

Do continuous disasters make companies stronger?

- Case studies of two disasters “3.11 and COVID-19” -

ABSTRACT

Different types of disasters occur around the world and companies need to deal with them. Most existing studies focus only on a single disaster, which does not reflect the reality of various types of disasters occurring continuously. Thus, in this study, we focus on continuous disasters and investigate if a company’s experience of overcoming one disaster can help to deal with a different subsequent disaster. We interviewed 15 manufacturing SMEs in Miyagi, which experienced both 3.11 and COVID-19. The results revealed that an experience of one disaster does not necessarily lead to a better response to a different subsequent disaster. However, we found interesting cases where companies had changed positively after the disaster, so we conducted second-round interviews to explore the reasons. As a result, we identified a process of solving a chronic corporate problem where they used the disaster as a positive opportunity. This study extends previous research that has focused solely on single disasters and offers an alternative perspective to crisis management research.

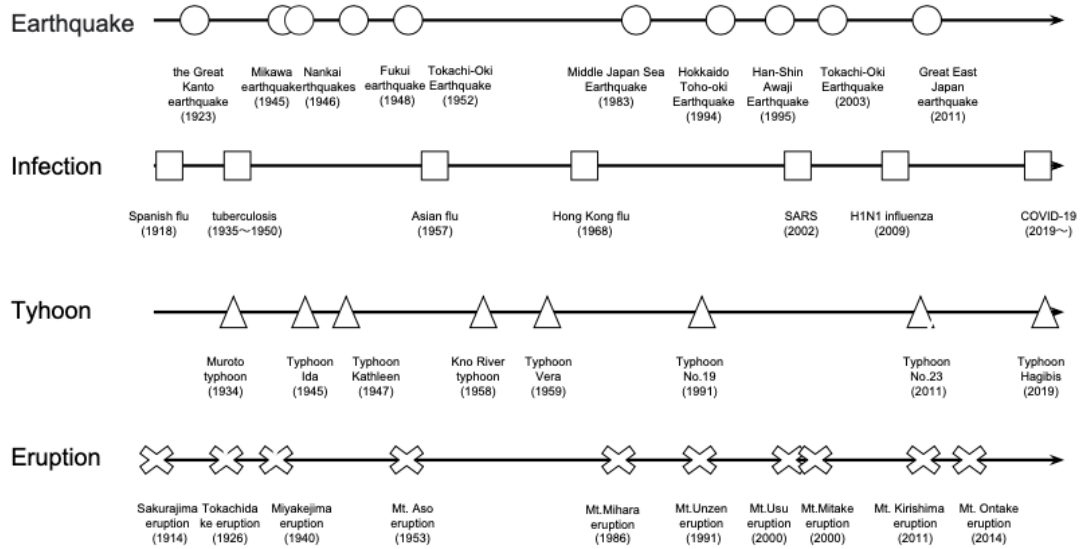
Keywords: Continuous disasters, SMEs, 3.11, COVID-19

7962 words

1. INTRODUCTION

In recent years, the environments surrounding companies have changed drastically. Disaster is one of the major threats to stable corporate management in the turbulent external environment. For example, the Great East Japan Earthquake that occurred on March 11, 2011, caused over 15,000 casualties and caused 9.9 trillion yen of economic damage in total (Cabinet Office, 2011). Also, as of 2022, a biological disaster called COVID-19 has caused more than 6.6 million deaths worldwide. This disaster also has caused economic losses estimated at over 100 trillion yen and has extremely limited human and business activities. Figure 1 shows the types and frequency of natural and biological disasters experienced in Japan. While disasters seem to be rare events in the short term, various types of disasters have occurred continuously in the long term. From this point forward, the great east Japan Earthquake is referred to as “3.11” and the coronavirus pandemic as “COVID-19”.

Figure 1
Various Disasters Occurring in Japan



(Source: Authors)

Companies have to prepare for and respond to these various disasters in order to survive. Existing studies have analyzed this important issue from two main perspectives (Bullough et al. 2014). The first perspective is crisis management. Research about crisis management has focused on the need for it and discussions about the challenges involved, in addition to the magnitude of the impact of crises on companies (e.g., Auzzir et al. 2022., Daimon et al. 2022., Hashim et al. 2021). Some studies also pointed to the lack of awareness of crisis management among companies (e.g., Herbane 2010., Peason et al. 1997). The second perspective is resilience. There are two major aspects in the research

on resilience. One focuses on clarifying resilience capacity and advocating the need for it (e.g., Fredrickson & Tugade 2003., Zhang et al. 2022.) and the other focuses on influential resilience by those that investigated ways to identify external factors and increase resilience capacity (e.g., Ma & Zhang 2022., Li et al. 2022.). In recent years, many studies have also focused on the relationship between COVID-19 and resilience (Ozanne et al. 2022., Mızrak & Çam 2022), and the importance of resilience in the field of crisis response is increasing.

Thus, existing studies have analyzed disaster correspondence from the perspective of crisis management and resilience. However, since these studies focused on “a single disaster”, they were limited in their ability to provide suggestions regarding “a continuous crises and correspondence of companies”, which is the key issue of this study. Exceptionally, Noth & Rehbein (2019) conducted a study that focuses on the continuity of multiple disasters. In this study, they reported that companies that had already experienced a flood in 2002 performed better after the 2013 flood. The valuable point of this study is that it focused on the continuity among multiple disasters and on the effects for companies.

In our study, we add the perspective of “continuity of disasters” to existing studies that focus on a single disaster, and as an attempt to further develop the research of Noth

& Rehbein (2019), we set our research question as “Does an experience of overcoming one disaster help to deal with a different subsequent disaster?” As a research context, we focused on manufacturing small and medium-sized enterprises (SMEs), in Miyagi Prefecture. We sent an interview request to 220 SMEs that matched our standard of sample selection, and 15 of them accepted it, with which we conducted interviews either in person or online. Our research is mainly composed of two phases. In the first phase of the study, we explored the effects of heterogeneous and sequential disasters, such as 3.11 and COVID-19. Surprisingly, all 15 SMEs did not recognize any connections between the two disasters. A more interesting finding was that three of these SMEs resolved chronic managerial issues that their organizations had faced in the process of experiencing the disasters. To further explore these three cases, in the second phase of the study, we explored the driving force and organizational factors that enabled these SMEs to consider a crisis such as a disaster, as a positive opportunity to solve their managerial problems. Based on the results of the analysis, we attempted to construct a theoretical model.

