



UNION OF ENGINEERS AND TEXTILE
TECHNICIANS OF SERBIA

EDITOR:
SNEŽANA UROŠEVIĆ

III INTERNATIONAL SCIENTIFIC CONFERENCE
CONTEMPORARY TRENDS AND INNOVATIONS
IN THE TEXTILE INDUSTRY

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TEXTILE INDUSTRY

IV MEĐUNARODNA NAUČNA KONFERENCIJA
SAVREMENI TRENDOVI I
INOVACIJE U TEKSTILNOJ
INDUSTRIJI
PROCEEDINGS

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Belgrade, 16-17th September, 2021.
Union of Engineers and Technicians of Serbia
Dom inženjera „Nikola Tesla“



**UNION OF ENGINEERS AND
TEXTILE TECHNICIANS OF SERBIA
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**UNION OF ENGINEERS AND TECHNICIANS OF SERBIA
FACULTY OF TECHNOLOGY AND METALLURGY IN BELGRADE
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SOCIETY FOR ROBOTICS OF BOSNIA I HERZEGOVINA
BASTE - BALKAN SOCIETY OF TEXTILE ENGINEERING, GREECE**

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and Technological Development of the Republic of Serbia**



UNION OF ENGINEERS AND TEXTILE TECHNICIANS OF SERBIA

“CONTEMPORARY TRENDS AND INNOVATIONS IN THE TEXTILE INDUSTRY” CT&ITI 2021

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PREFACE

The 4th International conference "Contemporary Trends and Innovations in the Textile Industry" CT&ITI 2021, is co-organized by the Union of Engineers and Textile Technicians of Serbia, the Union of Engineers and Technicians of Serbia, the Faculty of Technology and Metallurgy in Belgrade, the University of Faculty of Technology, Shtip, North of Macedonia, Society for Robotics of Bosnia i Hercegovina and Balkan Society Of Textile Engineering-BASTE of Greece.

The Ministry of Education, Science and Technological Development of the Republic of Serbia recognized the importance of this Conference, and thus, supported it.

The aim of this Conference is to consider current technical, technological, economic, ecological, R&D, legal and other issues related to the textile industry, then the application of contemporary achievements and the introduction of technical and technological innovations in the production process of fiber, textile, clothing and technical textile by applying scientific solutions in order to improve the business and increase the competitive advantages of the textile industry on the domestic and global market.

Leading scientists and experts from the Balkans and other countries, working at faculties, textile colleges and institutes, but also individuals who professionally deal with the issues at hand are taking part in this Conference.

The Conference program involves papers dedicated to the scientific and practical aspects of the following topics: Textile and Textile Technology, Textile Design, Management and Marketing in the Textile Industry and Ecology and Sustainable Development in the Textile Industry. The Conference program includes 56 papers, and a total of 129 participants from 16 countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, India, Latvia, North of Macedonia, Montenegro, Portugal, Romania, Russia, Serbia, Slovenia, Turkey and Ukraine.

Therefore, this Conference is an opportunity for establishing scientific, educational and economic cooperation of our country with other countries. Certain number of papers by domestic authors present the project results dealing with fundamental research and technological development, financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

I would like to thank all those who have made it possible to organize the conference Contemporary Trends and Innovations in the Textile Industry and make it a success. First, I would like to thank the Scientific and Organizing Committee for working hard, spending countless hours and finding the best solutions for numerous organizational aspects of our Conference. Also, I would like to express my gratitude to all sponsors who believed in the importance of this Conference and co-financed it. I also thank all the other institutions that supported the Conference in various ways, because without their support, the Conference could not have been organized. Last but not least, I would like to thank plenary lecturers, all authors and co-authors and guests for their participation in the Conference.

On behalf of the Organizing Committee
Prof. dr Snežana Urošević, president



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EFFECT OF THE PANDEMIC ON THE CLOTHING INDUSTRY IN THE EASTERN REGION OF R. N. MACEDONIA

Sashka G. Longurova¹, Silvana Zezova¹, Sonja Jordeva¹, Stefan
Maksimov¹, Darko Andronikov¹, Kiro Mojsov¹

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ABSTRACT: *The purpose of this study was to make an initial assessment of the impact of the pandemic on the clothing industry. This paper provides an analysis of statistics on the clothing industry. The data reviewed include the number of employees, the quantity of industrial production, and the changes in type of production. The data for the past 30 months were reviewed in order to see the effect of the pandemic on the clothing companies.*

Keywords: *Clothing industry, pandemic, statistics, production quantity.*

UTICAJ PANDEMIJE NA ODEVNU INDUSTRIJU U ISTOČNOM REGIONU R. S. MAKEDONIJE

APSTRAKT: *Cilj ove studije je bio da se napravi početna procena uticaja pandemije na odevnu industriju. Ovaj rad daje analizu statistike o odevnoj industriji. Pregledani podaci uključuju broj zaposlenih, količinu industrijske proizvodnje i promene u vrsti proizvodnje. Podaci o poslednjih 30 meseci su pregledani kako bi se sagedao efekat pandemije na kompanije u odevnoj industriji.*

