

FRI-2B.412-1-EM1-03

CONTEMPORARY SUPPLY CHALLENGES FOR BULGARIAN FURNITURE PRODUCERS²

Assist. Prof. Igor Sheludko, PhD

Department of Business Development and Innovation,

Faculty of Business and Management,

University of Ruse "Angel Kanchev"

Phone: +359-82-888-495

E-mail: isheludko@uni-ruse.bg

Abstract: *The paper reviews the main contemporary challenges and problems for Bulgarian furniture producers regarding material supply. The research is based on a survey and interview of supply managers of furniture production companies in Ruse, Bulgaria. The main target is to reveal the impact of the logistic limitations caused by the war in Ukraine, COVID-19 and other global events, influencing the business processes of the furniture producers. The research focuses over the period of March-September 2022. Based on the interviews the author presents the list of activities the producers often apply to minimize the risks generated by the environment's uncertainty.*

Keywords: Supply Chain Management, Materials, Logistic challenges

JEL Codes: M11, M21

INTRODUCTION

Furniture production is an important industry sector for Ruse. It has a long history and traditions. Furniture producers are in the list of main job creators for the region (The report of Ruse District Administration, 2014). According to the data collected from Bulgarian Trade Register (as of 2019) there are at least 24 active furniture (flatpack PCB furniture) producers in the city of Ruse with 1435 workers, and total turnover more than 100M BGN. There is no published information for a part of the companies (especially small companies), so the numbers are expected to be bigger. Flatpack furniture produced mainly from PCB and MDF panels include a lot of components (i.e. fittings, plastic and metal parts, glass, etc). Some critical materials and components are imported (i.e. fittings from Germany, Poland, China, etc). It makes local producers especially dependent on the global supply chains. Thus the shocks in the global economy inevitably reflect on their supply - in matters of delivery time, cost, service level.

Supply Chain Capability is the biggest factor influencing Competitive Advantage (Puspita et al., 2020). But the situation in global supply chains in recent years could be described as a "state of emergency", when producers in a global perspective have experienced significant issues regarding disruptions and raising the prices (Todorova, 2021). The most significant impact for furniture producers in 2020 and 2021 has been caused by the COVID-19 pandemic (Fransiska, 2022). The most significant consequences for furniture producers had been uncertain supply, unstable price and inconsistent quality (Ratnasingam et al, 2020). Some of the producers concern switching their production from make-to-stock to make-to-order mode to shorten and simplify supply chains (Bumgardner and Nicholls, 2020). Since 2022 there are new factors on the scene: war in Ukraine, significant raise in gas and fuel prices, expectations for recession of the global economy.

This article describes the pilot research, which investigates the actual situation in material supplies for furniture producers (the pilot research is focused over flatpack PCB furniture producers in the city of Ruse). It shows the reflection of the global supply issues as challenges for each producer, their expectations and thus their activities for managing the supply risks.

² The paper is an output of implementing a research project of the Faculty of Business and Management, "A study of regional potentials for development of socially innovative ecosystems in terms of digital transformation," financed under the Scientific Researches Fund.

EXPOSITION

Methods

In this pilot research the author had created a questionnaire including 17 questions. The author uses Google Forms platform to collect the responses. The questions are divided into 3 types:

1. Direct questions on problems and challenges in context of supply management;
2. Text fields for notes, additional information and explanations. Here respondents could add and describe other response options;
3. Information about the respondent himself.

The author additionally conducted an interview when it was possible. The information received within these interviews has been attached to the response form inside the text fields for notes.

