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A study to measure the economic effects of COVID-19 on the textile industry: Comparative evidence from Bursa and Gaziantep

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Abstract

The textile sector is one of the leading industries in the world and Turkey. This sector is one of the most affected sectors by the recently emerged New Coronavirus pandemic. Both people's and business life were affected, and supply chain activities were disrupted. Many companies tried to mitigate negative impacts of the pandemic. This study focused on analyzing the economic effects of the New Coronavirus pandemic based on yearly comparisons on the textile sector in Bursa and Gaziantep, Turkey. A questionnaire is applied and it includes descriptive questions, economic impact questions, and yearly based comparison analyses of 241 textile companies in Bursa and 181 textile companies in Gaziantep. The obtained data were analyzed via IBM SPSS (Statistical Package for Social Sciences) 25.0 software by means of, frequency, percentage, average, standard deviations, T-test, and One way ANOVA tests. Most of the participants stated their economic worries and opinions in the economic impact analysis section. The hypotheses are tested and it is revealed that there is a significant difference between operation year, legal status, the market of businesses, and the monthly turnover of companies and how they were affected by COVID-19 in some of the subsets. In Bursa, participants have fewer negative opinions about the sustainability of economic activities. The study results showed that despite increased lead times, delivery times and participants' negative opinions, monthly turnover, and the number of employees, the number of exporting companies increased in both cities.

1. Introduction

The textile sector is one of the leading businesses in the world and Turkey. The textile sector accounts for 8.8% of the total production value of Turkey's manufacturing industry and provides 9.9% of added value in the industry. In the provinces of İstanbul, Gaziantep, Bursa, Kahramanmaraş, Adana, Kayseri and Denizli, the biggest volume of production in many sub-sectors such as fiber, yarn, woven-knitted fabric, nonwoven surface take place (Uyanık and Çeliker, 2019).

Supply chains are effected by natural disasters, employee strikes, or man-made catastrophes which may also effect supplies, producers, transporters, and distributors as a link in the chain (Ivanov, 2020). In recent years, The world has been struggling with the New Coronavirus pandemic and its effects on the supply chain, businesses, and human life. On 31 December 2019, the WHO (World Health Organization) announced cases of pneumonia detected in Wuhan, China. On March 11, 2020, the WHO informed "Coronavirus disease 2019" (COVID-19) as

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a global pandemic. Because of the pandemic, 6,670,502 million people have lost their lives in the cases of 657,275,999 up to the 17th of December in 2022 (Worldometer, 2022). To prevent the spread of the virus, governments took precautions such as isolation of people, and closing the institutions, public facilities, and businesses for a certain time. As expected, these actions caused negative effects on the economy (Han et al., 2022). The world economy achieved 2.8% growth in 2019, but a negative growth of -3.1% in 2020, and a 5.9% growth in 2021. In 2020, the effects of the pandemic were visible. The vaccine studies and transition to controlled normalization in human life caused positive economic growth in 2021. Despite the fact that the Coronavirus emerged in China, the least economic effects were felt in the country. China achieved the biggest economic growth rate in 2020 with a 2.3% growth. In terms of developed countries, England felt the economic effects most. In Turkey, the negative effects were felt especially in the second quarter of 2020. The worst export volume were achieved in 2020 in the past four years. Despite this, Turkey achieved the second biggest growth rate in the world with 1.7% growth in 2020, and then the biggest growth rate in 2021 with 8.9%. In the manufacturing industry, the significant increase in export is one of the important factors in achieving such a high growth (Ünüvar and Aktaş, 2022).

This paper aims to analyze the effects of New Coronavirus pandemic on textile industry companies in Turkey. Bursa and Gaziantep are selected as sample cities due to having a large number of textile companies, with a big production volume, export, and import rates in Turkey. In the year 2021, Bursa had 1.19 billion $ export in textile sector, and Gaziantep had 1.85 billion $ export in textile sector and they increased their export volume by 32.2% and 36.7% respectively in 2021 compared to 2020 (Turkish Exporters Assembly, 2022). In Turkey, the textile and raw materials export remained at $12.32 billion in 2020, compared to $12.51 billion export in 2019 (Ministry of Commerce). The data used in this study were collected via a questionnaire applied on 422 textile companies in Bursa and Gaziantep and the analyses are done by SPSS 25.0 software.