Ključne reči: *Odevna industrija, pandemija, statistika, proizvodni kvantitet.*

1. INTRODUCTION

Global changes of any type, social, economic or health, have an impact on industry and all business sectors. In R. North Macedonia, especially in the Eastern region, one of the most dominant industries is the clothing industry [1,2]. Most of the companies have a CMT (Cut Make Trim) manufacturing process, which means import of materials, their processing, and export of the finished product, and such changes have a major impact on the sector [3,4]. From March 2020, we have been facing the Covid 19 pandemic, which has literally stopped the world. Several activities were introduced to protect human health, such as curfew, isolation, restricted movement, borders were closed, which indirectly affected the reduction of companies' economic activity [5]. In this study, an initial assessment was made of the impact of the pandemic on the clothing industry.



2. ANALYSIS OF THE STATISTICAL DATA ON THE CLOTHING INDUSTRY

The data were collected from three clothing companies (Table 1), which, according to the size, are medium companies with 51-250 employees. All companies are located in the Eastern region of R. North Macedonia and produce fashion and corporate clothes for German, Dutch, and Italian buyers. The production range of the companies is shown in Table 1. The analysis considers a period of two and a half years - 2019, 2020 and 2021 from January to June.

Table 1: Analyzed clothing companies

	Clothing companies		
Company name	ASM	BSM	VSM
Location	Eastern region	Eastern region	Eastern region
Size	Medium	Medium	Medium
Foreign buyers	Germany, the Netherlands	Germany, Italy	Germany, Netherlands
Production range	Blouses	Blouses	Blouses
	Shirts	Shirts	Shirts
	Blazers	Blazers	Blazers
	Dresses, skirts		
	Traditional costumes		
	Corporate clothing		

The collected data are presented monthly for each year in Figures 1, 2 and 3. The data presentation is divided into six months and further analysis is made by calculating the average value of the production for every six months (Figure 4).

From the data presentation in Fig.1 and Fig.4 and from the analysis made, the company **ASM** has a reduction of production quantity by 12% in the first half of 2020 compared to the same period in 2019, Table 2. This is due to the reduction of the number of employees at the end of the second half of 2019 by 10%. In this case, we can say that there are no changes in the productivity of the company because the reduction in the number of employees and quantity of production is almost proportional.

In the second half of 2020, the production of this company decreased by 27% compared to the same period in 2019. Although there is a 10% lower number of workers, there is still a significant decline in quantity of production and productivity of the company. This is due to the closure of the company for 10 days because a Covid cluster appeared and there was continuous absence of some employees who were in isolation or self-isolation.

The spring-summer collection 2020 remained in the warehouses and the stores because during this period all of the Western Europe was in a total lockdown, consequently the orders for the season spring-summer 2021 were reduced by the buyers for 50%. As result of this, the company introduced the production of masks in the period from September to December 2020, which covered 35% of the total production. Also, buyers delayed exports for three months, from November 2020 to January 2021. The delayed export and payment of orders, orders in lower quantity, production of lower cost products, were reasons for the company to reduce the number of employees by 10%.



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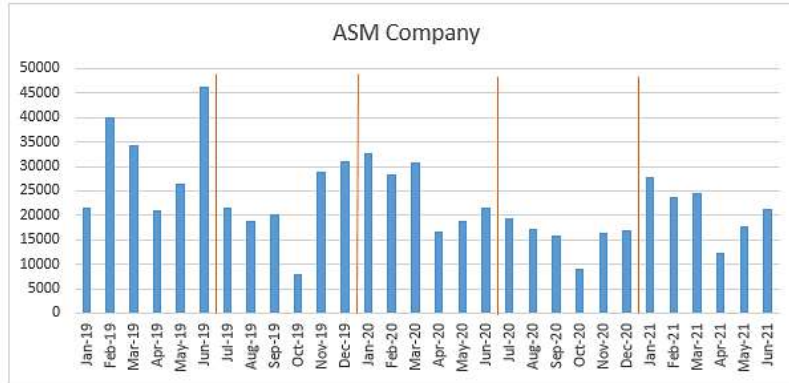


