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The Economic Impacts of the February 6, 2023, Kahramanmaraş-Centered Earthquakes on Entrepreneurs in Türkiye*

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Abstract

This study aims to examine the economic impacts of the Kahramanmaraş-centered earthquakes, which occurred on February 6, 2023, on entrepreneurs in Türkiye. The research was conducted in the provinces of Kahramanmaraş, Adıyaman, Malatya, Gaziantep, and Hatay, which were both the most affected by the disaster. Semi-structured interviews were used as the data collection method. In-depth interviews were conducted with representatives of the Chambers of Commerce and Industry, Trade Chambers, Industry Chambers, and Commodity Exchanges operating in these provinces. The findings revealed significant issues, such as labor shortages and physical damage in the region, with many entrepreneurs losing their homes and/or workplaces. Some entrepreneurs were forced to relocate to other provinces to continue operations and avoid market losses. Furthermore, micro and small enterprises were identified as the most affected groups. Additionally, it was observed that the consumption preferences and priorities of businesses and individuals in the region shifted following the earthquake.

Key words: Entrepreneurship, Economic Impact, Earthquake, Effect, Disaster

JEL Code: L26, M21, Q54

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1. Introduction

Natural disasters, in addition to causing deaths, injuries, and homelessness, impose substantial costs on countries and the international community at the macro level. Depending on the scale of the disaster and the economic structure of the affected region, natural disasters can adversely impact a country's growth and development. Studies on natural disasters with destructive effects, such as earthquakes, tsunamis, floods, and fires, reveal varying outcomes. However, these disasters consistently result in losses of life, property, and infrastructure, which lead to short, medium, and long-term effects on the production, services, and employment structures of economies. The economic impact of such losses varies depending on the duration and magnitude of the disaster, the economic conditions of the affected country, and the organizational capacity of its institutions. The twin earthquakes of Mw 7.7 and 7.6 that struck Kahramanmaraş, Türkiye, on February 6, 2023, and the subsequent aftershocks caused widespread destruction and significant loss of life across 11 provinces (Adana, Adıyaman, Diyarbakır, Elazığ, Gaziantep, Hatay, Kahramanmaraş, Kilis, Malatya, Osmaniye, and Şanlıurfa). These events have been described as the "disaster of the century." The loss of life and property in the most affected provinces, along with the costs of shelter, repair, restoration, and reconstruction in the post-disaster period, are expected to have significant and long-term adverse effects on Türkiye's economy. These effects are particularly pronounced in areas such as employment, pricing, and financial stability.

Türkiye is a high-risk country in terms of natural disasters. Over 95% of its territory is located in one of the world's most active earthquake and landslide regions (CBİ, 2016). Over the past 70 years, natural disasters in Türkiye have resulted in approximately 100,000 fatalities, damage to 600,000 buildings, and impacts on around 500,000 additional structures due to earthquakes. Among all natural disasters, earthquakes occur most frequently in Türkiye and are the most destructive in terms of their effects. Anatolia is dominated by three major tectonic fault systems extending from east to west, and 70% of the population resides in earthquake-prone areas, predominantly in urban regions. Recent statistical analyses of structural damage caused by natural disasters in Türkiye indicate that 62% of such damage is due to earthquakes (İTÜ, 2023). Despite being a country with such a high disaster risk, a review of the literature reveals a lack of studies examining the economic impacts of earthquakes and natural disasters on entrepreneurs. This research, therefore, serves as a pioneering study in this field and is expected to provide a guiding framework for future studies.

Despite the extensive literature on the general economic consequences of natural disasters, studies specifically examining their effects on entrepreneurs remain scarce. Investigating how the Kahramanmaraş-centered earthquakes impacted entrepreneurs is crucial for understanding the sector-specific economic vulnerabilities and resilience. By addressing this gap, the present study not only contributes to academic knowledge but also provides practical insights for policymakers, chambers, and institutions involved in post-disaster recovery and

support programs, thereby informing strategies to enhance business continuity and regional economic stability.

The February 6, 2023, Kahramanmaraş-centered earthquakes, referred to as the "disaster of the century," have had multifaceted impacts on businesses, entrepreneurs, society, and the national economy. In this context, the aim of this study is to investigate the economic impacts of the Kahramanmaraş-centered earthquakes on entrepreneurs.

2. Literature Review

Natural Disasters and Entrepreneurship

The Disaster and Emergency Management Authority (AFAD) (2023) defines a disaster as "a natural, technological, or human-induced event that causes physical, economic, and social losses for the entire community or certain segments of it, disrupts or halts normal life and human activities, and exceeds the affected community's ability to cope." In this context, a disaster can be briefly defined as a natural event that impacts human life. The stages of disaster management can be categorized into three phases: "pre-disaster, during the disaster, and post-disaster" (Gökçe and Tetik, 2012: 27). The study within this research will focus on the post-disaster phase and the processes involved.

Natural disasters, such as earthquakes, can disrupt the daily operations of a business, which in turn affects the business's performance. Research on natural disasters and small businesses has shown that small businesses are particularly vulnerable to natural disasters (Sydnor et al., 2017; Corey and Deitch, 2011; Mahto et al., 2022). In this context, Cochrane (1992) highlights the importance of recovery and support efforts, as small businesses have a lower capacity to survive and thrive after a disaster. In this regard, this study is significant for entrepreneurs in maintaining their assets and operations after an earthquake.

Natural disasters also have adverse effects on the economic structure in terms of loss of life and physical damage. The impact of the disaster can cause damage to factories, workplaces, production facilities, and employment structures, leading to a loss of labor, and the repair or relocation of these structures may take a long time. The economic aspect of post-disaster recovery involves making new arrangements to restore the fundamental elements of the local economy, such as agriculture, industry, the service sector, and commercial activities. Following a disaster, the social system, supported by assistance from the government, private sector, and non-governmental organizations, aims to restore economic vitality as quickly as possible, returning to its pre-disaster state. This includes reorganizing household incomes, recovering lost labor, restoring employment opportunities, and ultimately reintegrating the entire economic structure as soon as possible, which are key objectives of successful reconstruction (Genç, 2021). In this process, while public authorities and civil society organizations play a crucial role, the most important responsibilities lie with entrepreneurs. This is because most of these tasks

(reorganizing businesses, providing employment, increasing income, etc.) are carried out by entrepreneurs, thus contributing to the restoration of economic functionality.

Table 1. Studies on the Economic Impacts of Natural Disasters.

Author(s)	**Main Dimensions**	**Sub-dimensions**
Tierney (1995)		Physical damage, service disruptions, business closures and relocations, insurance and other aid, post-disaster recovery
Bradshaw (2004)	Direct	Damage to buildings, loss of productive labor, production loss
Stéphane ve Valentin (2010)	Direct and indirect	Price changes
Ballesteros ve Domingo (2015)		Capital, labor, logistics, and markets/consumers
Ademola et al. (2016)	Economic disruption	Physical damage
Stevenson et al. (2017)	Economic impacts	Direct and indirect impacts
Sydnor et al. (2017)		Physical damage to structures, damage to non-structural business assets, inventory damage, equipment damage, loss of customers and sales, loss of key suppliers, loss of workers, service interruptions, downtime/delays in reopening and causes
Altun (2018)	Economic	Primary and secondary effects
Samantha (2018)		Capital, labor, logistics, and market
Panwar ve Sen (2019)	Direct	Loss of labor, including human deaths, disabilities, or injuries, and loss of capital, which encompasses damage to physical assets such as homes, factories, and infrastructure.

	Indirect	The loss of potential working hours (wages) and the lost wages, which are added to the country's GDP. The loss in potential wages and the subsequent decline in expected production indirectly affect the country's economic growth.
	Short, Medium, and Long-term	The economic effects of natural disasters have been addressed in terms of short and medium-term effects (up to 5 years) and long-term effects (10 years and beyond).
Meltzer et al. (2021)		Effects on local trade
Chang et al. (2022)		Physical capital and infrastructure damage, harm to workforce and human capital, damage to financial capital, damage to transportation networks, damage to critical inputs in the supply chain, damage to financial connections, sectoral demand shifts, behavior changes, government instructions
Aydınbaş (2023)	Socio-economic	Economic growth, development, inflation, finance and insurance, public revenues, public spending, public finance, balance of payments, technology, tourism, taxes, production, manufacturing, firms, investments
Marangoz and Izci (2023)	Economic	Logistics, labor, production and trade, supply chain, economic growth, education, health, and foreign trade
Zlateva et al. (2023)		Physical damage, disruption to supply chains, operational halts, raw material price increases, higher costs, adaptation to changing climate conditions, need for improved product and service quality

Source: Created by the authors.