This paper includes six sections. The literature review is given in Section 2, the research methodology is presented in Section 3, the data collection and analysis are provided in Section 4 and the obtained results are provided in Section 5. The final section includes the conclusion of the research and recommendations.

2. Literature review

Many global sectors and businesses are affected negatively by COVID-19. Ivanov (2020) stated that 94% of the Fortune 1000 companies have experienced supply chain disruptions because of COVID-19. Gruszczynski (2020) stated that the total demand and supply were affected and the global economy was interrupted due to the pandemic. Beck (2020) analyzed the economic and financial effects of the pandemic and advised precautions to mitigate these negative effects.

In literature, the researchers made studies on different industries that aims to analyze the impacts of pandemics. Eğri and Doğaner (2020) conducted a study on small-medium-sized enterprises and the managers stated that they faced problems on the supply-demand side. During the pandemic, healthcare, information, and communication, individual security on corporate computers gained importance but demand for textile, tourism, structure, and manufacturing decreased. Kabadayı and Kardeş (2020) proposed a questionnaire on 731 people in tourism sector. Results showed that the touristic activity decreased due to the pandemic. Hygiene and safety factors were the most important determining factors in tourism preferences which may mean that the tendency toward technology will have importance more. Using technological tools and smart applications will be more important in the future. Most of the participants in the study of Aracı and Ergen (2021) stated that the use of technology in hospitality has a large impact on the pandemic. This provided them to save on-site paper, do more work, and reduce overall costs. Danışmaz (2020) conducted a study to analyze the impacts of the pandemic on consumer preference during online shopping and 64.5% of 200 people stated that their preferences were changed. While the apparel sector was the most preferred before the pandemic, the food sector replaced it during the pandemic years. Supply chain resilience of automobile and airline industries were analyzed by Belhadi et al. (2021) based on the interviews. They stated that the automobile industry perceived the best way to use industry 4.0 technologies and developed localized supply sources, also airline industry perceived the best way to define their operations both at the airports and within the flights. To be sustainable, agile, and resilient, manufacturing operations can be possible with a high level of coordination and collaboration. Industries should use technological tools, smart applications, and industry 4.0 to mitigate the negative effects of the pandemic, be more resilient, and be better prepared against similar disasters.

Most of the searches around the world stated that the textile industry is one of the severely affected industries (Textile Industry Analysis Report and Guide for TR32 Region, 2021). Mishra and Mishra (2021) conducted a study in India with 51 financial individuals/specialists and academicians and they categorized the textile sector

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as severely affected sectors together with tourism and transportation. Eskin (2021) applied a questionnaire to small-medium enterprise managers in textile industry and they stated that the orders were canceled or suspended due to pandemic and most business activities were disrupted. But the effects differed according to the field of activity. The financial structures of textile industries that sell through e-commerce or which started to produce anti-bacterial medical products haven't changed. Kaur (2021) analyzed the data of 123 textile entrepreneurs and it was stated that their stress levels increased due to canceled or postponed orders. During the pandemic, the marketing departments had to grab the opportunities and had to propose new products, being creative and using digital technology were found necessary.

In the literature, the researchers studied on impacts of the pandemic on various sectors. This study will contribute to the literature by both analysing the economic effects of pandemic and comparison analysis based on different criteria to analyze pre and post pandemic. To the best of author's knowledge, there is no study in the literature that analyses the Covid 19 economic impacts on Bursa and Gaziantep textile industry, hoping this study will be beneficial to analyze participants opinion and comparing economic growth results in Turkey.

3. Methods

In this study, questionnaires were conducted to participants in Bursa and Gaziantep textile industry. The questionnaire study includes descriptive analyses, twenty-four questions for economic impact analyses with three subsets (COVID-19 effect on the sustainability of economic activities, opinions on economic policies implemented in COVID-19, economic forecasts for post-COVID-19), and comparative questions for 2019 and 2021 with eight different criteria. The part which includes twenty-four questions was taken from the survey which applied before (Nakıboğlu and Işık, 2020).