The questionnaire is divided into 6 sections:

1. The field of view of the respondent and overall changes in material supply
2. Changes in material cost
3. Changes in delivery terms
4. Activities for minimizing the risks
5. Current state and the trends
6. Contact information

The questionnaire avoids using “required” questions. The list of the questions:

1. The list of the materials the respondents have direct or indirect view regarding the supply: panels (PCB, MDF, HDF - laminated or not); MDF profiles; veneer; raw wood; fittings; mechanical parts (shock absorbers, rails for doors); metal parts; plastic parts; glasses and mirrors; textile; soft fillers (PU foam, etc.); chemicals (glue, cleaner etc.); materials for packing and other.
2. The list of the materials the respondents have noticed any abnormal issues (including physical absence of the articles in distributors warehouses; dramatic changes in prices and delivery terms; etc.)
3. Additional notes on the challenges mentioned in question #2: particular article, distributor, period; frequency of such issues and the current state; other details.
4. Overall situation regarding price changes for the most of the materials (increased more than double; increased by 50-100%; increased by 10-50%; same level; price decrease; no information)
5. Additional notes on the question #4: particular article, distributor, period; frequency of such issues and the current state; other details.
6. Overall situation regarding delivery terms (lead time) for the most of the materials (increased more than double; increased by 50-100%; increased by 10-50%; same level; decrease in time; no information)
7. Additional notes on the question #6: particular article, distributor, period; frequency of such issues and the current state; other details.
8. Activities the company has applied to overcome the issues regarding supply of certain material or components: increase in orders to the suppliers within current prices and delivery terms; increase in safety stock for critical material or components; increase in safety stock for non-critical material or components; increase in search and communication activities with new vendors; order samples and test-purchase from new vendors; change in the vendor structure - using new vendors on regular basis; change in the production process - self-produced components, repair, recycle; change in the product line - stop producing certain products; change in the product specification (bill of materials) - switch to compatible products available on the market; increasing the estimated lead time used for material planning; change in transportation schemes - using own transport for picking the goods; extend the monitoring activities regarding the market dynamics for the components at risk; extend the monitoring activities regarding the control over the deliveries; other.
9. Additional notes on the question #8.

10. Overall perception on the stability of supply chains. How stable do you estimate the current situation regarding material supply compared to the same period in 2021? (Likert-type scale, from 1 to 5)
11. Recent trends in supply. Has the situation regarding material supply changed in recent months? (became more stable; same; less stable)
12. Point the reasons and their impact over the stability of material supply (Likert-type scale for the impact: very strong; strong; medium; little; no impact). There are 4 preset events listed for the estimation: The war in Ukraine; COVID-19 restrictions; Global economy recession; Raising gas prices; Other.
13. Additional notes on the stability issues and the events causing such issues.
14. Company name
15. Job position
16. Contact info
17. Share any additional information of your private experience regarding the material supplies in the company you work in.

The question #1 serves as a filter for false negative responses for question #2. The author considers both questions as one logical scheme. The author provides a ratio between the responses that report issues and challenges to all responses reporting observations on the particular material or component. In terms of table 1, the ratio of positive answers is calculated as the number of responses (2) is divided by the sum of (1) and (2) responses.

Table 1. Logical connection between responses for questions #1 and #2

Question 1 \ Question 2	The respondent has not experienced any issues	The respondent has experienced some issues
The respondent has direct or indirect observation over the material	(1) There were no additional issues in supplying the material or component.	(2) There were additional issues in supplying the material or component.
The respondent has not direct or indirect observation over the material	(3) The respondent has no information if there are any additional issues.	(4) No clear explanation. Should be additionally interviewed for more details.

One of the main goals of the research is to understand the attitude of the supply managers to the challenges for supply chains in a global perspective. Question #12 is about how the respondents see the impact of global events on the challenges their supply chain is experiencing. It includes the war in Ukraine, higher fuel prices and other reasons. This question should be reviewed in close connection to the question #8 (activities for stabilizing the supply). The answers for the two questions should describe the expectation of the respondents about the perspective of the new challenges, their expected duration and transformation.

Results

The author compiled a list with 24 active furniture producers in the city of Ruse (PCB furniture producers only) and had collected 5 responses from 4 companies. It represents nearly 17% of the active companies. The whole general set would include all supply officers from all active companies. The author does not have the information on the number of supply officers involved in the supply process. Bigger companies usually have more than 1 supply officer. Each of them works with a limited list of the materials. Some producers share their production lines and logistic functions with other companies. Thus one supply officer can serve more than one company.