This study develops and extends existing studies that focus on a single disaster by adding a perspective of “continuity of disasters”. Of particular significance is the study of SMEs, which face multiple heterogeneous disasters in the long run while engaging in

management activities. Specifically, our case studies on three SMEs show how organizations not only survive through continuous disasters but also take disasters as an opportunity to solve their chronic managerial problems. No one can choose or avoid disasters. By showing the examples of companies and their organizational mechanisms that take disasters as positive opportunities, our study opens a new avenue for future studies.

This paper will proceed as follows. In “Literature Review”, we will review existing research on crisis management, and identify research gaps in the field of crisis management, in order to clarify our research question. In “Method”, we will introduce our research context, sample selection, interview subjects, data collection, and analysis process. In “Findings”, we will analyze the content of interviews with SMEs who experienced 3.11 and COVID-19, with the aim of developing a theory. In “Discussion”, we will present the theoretical and practical implications of this study as well as its limitations.

2. LITERATURE REVIEW

The purpose of this study is to elucidate the question, “Do continuous disasters make companies stronger?”. In this section, at first, we consider disasters as a type of

crisis and review how previous studies have discussed the relationship between crises and corporate management. Next, we present the gaps found in the existing studies and finally, we set a research question.

2-1. Crisis

No company is immune to crisis. Crisis is considered as an event that compromises the health and safety of employees, customers, and community, or that threatens to destroy public trust in the organization, thus beleaguering the company's longstanding reputation (Peason et al.1997). The impact of a crisis extends beyond any one company or organization because crises usually involve many stakeholders (Elliott & McGuinness, 2002). As the probability of a crisis occurring in a short term is low, not many companies have a clear understanding of the causes and effects of crises (Quarantell, 1988), and it makes decision-making difficult. Due to the increasing occurrence and significant impacts of various crises, numerous crisis management studies have been conducted to identify the causes of crisis occurrence and the impacts of crises on companies (Leta & Chan, 2021). To prevent serious damage from crises, organizations must respond swiftly to emergent and ongoing events so they can sustain or restore operations (Eismann et al. 2021).

The crisis field has been studied from various perspectives and can be divided into two main types: research focusing on the pre-crisis “preparation” phase, and the post-crisis “response and recovery” phase. In the research area of business, the topics related to the crisis are primarily crisis management and resilience (Bullough et al. 2014). Crisis management focuses on both pre-and post-crisis aspects, while resilience is primarily focused on the post-crisis period. The following section describes how crisis management and resilience have been discussed in previous studies.

2-2. Crisis management

Crisis management is the organization and coordination of activities in preparation for, and response to, events that prevent or impede normal organizational operations (thereby threatening its most important goals) (Herbane, 2010). Crisis management has been discussed by many researchers to enhance organizational capacity to effectively deal with various crises (Ma & Zhang 2022). The goal of crisis management is to help organizations avert crises or more effectively manage those that occur. The best-prepared organizations compile a crisis portfolio (Peason et al., 1997). Especially, a disaster is an external environment that includes the occurrence of a sudden external event over which organizations have little power or control and to which

they fail to respond (Hyndman & Hyndman, 2016). To avoid such a situation, it is essential to deepen our knowledge of crisis management.

Research on crisis management is important, and numerous studies address crisis management. For example, Auzzir et al. (2022) surveyed Malaysian SMEs in 2016 to determine the types of disasters that occurred and the impact of disasters on Malaysian businesses. Daimon et al. (2022) proposed and demonstrated the “Noah’s Ark” effect, a concept wherein major disaster scenarios generate radical engagement in disaster preparedness within local communities from the perspective of disaster prevention. Hashim et al. (2021) shows that risk perception is the most consistent factor influencing preparedness behavior and provides insight into why SMEs should engage in disaster preparedness activities.

Also, some studies argue for the role and usefulness of social media in crisis management, given the recent social environment of rapid digitization (e.g., Eismann et al. 2021). Burhan et al. (2021) explored the underlying factors and management practices affecting the business continuity of small companies in the hospitality sector that continue to struggle with the COVID-19 crisis in Pakistan. In-depth interviews with the management of each company showed that government support, cordial relationships with stakeholders, self-determination of entrepreneurs, and formal

planning are the most crucial factors that shaped the immediate adjustments of operational activities in response to COVID-19.

While some studies assert the importance of such crisis management, others argue that companies have a low awareness of crisis management. Herbane (2010) pointed out that crisis management is, for many organizations, ad-hoc reactions to events rather than a predetermined management process. Similarly, Peason et al. (1997) pointed out that many organizations that believe they are practicing crisis management are actually “cleaning up the mess” once a crisis has occurred. They also argue that managers underestimate the value of crisis management, which reinforces the vulnerability of their organizations. Compared to large companies, SMEs are less likely to see the need for a crisis management plan and team, and there is concern that when SMEs are faced with a crisis, they will suffer tremendous consequences, exposing the vulnerability of SMEs (Herbane 2010). Kato & Teerawa (2018) said that their study reveals a low level of preparedness for business continuity, despite a substantial degree of Thai SMEs’ disaster experience, including a failure to develop a written business continuity plan (BCP).

As stated above, it can be seen that there are numerous studies on crisis management. Some of them are sector-specific (Burhan et al. 2021) or focused on SMEs

(Peason et al.1997). Some studies point out the lack of awareness of crisis management (e.g., Herbane 2010., Peason et al. 1997). Although crises have been studied from a variety of perspectives, in general, most of the studies have emphasized the necessity of crisis management based on actual crises that have occurred.

2-3. Resilience

In general, one of the most negative influences on entrepreneurial activity is adversity, and resilience is the willingness to face and confront adversity (Fredrickson et al. 2003). Organizational resilience has attracted widespread attention in the management field as an indispensable element for successful organizational response to crises (Zhang et al. 2022). Resilience, in general, is key to understanding coping in and after crises (Folkman & Moskowitz, 2000; Tedeschi & Calhoun, 2004), and it has been considered an important source of sustainable competitive advantage (Hamel & Valikangas 2003). From here, we will look at recent research on resilience and how resilience has been discussed so far.

Lu et al. (2022) pointed out that few comprehensive pre-and post-disaster analyses based on resilience indicators have been conducted, and novel resilience evaluation criteria and a resilience score that accounted for both short-term resistance and long-term recovery and creativity are also proposed. Ma & Zhang (2022) surveyed

215 Chinese companies on resilience and revealed how organizational resilience is shaped by both external and internal tie strength and helps companies overcome crisis. Mızrak & Çam (2022) claimed that a more resilient community can be built after disasters by reducing the damages of disasters at the national and international levels.