This study was conducted between the 1st and 30th of December in 2021 on online platforms. A simple random sampling method was used and 5% acceptable margin of error and 95% confidence level were used and 385 companies were identified as representative. 422 textile companies participated in the survey. 241 participants from Bursa textile industry and 181 participants from Gaziantep textile industry replied to questions. IBM SPSS 25.0 software was used to analyze the data.

Descriptive statistics, percentage, frequency, average, and standard deviations were used to analyze the data. The sufficiency of the sample was analyzed by the Kaiser-Mayer-Olkin test and resulted in 0.95 showing that the sample is sufficient. The Kaiser-Mayer-Olkin value varies between 0 and 1. A value that is greater than 0.5 is accepted as sufficient (Kaiser, 1974). The reliability of the sample was analyzed by Cronbach's Alpha test and resulted in a 0.92 Cronbach's Alpha value. That value varies between 0 and 1. A value that is greater than 0.7 is accepted as satisfactory (Leung, 2001). T-test and ANOVA tests were used to analyze the COVID-19 effect on participants and textile industries. In this study, p values less than 0.05 were considered significant. Different hypotheses were also developed to analyze the impact of the pandemic.

4. Results and discussions

In this survey, 233 male and 189 female replied to survey questions. Table 1 shows 55.9 percent of the participants have graduated from university with a Bachelor's Degree, 29.4 percent of them have graduated from university with a Master's Degree and the rest of them have graduated with an Associate's Degree. Most of the participants' age were between 46-55 with 41.0 percent and corporation company with 51.7 percent. 66.6% participants were working in companies that serve internationally, and only 7.6% were serving locally.

Table 1. Demographic information of participants

		Frequency (n)	**%**
Gender	Male	233	55.2%
	Female	189	44.8%
Educational Status	Associate Degree	62	14.7%
	Bachelor's Degree	236	55.9%
	Master's Degree	124	29.4%

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		Frequency (n)	%
Age	0-25	12	2.8%
	26-35	31	7.4%
	36-45	169	40.1%
	46-55	173	41.0%
	56 and above	37	8.7%
Operation Year of Business	6-10	82	19.4%
	11-15	42	10.0%
	16-20	185	43.8%
	21 and above	113	26.8%
Legal Status of Business	Corporation	218	51.7%
	Limited Company	115	27.2%
	Sole proprietorship	89	21.1%
Market of Business	International	281	66.6%
	National	109	25.8%
	Local/ Regional	32	7.6%
City	Bursa	241	57.1%
	Gaziantep	181	42.9%

In this survey, higher scores show the negative opinions of participants. Participants' opinions related to COVID-19 effect on the sustainability of economic activities show that most of them thought to decrease the number of employees working at the company and they worried about not being able to take care of their families and children. Table 2 shows most of the opinions are negative in terms of the sustainability of economic activities.

Table 2. Opinions on COVID-19 effect on sustainability of economic activities

COVID-19 Effect on Sustainability of Economic Activities	X± s. d.	Factor load	Explained Variance	Internal Consistency
I think I have to decrease the number of employees who work at the company.	4.16±0.56	0.62	24%	0.89
I think I will not be able to pay the collateral.	3.59±0.60	0.65		
I believe, there will be no demand for the products and services we offer as before.	3.90±0.76	0.64		
I am worried about not being able to take care of my family and children.	4.08±0.78	0.56		
I think I will have trouble with banks cause of the loan payments.	3.99±0.68	0.61		
I think I will lose a significant job loss.	3.41±0.84	0.62		
I am scared of shutting down my business.	3.85±0.73	0.62		
I think I will not tend to do new entrepreneurship activities.	3.31±0.61	0.63		
I think I will not collect my debts.	3.78±0.77	0.65		
I think, applied economic policies can not recover the damage which I have seen caused by the COVID-19.	3.66±0.68	0.66		

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According to table 3, most of the participants thought that they couldn't profit from the benefits which were given. Economic incentives were insufficient and they had economic worries for the future. So, participants thought that implemented policies were not sufficient during the pandemic. Government and companies could prepare better economic packages during the pandemic or they can prepare better plans for economic recovery for post-COVID-19.