The experience of the respondents. The ratios of the reported issues show that the respondents have met challenges in some materials more than in others. Table 2 shows that each respondent who is directly or indirectly connected to the procurement of fillers (e.g. PU foam) reports abnormal situations with this type of material in terms of stable supply. While veneer and fittings are the materials with less issues (20% of the respondents involved in the supply process have experienced significant issues).

Table 2. Ratios of significant issues in supply for different types of materials

	Filler	MDF profiles	Wood	Textile	Metal	Chemicals	Panels	Mechanical	Glass	Plastic	Packing	Veneer	Fittings
Work with the material	3	4	3	3	4	2	5	5	5	4	4	5	5
Reported addit. issues	3	3	2	2	2	1	2	2	2	1	1	1	1
Ratio	1	0.75	0.67	0.67	0.5	0.5	0.4	0.4	0.4	0.25	0.25	0.2	0.2

The respondents report issues in buying MDF profiles, raw wood and textile. Veneer and fittings have been reported to be the most stable materials in terms of stock availability, cost and delivery time. Some of the most frequent notes to these responses refer to rising prices and delays. The first half of 2022 is more about unavailability challenges. The second half of 2022 is more about rising prices. One of the respondents added that most of the “out-of-stock” cases had been resolved by the distributors in less than a month. The suppliers, who hadn’t succeeded to manage the shortages in short terms have been replaced by more flexible suppliers.

Changes in material cost. All the respondents report rising costs for the materials. One respondent has noted that the prices for most materials have become more stable since June.

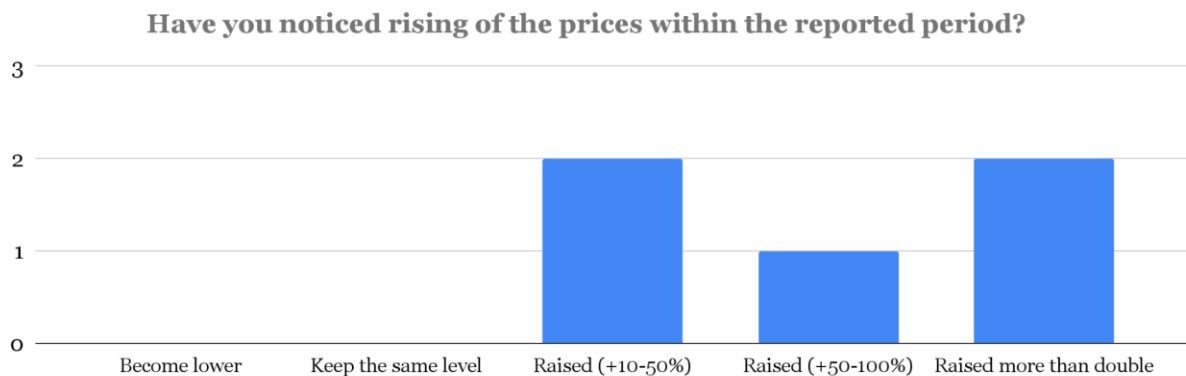


Fig.1. The responses distribution for the question on price changes

Changes in delivery terms. Most respondents report delays in deliveries and increasing the expected time for delivery. The respondents noted that most cases are related to metal parts and MDF-profiles.

Have you noticed shift in delivery time for most materials within the reported period?