A summary of academic studies on the economic impacts of natural disasters on entrepreneurs is presented in Table 1. A review of the literature reveals that economic impacts are addressed from various dimensions (direct, indirect,

primary, secondary, physical, labor, production, etc.). However, it is observed that there is no comprehensive study that examines the economic impacts of earthquakes on entrepreneurs.

The occurrence of a natural disaster disrupts many aspects of daily life. First and foremost, a natural disaster leads to the loss of human life and, consequently, human capital. Secondly, natural disasters cause physical capital damage by destroying homes, vehicles, and infrastructure. Thirdly, people may be forced to leave the disaster-stricken area in search of a safer place to rebuild their lives. All of these factors result in the disruption of economic activities and the need to establish a new equilibrium (Marangoz and İzci, 2023). Therefore, the impacts of a natural disaster can be multidimensional.

The effects of natural disasters on entrepreneurs have been analyzed in six categories by Metcalf et al. (2010). These categories are: markets, logistics, facilities, people, procedures, and finance. The Philippine Institute for Development Studies (2015) and Samantha (2018) have examined the impacts of natural disasters on the business world in four categories: capital, labor, logistics, and markets. Marangoz and İzci (2023), in their study, evaluated the economic impacts of earthquakes across six dimensions: logistics, labor, production and trade, supply chain, economic growth, and foreign trade.

According to the terminology developed to explain the economic consequences of disasters, economic impacts can be examined under two main headings: primary (direct and indirect) economic effects and secondary economic effects. The effects of disasters on systems such as transportation, energy, communication, infrastructure, and industry are considered primary effects. Secondary effects, on the other hand, refer to macroeconomic impacts, that is, the effects on the national economy. Secondary effects occur some time after the disaster and are related to their impacts on growth and employment levels, general price levels, and the balance of payments. Additionally, economic growth, inflation rates, budget deficits, public expenditures, and imbalances in the debt balance are also secondary economic effects (Altun, 2018).

Primary effects include both direct and indirect impacts. The effects of natural disasters on businesses can be categorized into short-term and long-term effects, as well as direct and indirect effects. Direct effects involve damage to fixed assets and capital, damage to raw materials and products, injuries, and fatalities. Indirect effects refer to issues that arise in the production/services or continuity of the business. A large portion of the effects of natural disasters is clearly visible (material damages, destroyed inventory, temporary business closures, etc.). However, there are also some negative effects of earthquakes that are not immediately apparent. These include issues in the recovery process, monitoring of order status/payments, and problems with insurance claims (Samantha, 2018).

Direct and indirect damages caused by natural disasters are expected to disrupt economic activities in the short term. Direct damages occur in two ways: (a) the loss of labor, including human deaths, disabilities, or injuries; and (b) the loss of capital, which includes the destruction of physical assets such as homes, factories, and infrastructure. These direct losses may result in further loss of potential working hours (wages) and, for example, cause a decrease in expected production output in agricultural or industrial sectors. The loss in potential wages and the decline in expected output may indirectly affect the country's economic growth. Most of the current research in this field shows that the short-term impact of natural disasters on economic growth is negative. Developing countries are more vulnerable to the economic and financial consequences of such events due to their limited capacity to cope with the economic shocks of natural disasters compared to developed countries. Additionally, countries with higher per capita income, better institutional frameworks, higher literacy rates, and more effective pre-disaster risk financing mechanisms tend to recover more easily from the economic shocks caused by natural disasters (Noy, 2009; Panwar and Sen, 2019).

3. Methodology

The aim of this study is to explore the economic effects of the earthquakes that occurred on February 6, 2023, centered in Kahramanmaraş, Türkiye, on entrepreneurs using qualitative methods (semi-structured interviews). As the study is qualitative, it serves as a situation assessment.

Population and Sample

The number of manufacturing industry firms in the provinces affected by the February 6, 2023, earthquakes in Türkiye is provided in Table 2. Among these provinces, Gaziantep has the highest number of firms. According to the report by the Strategy and Budget Directorate of the Republic of Turkiye (2023), there are a total of 38 Organized Industrial Zones (OIZs) in the region. These OIZs host 4,997 firms and employ approximately 550,000 people. Of the 38 OIZs, 4 are located in Adıyaman, 6 in Kahramanmaraş, 5 in Hatay, 5 in Gaziantep, and 3 in Malatya. Additionally, there are 116 Small Industrial Sites (SIS) in the earthquake zone, with 31,127 workplaces. Of these 116 SIS, 5 are in Adıyaman, 10 in Kahramanmaraş, 12 in Hatay, 15 in Gaziantep, and 9 in Malatya. Based on this data, the research sample includes the provinces most affected by the earthquake: Kahramanmaraş, Adıyaman, Malatya, Gaziantep, and Hatay.

Table 1: Number of Manufacturing Industry Firms in the Earthquake Region (2023)

Province	Large	Medium	Small	Micro	Total
Adana	28	126	886	8.308	9.378
Adıyaman	**4**	**13**	**96**	**1.817**	**1.930**
Diyarbakır	4	34	285	3.209	3.532
Elazığ	3	12	124	1.703	1.842
Gaziantep	**152**	**308**	**1.269**	**11.798**	**13.527**

Hatay	**23**	**60**	**285**	**4.148**	**4.516**
Kahramanmaraş	**55**	**92**	**301**	**3.863**	**4.311**
Kilis	-	8	26	358	392
Malatya	**7**	**43**	**194**	**2.682**	**2.926**
Osmaniye	6	17	71	1.467	1.561
Şanlıurfa	2	66	232	3.366	3.666
Total	314	779	3.769	42.719	47.581

Source: Presidency of Türkiye, Presidency Strategy and Budget, 2023:96.

According to Article 9 of the Law on "Chambers of Commerce and Industry," "Trade Chambers," "Industry Chambers," "Maritime Trade Chambers," "Commodity Exchanges," and "Union of Chambers of Commerce, Industry, Maritime Trade Chambers, and Commodity Exchanges of Türkiye," it is stated that "all natural and legal persons registered in the trade registry, including traders and industrialists under this law, as well as their branches and factories, are obliged to register with the chambers or agencies they belong to in accordance with this law." Accordingly, traders and producers in the relevant provinces and districts must register with these chambers, and Article 5 of the same law outlines the responsibilities of these chambers. Therefore, these chambers and exchanges act as representatives of the registered members (entrepreneurs) in their respective regions. For this reason, obtaining information about the effects of the earthquake from these institutions, which represent entrepreneurs, is crucial. In this context, in-depth interviews were conducted with the representatives of the relevant institutions in the selected provinces to determine the post-earthquake situation of the entrepreneurs.

Data Collection Tools and Techniques

In this study, semi-structured interviews were used as the data collection method. In qualitative research, the interview form method is designed to obtain similar types of information from different individuals by focusing on related topics. The interview form is a method developed to ensure that all dimensions and issues related to the research problem are covered (Yıldırım and Şimşek, 2000). The interview form, created in accordance with the project's objectives, was approved by the Ethics Committee of Muğla Sıtkı Koçman University (Date: 23.05.2023, Protocol No. 230059, Decision No. 61). Due to time and budget constraints, in-depth interviews were conducted with the heads/officials of the Chambers of Commerce and Industry, Trade Chambers, Industry Chambers, and Commodity Exchanges in the five provinces most affected by the earthquake and economically significant to the region (Kahramanmaraş, Adıyaman, Malatya, Gaziantep, and Hatay). The location and duration of each interview are shown in Table 3. Before the interviews, participants were asked for their consent to record the sessions, and since they agreed, the interviews were audio-recorded. Support was provided by the Muğla Chamber of Commerce and Industry (MUTSO) and the Muğla Commodity Exchange (MTB), and interview plans and appointments with relevant officials from the earthquake-affected regions' chambers and exchanges were arranged with MUTSO and MTB's assistance.

Table 3. Interview Durations and Environments

Participant	Interview Date	Duration (Minutes)	Environment
Institution 1-1 (GTB)	October 2, 2023	40	Workplace
Institution 1-2 (GTO)	October 2, 2023	35	Workplace
Institution 1-3 (GSO)	October 2, 2023	39	Workplace
Institution 2-1 (MTB)	October 3, 2023	75	Workplace
Institution 2-2 (MTSO)	October 3, 2023	53	Workplace
Institution 3-1 (ATB)	October 4, 2023	58	Workplace
Institution 3-2 (ATSO)	October 4, 2023	65	Workplace
Institution 4-1 (KTB)	October 5, 2023	33	Workplace
Institution 4-2 (KTSO)	October 5, 2023	62	Workplace
Institution 5-1 (HTSO)	October 6, 2023	29	Workplace
Institution 5-2 (HTB)	October 6, 2023	30	Workplace

Source: Created by the authors.