Table 3. Opinions on economic policies implemented in COVID-19

Opinions on Economic Policies Implemented in COVID-19	X± s. d.	Factor load	Explained Variance	Internal Consistency
I think economic precautions are insufficient.	3.99±0.42	0.66	26%	0.92
I think, given economic incentives are insufficient.	4.08±0.27	0.67		
I have economic worries for the future.	4.05±0.61	0.68		
I think, economic recessions these days will cause economic troubles in the future.	3.88±0.48	0.63		
I feel myself, economically insufficient.	3.76±0.83	0.64		
I don't believe that economy will not easily return to the old state from now on.	3.90±0.44	0.62		
I can't profit from the benefits which are given.	4.25±0.64	0.63		

Table 4 shows participants' opinions related to economic forecasts for post-COVID-19 are negative generally. Most of them thought that the economic recovery will take a long time, small businesses are at risk of a shut down and unemployment will increase. Economic incentives for especially small businesses have gained importance during this term.

Table 4. Opinions on economic forecasts for post COVID-19

Economic Forecasts for Post COVID-19	X±s.d.	Factor load	Explained Variance	Internal Consistency
I think, all the sectors are affected negatively in terms of economy.	4.13±0.43	0.65	25%	0.91
I think competition will be more and profitability will be less.	3.87±0.53	0.65		
I think inflation will increase significantly.	4.14±0.56	0.66		
I think, there will be a rapid transition from the general economy to the digital economy.	4.01±0.63	0.67		
I think small businesses are at risk of shutting down.	4.14±0.50	0.68		
I think unemployment will increase.	4.14±0.65	0.69		
I think the recovery of the economy will take a long time.	4.20±0.68	0.70		

The hypotheses were tested to analyze the impact of the pandemic and participants on the textile sector.

Hypothesis 1 (H1): There is a significant difference between the gender of participants and how companies are affected by the COVID-19.

Survey results don't show a difference according to participants' gender ($p > 0.05$). H1 hypothesis was rejected for all subsets.

Hypothesis 2 (H2): There is a significant difference between the operation year of companies and how they are affected by the COVID-19.

The H2 hypothesis was accepted for the sustainability of economic activities ($p < 0.05$) but rejected for other subsets ($p > 0.05$). According to the results, 6-10 years operated companies were affected worse than others in terms of sustainability of economic activities. That is related to companies' experience in managing crises situation for the sustainability of economic activities.

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Hypothesis 3 (H3): There is a significant difference between the legal status of companies and how they are affected by the COVID-19.
H3 hypothesis was accepted for the sustainability of economic activities ($p< 0.05$) and opinions on economic policies implemented in COVID-19 ($p< 0.05$) but rejected for other subsets ($p> 0.05$). Corporations and limited companies have fewer negative opinions than a sole proprietorship.
Hypothesis 4 (H4): There is a significant difference between the market of companies and how they are affected by the COVID-19.
H4 hypothesis was accepted for the sustainability of economic activities ($p< 0.05$) and opinions on economic policies implemented in COVID-19 ($p< 0.05$) but rejected for other subset ($p> 0.05$). National and local serving companies were affected worse during the pandemic.
Hypothesis 5 (H5): Participants in Bursa have more negative opinions than Gaziantep about the effects of COVID-19.
H5 hypothesis was rejected for all subsets ($p> 0.05$). Opinions on economic policies implemented in COVID-19 and economic forecasts for post-COVID-19 don't differ in Bursa and Gaziantep. In terms of sustainability of economic activities, participants in Bursa have fewer negative opinions. Results are shown in Table 5.