In addition, an increasing number of studies have focused on COVID-19 and resilience in recent years. For example, Ozanne et al. (2022) analyze COVID-19 from a social capital perspective and argue that increasing organizational resilience capacity is critical for economic, social, and community recovery during a COVID-19 pandemic. Li et al. (2022) examined how service-oriented business model diversification of manufacturing companies has affected their organizational resilience during COVID-19. It showed that manufacturing companies with more revenue from service businesses endure more significant stock price loss and take longer to bounce back from the loss caused by the COVID-19 disruption.

In summary, it can be seen that existing research on resilience analyzes it from two aspects. One focuses on clarifying resilience capacity and advocating the need for it (e.g., Fredrickson & Tugade 2003., Zhang et al. 2022.) and the other focuses on influential resilience by those that investigated ways to identify external factors and increase

resilience capacity (e.g., Ma & Zhang 2022., Li et al. 2022.). Research on companies facing crises is meaningful because it is difficult to avoid crises without fail.

2-4. Research Questions

As mentioned above, based on the key assumption that disasters are destructive for companies in almost all studies (Noth & Rehbein 2018), numerous studies have been conducted on disaster response, such as crisis management and resilience. Research on crisis management has focused on discussions on the need for crisis management, problems, and perceptions of crisis management, in addition to the magnitude of the impact of crises on companies. On the other hand, research on resilience has focused on two major aspects of resilience: one is aimed at clarifying resilience capabilities and asserting the need for resilience, and the other is identifying external factors that affect resilience and investigating ways to enhance resilience, based on the recognition that resilience is important.

These existing studies clearly show that crises have a very significant impact on corporate management. However, since most of these existing studies focus on “a single disaster”, there are limitations in obtaining suggestions regarding the question of this study, “Do continuous crises make companies stronger?”. As shown in Table 1, while many studies focus on a single disaster, investigate its impact, and examine what

measures companies took and what effect these measures had, there are few studies that focus on the continuity of disasters. Most disasters come suddenly, and companies must prepare for all types of disasters, even after overcoming one disaster.

As an exceptional study focusing on the continuity of disaster, Noth & Rehbein (2018) provides insight into our question. This study shows that there is a positive net effect on company performance in the direct aftermath of a natural disaster. They investigated company outcomes after a major flood in Germany in 2013 and robustly found that companies located in the disaster regions have significantly higher turnover, lower leverage, and higher cash in the period after 2013. They also provide evidence that this effect originates from companies that experienced a similar catastrophe in 2002.

Once one crisis is overcome, prepare for the next one. As shown in Figure 1, various disasters have occurred in succession over the long term. It is important to examine companies in terms of their response to successive disasters to ensure their long-term survival. That is why studies such as the aforementioned Noth & Rehbein (2018) are valuable that focus on the continuity among multiple disasters and their effects.

Table 1
Examples of Crisis management and Resilience Research

Paper	Disaster	Category	Overview	Analysis method
Lu et al. (2022)	Earthquake	Resilience	Comprehensive pre- and post-disaster analysis based on new resilience indicators	Data from 55 counties in Sichuan Province, China, before and after the 2008 Wenchuan earthquake Quantitative research using data before and after the 2008 Wenchuan earthquake in 55 counties in Sichuan Province, China
Daimon et al. (2022)	Tsunami	Crisis management	Comparative analysis of tsunami damage caused by the Great East Japan Earthquake and expected tsunami damage in other regions	Quantitative and Qualitative Analysis of Japanese Newspaper Articles on "Disaster Prevention" by Text Mining
Hishan et al. (2021)	Cyclone	Crisis management Resilience	Identifying Factors Contributing to Disaster Risk Considerations for building resilience	Qualitative study of social, governmental, and nongovernmental organizations affected by Cyclone Anfan that hit India
Eggers (2020)	COVID-19	Resilience	Literature Review on Crisis Responses of SMEs and Suggestions for Overcoming External Shocks	Literature review of 69 manuscripts that studied small businesses in past crises
Burhan et al. (2021)	COVID-19	Crisis management	Elucidating the Impact of COVID-19 on Small Businesses Serving Hospitality	Interviews conducted with managers of SMEs in the hospitality sector in Pakistan
Smith et al. (2022)	COVID-19	Crisis management	A study of the impact of COVID-19 on owners and managers of small and medium-sized tourism businesses	A mixed-method analysis of tourism operators in Victoria, Australia, combining qualitative and quantitative research.
Samantha (2018)	Flood	Crisis management Resilience	Impact of Floods on Small and Medium Enterprises Impact Study Disaster risk reduction and coping mechanisms in SMEs Disaster Coping Mechanisms in SMEs	MSMEs affected by flooding in the Colombo region flood-affected MSMEs in the Colombo region Quantitative cross-sectional survey study
Noth & Rehbein (2018)	Flood	Crisis management Resilience	Implications of possible disaster continuity and its factors in post-disaster firm performance.	SMEs that experienced the major flooding in Germany in 2013. Quantitative analysis of SMEs that experienced severe flooding in Germany in 2013
Hashim et al. (2021)	Flood	Crisis management	Flood Disaster Preparedness of Small and Medium Enterprises Factors Affecting Flood Disaster Preparedness of SMEs	Questionnaire-based survey of small and medium business owners and managers Interview survey

(Source: Authors)

Based on the above, in an attempt to add a “continuum of disasters” perspective to the many existing studies that focus on a single disaster and to further develop the work of Noth & Rehbein (2019), this study asks this research question, “Does an

experience of overcoming one disaster help to deal with a different subsequent disaster?").

By approaching companies that have experienced and survived different types of disasters, we aim to provide new insights into existing research on crisis and company management.

3. METHOD

This study is conducted in two phases, Phase 1 and Phase 2. The concrete method of each phase is presented below.

3-1. Phase 1

3-1-1. Research Method

We took a qualitative approach to explore our research questions and decided that a qualitative case study was the most appropriate way to elucidate whether an experience of overcoming 3.11 helped to deal with COVID-19. We note that due to the limitations of data available in the literature and on the Internet, we collected data through interviews.