Development of the Qualitative Measurement Tool

The in-depth interview technique was used as a qualitative measurement tool. The purpose of conducting in-depth interviews is that it is one of the best methods for understanding others (Punch, 2005: 166). In-depth interviews, which are the best and most powerful method for gaining insight into people's perceptions, meanings, definitions, and how they construct reality, offer the researcher the advantage of flexibility. Although questions intended to reference the information being sought are prepared in advance, the in-depth interview technique allows for the reorganization and discussion of questions during the interview process. Even though the researcher initially defines the appropriate questions, this type of interview also allows participants to openly present their own contributions to the research (Şanlıer-Yüksel, 2008: 19). By evaluating participants' responses and feedback, the interview can continue. It is also possible to foresee potential issues that may arise during the interviews and improve the researcher's interview performance (Sevim, 2010). The qualitative measurement tool was developed by the research team based on a literature review, in accordance with the purpose of the study (See Appendix). Feedback on the questions was obtained from the first

institutional representative interviewed, and based on the information provided, the flow of the questions was adjusted (without removing or adding questions to the semi-structured interview form approved by the ethics committee). The final version of the question form, as seen in appendix, was used in the interviews.

In the study, it was stated that the real names of the participants would not be used to ensure that they would not suffer any harm from the results and to uphold research ethics.

Analysis of the Data

This study adopts qualitative research techniques. According to Gegez (2015), the findings obtained from qualitative research are exploratory and are used in problem definition or in the formulation of hypotheses to be tested in future studies. The data obtained through qualitative interviews were analyzed using the content analysis method. According to Yıldırım and Şimşek (2000), the primary aim of content analysis is to reach concepts and relationships that can explain the collected data. In this context, the data obtained were analyzed in four stages: coding the data, identifying themes, organizing and defining the codes and themes, and interpreting the findings. First, the data were systematically coded to label relevant information; second, similar codes were grouped to identify overarching themes; third, the codes and themes were organized and clearly defined to ensure consistency; and finally, the findings were interpreted to derive meaningful insights from the data.

The data obtained from the in-depth interviews were first transcribed. The notes taken by the researchers and all statements made by the participants during the interviews were transcribed. These documents were analyzed through cross-coding by two individuals and categorized according to the dimensions in Table 1.

4. Findings

As a result of the cross-coding conducted for verification purposes, the dimensions obtained were reduced to the categories shown in Table 4, and it was found that this classification was consistent with that in Table 1. Therefore, the economic dimension of the earthquake's effects on entrepreneurs has been addressed in 13 dimensions, as shown in Table 4. Following the analysis of the data obtained from the institutions (officials) participating in the qualitative interviews, each dimension was evaluated on an institutional basis, and the results presented in Table 4 were obtained.

Table 4. The economic dimensions and impacts of the earthquake

	Economic Dimensions	**Insti**	**Insti**	**Insti**	**Insti**	**Insti**	**Insti**	**Insti**	**Insti**	**Insti**	**Insti**	**Insti**

1	Logistics	✓	✓	✓							✓	
2	Labor	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	Production	✓		✓		✓	✓	✓	✓	✓	✓	
4	Supply Chain		✓	✓					✓	✓		✓
5	Physical Damage	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6	Foreign Trade		✓	✓								✓
7	Loss of Customers and Sales	✓	✓	✓	✓	✓		✓	✓	✓	✓	
8	Business Closures/Relocations	✓		✓	✓	✓	✓	✓	✓	✓	✓	
9	Insurance and Financing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10	Cost and Price Increase	✓			✓	✓	✓	✓	✓	✓	✓	✓
11	Opportunities for Entrepreneurs					✓	✓	✓	✓	✓	✓	
12	Incentives (Supports)	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
13	Changes in Consumption Trends			✓			✓					

Source: Authors' calculations

Logistics: Functional disruption in facilities and public infrastructure is an expected consequence of disasters and requires businesses to resort to alternative or emergency logistics support to maintain operations. These public infrastructure damages can lead to prolonged business closures until repairs are completed (Samantha, 2018). In this context, the statement from the representative of Institution 1-3 is as follows: *"One of the most important transportation routes for our industrialists here is the ports of İskenderun and Mersin. A fire broke out at the İskenderun port during the earthquake. A very serious amount of damage occurred, and the majority of it. Many of our industrialists' products were damaged there. The damage assessment is still ongoing. Efforts related to that are still underway. Now, there has been a backlog at the Mersin port as well."* At this point, significant damage occurred to the infrastructure (roads, bridges, ports, etc.) in the region, and especially immediately after the earthquake, there were severe logistical challenges faced in the region.

The 2010-11 flood events in Queensland are among the worst disasters in recent Australian history. The floods significantly impacted the economy, reducing the country's GDP by 0.3% due to the effects of the floods alone. They caused disruptions in all modes of transportation, including roads, rail, air, and sea (Wisetjindawat et al., 2017). Institutions also face numerous logistical challenges following natural disasters such as earthquakes, including the destruction of physical infrastructure such as roads, bridges, and airports, as well as issues related to the region's remoteness and limited transportation capacity. Effective information sharing and connections between the logistics network and the supply chain can help improve logistics efficiency (Marangoz and İzci, 2023). Entrepreneurs, like everyone else, were affected in many ways by the devastation caused by the disaster of the century.

Labor: The Centre for Research on the Epidemiology of Disasters (CRED) reports that in the last twenty years, 7,348 natural disasters have occurred worldwide, resulting in approximately 1.23 million deaths and economic losses totaling 2.97 trillion dollars. Studies (Belasen and Polachek, 2009; Kirchberger, 2017) have emphasized the significant impact of natural disasters on local labor market outcomes. Particularly, labor loss after disasters can destabilize the economic balance of affected regions. According to data from 2021, 3.8 million people are employed in the disaster zone, which covers 11 provinces, accounting for 13.3% of national employment. Of the employees, 2.3 million are registered, and 1.5 million are informally employed. The informal employment rate in the region is 39%. Approximately one million of this population is employed in the three most affected provinces (Kahramanmaraş, Hatay, and Adıyaman), while the remainder are employed in other provinces. Since it is inconceivable for those employed in the public sector to remain unemployed, losses will primarily occur in private sector businesses, especially in service-producing units. It is expected that there will be an employment loss of around 8% in the first few months, due to the loss of life of some employees and the destruction of workplaces (mostly service units) in these provinces (Republic of Türkiye, Strategy and Budget Directorate, 2023). The situation in the region also confirms this, with Institution 3-2 stating: *"Right now, we need electricians. We need plumbers. We need masons. In the automotive industry, cars are breaking down, but there are no specialists. Many vehicles were damaged in the earthquake. We can't find employees for the marketplace, especially in the organized zone. We can't find workers. Our workforce in the industrial zone, which was around 17,000, has dropped to 6,000, 5,000—it has decreased significantly."* Similarly, Institution 1-1 states, *"We talk about entrepreneurship, but life is so expensive right now in the earthquake zone. Of course, you can't find specialists, like electricians or plumbers, because the demand is so high."*

Human resources are generally the core asset of any organization. Employees of these firms can be direct victims of a disaster, including deaths and injuries. Additionally, the workforce may face physical and psychological health impacts, including injuries and stress (Penning-Rowsell et al., 2005). In the disaster

of the century, entrepreneurs lost many of their employees and relatives, and many others left the city due to fear and anxiety. Institution 2-2 explains this situation: *"Will those who left return? It's a bit difficult, a bit difficult. The established shopkeepers—I'm not talking about the young people—those who have spent 40 or 30 years here are really trying to stay, they are really making an effort. The civil servant population is already gone, a third of the population has left. The population of Malatya, initially, two-thirds was gone. Now, a third is still gone, and two-thirds are mostly people who have spent their lives here, whose livelihood is here, whose families are here. This gives them a sense of life. So, workers, the working-class people, there's nothing that binds us here, we no longer have homes here, and because of this psychological state, most of them have already left the city."*

In a small business, in addition to physical damage, the loss of employees—who are key human capital assets critical to the firm's success and operational capacity—can also harm the business. Natural disasters often lead to labor shortages due to personal and household-related disaster issues, such as employees losing their homes and being unable to travel to work due to infrastructure disruptions (Sydnor et al., 2017). In this regard, Institution 4-2 states: *"Industrialists say that we can somehow compensate for the machines, but there is a lost workforce. One of the biggest handicaps of the region right now is that, especially, it is more difficult to find what is referred to as white-collar workers."*

The loss of employees can mean that a business must invest in new training and may also experience revenue loss when no staff can be found. By observing that a significant portion of the local labor market is spent on resolving household and family issues caused by disruptions, finding personnel has become a challenge for small businesses after the earthquake (Sydnor et al., 2017). Following the earthquake, it has been observed that, in addition to labor in all sectors, there have been difficulties in retaining and employing skilled workers in the region.

