perceptions and agreement for company engagement in PPECs. We summarized the results in Table 4. It can be seen that there is a significant correlation ( $p = 0.000$ ) between the *risk perception index* and the *positive attitude index*.

To analyze correlations between the *positive attitude index* and respondents' age or gender, we computed up the Eta coefficients. These were for the age  $Eta = 0.149$  ( $n = 366$ ) with an  $Eta^2$  of 0.022 and for the gender  $Eta = 0.041$  ( $n = 364$ ) with an  $Eta^2$  of 0.002.

Thus, we can only partially not reject hypothesis 2.

An interesting side note: For the *risk perception index*, there is a difference in the average mean values for respondents who know someone in their social network who had a COVID-19 disease ( $Mean = 3.3457$ ,  $SD = 0.932$ ,  $n = 274$ ) and those who do not know anyone in their social network ( $Mean = 3.1792$ ,  $SD = 1.075$ ,  $n = 84$ ).



**Table 4**  
Mean, Standard deviation and correlation of our indices and the purchase intention.

	Measure	Mean	SD		Correlations		
					1.	2.	3.
1.	<i>Positive Attitude</i>	4.0982	0.03144	Pearson's r p-value N	1 0.002 366	0.160 0.002 363	0.315 0.000 355
2.	<i>Risk Perception</i>	3.3049	0.05232	Pearson's r p-value N	0.160 0.002 363	1 397	0.068 0.186 382
3.	<i>Purchase Intention</i>	3.2472	0.06008	Pearson's r p-value N	0.315 0.000 355	0.068 0.186 382	1 387

**Table 5**  
Results of regression analysis for positive attitude on Purchase Intention.

	Coefficient (B)	Standard Error	95% CI <sup>a</sup>	$\beta$	t	p-value	ANOVA F(1, 353) = 38.984 p-value = 0.000
(Intercept)	0.760	0.402	[-0.30, 1.551]		1.891	0.059	
<i>positive attitude index</i>	0.606	0.097	[0.415, 0.797]	0.315	6.244	0.000	

Notes:  $R^2 = 0.099$ ,  $N = 355$ .

Dependent Variable: Purchase Intention.

<sup>a</sup>95.0% confidence interval for B.

**H3** concerns whether companies have an economic incentive to engage in such partnerships. To determine the respondents' purchase intention, respondents were asked to indicate on a 5-point Likert scale (1) whether they were more likely to purchase from an engaged company and (2) whether they were willing to take a detour to purchase from an engaged company. Of the 393 respondents who answered the first statement, 265 people (67.43%) indicated they would consider the company's engagement in a PPEC as a reason to be more likely to purchase from the company. Among 390 participants who responded to the second item, 125 individuals (32.05%) agreed on their willingness to take a detour to purchase from an engaged company. In contrast, another 102 people (26.15%) indicated a neutral opinion in this regard.

To derive economic incentives for companies, we have then tested whether a positive attitude towards an engaged firm, measured by the previously established *positive attitude index* (seven items, Cronbach  $\alpha = 0.778$ ), leads to an increased purchase intention on a company engaged in a PPEC. Regarding the purchase intention, with a Spearman–Brown Coefficient of 0.812, we combined those mentioned above described two items, resulting in a new variable with a mean value of 3.208 ( $SD = 1.1489$ ,  $n = 387$ ) [68].

First, findings revealed a significant correlation between the *positive attitude index* and the respondents' purchase intention towards an engaged company ( $r = 0.315$ ,  $p = 0.000$ ). Second, a standard linear regression was performed to test whether the positive attitude significantly predicts respondents' purchase intention (see Table 5). The results showed a significant regression equation ( $F(1, 353) = 38.984$ ,  $p = 0.000$ ) with a quite weak  $R^2 = 0.099$ . It was found that the positive attitude significantly predicts the respondents' purchase intention from an engaged company ( $\beta = 0.315$ ,  $p = 0.000$ ). We cannot reject hypothesis 3.

We computed the Eta coefficients to analyze correlations between the Purchase Intention and respondents' age or gender. These were for the age  $Eta = 0.088$  ( $n = 387$ ) with an  $Eta^2$  of 0.007 and for the gender  $Eta = 0.102$  ( $n = 382$ ) with an  $Eta^2$  of 0.010.