3-1-2. Research context and data

In this study, we define disasters as “unpredictable external shocks that physically constrain human and corporate activities”. 3.11 and COVID-19 were selected as the two disasters to be studied in this study. There are three reasons for this selection. First, these disasters meet the definition above. Second, they are different types of disasters. Specifically, 3.11 caused significant damage in a short time, whereas COVID-19 caused damage over a long period of time. Also, 3.11 affected facilities, while COVID-19 did not. The last one is because both disasters occurred relatively recently, more accurate and richer data can be collected.

We set our research context as “SMEs in the manufacturing industry in Miyagi Prefecture which were established before 3.11 and are still alive today”. The following four criteria were used to narrow down the list of interviewees. First, we chose companies in Miyagi Prefecture as the context for the study. This is because Miyagi Prefecture has suffered the most damage in Japan from 3.11. Looking at the number of fatalities, one indicator of the extent of damage, of the approximately 19,000 deaths caused by 3.11, about 10,000 were in Miyagi Prefecture (Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, 2017). Second, we focused on SMEs because SMEs are the backbone of the economy (Eggers, 2020) and have an essential role in the Japanese economy. Third, among various industries, we focused on the

manufacturing sector. The reason for focusing on the manufacturing industry is that it is an important core industry, accounting for about 20% of both the GDP and the working population in Japan (Ministry of Economy, Trade and Industry, 2020). Fourth, in the context of the study, we focused on SMEs that were established before 3.11 and experienced COVID-19.

In searching for SMEs that meet the criteria above, we used a web application, Musubu (<https://www.musubu.in/>). With this application, by entering the selected criteria, SMEs that meet those criteria are presented. The search yielded 220 SMEs that met the criteria above. In order to secure as large a sample as possible, we requested interviews via email with all 220 SMEs. As a result, we obtained interview permission from 15 of them. After that, we arranged the schedule and conducted the interviews one after another. The following is a list of the interviewed SMEs in chronological order.

Table 2
Interview Details

No.	Company	Interviewees	Interview Date and Time	InterviewMethod
1	A	two Managers	2022.6.22 15:00~16:10	In-Person
2	B	President	2022.6.29 13:00~14:39	In-Person
3	C	President Manager	2022.7.6 15:00~16:53	In-Person
4	D	two Managers	2022.7.8 15:00~16:11	In-Person
5	E	Manager	2022.7.20 15:00~15:57	Online
6	F	President	2022.7.25 15:00~16:09	Online
7	G	President Manager	2022.7.27 14:00~15:06	In-Person
8	H	President	2022.8.8 16:00~17:29	In-Person
9	I	President	2022.8.19 9:30~10:55	Online <input type="text"/>
10	J	President	2022.8.24 14:30~15:41	Online
11	K	President	2022.8.30 14:00~14:55	Online
12	L	President	2022.8.31 13:00~14:32	In-Person
13	M	President	2022.9.12 14:00~16:08	In-Person
14	N	Manager	2022.9.13 13:00~13:28	Online
15	O	President	2022.9.27 10:00~10:42	Online

(Source: Authors)

3-1-3. Interview Questions

Semi-structured interviews were employed as the interview technique. The reason why we selected this method is that this study had a predetermined orientation of questions and that some of the questions needed to be asked in more depth. Eight Interviews were conducted in person while seven interviews were online. The in-person interviews were conducted at the SMEs' offices, while the online interviews were conducted via Zoom. Interviews lasted from 30 to 90 minutes.

The main interview questions are summarized in Table 3 below.

Table 3
Question Items

Disaster	Category	Question
3.11	Questions about the damage	Please tell us about the damage to your facilities caused by 3.11.
		Please tell us about the human suffering caused by 3.11.
	Questions about damage response	What factors motivated recovery?
		What was the initial response and how long did it take?
		Please let us know if there is a long-term response.
	Questions about results and learning	What is the extent of your recovery? -Sales, number of employees, size of business, nature of business
		Please let us know if there are any changes before and after the earthquake.
	COVID-19	Questions about the damage
What damage has been done to the supply chain by COVID-19?		
Questions about damage response		When did you start considering measures against COVID-19?
		What measures have you taken?
Questions about results and learning		What results have been achieved by the measures? -Number of employees, sales, results
		Please let us know if there are any changes between before COVID-19 and now.
3.11 × COVID-19	A question about RQ	Did the experience of 3.11 help you in your response to COVID-19?

(Source: Authors)

3-1-4. Analysis

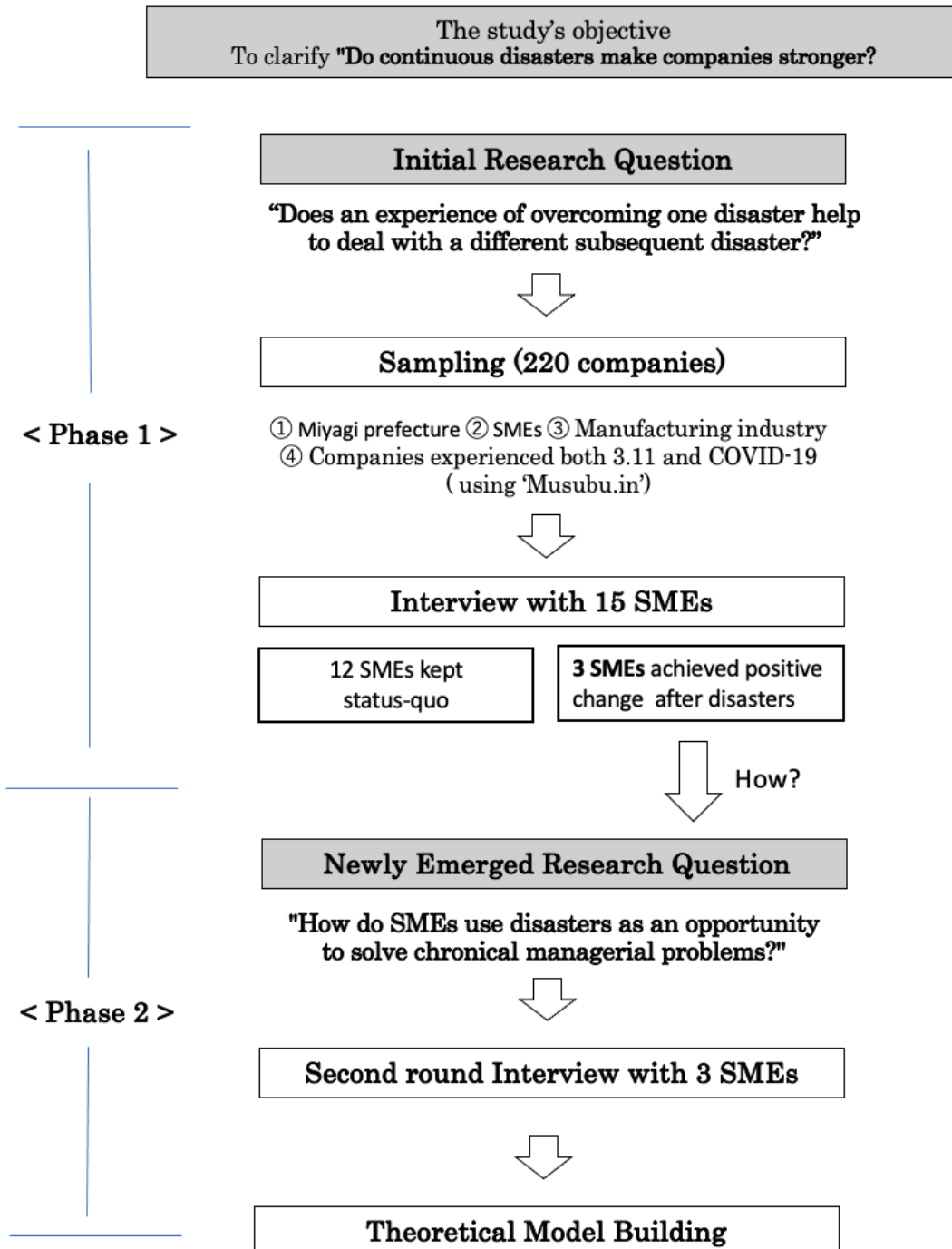
All interviews were recorded and transcribed verbatim. This was done to eliminate any misremembering of the interview content. The first step in the analysis was to analyze the case studies to determine what actions each SMEs had taken. We then analyzed the 15 SMEs to see if there were any commonalities in their processes or changes as a result of their responses. Subsequently, we planned and carried out the second phase of research with three SMEs.