Employees may remain vulnerable to numerous health hazards that emerge weeks or even months after a natural disaster. Waterborne diseases such as diarrhea and cholera are among the most common epidemics that can flare up after a disaster. Employees who are seriously affected by this situation may also be under financial distress. Therefore, the availability of human resources is crucial, and companies must consider workforce reinforcement and support affected employees in returning to their duties as soon as possible, ensuring that they help the firm meet its goals, respond to increased demand, and resume operations promptly (Samantha, 2018). It is also observed that institutions and organizations in the region have developed their own solutions. Institution 1-2 states: *"What are we doing, for example? Together with the business owners, we are also working on employment-related activities. For example, a project is being initiated to train women as chefs and other service sector employees to ensure their employment in firms."*

Research on natural disasters and small businesses worldwide has shown that small businesses are highly vulnerable to natural disasters. Additionally, the

larger the business, the more likely it is to recover quickly compared to small businesses. One reason for this is that small businesses have fewer financial and technical resources to reduce risks and cope with them, including in terms of physical and emotional recovery. Furthermore, limited access to capital and the lack of geographic diversification may mean that small businesses are more likely to be affected by the long-term impacts of a disaster (Fabeil et al., 2019). In this context, Institution 1-3 states, *"In terms of recovery and resumption of operations, as well as employment, of course, small and medium-sized businesses suffered the greatest damage. Why? Because a large-scale business, one that employs 50 or more workers and has reached a certain level, can somehow manage the loss of personnel. But a small business, for example, had 5 employees, and three of them left. The person is devastated, not knowing what to do. As you scale down the business, the magnitude of the problem becomes more apparent. Because the biggest problem here is human resources, as you can see."* This reflects that small entrepreneurs were more severely affected by the disaster of the century.

Production: A study conducted by Halkos et al. (2015) found that high-intensity natural disaster events have a negative impact on production efficiency. In the drought and flood events in Sri Lanka, rice production was observed to decrease by 2% to 5% (Weerasekara et al., 2022). Following natural disasters, private sector activities in the affected area or region are disrupted and come to a halt. In businesses, production machinery damage, loss of raw materials, loss of transportation routes, damage to power lines, and injuries or fatalities among employees prevent companies from continuing production. This results in a significant decrease in the sectoral output generated by production (Aydınbaş, 2023). The February 6 earthquakes affected a vast geographical area and negatively impacted the production activities (both goods and services) of many entrepreneurs, large and small. In this regard, Institution 3-2 explains: *"As I said, our industry is entirely labor-intensive, so it affected the entire sector. There are both small and large textile businesses, and the textile sector was impacted. The furniture sector was affected. The food sector was affected. In Adıyaman, these are the top three sectors: 1. Textile, 2. Furniture, 3. Food. Members could not produce*." Regarding this issue, Institution 4-1 states: *"Currently, businesses are operating at 40% capacity,"* highlighting the production loss.

Supply Chain: Natural disasters can disrupt supply chains, which in turn can affect a business's ability to produce and sell its products. For example, if a business relies on a supplier located in a disaster-affected area, it may be unable to obtain the necessary raw materials or components to continue production. This can lead to delays, increased costs, and revenue losses (Zlateva et al., 2023). Entrepreneurs in the earthquake region have been similarly affected, as seen in the statement from Institution 1-3: *"This time, product delays began to occur. But the purchasing company doesn't care about your earthquake or any of your issues. It only cares about what you deliver to them, and the order delivery date. The person has produced the product on time, taken it from the factory, and brought it to Mersin port. The product has been stuck at Mersin port for 10 days because of congestion*

there. The incoming product must be unloaded before loading can take place. So, these types of problems still persist."

The Tohoku earthquake in Japan on March 11, 2011, triggered a tsunami and caused damage to nuclear power plants. This event seriously affected a large geographical area and led to unprecedented disruptions in industrial supply chains in Japan. What makes this event even more significant is that its impact affected both national and global supply chains. Since Japan's electronics industry holds a major market share in the electronics product market, this disaster impacted many leading companies, such as Sony, Fujitsu, and Dell (Gunessee et al., 2018). Suppliers are key partners for small businesses and often develop relationships over time. In natural disasters, businesses are likely to experience inventory shortages, which can lead to order cancellations, stock shortages, and operational halts (Sydnor et al., 2017). In this context, Institution 1-2 states: *"The transportation of raw materials, like cotton yarn from Maraş to make yarn and then fabric for export, was significantly disrupted for a long time because the organized industry in Maraş was destroyed."* Institution 4-1 also explains: *"Now, the person's factory was destroyed, the machinery was lost. They can't immediately replace the machinery. Even if they pay for it overseas, they need to find brand new machinery, which could take at least 1 to 2 years. They can't just push a button and resume production right away."* These statements highlight how the earthquake disrupted the entrepreneurs' supply chains locally, nationally, and even internationally.

The vulnerabilities of SMEs and their roles in the supply chain are related to their ability to manage risks and continue operations and recover during a disaster event, particularly how the company and, more broadly, the supply chain address pre- and post-disaster requirements. The resilience of SMEs requires partnerships and collaboration among firms, public, and other private organizations. This cannot be achieved by a business or industry alone, nor can it be accomplished solely by the government (Ballesteros and Domingo, 2015). In this context, it is clear that collaboration among local businesses in the earthquake-affected region is both necessary and crucial.

Foreign Trade: The share of the 11 provinces affected by the earthquake in the total exports for 2022 is 8.6%. Gaziantep stands out with a 4.4% share of total exports. Gaziantep is the sixth largest exporter in the country. Hatay, Adana, and Kahramanmaraş have shares of 1.6%, 1.2%, and 0.6%, respectively. The share of these 11 provinces in the total imports for 2022 is 6.7%. Gaziantep and Hatay lead with shares of 2.3% and 2.1% of total imports, respectively (Republic of Türkiye, Strategy and Budget Directorate, 2023). After the destruction in the earthquake region, entrepreneurs are facing difficulties in meeting demand from external markets as much as, if not more than, from the domestic market. They are also at risk of losing their foreign markets. Institution 5-2 illustrates this situation as follows: *"This is one of the largest fruit and vegetable exporting regions in Türkiye. Most of their warehouses collapsed. I think there are no workers left now; each company used to send 8-10 truckloads of goods from here. There were exports to*

Russia and Europe, but now all of that is gone, nothing is left, there were farming factories and they collapsed."

The impact of natural disasters on international trade can occur in various ways. Direct effects on exports can result from human losses and injuries (affecting the human resources of companies) as well as damage to or destruction of physical capital and equipment in the export sector. Damage to public infrastructure, such as roads, bridges, railways, and telecommunications systems, can also cause disruptions in the export supply chain (Gassebner et al., 2010).

Physical Damage: More than one million earthquakes occur worldwide each year, which equates to approximately two earthquakes per minute. The greatest damage caused by earthquakes is to buildings and structures. Earthquake-induced building damage is one of the most critical threats to cities. The extent and magnitude of the damage, the proportion of collapsed buildings, the severity of damage in the affected areas, and the type of damage each building suffers are essential information for successful rescue and reconstruction in disaster zones (Dong and Shan, 2013). In the February 6 earthquakes, more than half a million buildings were damaged in the affected region, communication and energy infrastructure were damaged, and significant material losses occurred. The total number of buildings in the region is approximately 2.6 million. Of this building stock, around 90% is residential, 6% is business premises, and 3% is public buildings. As of 2022, the number of residences in the 11 affected provinces is 5.6 million, accounting for 14.05% of the total housing stock in Türkiye. The earthquake caused significant loss of life and property in the 11 provinces. It is estimated that 40% of the building stock in the earthquake-affected region has suffered light, medium, or severe damage or has been destroyed and will need to be rebuilt (Republic of Türkiye, Strategy and Budget Directorate, 2023). The extent and impact of the disaster of the century are further highlighted by Institution 5-2: *"The small industry has been destroyed, it's all gone, there is no small industry anymore. A lot of businesses in the commercial sector have suffered major losses. There is no such thing as local market trades anymore; everything is gone now. Right now, what can we say, what can we do? I don't even know, personally, my four shops and three houses were destroyed, and then I had a warehouse. Now, when we need to source anything, we are struggling to find it in Antakya because the industry is gone. We need to buy materials from the industry, parts for machines, but we can't access them. There's nothing left; there is not even a place to live."*

As in all provinces, many businesses, large and small, have either been severely damaged or destroyed, in addition to residential buildings. The most significant of these destructions occurred in Malatya, where many businesses, including the historic corn market, were affected. Below, in Figure 1, the former state of the historic corn market and the excavation work initiated to rebuild the market are shown.