Table 5. Opinions based on Participants and Business Characteristics

		COVID-19 Effect on Sustainability of Economic Activities		**Opinions on Economic Policies Implemented in COVID-19**		**Economic Forecasts for Post COVID-19**	
		X± s. d.	p	X± s. d.	p	X± s. d.	p
Gender	Male	3.77±0.50	0.86	3.97±0.29	0.55	4.10±0.33	0.62
	Female	3.78±0.50		4.01±0.28		4.07±0.3	
Operation Year of Business	6-10	3.98±0.48	0.01*	4.12±0.21	0.13	4.05±0.29	0.18
	11-15	3.64±0.38		3.82±0.32		4.15±0.36	
	16-20	3.83±0.49		4.02±0.28		4.11±0.29	
	21 and above	3.58±0.50		3.90±0.28		4.05±0.35	
Legal Status of Business	Corporation	3.68±0.48	0.01*	3.92±0.29	0.03*	4.13±0.3	0.22
	Limited	3.63±0.48		3.94±0.28		4.06±0.35	
	Sole proprietorship	4.19±0.32		4.22±0.15		4.02±0.29	
Market of Business	International	3.65±0.45	0.01*	3.92±0.29	0.04*	4.12±0.32	0.49
	National	4.03±0.48		4.11±0.24		4.01±0.28	
	Local	3.99±0.55		4.20±0.15		4.06±0.36	
City	Bursa	3.70±0.51	0.04*	3.99±0.28	0,81	4.03±0.31	0.05
	Gaziantep	3.88±0.47		3.98±0.30		4.16±0.31	

*0.05 as level of significance

Hypothesis 6 (H6): There is a significant difference between the monthly export average of companies and how they are affected by the COVID-19.
According to the years 2019 and 2021, the H6 hypothesis was accepted for the sustainability of economic activities and opinions on economic policies implemented in COVID-19 ($p< 0.05$) but rejected for other subset ($p> 0.05$). The firms whose monthly export average is 1,000,000 or less, have been affected negatively. Results are shown in Table 6.
Hypothesis 7 (H7): There is a significant difference between the monthly turnover of companies and how they are affected by the COVID-19.
According to the years 2019 and 2021, the H7 hypothesis was accepted for the sustainability of economic activities ($p< 0.05$) but rejected for other subsets ($p> 0.05$). The firms whose monthly turnover is less than 1,000,000 have more negative opinions than the other first two subsets, but in terms of economic forecasts for

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post-COVID-19 turnover between 45,000,001 and 60,000,000 have more negative opinions. Results are shown in Table 7.

Table 6. Comparison for Monthly Export Avarage

		COVID-19 Negative Effect on Sustainability of Economic Activities		**Opinions on Economic Policies Implemented ın COVID-19**		**Negative Economic Forecasts for Post COVID-19**	
		X±s.d.	p	X±s.d.	p	X±s.d.	p
Monthly Export Average 2019	1,000,000 TL and less	4.09±0.51	0.01*	4.12±0.24	0.01*	4.08±0.33	0.23
	1,000,001 -15,000,000 TL	3.75±0.38		3.77±0.34		4.06±0.41	
	15,000,001 - 30,000,000 TL	3.57±0.47		3.96±0.25		4.08±0.25	
	30,000,001 - 45,000,000 TL	3.70±0.03		4.00±0.15		4.18±0.14	
Monthly Export Average 2021	1,000,000 TL and less	4.02±0.51	0.01*	4.12±0.24	0.01*	4.08±0.33	0.26
	1,000,001 -15,000,000 TL	3.75±0.38		3.77±0.34		4.06±0.41	
	15,000,001 - 30,000,000 TL	3.66±0.27		4.02±0.23		4.15±0.16	
	30,000,001 - 45,000,000 TL	3.65±0.48		3.96±0.21		4.08±0.25	