3-2. Phase 2

In the 2nd phase of our study, we conducted second-round interviews with three SMEs that had solved chronic managerial problems in the process of experiencing disasters. Here, we set a new research question: “How do SMEs use disasters as an opportunity to solve chronic managerial problems?”. The research method in the second phase is basically identical to that of the first phase. When analyzing the data, we first transcribed the recorded data. Then, we aimed to construct a theoretical model based on the interview data collected in Phase 2.

The following is the flow of our study.

Figure 2
Our Research Flow



(Source: Authors)

4. FINDINGS

4-1. Phase 1

Surprisingly, none of the 15 SMEs responded that their experience of 3.11 was helpful in their response to COVID-19. In addition, although we asked questions regarding the damage and response to each of the disasters, there was no objective linkage between the experience of 3.11 and the response to COVID-19. Company A's CEO said, "We had a rough direction, but we responded to each crisis situation (3.11 and COVID-19) accordingly.". As Company A's CEO stated, the experience of 3.11 did not lead them to a better response to COVID-19, but rather the company responded to and overcame both 3.11 and COVID-19 respectively. The results of the primary interviews with 15 companies are briefly summarized in Table 4 below where "3.11 Damage" and "COVID-19 Damage" indicates whether the companies were or were not damaged by the respective disasters. In the table, we marked a circle(O) when a company cannot continue to operate its facilities at the same level as before the disaster in "3.11 Damage", and when COVID-19 affected its sales in the med/long term in "COVID-19 Damage". In the cell of "3.11 × COVID-19", we marked a circle if the companies perceived that the experience gained from 3.11 could be applied to responding to COVID-19.

Table 4
Summary of primary interview results

Company Name	3.11 Damage	COVID-19 Damage	3.11 × COVID-19	Positive Change
A	○	○	×	×
B	○	○	×	○
C	○	○	×	×
D	○	×	×	×
E	○	○	×	×
F	○	○	×	○
G	○	○	×	○
H	○	○	×	×
I	○	×	×	×
J	○	○	×	×
K	○	×	×	×
L	○	○	×	×
M	○	×	×	×
N	○	○	×	×
O	○	×	×	×

(Source: Authors)

As can be seen from this table, of the 15 companies that experienced both 3.11 and COVID-19, none of them responded that their experience of 3.11 led to a better response to COVID-19. In addition, interviews conducted with each SMEs were transcribed, and the damage and responses to the two disasters were summarized and cross-checked, but no objective connection was found in the end. Thus, what we found from our survey on 15 companies can be concluded as “companies do not perceive that

their experience in overcoming one type of disaster is utilized for their response to another type of disaster”. We interpret this finding in two ways. First, the 15 companies that cooperated with our study might be “a winning group” from the disasters. Many of them have long-built local networks, patented technology, and differentiated business models targeting a niche market. Therefore, their perception and damage from the disasters might not have been as serious as other less competitive companies. Second, although 3.11 and COVID-19 are one of the biggest and the most recent disasters we’ve experienced, the nature of the two disasters might be too different to think in the same line. We will discuss more about this in the “discussion” section.

However, very interestingly, as shown in the right column of Table 4, unexpected cases were found among the 15 interviewed companies: 12 of the 15 companies tried to return to their “pre-disaster state” after the disaster, while the remaining three SMEs changed more positively after the process of going through the disaster. Thus, in order to further explore this unexpected phenomenon, we proceeded to Phase 2 for an additional study focusing on these three SMEs.

4-2. Phase 2

Unlike our initial assumption that disasters are harmful to companies, our research revealed that there are three cases of companies that used disasters as an

opportunity to solve chronic managerial problems. We wanted to learn more about the nature of the changes of these three SMEs, so we set a new research question: “How do SMEs use disasters as an opportunity to solve chronic managerial problems?”.