Figure 1. The Former and Post-Destruction States of the Historic Corn Market in Malatya

Source 1: *https://ilkha.com/photo-gallery/malatyada-tarihi-misir-carsisi-esnafi-yikim-kararina-tepki-gosterdi-368951* 28.05.2024 (Former State)

Source 2: Malatya, Taken by the authors, (October 3, 2023) (Excavation State)

Natural disasters, such as floods, hurricanes, earthquakes, and others, can cause damage to a business's buildings, equipment, and other physical assets. These damages can lead to significant repair or replacement costs, as well as reduce the sustainability of the business (Zlateva et al., 2023), and may even eliminate it altogether.

The extent of damage a commercial facility experiences as a result of a natural disaster is an indicator of poor business performance or eventual closure. Businesses exposed to physical damage tend to have high closure rates. The recovery of a business after a disaster is directly proportional to the severity of the physical damage it has sustained. Recent studies have also shown that damage to business assets, such as inventory and equipment, are significant sources of business loss and disruption following natural disasters like earthquakes and tsunamis. Examples of physical damage that lead to disruptions include damage to inventory and crops that render them unsellable, damage to production equipment, and the loss of physical business records that could affect order fulfillment, communication with customers, and future sales (Sydnor et al., 2017). Entrepreneurs in the region have been seriously affected by this, as illustrated by Institution 3-1: *"Four flour mills are out of operation. Initially, we had about 30 flour mills, including Çetin Flour, but they have been destroyed. We can say they are halved. One of the physical impacts, particularly in city centers and small businesses, was felt most severely. Fortunately, in Adıyaman, the destruction of*

large businesses was limited. As for the Organized Industrial Zone, I am specifically referring to Adıyaman. Here, micro enterprises suffered the most damage. Similarly, Institution 4-1 states: *"By the way, there was also a jewelry-focused area, I should mention that. The jewelry district was severely damaged; a large area with all the jewelry workshops was heavily damaged. Most of the merchants' silos collapsed. There are also significant problems with large businesses. As I said, a machine the size of this room was toppled, and there were factories that caught fire. In our small and medium-sized industries, a lot of the industry was destroyed. Since most of their centers are located in different areas, they have multiple locations, and they managed to save some of the inventories and records. They were able to save the records. Generally, the areas that burned were the business side. The machinery and administrative areas were mostly saved. Even though many places were destroyed, they managed to save computers and other items from the administrative offices."*

Natural disasters can cause temporary disruptions to business operations due to difficulties accessing the workplace (such as road closures or employees struggling to reach work), power outages, various infrastructure damage, or other reasons. This, in turn, leads to losses in customers, suppliers, and profits for entrepreneurs (Zlateva et al., 2023). Entrepreneurs already facing economic difficulties will be further burdened as their cash flow is disrupted. Institution 5-2 explains this situation: *"For example, we have around 5-10 olive oil companies here. Everyone had stock on hand because it was the peak season, there were oils available. One friend had 200 tons in stock, another had 500 tons, and another had 70 tons. During the earthquake, some of it spilled. It fell over, and it's impossible to collect it. We sold the oil, and at the time, we were selling it for 75-80 TL, but now it's 200 TL. We had to sell it out of necessity because we couldn't store it due to the continuous aftershocks. Many of our friends had 50 tons or 100 tons of oil spilled."* Similarly, Institution 4-2 states: *"There is significant damage. There is serious damage to machinery. Machinery will be imported from abroad, and this will take 6 months. Within these 6 months, we have companies with 10,000, 15,000, or 20,000 employees. For a factory with 10,000 workers to wait for 6 months means a huge financial loss. You can't tolerate this. It was very important during this process to have at least enough capacity to intervene in terms of maintenance and repairs, and we saw that. Now, a company from Italy is expected for calibration, and also a company from Germany."*

Electricity, telephone, water and sewage services, gas supplies, and accessible transportation networks constitute the essential lifelines that affect small business operations. Even if physical damage does not occur in businesses, interruptions in these lifelines can lead to serious consequences. When considering the potential impacts of these disruptions on businesses, it is believed that broken lifelines can lead to larger disruptions and potential closures (Sydnor et al., 2017). Below, in figure 2, although the building has not collapsed, it is severely damaged, and as a result, the entrepreneur will be forced to suspend operations for a period of time.

Figure 2: A Commercial Property and Residential Building Severely Damaged by the Earthquake in Kahramanmaraş

Source: Kahramanmaraş, Taken by the authors, (October 5, 2023)

Loss of Customers and Sales: After Hurricane Sandy in New York, flooding occurred in the area. Retail businesses in the heavily flooded regions experienced a 9% drop in sales revenue compared to businesses in areas with less flooding. The sales decline was permanent, and even four years after the storm, pre-storm sales levels were not reached (Meltzer et al., 2021). Businesses do not operate in isolation; they are interdependent with the communities they serve. A devastating disaster can cause disruptions and interruptions at both the business and household levels. After a disaster, there can be effects such as population displacement, workforce reduction, loss of customers, and decreased demand. A loyal, local customer base is particularly important for retail, restaurant, and tourism businesses. A business's customer base is a critical human capital asset that is developed, nurtured, and essential for the survival of the business. When these customers are displaced or cannot reach the business due to local transportation and infrastructure issues, the business experiences a loss of revenue. The loss of displaced customers and employees is a significant indicator that affects business performance immediately following a natural disaster (Sydnor et al., 2017). Entrepreneurs in the region affected by the disaster of the century have lost customers, and sales have significantly dropped. Institution 4-2 explains this situation: *"We experienced market loss, professor. The branded companies didn't*

lose much of their market share, but especially in our region, where brand perception is not very high, these areas generally have subcontracted production. Maraş, Gaziantep, and Hatay. Since they didn't have their own brands, they lost a huge part of their market." Institution 4-1 states: *"Well, the earthquake happened, then the war (Russia-Ukraine war) affected Türkiye's market. Plus, the pandemic followed by the war impacted Türkiye's markets. This has caused significant problems in the textile sector, especially in Maraş."*

The damage to land, equipment, and the decline in revenue after disasters are significant sources of financial stress for businesses. Sales typically decrease or cease entirely during and after a disaster, leading to a drop in revenue. Damage to or loss of inventory can create issues for business continuity. Structural repairs necessary to restore operations often require substantial financial and other resources, which may lead to temporary business closure. Damage to production equipment and machinery can severely affect and disrupt production. If businesses lack insurance or are short on resources for these repairs, the survival of the business is in doubt, and it may even face complete closure (Samantha, 2018). Institution 2-1 explains this situation: *"Now, these businesses, of course, lost their shops, lost their business, lost their customers. Their capital has significantly decreased."* Institution 1-2 adds: *"Of course, the reduction in orders, postponements, delayed or nonexistent receivables, this is one of the major issues we can point to."*

Following the Hurricane Katrina disaster in New Orleans, a study reported that, as a result of the storm, there was an increase in spending on practical items such as clothing, household appliances, personal care products, and tools and materials for repairing people's properties (Larson and Shin, 2018). In the short term, there was a sharp increase in demand for essential goods, while many non-essential goods saw a decline, leading to changes in market demand. In general, challenges related to the distribution, receipt, and transportation of products after a natural disaster are commonly encountered issues. As the demand side for many products weakens, sales volumes significantly decrease, and as a result, businesses struggle to manage their accounts receivable and payables, ultimately finding it difficult to manage their financial balances. For small businesses that are disaster victims, the decline in demand is often more severe in neighboring markets where the disaster occurred (Samantha, 2018). In this context, the priorities and demands of the people and entrepreneurs in the region change along with the disaster.

Business Closures/Relocations: According to the report by the Strategy and Budget Directorate of the Republic of Türkiye (2023), by the end of 2022, more than half of the businesses in the 11 provinces declared as disaster areas were registered in Adana, Gaziantep, and Hatay, accounting for a total of 220,558 businesses, which constitutes 10% of the total in Türkiye. When examining the distribution by size, it is found that, similar to the national distribution, 86.6% of the businesses in the region are micro-sized businesses with fewer than 10 employees. Small businesses with 10-49 employees account for 11.1%, businesses with 50-249 employees make up 2%, and large businesses with more than 250

employees comprise only 0.4%. Figure 1 shows the construction area for the proposed new market to replace the demolished market in Malatya. All of the businesses that were destroyed here were micro and small-sized enterprises.