Table 7. Comparison for Monthly Turnover

		COVID-19 Negative Effect on Sustainability of Economic Activities		**Opinions on Economic Policies Implemented ın COVID-19**		**Negative Economic Forecasts for Post COVID-19**	
		X±s.d.	p	X±s.d.	p	X±s.d.	p
Monthly turnover 2019	1,000,000 TL and less	4.31±0.17	0.01*	4.14±0.12	0.08	3.90±0.26	0.11
	1,000,001 -15,000,000 TL	3.84±0.52		4.02±0.33		4.07±0.34	
	15,000,001 - 30,000,000 TL	3.41±0.22		3.76±0.34		4.18±0.41	
	30,000,001 - 45,000,000 TL	3.56±0.58		4.01±0.21		4.13±0.21	
	45,000,001 – 60,000,000 TL	3.77±0.16		3.98±0.10		4.19±0.15	
	60,000,001 - 75,000,000 TL	3.6±0.43		4.07±0.07		3.92±0.20	
Monthly turnover 2021	1,000,000 TL and less	4.31±0.17	0.01*	4.14±0.12	0.19	3.90±0.26	0.1
	1,000,001 -15,000,000 TL	3.84±0.52		4.02±0.34		4.07±0.34	
	15,000,001 - 30,000,000 TL	3.47±0.27		4.10±0.25		4.17±0.10	
	30,000,001 - 45,000,000 TL	3.40±0.19		3.64±0.27		4.16±0.48	
	45,000,001 – 60,000,000 TL	3.51±0.58		3.98±0.22		4.18±0.21	
	60,000,001 - 75,000,000 TL	3.80±0.20		4.03±0.08		4.10±0.18	

Hypothesis 8 (H8): There is a significant difference between the average number of monthly employees of companies and how they are affected by the COVID-19.
According to the results of 2019, the H8 hypothesis was accepted for the sustainability of economic activities ($p< 0.05$) but rejected for other subsets ($p> 0.05$). Firms that have more employees have fewer negative opinions. According to the results of 2021, the H8 hypothesis was accepted for all subsets ($p< 0.05$). Results are shown in Table 8.

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Table 8. Comparison for Number of Monthly Employee

		COVID-19 Negative Effect on Sustainability of Economic Activities		**Opinions on Economic Policies Implemented ın COVID-19**		**Negative Economic Forecasts for Post COVID-19**	
		X±s.d.	p	X±s.d.	p	X±s.d.	p
Average Number of Monthly Employee 2019	200 and less	4.15±0.55	0.01*	4.16±0.23	0.13	4.01±0.34	0.15
	201-400	3.67±0.38		3.94±0.22		4.19±0.17	
	401-600	3.55±0.28		3.88±0.30		4.09±0.30	
	601-800	3.63±0.43		3.89±0.30		4.13±0.35	
	801-1000	3.62±0.48		3.95±0.25		4.15±0.25	
	1001-1200	3.40±0.46		3.91±0.19		4.06±0.13	
Average Number of Monthly Employee 2021	200 and less	4.14±0.52	0.01*	4.14±0.21	0.01*	4.12±0.31	0.01*
	201-400	3.67±0.38		3.94±0.22		4.19±0.17	
	401-600	3.47±0.27		4.10±0.25		4.17±0.10	
	601-800	3.57±0.12		3.65±0.31		4.12±0.48	
	801-1000	3.41±0.33		3.76±0.28		3.75±0.21	
	1001-1200	3.64±0.47		3.97±0.21		4.18±0.24	

From 2019 to 2021, in both cities, the number of companies whose monthly export average is between 30,000,001 - 45,000,000 TL and the number of firms whose monthly turnover is between 60,000,001 - 75,000,000 TL are increased in 2021. According to the result in Table 9, export average and monthly turnover increased in both cities despite the pandemic. In both cities, the number of companies whose monthly domestic sales average is between 15,000,001-30,000,000 TL has differed. Some of the firms leveled up to 30,000,000-45,000,000 TL in 2021 but some of them went down to 1,000,001 -15,000,000 TL.