## 6. Discussion, further results and managerial implications

This Section discusses our previously obtained results and puts them into context. Considering further insights from our study, we derive managerial implications for those companies in the area of essential goods that have already pursued CSR issues in the past with their business model or want to use CSR in the future increasingly.

Regarding the probability of a shortage of essential goods due to a natural disaster, most of the 402 respondents considered this to be very unlikely (32.08%). Only 18 people perceived the occurrence as very likely (4.48%). Based on our research findings, we confirmed the current view obtained from the literature that population awareness can be positively linked to supporting a company's CSR initiatives. However, following our findings from Section 2, current research suggests a generally low level of population's awareness towards companies' CSR engagement practices due to a lack of knowledge [34–37]. We argue in the same direction as a growing number of publications, which is to highlight the need for comprehensive communication programs e.g. [69]. This includes tactics, strategies, or channels to raise the level of awareness [38]. Therefore, we asked for the knowledge on companies that engaged in PPECs. 219 respondents (54.48%) were already aware of projects worldwide in which private companies engage in PPECs. However, only 49 individuals knew specific companies involved in such partnerships. Our data also suggest that those known partnerships mainly referred to short-term set-up partnerships in the COVID-19 context. At this point, one could argue in the direction of the companies: If PPECs become much better known, which, e.g., also current examples like known partnerships from

COVID-19, show, then the whole topic of CSR and PPEC engagement could gain more attention in the future. This, in alignment with our research results on purchase intentions, would also promote companies' economic interests. To shed some light on this issue, as a first step, we asked participants the following about the credibility of various activities in company engagement in PPECs:

*In what cases do you consider engagement credible, in the sense that the company's actions are primarily motivated by a motive to help, rather than tactical or similar considerations?*

By far, the highest credibility was expressed for companies that take action over the longer term, i.e., not just on a one-time occasion ( $n = 399$ ) with a mean score of 4.34 ( $SD = 0.847$ ), followed by the use of diverse resources ( $n = 397$ ) with a score of 4.11 and  $SD = 1.012$ . If a company does little advertising with its commitment ( $n = 399$ ), this was rated with an agreement of credibility of 3.68 and a  $SD = 1.170$ . The company's announcement on its website to help in the future was only ( $n = 394$ ) rated as weakly credible with 2.34 and  $SD = 1.052$ .

In addition, we asked the population which sources of information they find particularly trustworthy. Unsurprisingly, with an approval rating of 4.32 and a standard deviation of 1.029 at  $n = 401$ , the highest credibility was expressed when the commitment could be seen with one's own eyes. Behind them were educational brochures from government agencies and their websites ( $n = 399$ ) with 3.97 and  $SD = 1.028$ . In the midfield were annual reports ( $n = 394$ ) with 3.15 and  $SD = 1.289$ , and particularly low trustworthiness was given to advertising that discussed the engagement ( $n = 397$ ) with 2.01 and  $SD = 1.009$ .

The results presented in this Section and the findings from the previous Section illustrate that respondents not only rate company engagements in PPECs generally positively, but also that it is highly correlated to their risk perception. These are the main results to answer our two research questions. Furthermore, it was found that a respondent's positive attitude towards company engagement in PPECs was associated with an increased purchase intention from that specific company. It represents the economic potential of this form of collaboration and is to be added to the factors of securing the value chain and improved perception already mentioned. Even though corporate engagement in PPECs is highly valued, it also depends on the quality and quantity of corporate outreach. In addition, even the best-intentioned assistance measure can be misreceived by the buyer group if the associated communication strategy does not appear trustworthy or is not used as an information source at all. Every company should consider these aspects when considering a possible involvement in a PPEC. We could find out a correlation between the risk perception and the agreement to a company's PPEC engagement. We determined a relationship between heightened risk perceptions and agreement for company engagement in PPECs, as one of the population's coping strategies.