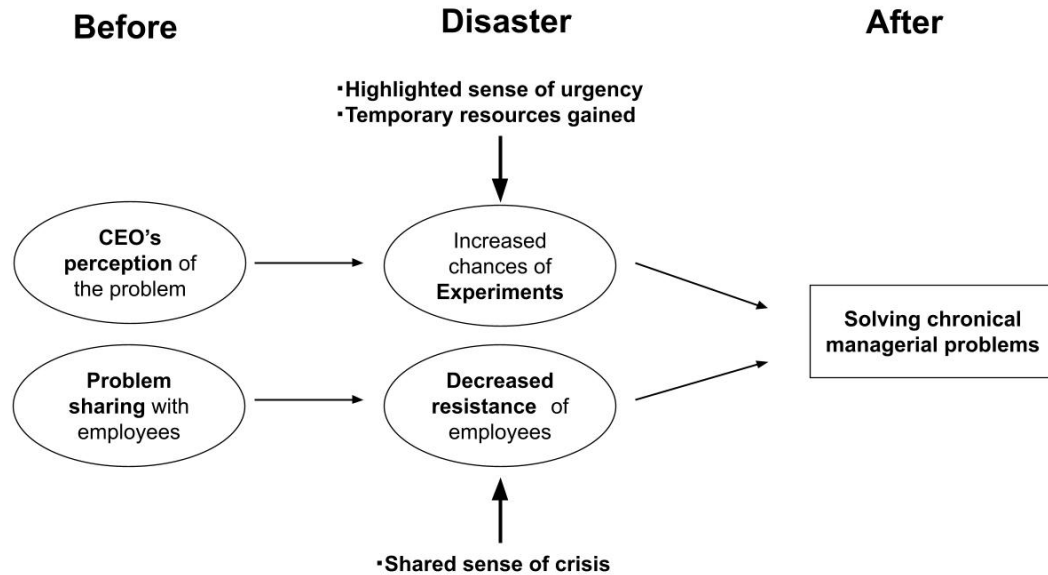
Table 5
Overview of the three SMEs

Company	Established year	Number of Employees	Head Office Location	Main Business	Description of change
B	1920	600	Sendai City	Food production and sale	Improved staffing efficiency
F	1973	37	Osaki City	Precision parts processing	Digitalization and Training Implementation
G	1948	80	Ishinomaki City	Paper Processing and Sales Packaging Materials Sales	Diversification of commercial products

(Source: Authors)

To unravel this research question, we conducted semi-structured interviews that asked about the factors driving change, transcribed them, and worked to abstract the concepts commonly found in each case. Figure 3 is a theoretical model that summarizes the process and key factors by which the three SMEs overcame their chronic managerial problems in the wake of the disaster.

Figure 3
Process for solving chronic managerial problems



(Source: Authors)

Before

First, regarding the construct of “CEO’s perception of the problem”, the CEOs of all three SMEs had a strong awareness of their problems before 3.11 and COVID-19 and attempted to share and solve them with their employees. The CEO has the authority to decide whether or not to implement measures necessary to solve the issues. However, the CEO was unable to do so due to barriers such as the inability to make radical decisions or the lack of resources necessary to solve the problems.

“Sharing issues with employees” refers to a state in which the entire workforce, not only management, is aware of chronic managerial problems. Companies whose

employees were able to recognize the issues were either taking actions to solve the managerial problems before the disaster or were facing major issues where the issues were directly linked to a decrease in sales. These companies had employees who were also aware of the problems. However, employees were resistant to change.

Disaster

Disasters provide “increased opportunities for experimentation” and “decreased employee resistance”. We define “experimentation” as the testing of measures that are difficult to perform under normal circumstances but necessary to solve the chronic problems. In this study, there were instances in which disasters increased the opportunity for experimentation either by increasing the sense of urgency or by providing temporary resources. Companies that were unable to solve problems due to lack of resources can solve them by making good use of unexpected resources brought about by disasters such as time and government subsidy, and successful application of them.

In general, it is very difficult to push people out of their comfort zones (Kotter, 1995). Even if problems were shared with employees prior to the disaster, these resistances prevent them from resolving the issues. However, when a sense of crisis is

shared during a disaster, the employee resistance that existed before the disaster decreases. As employee resistance gets reduced, implementation can proceed smoothly.

After

Through increased opportunities for “experimentation” and decreased employee resistance brought about by disasters, the three SMEs overcame chronic managerial problems. Using specific cases from the three SMEs, the following section describes the process of their change through solving chronic problems.

Case1: Company B

Before

Company B, which was established in Sendai and has more than 100 years of history, is in the business of manufacturing and retailing food products. Although all of its stores were destroyed in the Sendai Air-Raid during World War 2, it has steadily expanded its store network since its restoration and reached to expand 50 stores in 2010. However, even prior to COVID-19, this SMEs was suffering from poor financial performance. As one of the reasons for the poor financial performance, the CEO recognized the issue of excessive labor costs relative to sales. Company B’s CEO had been thinking of ways to improve performance and had been trying to improve staffing efficiency in order to reduce labor costs since 3 or 4 years before COVID-19 pandemic

occurred. Although this had been successful in a sense that “issues were shared within the company”, it did not lead to the anticipated results. In order to make staffing more efficient, adjustments must be made while reducing shifts, but this means a decrease in employees’ income. These dilemmas prevented thorough implementation of the measures.

Disaster

The COVID-19 made it difficult for many stores to operate their business as usual. They were forced by the Japanese government to shorten their business hours. On the other hand, the Japanese government provided an employment adjustment subsidy, allowing employees to receive a salary even if they did not come to work. This represents a temporary acquisition of resources in the form of a temporary subsidy.

Company B’s CEO, who had been thinking about reducing the number of shifts, took advantage of this opportunity to conduct an “experimentation” to see if they could operate the store with fewer employees by taking them to the limit. This represents an increasing opportunity for experimentation.

COVID-19 also created a sense of urgency among employees, as COVID-19 made it more difficult to operate and caused employees to worry about the company’s survival. This reduced “employee resistance” to the change.

After

As a result of the experiment, Company B succeeded in improving its staffing efficiency. Specifically, the company, which had been operating with 700 employees, is now able to operate with 600. Although sales itself fell from pre-COVID-19 levels, the company succeeded in improving profits. In addition, the measure was smoothly accepted by the company due to the decrease of employee resistance.

Case2: Company F

Before

Company F's CEO, which has been in the precision parts processing business for about 50 years, faced two issues while observing the workplace: The first one was inefficient information sharing. As a result, business operations were slow. Thus, the CEO introduced the iPad as a solution, but it failed to spread. The second problem was the work style. Knowledge is needed to seek safer ways of working and to work in accordance with laws that change on a daily basis. Therefore, training is necessary to obtain this knowledge and share it throughout the company, but the company has not been able to find the time to organize such training. The CEO also noted that one of the problems preventing the implementation of these measures was the craftsmanship spirit of their employees. Although they were aware of these two issues, they were reluctant to

change the way they had been trained or to promote digitalization through the introduction of the iPad for better information sharing. This resistance by employees was an obstacle to solve the problems.

Disaster

COVID-19 advanced two measures. The first one was the “experimentation” of using the iPad to improve the efficiency of information sharing; COVID-19 dramatically changed the social trend and made remote work more common. This social trend has also changed the way employees think. Employees began to have a sense of crisis that they should adjust to remote work or otherwise they would be left behind.