Table 9. Comparison for monthly export, domestic sales and turnover

		2019 January- November				**2021 January- November**			
		Bursa		Gaziantep		Bursa		Gaziantep	
		n	%	n	%	n	%	n	%
Monthly Export Average	1,000,000 TL and less	91	37.8%	72	39.8%	91	37.8%	72	39.8%
	1,000,001 -15,000,000 TL	38	15.8%	51	28.2%	38	15.8%	51	28.2%
	15,000,001 - 30,000,000 TL	83	34.4%	46	25.4%	25	10.4%	17	9.4%
	30,000,001 - 45,000,000 TL	29	12.0%	12	6.6%	87	36.1%	41	22.7%
Monthly Domestic Sales Average	1,000,000 TL and less	25	10.4%	33	18.2%	25	10.4%	33	18.2%
	1,000,001 -15,000,000 TL	107	44.4%	72	39.8%	144	59.8%	90	49.7%
	15,000,001 - 30,000,000 TL	97	40.2%	64	35.4%	22	9.1%	27	14.9%
	30,000,001 - 45,000,000 TL	12	5.0%	12	6.6%	50	20.7%	31	17.1%
Monthly Turnover	1,000,000 TL and less	25	10.4%	33	18.2%	25	10.4%	33	18.2%
	1,000,001 -15,000,000 TL	94	39.0%	63	34.8%	93	38.6%	62	34.3%
	15.000,001 - 30,000,000 TL	32	13.3%	36	19.9%	16	6.6%	6	3.3%
	30,000,001 - 45,000,000 TL	49	20.3%	25	13.8%	20	8.3%	31	17.1%
	45,000,001 - 60,000,000 TL	34	14.1%	23	12.7%	42	17.4%	29	16.0%
	60,000,001 - 75,000,000 TL	7	2.9%	1	0.6%	45	18.7%	20	11.0%

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From 2019 to 2021, in both cities, monthly operation capacity, the average number of monthly employees, and the number of exporting countries increased. Results are shown in Table 10. These can be related to the location advantage of both cities, close to the suppliers, but results show that despite the pandemic, companies developed these aspects.

Table 10. Comparison for monthly operating capacity, number of exporting countries, number of monthly employee

		2019 January- November				2021 January- November			
		Bursa		Gaziantep		Bursa		Gaziantep	
		n	%	n	%	n	%	n	%
Monthly Operating Capacity	40% and less	9	3.7%	9	5.0%	13	5.4%	27	14.9%
	51%- 60% capacity	26	10.8%	44	24.3%	39	16.2%	43	23.8%
	61%- 70% capacity	64	26.6%	57	31.5%	52	21.6%	36	19.9%
	71%- 80% capacity	104	43.2%	60	33.1%	72	29.9%	51	28.2%
	81% - 90% capacity	38	15.8%	11	6.1%	63	26.1%	22	12.2%
	91% and more	2	0.8%	2	1.1%	2	0.8%	2	1.1%
Average Number of Exporting Countries	10 and less	101	41.9%	104	57.5%	93	38.6%	104	57.5%
	11- 30 country	124	51.5%	71	39.2%	83	34.4%	51	28.2%
	31- 50 country	16	6.6%	6	3.3%	65	27.0%	26	14.4%
Average Number of Monthly Employee	200 and less	71	29.5%	68	37.6%	89	36.9%	82	45.3%
	201-400 employee	7	2.9%	11	6.1%	7	2.9%	11	6.1%
	401-600 employee	47	19.5%	38	21.0%	16	6.6%	6	3.3%
	601-800 employee	63	26.1%	31	17.1%	23	9.5%	33	18.2%
	801-1000 employee	48	19.9%	33	18.2%	19	7.9%	10	5.5%
	1001-1200 employee	5	2.1%	0	0.0%	87	36.1%	39	21.5%

From 2019 to 2021, in both cities, the average delivery time and average lead time of raw material increased. Results are shown in Table 11. In 2021, the number of participants who think 21-30-day average lead time of raw material increased. Most of the participants preferred a 31-40-day average delivery time with 46.1% in Bursa and 39.2% in Gaziantep. These are related to pandemic effects on logistics and transportation activities. Delayed activities affected supplier of goods, also the delivery of goods from companies to customers.