Natural disasters can lead to business closures by causing a significant reduction in their service capacities, inventories, or capital assets. The Loma Prieta earthquake and Hurricane Andrew caused many businesses to close or relocate (Wasileski et al., 2011). Similar situations have occurred in the disaster of the century. Institution 2-2 explains this situation: *"Now, those who were already struggling have gradually downsized, and some are on the verge of closing. For example, a very old business in Malatya, a restaurant within a historic mansion that also provides cultural services, has decided not to reopen. They decided not to reopen because they are not sure they can cover the rising costs. This is a very serious situation."*

According to the literature on natural disasters, the duration a business remains closed is an indicator of its likelihood of reopening. The recovery ability of a regional economy is affected by the duration of disruptions to its lifelines. The extended closure of a business is not solely due to lifeline disruptions; the damage also has long-term effects on the sustainability of the business. Businesses with significant damage may be forced to close for necessary repairs. Additionally, businesses may be forced to shut down if there are disruptions in the supply of lifeline services or other inputs. The longer a business remains closed immediately after a natural disaster, the higher the likelihood of customer and supplier losses, and the lower the chances of the business recovering and continuing its operations (Webb et al., 2002). In the earthquake-affected region, we observe that businesses have closed or ceased operations for various reasons.

According to the report by the Strategy and Budget Directorate of the Republic of Türkiye (2023), the number of registered businesses in the 11 provinces affected by the earthquake has decreased to 69,545; in Kahramanmaraş, Hatay, Adıyaman, and Malatya, the declines in the number of businesses exceed 65%. These provinces are followed by Osmaniye and Gaziantep, where the decreases in the number of registered businesses are 32% and 25.6%, respectively. In Kahramanmaraş, 13,421 businesses and in Hatay, 19,302 businesses have not reported. In Malatya and Gaziantep, the declines are close to 10,000, while in Adıyaman, the decline is 5,677 and in Adana, it is 4,675. In Diyarbakır and Elazığ, the declines in the number of businesses are less than 10%. Many of these closures are due to deaths. There may not be immediate closures following a disaster that causes death; instead, the delay in reopening may be prolonged due to various factors such as damage, loss of customers and suppliers, delays in insurance claims, and disruptions in lifelines (Sydnor et al., 2017). The impact of losing family members in the earthquake on the continuation of the business is described by Institution 3-1: *"I spoke with him a lot. He said, 'I don't understand, I will sell and leave. This is not my business.' He is 20 years old and says, 'I will sell and go to Istanbul or Izmir.' He can't do it anymore because that person has been involved in this business since childhood, working hard with his own hands. I remember Mr.*

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Ismail had a small shop. He expanded it and turned it into a chain, but that's gone too. I spoke with his brother, I called him and asked, 'Mr. Mehmet, what will you do?' He said, 'We can't do it.' Even though his brother was a butcher, he said, 'I will sell the shop.' So, the business stopped completely. It really stopped because it came to that point." Similarly, Institution 3-2 states: *"After the earthquake, many employers who lost their businesses have already left. That's why we couldn't reach many of them. The remaining ones are those with alternative places. For example, those with land or receivables, they want to manage somehow with those."*

Some businesses have relocated their operations and activities to other provinces and regions due to damage or destruction of their buildings. These relocations may be to different provinces in Türkiye, or even to nearby neighboring provinces. In this regard, Institution 2-1 states: *"Some have gone outside the province,"* and Institution 2-2 adds: *"The departure from the city has increased. Today, many people, due to the increased cost of living in the city, have closed their businesses and are starting a life in another place."*

Relocation is not only limited to moving to another province or region. Entrepreneurs whose businesses have been destroyed may move to temporary container workplaces. It is observed that container markets have been set up by public authorities in the region, and container workplaces are provided to entrepreneurs who wish to continue their business activities. Below, Figure 3 illustrates the temporary commercial area established by AFAD in Adıyaman.

Figure 3: Temporary Trade Area Established by AFAD in Adıyaman (Container Market)

Source: Adıyaman, Taken by the authors, (October 4, 2023)

Institution 1-1 explains this situation as follows: *"Because, you know, when you go to the market, everywhere, people's psychology is disturbed. You're talking about entrepreneurship, but you don't want to stay in the city. If everything is destroyed, if every part of the city is in ruins, those images need to go away, and*

the cities need to normalize as soon as possible. In the cities, shops are destroyed, barbers and hairdressers are trying to work in containers. Do you understand what I mean?"

Opportunities for Entrepreneurs: Entrepreneurship contributes to economic growth in societies facing major disasters by creating new jobs and employment opportunities. Entrepreneurs are considered key actors in the recovery of economies affected by natural disasters (Bustamante et al., 2022). In the Kahramanmaraş-centered earthquakes, more than 50,000 people lost their lives, over 500,000 buildings collapsed or were severely damaged, and significant material losses occurred. Although these earthquakes may shake investors' confidence in ventures in disaster-affected areas or reduce their willingness to invest in the region, new business opportunities may emerge for entrepreneurs, especially in sectors such as reconstruction, logistics, cleaning, and maintenance. Additionally, the challenging post-earthquake conditions can help entrepreneurs enhance their creativity and business skills. Furthermore, these earthquakes can become an opportunity for entrepreneurs to develop innovative solutions (TERRA, 2023). In this context, Institution 4-2 states: *"Yes, the earthquake was a very significant and painful turning point for us. However, after this milestone, we want to use it as an opportunity to transition from low-profit, labor-intensive sectors to more technology-focused, higher-profit sectors. We have been communicating this to businesses. As our Chamber's Assembly President and Board Chairman mentioned during the assembly meeting, 'Friends, we have experienced a painful event and a significant milestone. But from now on, let's consider this a turning point and move away from low-profit, low value-added sectors. Let's focus on industries where we can produce more technological and higher value-added products.' This has become a major breakthrough for us. Opening new facilities is now very important for us. New factories will be established, and we will rapidly move them to production and manufacturing, transforming the city into a production hub."* This statement highlights that regional entrepreneurs are actively seeking new business opportunities and working toward new entrepreneurial ventures.

Natural disasters can create new entrepreneurial opportunities not only by supporting the reconstruction of destroyed infrastructure, goods, and services but also by alleviating suffering (Salvato et al., 2020). During the post-disaster reconstruction process, individuals who wish to capitalize on entrepreneurial opportunities may choose to stay in the disaster-affected area or move to the region to engage in disaster-related ventures (Marangoz and İzci, 2023). This, in turn, creates new business and employment opportunities. Institution 5-1 explains this situation as follows: *"People have shifted their focus. In the past, someone might have wanted to open a café. Now, they are giving up on opening cafés. Instead, they say, 'I want to become a welder, or a plumber, or if I have capital, I want to open a store selling construction materials like bricks, concrete blocks, or cement.' These are currently in high demand, and the need will not diminish for at least 3, 4, or 5 years—it will even increase because production will continue at an accelerated pace. Especially excavation companies that have won contracts here are*

establishing branches in the area. There is also a significant influx of prefabrication companies setting up prefabricated structures."

In contrast, it is estimated that a significant portion of the employment losses will recover in the coming months due to the increase in construction, repairs, infrastructure projects, and the industrial, service, and commercial activities required for these projects (Strategy and Budget Directorate of the Republic of Türkiye, 2023). In this context, individuals in the disaster-affected region may turn to labor migration to escape disaster-induced income losses and seek better employment opportunities (Marangoz and İzci, 2023), thereby creating new employment opportunities for newly established businesses. Institution 4-1 explains: *"Entrepreneurship, especially in construction and construction-related fields, is slowly beginning to emerge. As I mentioned, many places were destroyed, and their reconstruction will happen. Plasterers are needed, as well as necessary engineers, surveyors, civil engineers, electrical engineers—everything is needed. For instance, TOKİ [Türkiye's Housing Development Administration] projects are being constructed, and even these are generating employment opportunities. Are there people coming from outside as well? Yes, there are."* Similarly, Institution 2-2 states: *"When we look at it, the number of companies established has actually increased compared to before and after the earthquake. For example, new job areas are being created in the city; for instance, concrete plants are starting to be established."*

Insurance and Financing: There is uncertainty in the environment in which an entrepreneur operates. Environmental uncertainty includes market variances, especially those originating from external factors, such as unexpected events like natural disasters, which can present threats and sometimes opportunities that affect entrepreneurial activities. In this context, entrepreneurs need to account for potential difficulties their businesses may face and ensure their operations and resources are covered by insurance (Marangoz, 2020). Research has shown that adequate insurance contributes to recovery, and individuals with higher income and education levels are more likely to have such insurance (Bolin and Bolton, 1986). In the region, it is evident that the awareness of insuring businesses and residences was very low before the earthquake. In particular, residences and micro and small enterprises were less likely to have insurance. Institution 3-2 explains: *"Our biggest issue is that we don't insure our workplaces. We cannot instill this awareness. Now the employer comes and asks for grants or loans. Okay, we'll take your request, but I ask, do you have insurance for your workplace? He says no. Brother, how much investment do you have? 10 million. You're investing 10 million, so spend 100,000 TL and get insurance! Insurance costs have also increased. If it was 1 TL before the earthquake, it is now 10 TL—10 times the cost because it's now an earthquake zone."* Similarly, Institution 4-1 states: *"Most of the larger businesses had insurance. Even there, they're having issues, but they can't buy new machinery with the money they receive from insurance. They can't rebuild their business. For example, a textile entrepreneur came the other day and said, 'My building is destroyed, I have this much debt. I repaired the roof, but I don't have the money to*

finish covering it.' He can't get a loan either because he already had debt in the past. And now when he asks for a loan, he has nothing left to use as collateral. His house is destroyed, his property is gone, his factory building is gone. This is a big problem for them… When a private bank considers giving a loan, they secure themselves first. For instance, in this region, they aren't issuing housing loans. They don't explicitly say they won't, but they don't approve them either."