Another critical factor, when it comes to the economic evaluation of CSR engagement, Madsen and Rodgers [19] emphasize, is that the financial performance will relatively certainly not pay off in the short term. However, these investments can be more than compensated for in the long term.

## 7. Limitations, future research, and conclusion

### 7.1. Limitations and future research

A few limitations to our research design can serve as starting points for further research in this area. First, we only conducted the study in Germany in an online format. Although we collected the participants' demographic data, the quality and scope of the study could be enhanced by a representative design, possibly including other geographic destinations such as other European countries or the United States. Although it can be assumed that similar results would be achieved in these Western countries, the political and structural differences are worth considering in future studies. With the same argument, the transferability of our results to countries from different cultures and economic backgrounds is doubtful. The age structure in our study, which is skewed in comparison to the German population, suggests divergent results for the total German population [70]. In addition, we only conducted this survey for a limited period at the turn of 2020–2021. Interesting conclusions could be drawn from re-surveying with the same group of participants. By conducting a comparative study after the COVID-19 pandemic, we could find out what has changed in the population's eyes and to evaluate if there are any changes recognizable at all.

A general problem with surveys, which also affects this survey, is the problem of social desirability. Since, in an ethical sense, CSR is often perceived as the right thing to do, a desirability effect can overstate CSR-related attributes in surveys and bias the results, creating a gap between attitudes and actual behavior [71,72]. Especially when it comes to questions concerning purchase intentions, one may argue that the stated intentions are consistent with actual behavior, but nevertheless, intention to buy answers in empirical studies have not necessarily shown the actual purchasing behavior afterward [73]. Finally, it can be noted that controlling for potential bias and asking for additional factors in future surveys could provide revealing information. For example, implementing more specific willingness to purchase questions based on different product categories or attributions would provide additional recommendations for companies. In addition, in the related research field of consumers' willingness to pay (WTP), which we did not explore in our survey, approaches exist to reduce bias between hypothetically measured and actual WTP. Both, Schmidt and Bijmolt [74] and Hofstetter et al. [75] analyze direct and indirect measurement procedures of WTP. The latter authors propose a de-biasing single question approach that could be considered for further investigations [75]. One could also specifically examine past purchasing behavior in the form of an examination of individual purchases, for example at the supermarket.

In our *risk perception index*, we focused only on a portion of items relevant to our study. An extension of these risk perception items, also about Slovic's model, could provide additional information on the risk perception of the population due to the ongoing COVID-19 pandemic. In addition, within the *risk perception index*, we have focused only on the COVID-19 pandemic. We decided to give participants a concrete, current event to use as a guide for evaluating this question. Future studies could also analyze risk perception in other crises or a more general view of risk perception. Finally, additional research results on the general risk perception of the population in combination with CSR would be welcome.

## 7.2. Conclusion

We have addressed a very crucial issue with this study, which is particularly important in light of the COVID-19 pandemic that is still ongoing at this point. Public actors in crisis management can better serve the population with the help of companies in so-called PPECs. With our study, we have made an essential contribution to how the population evaluates companies' engagement in PPECs and could derive managerial implications for companies.

The main findings of our study are that the population generally rates the involvement of companies in PPECs positively and that we were able to uncover a correlation between this agreement and the risk perception of those involved, but not between approval and sociodemographic factors such as age or gender. As a critical insight for companies, we found that the respondents' agreement also leads to an increased purchase intention among consumers, so companies should price the economic component of this involvement into their business planning.

In a nutshell, with the present work, we have taken the particular approach to evaluate corporate engagement in PPECs by raising the stakeholder approach from the population's perspective. In the long run, they are the ones providing the profits to the companies. We found that the population highly values company engagement in PPECs, but it also depends significantly on the quality and quantity of company outreach. The right communication channel and strategy are essential to promote PPEC engagement. We could find a correlation between the risk perception and the agreement to a company's PPEC engagement to determine if there was a relationship between heightened risk perceptions and agreement for company engagement in PPECs, as one of the population's coping strategies. Thanks to our study, companies can better understand how their engagement is perceived by customers and adjust their strategy accordingly to achieve a better return on their investments in CSR.

## Data availability

Data will be made available on request.

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## Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.ijdr.2022.103370>.

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