Figure 1: Production quantity of ASM Company



Figure 2: Production quantity of BSM Company

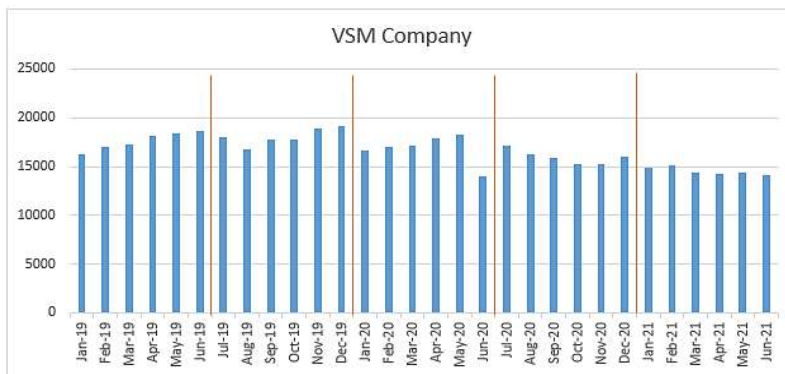


Figure 3: Production quantity of VSM Company

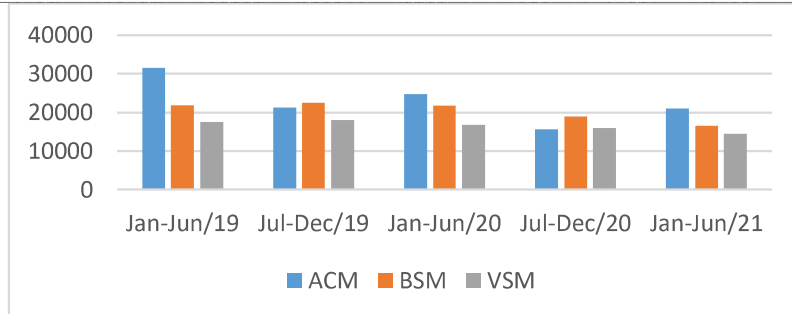


Figure 4: Calculated average value of the six-month production for 2019, 2020 and the first half of 2021

In the first half of 2021, the production of this company is 15% lower compared to 2020 in the same period, but there is a smaller number of workers by 10%, which means there is a small decline in the productivity of the company. In this period, the ordered quantities of clothes are smaller compared to the first half of 2020, but they are larger than in the second half of 2020 due to the reduction of measures against the coronavirus. The shops, restaurants and shopping malls are open and the most important for the fashion industry is the permission to organize events.

In this period, the production of masks covers 25% of the total production.

Table 2: Changes in the clothing industry for 2020 and 2021

Company		I half 2020 compared to 2019	II half 2020 compared to 2019	I half 2021 compared to 2020
ASM	Employees	*-10%	-10%	-10%
	Quantity of production	- 12%	-27%	- 15%
	Changes in type of production	/	30% masks	25% masks
BSM	Employees	/	/	-15%
	Quantity of production	/	-16%	-24%
	Changes in type of production	/	35% masks and disposable coats	/
VSM	Employees	/	/	/
	Quantity of production	/	-12%	-14%
	Changes in type of production	/	30% masks 10% own collection for domestic market	/
	*(-) minus			



The data analysis for the **BSM** company (Table 2) has shown that this company has no differences in the quantity of production in the period from January to June in 2019 and 2020. In the second half of 2020, there was a decline in production and productivity by 16% compared to 2019 in the same period. During this period there was a rise in the number of people infected with the corona virus globally and this had an impact on the reduction of industrial production. In November, most of the employees were infected with the Covid virus and the company did not work for 10 days. On the other hand, buyers have reduced the orders for the spring-summer 2021 season because most of the spring-summer 2020 collection has been put on sale in 2021. The company complemented the lack of work orders by sewing masks and disposable coats for export and the domestic market. In the period from July to December 2020, 35% of the total production belonged to the production of masks and disposable coats. However, the company could not withstand the financial pressure and decided to lay off 15% of employees.

In the first half of 2021, the quantity of production is 24% lower compared to 2020 in the same period. The trend of decreasing orders from customers is continuing to grow and the company is considering a further reduction in the number of employees.

The situation with the company **VSM** is the similar as with the company **BSM**. In the first half of the 2020, the production was almost the same as in 2019 (Table 2). In the second half of 2020, it was 12% lower compared to 2019. Due to the reduction of orders from customers and the increase in the need for masks, 30% of the production was redirected to the sewing of masks. Additionally, the company introduced its own clothing production for the domestic market, which is 10% of the total production.

In the first half of 2021, the decline in the company's production continues to increase and is 14% compared to 2020. As a result of this, the company considers reducing the number of employees.

3. CONCLUSION

The social and health changes in the society as a result of the Covid -19 pandemic have caused a change in the clothing industry. From the analysis in this paper, we can conclude that:

1. For the first half of 2020, orders from the buyers had already been made in 2019 and in this half of the year the production capacities of companies were full. The impact of the pandemic on the production of clothing was felt from the second half of 2020.
2. The Covid-19 crisis has a significant impact on the production quantity. In 2020 and 2021, the production quantity of companies is reduced between 12-27%. It is explained by the absence of employees and the reduction of orders.
3. As a result of reduced orders by foreign buyers, companies have introduced another type of production, such as protective masks, which takes 25-35% of the total



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production. One of the companies started to produce its own collections for the domestic market. The share of this production is 10% of the total.

4. The crisis caused a decrease in the number of employees. Companies have reduced the number of employees by 10 -15%.

This was a short analysis for an initial assessment of the impact of the pandemic on the clothing industry. The research will continue by expanding the analysis of a large number of clothing companies from different regions in R.N. Macedonia and will be done for a longer period of time.

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