Social safety nets such as insurance play a crucial role in ensuring the swift recovery of losses caused by natural disasters (Ademola et al., 2016). A study by Peacock and Girard (1997) found that smaller, undercapitalized companies with insurance faced significantly more financial difficulties compared to larger companies with insurance, as their claims were often not fully compensated. In this context, the reliability of the insurance provider becomes important. Institution 2-2 shares their views on this issue*: "Regarding procedures, honestly, the brand of the insurance company is very important here. Extremely important. If this process has been handled with a good insurance company, there are no issues. No matter how many of your documents are lost or missing, it doesn't matter if the company is reliable. You can't control everything anyway, and those tiny terms in the insurance agreement—you don't look at them; you sign, and it's done. So, the reliability of the insurance company is critical."*

Natural disasters increase uncertainty in financial markets and significantly affect expectations. The heightened uncertainty in financial markets caused by disasters directly impacts the value of institutions by damaging or destroying their productive capital, leading to a loss of value (Aydınbaş, 2023). The need for capital at the firm level increases to repair disaster-related damages, ensure business continuity, secure liquidity positions, and develop new opportunities, which in turn leads to tighter credit constraints. Large-scale natural disasters elevate physical risks, weakening firms' creditworthiness and their ability to borrow from banks. Specifically, natural disasters result in interruptions to physical assets, reducing the value of collateral and impairing a firm's ability to access financing from primary sources (Baltas et al., 2022). This situation may push entrepreneurs into financial bottlenecks, preventing them from managing their debt-repayment cycles effectively. The perspectives on this issue are as follows: Institution 3-2: *"Members couldn't pay their loans… In the short term, urgent access to financing must be provided. Many businesses are currently unable to pay their loans."* Institution 2-2: *"One of the new challenges in accessing resources is that we are now experiencing significant difficulties in obtaining credit. We can't access it, and even when we do, it's at a very high cost. These are all factors that increase costs for employers."* Institution 4-2: *"Additionally, access to financial resources has become extremely difficult. Unfortunately, banks are directly labeling the region as risky. While the region expects more support after the disaster, they have declared this region a high-risk area, and within their own frameworks, they have made financial resources even harder to access. Now they demand collateral, but the house is destroyed, the business is destroyed—there is nothing left to offer as collateral."*

The lack of cash flow and limited access to capital are significant barriers to reinvestment following a natural disaster. Natural disasters create highly uncertain environments that increase the fear of failure and reduce entrepreneurial intentions (Reyhanoğlu and Habiboğlu, 2023). In such cases, the increased instability in financial markets and the uncertain environment caused by the disaster are seen to affect and delay the initiation of new entrepreneurial activities. Institution 2-2 explains this situation as follows: *"In terms of starting a new business, yes, the risk has significantly increased. The decision to take a bold step and enter the market has become much more difficult. Now there is both economic uncertainty and macro-level tightening in monetary policies, and we are struggling to access credit. Even if credit were accessible, which isn't, it would still be very challenging."*

Cost and Price Increase: Natural disasters can lead to increases in the prices of raw materials required for production. For example, drought can reduce the availability of wheat, causing price hikes for both wheat and wheat-based products such as flour and baked goods. In the earthquakes that occurred in Chile in 2010 and Japan in 2011, even in regions not significantly affected by the disaster, issues related to food shortages and price increases emerged. In Chile, the National Bakers Association complained about unjustified price increases in flour. Similarly, in Japan, shortages of essential goods such as food and gasoline were observed, raising the likelihood of price increases for available products. Additionally, businesses may face higher costs to recover from natural disasters, such as repair expenses, replacing damaged equipment, revenue losses due to disruptions, increased insurance premiums, and more (Zlateva et al., 2023; Cavallo et al., 2014). This situation generally negatively impacts life in the disaster-affected region and increases maintenance and repair costs. Institution 2-2 notes: *"Even companies employing unskilled personnel with lower technical expertise are reporting the same issue; they are struggling to hire staff even at the minimum wage. It's difficult to find even unskilled workers willing to work for minimum wage."* Similarly, Institution 3-2 states: *"Today, many from my circle are going to Antep or the industrial zones; they can't come here because there are no skilled workers, and those available are expensive. Production has declined, and many of the companies I mentioned have started outsourcing orders abroad because labor costs are lower, and production costs are higher here. What happened then? Production shifted abroad, and unfortunately, our companies here had to downsize."*

In addition to the loss of workforce due to deaths and injuries caused by the earthquake (e.g., barbers, plumbers, construction workers), many individuals have been forced to migrate because of destroyed homes and deteriorating living conditions. This has made it difficult to find labor in needed fields, leading to rising labor costs. Consequently, the cost of living in the earthquake-affected region has increased. Institution 1-1 describes the situation as follows: *"Everything is very expensive right now in the earthquake-affected regions. Workers have left, they say. Their houses were destroyed, and they left with their families. They were apprentices at hair salons or electricians. Now, with fewer people remaining, prices have skyrocketed. This is the situation. We talk about entrepreneurship, but life in*

the earthquake zone is so expensive right now. Of course, you can't find skilled workers—plumbers or electricians—because there is such high demand." Similarly, Institution 2-2 states: *"Personnel costs have risen significantly for employers. This is the case across every sector today."*

For individuals whose homes or workplaces were destroyed by the earthquake, or for labor brought in from outside, finding rental housing or commercial spaces is challenging due to the destruction. Even when available, rental prices have significantly increased, further negatively impacting the cost of living. Institution 4-1 describes the situation as follows: *"I'm setting aside large businesses. Construction workers have work, electricians have work, skilled laborers have work. But now, a job that used to cost 1,000 TL is being charged at 5,000 TL... And then there's rent—rents are exorbitantly high. Rising rental and sales prices for workplaces are currently one of the biggest problems."* Similarly, Institution 2-1 states: *"Right now, as you can see, with inflation and everything else, prices in the earthquake zone are skyrocketing. Before the earthquake, people were renting for 2,000 or 3,000 TL, but now it's 10,000 TL, 12,000 TL."*

Incentives (Supports): Previous studies (Deryugina, 2017; Miao et al., 2018; Davlasheridze and Geylani, 2017; Gallagher and Hartley, 2017; Davlasheridze et al., 2017) have suggested that disaster support plays a critical role in alleviating disaster-induced shocks and financial burdens, accelerating post-disaster economic recovery, and increasing resilience to future disaster shocks. For example, Davlasheridze and Geylani (2017) demonstrated that each additional dollar of subsidized disaster loans provided through the Small Business Administration in one district helped to ensure the survival of four small businesses. Gallagher and Hartley (2017) emphasized the importance of disaster support in preventing deeper financial distress for the affected population in New Orleans after Hurricane Katrina.