Company F also experimented with the implementation of training programs. COVID-19 has helped to share the sense of crisis within the company and has reduced resistance among employees. In addition, the reduced number of orders created vacant time, which was “experimented” to be used for training.

After

The introduction of the iPad resulted in more efficient information sharing and eliminated work stoppages. In addition, the CEO analyzed that the introduction of chat tools has increased communication. Another measure, the implementation of training, resulted in increased operational efficiency and safety. The unexpected “vacant time”

created by the social changes brought about by COVID-19 and the decrease in the number of orders was used as an “opportunity for experimentation” to overcome the problems by introducing the iPad and conducting training sessions.

Case3: Company G

Before

One of the problems facing Company G, which has been sourcing and retailing paper products for more than 70 years, is that its main business itself is incompatible with the current trend toward a paperless society. As a result, even before 3.11, the company was facing the problem of declining sales along with declining demand for paper. It was Company G's corporate culture that prevented itself from resolving this issue. Company G, which emphasized transactions with its existing customers, was reluctant to disrespect them by dealing with products other than paper. As Company G's CEO said, “It is a very risky decision to venture into a different field of business”. Although the entire company, including its employees, was aware of the issues, the risk of taking measures was a huge barrier to implementing them.

Disaster

It was under these circumstances when 3.11 occurred. Since this company was located in a coastal area, its head office, factory, branch offices, and sales offices in Miyagi

Prefecture were severely damaged. In addition, its facilities and vehicles were damaged, as well as human casualties. After the disaster, the company got loans from banks and cooperated with surrounding companies to hasten restoration efforts.

Company G, which had suffered tremendous damage, had a strong desire to recover at all costs. As the urgency of change grew, Company G reexamined its past management policies and embarked on a major “experimentation” by diversifying its product lineup. Although it had previously handled only paper products, it began to deal with packaging materials as well. In addition, half of the employees were laid off due to the severe damage, and a sense of crisis was shared throughout the company. The disaster encouraged management to make a decision, which reduced the resistance of the remaining employees and led to the implementation of measures to diversify the company’s product line.

After

The change in product lineups of Company G may seem simple from an objective point of view. However, this change was such that it altered the corporate culture up to that point. That diversification included starting to sell packaging materials in addition to paper. Even if paper sales were to fall to a low level, the company created a foundation that could be covered by packaging materials. Pre-disaster sales were on a downward

trend, and although 3.11 caused tremendous damage, the company's sales leveled off after the recovery thanks to the diversification of its product lineups.

5. DISCUSSION

In this paper, we take “studying responses to a single disaster” as a gap in existing research and set the research question “Does an experience of overcoming one disaster help to deal with a different subsequent disaster?”. Collecting and analyzing 15 samples, we found that the experience of 3.11 did not apply to the response to COVID-19. The most interesting finding of our study is that we could observe “SMEs that have changed by solving chronic managerial problems in response to disasters”, Thus, we set a new research question “How do SMEs use disasters as an opportunity to solve chronic managerial problems?”. We developed a theoretical model explaining that CEO's awareness of problems and sharing of them with employees is important before disasters, and that these lead to increased opportunities for experimentation and decreased employee resistance during disasters, which in turn lead to solving the problems.

5-1. Academic Implications

Our findings have largely two academic implications. Firstly, our study adds a realistic perspective of “continuity of disaster” to many existing studies in the crisis management field. Most existing studies have focused on a single disaster or the same type of disaster, and none of them has focused on SMEs that have experienced multiple and heterogeneous disasters. In order for SMEs to survive for a long time, it must anticipate and prepare for different types of crises. Despite this, no study has focused on different types of disasters. This study attempts to address this gap. Secondly, we suggest a new perspective of utilizing disasters in a constructive way. Generally, disasters are regarded as only negative, limiting the activities of people and companies. As shown in Table 1, most existing studies dealing with crisis management and resilience reflect this negative side of disasters. In this respect, our study adds a new perspective to the existing research by suggesting that disasters can be a positive opportunity to transform corporate routines.

5-2. Practical Implications

Our findings have largely three practical implications. Firstly, we have shown the importance of employees also being aware of problems prior to a disaster. It is not rare for CEOs to be aware of their companies’ problems in the pre-disaster phase. However, sharing chronic managerial problems with employees, even during normal

times, can help reduce employee's resistance during a disaster and can lead to the resolution of the problems. Secondly, we have shown that continuous awareness of issues during a disaster is critical in resolving them. During a disaster, it may be difficult for SMEs to remain aware of their chronic problems because it is busy dealing with various problems caused by the disaster. However, by remaining aware of chronic issues even under such circumstances, you can expect to solve such problems for companies. Finally, we argue that by making better use of temporary resources and the sense of urgency that disasters bring, SMEs may be able to solve the chronic managerial problems they had before the disaster. We tend to focus only on the aspects of disasters that are destructive and negative for companies, but if we can broaden our perspective to "the benefits of disasters", we can view disasters as constructive. This study suggests that by constantly thinking about what we can do even under the severe conditions of a disaster, we may be able to solve chronic problems.

5-3. Limitation & Future Research

Although we attempted to collect data from 220 SMEs in Miyagi Prefecture and were able to interview 15 SMEs, two major issues remain to be further developed in terms of sample and disaster type. First, we could not find a clear benefit or learning of

SMEs in the process of experiencing continuous disasters, it is possible that different results could be found in the research question 1 if the sample size is increased. Although the physical damage experienced by companies and their response methods differ from disasters, there is a strong possibility that the disaster experience of managements and employees connected in deeper areas, such as psychological aspects. Second, since the disasters in this study were limited to 3.11 and COVID-19, it is not possible to examine the effects of a series of disasters occurring in various combinations. As shown in Figure 1, there are various types of disasters that have a significant impact on SMEs, such as typhoons, floods, earthquakes, and infectious diseases. For example, if studies were conducted on typhoons and earthquakes, which are also classified as natural disasters, there might be a clearer link between continuous disasters and SMEs' learning. Although we focused on the most lively experience of recent disasters, 3.11 and COVID-19, the two disasters might have too different nature to expect companies' learning. However, the "continuous disasters" perspective of this study opens a new avenue for a future study on disasters and SMEs. Despite these limitations, we would argue that our study, especially our findings of the three SMEs that utilized disasters as positive opportunities, provide a chance to see both sides of disasters in business management, not only negative and destructive but also positive and constructive.