Table 11. Comparison for average lead time of raw material and average delivery time

		2019 January- November				2021 January- November			
		Bursa		Gaziantep		Bursa		Gaziantep	
		n	%	n	%	n	%	n	%
Average Lead time of Raw Metariel	0-10 day	81	33.6%	43	23.8%	30	12.4%	24	13.3%
	11-20 day	159	66.0%	138	76.2%	126	52.3%	81	44.8%
	21- 30 day	1	0.4%	0	0.0%	85	35.3%	76	42.0%
Average Delivery Time	0-10 day	43	17.8%	35	19.3%	17	7.1%	23	12.7%
	11-20 day	48	19.9%	47	26.0%	43	17.8%	16	8.8%
	21- 30 day	109	45.2%	57	31.5%	70	29.0%	71	39.2%
	31- 40 day	41	17.0%	42	23.2%	111	46.1%	71	39.2%

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5. Conclusions and recommendations

New Coronavirus has been affecting the world since the end of 2019. Many people and businesses were affected by the pandemic so the impact analysis gained importance to understand pandemic impacts and make action plans to overcome with less severely.

In this study, the New Coronavirus pandemic impacts on the textile sector in Bursa and Gaziantep were analyzed. A questionnaire was applied on 241 companies from Bursa and 182 companies from Gaziantep. The questionnaire includes descriptive questions, economic impact questions with three subsets; COVID-19 effect on the sustainability of economic activities, opinions on economic policies implemented in COVID-19, and economic forecasts for post-COVID-19 and eight different criteria to compare different years.

Most of the participants in Bursa and Gaziantep thought that; they need to decrease the number of employees working at the company, taken precautions were not sufficient, inflation and unemployment will increase post-COVID-19. Participants have generally negative opinions about economic aspects, these show that taken precautions are not sufficient for the textile sector in Bursa and Gaziantep. For post-COVID-19, government and businesses can prepare better economic support packages. Different hypotheses were also tested in study. According to the results, there is no significant difference between the gender and how participants were affected by the pandemic. In Bursa, participants have fewer negative opinions about the sustainability of economic activities. There are significant difference in terms of some subsets between the operation year, legal status, market, monthly export average, and a monthly turnover of companies. Higher operation year is an advantage for COVID-19 effect on the sustainability of economic activities. Sole proprietorship affected more than corporations and limited companies, international serving is also an advantage for some subsets. So being institutional and international service have an advantage during the pandemic. As a firm size, operation year, and monthly turnover increases opinions of participants appear to be more positive.

In the final stage, eight different criteria were compared by the years 2019 and 2021. According to results, in both cities, monthly operation capacity, monthly turnover, monthly domestic sales, monthly export average, and monthly exporting country, the average number of monthly employees increased in 2021 compared to 2019. But, participants stated that average delivery time and average lead time increased in 2021. These are related to disrupted logistics activities during the pandemic and closed companies made it difficult to reach suppliers. In both cities despite the pandemic effect, disrupted logistics activities and its negative effects on the economy, and monthly operation capacity, monthly turnover, monthly domestic sales, monthly export average, monthly exporting country, the average number of monthly employees increased in 2021 compared to 2019. These show that despite the participants' negative opinions related to economic impacts, most of the criteria developed on the textile sector in Bursa and Gaziantep. That is also confirmed with increased export volume of Bursa and Gaziantep in 2021 compared to 2020. But decreased textile export in Turkey revealed that, Bursa and Gaziantep cities have good performance in Turkey despite the negative opinions on economy.

Questionnaire studies are beneficial ways to analyze participants' opinions. The limitation of this study is the examination of two cities in the textile sector. By increasing the sample cities, similar questionnaires may conduct in the textile sector or other sectors. This may be helpful to realize their deficiencies and strength, analyze suppliers' performance, take actions for post-term, and prepare strategic plans for similar disasters or diseases. Also, studies showed that during the pandemic, firm size, operation year, institutionalism, and technology gained importance. These companies impacted less than others within their industry. Transitioning to institutionalization and using technology more will make businesses stronger for all difficulties in the future.

Contribution of researchers

Melike Bulur reviewed the literature, conducted the questionnaire, and made data analysis. Eren Özceylan contributed to the interpretation of analysis results, examined methodology and coordinated the research process. Cihan Çetinkaya contributed to reviewing the adequacy of scientific publication research, preparing the questionnaire setup and reviewing the written language.

Conflict of interest

The authors declared that there is no conflict of interest.

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