The major earthquakes centered in Kahramanmaraş on February 6, 2023, caused significant loss of life and damage in our country. Especially in the disaster-affected regions, supporting creative and innovative entrepreneurial activities can help mitigate the negative impacts of the disaster. In this regard, it is essential to support R&D and entrepreneurship projects aimed at developing advanced and domestic technological products with potential usability before, during, and after the earthquake, particularly innovative projects and entrepreneurial activities that address the housing and food/water needs of the earthquake victims (TERRA, 2023). In particular, entrepreneurs in the region need support to return to their previous conditions, as they express: Institution 3-1 states: *"Half of those who left have returned. The remaining half would come back if better incentives were provided. One of the first incentives announced was that containers would be provided to the returning personnel. In the short term, the government, or the state, needs to offer incentives. The state must provide financial support, and when doing so, it must carefully target the real beneficiaries. The identification process must be done accurately. We heard that the government is providing replacements for animals that have died."* Institution 4-1 adds: *"Housing needs to be built quickly for*

people to return to the workforce. People won't come to containers, but if you offer 30 TL instead of 10 TL outside of Maraş, they will come." Institution 1-3 states: *"A region-specific, unparalleled, high-rate financial incentive must be provided. We must do this."*

To mitigate the effects of natural disasters, entrepreneurial activities must be carried out and supported. In this context, attracting skilled and creative entrepreneurs to disaster-affected areas becomes increasingly important in the long term. Although the stress caused by disasters such as earthquakes makes this more challenging, temporary internship programs funded by governments can offer entrepreneurial opportunities for young graduates in the affected regions. To attract entrepreneurs to disaster areas or help them return, certain coworking spaces and high-profile events should be built (TERRA, 2023). These efforts can be directed towards individuals, as well as the region and province. Institutions express this situation as follows: Institution 3-2 states: *"Production needs to happen here, I'm saying this to keep the workforce here. It could be in defense industry, it could be in agriculture, for example. Special incentives need to be applied. They'll say that the climate and soil infrastructure of Adıyaman are suitable for a specific agricultural incentive to be applied here. It could be dairy products. There is a lot of grazing land here, it's possible. Greenhouse farming could also be an option. As I mentioned earlier, special incentives need to be applied to textile, furniture, and food industries. I gave the example of TYP (Public Benefit Working Program) for this. If we do not provide cost-reducing support to employers, they will close their businesses, they will close."* Institution 4-1 states: *"The solution, as I said, is that the destroyed areas need to open up credit incentives. In other words, regions like Maraş, Adıyaman, Malatya, and Antakya should be declared special areas, and some of the regulations need to be softened."*

Changes in Consumption Trends: Natural disasters affect the consumption expenditures and trends of both consumers and businesses. The greatest behavioral change following natural disasters occurs in the area of pricing. Individuals and businesses tend to save more, meaning they become less extravagant, reduce the amount of all goods purchased, postpone the purchase of durable goods, and negotiate prices more frequently than before. They also shop more at discount outlet stores compared to before. Looking at the effects of natural disasters over a few years, both per capita consumption expenditure and per capita retail sales are reduced (Hayta, 2012). In this context, we observe that both individual and business needs and priorities have changed in the region after the earthquake. This change is expressed by Institution 3-1: *"So, the spending habits of the remaining population have also changed."* Similarly, Institution 1-3 states: *"Now, my wife is also an entrepreneur. She is a mosaic artist and makes mosaic productions. She has been trying to create something with mosaics. Before the earthquake, she had her own online sales channel and also presented her products to museums, municipalities, and institutions. She hasn't been able to sell anything for the past 6 months. The reason she hasn't been able to sell is that no one is interested in buying mosaics right now. As we said, it's not a priority."*

5. Conclusions

Discussion of Findings

One of the most significant issues in the region following the Kahramanmaraş-centered earthquakes is the lack of workforce and physical damage (Table 4). The physical damage in the disaster zone is extensive. Many entrepreneurs have lost either their homes or their businesses. This situation will strain both the entrepreneur's capital and the national economy. In the region, the shortage of workforce, due to both deaths and injuries as well as migration, poses a significant obstacle for entrepreneurs in carrying out their activities.

SMEs are vulnerable to natural disasters in various ways: capital, labor, logistics, and markets/buyers are some of these factors. Entrepreneurs are affected by these factors during a disaster. Their income falls below their expenses in the short term, and they will need capital/funds to finance the reconstruction period. This will depend on the entrepreneur's preparedness for the disaster and the impact of the disaster on the supply chain, which may occur in the short to medium term (Ballesteros and Domingo, 2015). During and after the earthquake, disruptions occurred in the supply chain, and entrepreneurs faced logistical issues. There is significant ignorance and lack of insurance (especially in micro and small businesses) regarding both business and housing insurance in the region. In general, micro and small enterprises appear to be more affected by the earthquake.

Infrastructure damage caused by natural disasters has always been considered a financial strain for small businesses. This can lead to the closure of businesses, and restarting operations typically requires significant costs and time. Previous studies conducted in developed countries have shown that more than one-third of small businesses do not reopen after a disaster, and more than one-quarter close their businesses within two years after the disaster (Fabeil et al., 2019). According to the research findings, many businesses in the region (at the time of the study) have either closed or relocated (due to the failure to update business registry records, the exact number of businesses that have closed is still unknown).

Policy Implications

Households/individuals are the direct victims of disasters. The availability of labor/human resources is crucial, and for entrepreneurs to achieve their goals, respond to increased demand, and resume their activities as quickly as possible, they must strengthen their workforce and support affected employees (Ballesteros and Domingo, 2015). In the earthquake-affected region, it is extremely difficult for entrepreneurs, especially micro and small businesses, to bear this heavy burden. They need support from the government, which should be provided through collaboration with local NGOs and professional associations.

In the short term, there is a sharp increase in demand for essential goods, while demand for non-essential needs decreases, leading to a shift in market demand. Entrepreneurs must consider the changes in activities and revenues resulting from these shifts and disruptions (Ballesteros and Domingo, 2015). Earthquakes can also create some market changes. After the earthquake, there may be changes in the products and services that people require, and entrepreneurs may turn to new markets to adapt to these changes (Marangoz and İzci, 2023). It has been observed that, along with the earthquake, there have been changes in the consumption preferences and priorities of businesses and individuals in the region.

Disasters with significant impacts, such as major earthquakes, can create new opportunities for entrepreneurs and help them develop innovative solutions. Earthquakes can also assist entrepreneurs in enhancing their risk management skills and developing technological innovations. For example, businesses may be required to take additional measures to construct earthquake-resistant buildings or ensure the safety of employees during earthquakes. Alternatively, earthquake detection systems or damage assessment technologies may emerge as new technologies that can be utilized in the construction industry. After the earthquake, entrepreneurs may work toward the reconstruction of society, initiate aid projects, and develop social entrepreneurship activities (Marangoz and İzci, 2023). In this context, social entrepreneurship, a crucial topic for entrepreneurs' contributions to the reconstruction process in the disaster-affected region, should also be investigated.

Concluding Remarks

To reduce the economic impacts of natural disasters, entrepreneurial activities must be implemented and supported. In this context, attracting skilled and creative entrepreneurs to disaster-affected areas becomes increasingly important in the long term. Although the deaths, stress, and psychological distress caused by disasters such as earthquakes complicate this process, governments, NGOs, and professional organizations can provide entrepreneurship opportunities, particularly for young graduates, in the affected regions. To attract entrepreneurs to these areas or assist them in returning, coworking spaces and high-profile events should be developed (TERRA, 2023). For the region's development, entrepreneurship activities need to be fostered, and qualified entrepreneurs should be encouraged to relocate to the area. At this stage, young entrepreneurs should be supported to replace those who have passed away or closed their businesses, and young people should be guided towards entrepreneurship. In this regard, the entrepreneurial tendencies of young people in the earthquake-affected region should be studied, and the barriers they face should be identified, with solutions proposed to overcome these challenges.

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Appendix

Semi-structured Interview Questions

No	Question
1	Information about the interviewee (Chamber/Exchange manager)
2	Could you provide information about the short-term effects of the earthquake on entrepreneurs?
3	Could you provide information about the long-term effects of the earthquake on entrepreneurs?
4	Could you provide information about the direct effects of the earthquake on entrepreneurs?
5	Could you provide information about the indirect effects of the earthquake on entrepreneurs?
6	Which businesses were most affected by the earthquake and what were the impacts? (Micro, Small, Medium, and Large)
7	Can you evaluate the effects of the earthquake on businesses in the following categories? (Markets, Logistics, Facilities, People, Procedures, Finance, Other (suppliers, inventory, etc.))
8	What actions do you foresee for the reconstruction of entrepreneurs (to return to normal)? (Short-term, Long-term)
9	How do you think the earthquake will affect entrepreneurial activities (e.g., new businesses)?
10	What actions should be taken to recover from the earthquake's effects and for the reconstruction of entrepreneurs (to return to normal), and what are the roles and responsibilities of stakeholders? (Government, NGOs, Entrepreneurs)
11	Do you think the earthquake created new opportunities for existing and potential entrepreneurs? How has it affected entrepreneurial tendencies?
12	Was there any pre-earthquake information/training for entrepreneurs? If so, what was done?
13	Was there any information/training for entrepreneurs during the earthquake? If so, what was done?
14	Was there any information/training for entrepreneurs after the earthquake? If so, what was done?

Source: Created by the authors.