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REFERENCES

Books

Kotter, J. P. (1995), "Leading Change", Harvard Business Review Press.

Journal articles

Auzzir, Z., Haigh, R., & Amaratunga, D. (2018), "Impacts of Disaster to SMEs in Malaysia", *Procedia Engineering*, 212, pp 1131-1138.

Bullough, A., Renko, M., & Myatt, T. (2014), "Danger Zone Entrepreneurs: The Importance of Resilience and Self-Efficacy for Entrepreneurial Intentions", *JOURNAL OF TROPICAL FUTURES*, 38(3), pp 473-499.

Burhan, M., Salam, M, T., Hamdan, O, A., & Tariq, H. (2021), "Crisis management in the hospitality sector SMEs in Pakistan during COVID-19", *International Journal of Hospitality Management*, 98, in print.

Daimon, H., nakano, G., Takahara, K., & Miyamae, R. (2022), "The Noah's Ark effect: Radicalization of social meanings of disaster preparedness in communities facing a major disaster", *International Journal of Disaster Risk Reduction*, 82, in print.

Eggers, F. (2020), "Masters of disasters? Challenges and opportunities for SMEs in times of crisis", *Journal of Business Research*, 116, pp 199-208.

Elliott, D., & McGuinness, M. (2002), "Public Inquiry: Panacea or Placebo?", *Journal of CONTINGENCIES AND CRISIS MANAGEMENT*, 10(1), pp 14-25.

Eismann, K., Posegga, O., & Fischbach, K. (2021), "Opening organizational learning in crisis management: On the affordances of social media", *Journal of Strategic Information Systems*, 30(4), in print.

Folkman, S., & Moskowitz, J. T. (2000), "Positive affect and the other side of coping.", *American Psychologist*, 55(6), pp 647-654.

Fredrickson, Barbara L., Tugade, Michele M., Waugh, Christian E., Larkin, Gregory R.(2003), "What good are positive emotions in crisis? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001.", *Journal of Personality and Social Psychology*, 84(2), pp365-376.

Hamel, G., & Valikangas, L. (2003), "The quest for resilience", *Icade. Revista De La Facultad De Derecho*, (62), pp355-358.

Hashim, H. M., Ng, Y. G., Talib, O., Bahri, S., & Tamrin, M. (2021), "Factors influencing flood disaster preparedness initiatives among small and medium enterprises located at flood-prone area", *International Journal of Disaster Risk Reduction*, 60, in print.

Herbane, B. (2010), "The evolution of business continuity management: A historical review of practices and drivers", *Business History*, 52(6), pp 978-1002.

Hyndman, D., & Hyndman, D. (2016), "Natural Hazards and Disasters", Cengage Learning, Boston.

Kato, M., & Charoenrat, T. (2018), "Business continuity management of small and medium sized enterprises: Evidence from Thailand", *International Journal of Disaster Risk Reduction*, 27, pp 577-587.

Leta, S. D., & Chan, I. C. C. (2021), "Learn from the past and prepare for the future: A critical assessment of crisis management research in hospitality", *International Journal of Hospitality Management*, 95, in print.

Li, H., Pournader, M., & Fahimnia, B. (2022), "Servitization and organizational resilience of manufacturing firms: Evidence from the COVID-19 outbreak", *International Journal of Production Economics*, in print.

Lu, Y., Li, R., & Wang, S. (2022), "Towards comprehensive regional resilience evaluation, resistance, recovery, and creativity: From the perspective of the 2008 Wenchuan Earthquake", *International Journal of Disaster Risk Reduction*, 82, in print.

Ma, B., & Zhang, J. (2022), "Tie strength, organizational resilience and enterprise crisis management: An empirical study in pandemic time", *International Journal of Disaster Risk Reduction*, 81(15), in print.

Mızrak, S., & Çam, H. (2022), “Determining the factors affecting the disaster resilience of countries by geographical weighted regression”, *International Journal of Disaster Risk Reduction*, 81, in print.

Noth, F., & Rehbein, O. (2019), “Badly hurt? Natural disasters and direct firm effect”, *Financial Research Letters*, 28, pp 254-258.

Ozanne, L., Chowdhury, M., Prayag, G., & Mollenkoph, D. A. (2022), “SMEs navigating COVID-19: The influence of social capital and dynamic capabilities on organizational resilience”, *Industrial Marketing Management*, 104, pp 116-135.

Peason, C. M., Misra, S. K., Clair, J. A., & Mitroff, I. I. (1997), “Managing the unthinkable”, *Organizational Dynamics*, 26(2), pp 51-64.

Quarantelli, E. L. (1998), “DISASTER CRISIS MANAGEMENT: A SUMMARY OF RESEARCH FINDINGS”, *JOURNAL OF MANAGEMENT STUDIES*, 25(4), pp 373-385.

Samantha, G. (2018), “The Impact of Natural Disasters on Micro, Small and Medium Enterprises (MSMEs): A Case Study on 2016 Flood Event in Western Sri Lanka”, *Procedia Engineering*, 212, pp 744-751.

Smith, G. L., Pyke, J., Gamage, A., Nguyen, V., & Lacy, T. (2022), “Tourism operator mental health and its relationship with SME organisational resilience during disasters”, *Tourism Management Perspectives*, 42, in print.

Tedeschi, R. G., & Calhoun, L. G. (2009), “Posttraumatic Growth: Conceptual Foundations and Empirical Evidence”, *Psychological Inquiry*, 15(1), pp 1-18.

Zhang, Y., Wang, W., Mi, L., Hung, C., Xiao, H., Shang, K., Qiao, L., & Wang, L. (2022), “Organizational resilience in development: A systematic review based on bibliometric analysis and visualization”, *International Journal of Disaster Risk Reduction*, in print.

ウェブサイトからの引用

内閣府政策統括官室（経済財政分析担当）「東日本大震災によるストック毀損額の推計方法について」, (<https://www5.cao.go.jp/keizai3/discussion-paper/dp111.pdf> 閲覧日：2022年11月7日)

総務省消防庁災害対策本部「2011年東北地方太平洋沖地震について」, (<https://www.fdma.go.jp/disaster/higashinihon/assets/jishin155.pdf> 閲覧日：2022年10月14日)

経済産業省製造産業局「製造業を巡る動向と今後の課題」,
(https://www.meti.go.jp/shingikai/sankoshin/seizo_sangyo/pdf/009_02_00.pdf 閲覧
日：2022年10月14日)