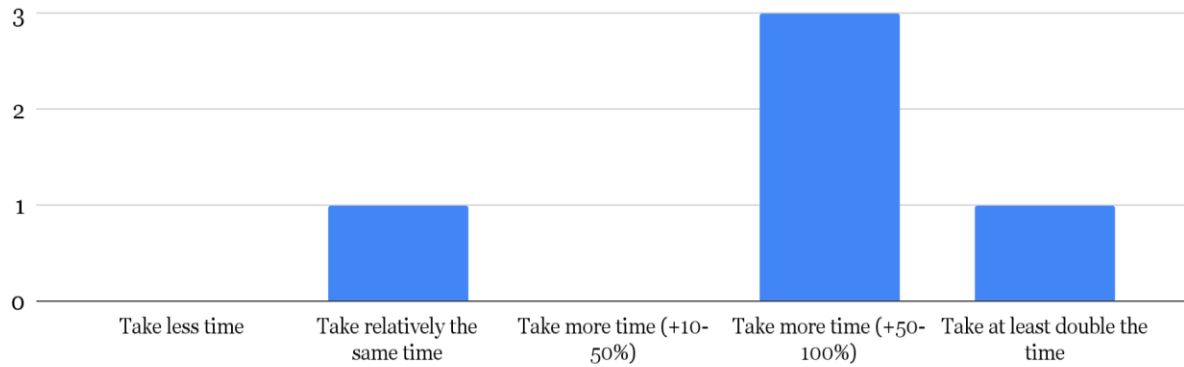


Fig.2. The responses distribution for the shift in delivery terms

Activities for minimizing the risks. The most popular (3 times) reported activities for minimizing risks are:

- increasing the orders to the suppliers within current prices and delivery terms
- extending the monitoring activities regarding the market dynamics for the components at risk.

The following activities were applied 2 times:

- Increase in safety stock for critical material or components;
- Increase in search and communication activities with new vendors;
- Change in the product specification: switch to compatible products available on the market
- Increasing the estimated lead time used for material planning.

No respondents reported applying the following activities:

- Increase in safety stock for non-critical material or components;
- Change in the production process: self-produced components, repair, recycle;
- Change in transportation schemes: using own transport for picking the goods.

Current state and the trends. In this section respondents have shared their perception and understanding of the current situation, including how stable are the current factors that define the performance of the supply chains. The respondents share their perceptions on the major events that have been influencing the material supply. Table 3 shows that the fuel prices is reported as the most significant factor influencing the supply processes in 2022.

Table 3. Impact of different global events on the supply process

Event	Very strong	Strong	Middle	Little	Very little	Rank
Raised fuel prices	2	3				1
War in Ukraine	2	2				2
Global recession	2	1	1			3
COVID-19		2	1			4

Table 4 shows the distribution of the responses for questions #10 and #11. It shows that the most respondents have described their perception of the situation in terms of neutral to relatively positive expectations. It means that they are not expecting any critical issues regarding material supply.

Table 4. Stability: overall vs recent weeks

Current state \ recent trend	less stable	same level	more stable
very unstable			
relatively unstable		1	
neither stable, nor unstable		1	1
relatively stable		2	
very stable			

Discussion

According to the report of NSI (2022) there is a significant increase in the industrial production indexes for the wood industry and furniture producers in 2022 compared to the same months of 2021 - starting at 36.1 in March and slowly lowering to 11.5. This increase could rely on 1) fast reorganizing supplies to the EU from the countries involved in the war in Ukraine and 2) increasing the current MTS production to fix the costs of the finished goods with the current price levels. At the same time NSI forecast the index for August 2022 to be negative (-7.1). This information fits into the results of this pilot research.

Though the sample is too small to make any precise conclusions and predictions, it is wide enough to understand the general problems and challenges for all furniture producers in the region. The supply officers have not made any significant changes in their supply or production process. They rarely imply proactive activities to lower the risks of supply issues. Their perception on the current supply challenges is more optimistic than pessimistic. They feel confident in the capacity of the global supply chains and its ability to overcome the global challenges.

The pilot research showed that the methods, the matrix assessment models and the ratios developed for this research could be used in full scale research. The results of the model could be used to analyze the activities of supply managers, and to group the supply managers into clusters and thus compile profiles. The same method could be applied for other industries such as automotive, textile.

REFERENCES

- Bulgarian National Institute of Statistics (2022). Indexes for industrial production for August 2022. (*Оригинално заглавие: НСИ (2022). ИНДЕКСИ НА ПРОМИШЛЕНОТО ПРОИЗВОДСТВО ПРЕЗ АВГУСТ 2022 ГОДИНА.*)
- Bumgardner, M. S., & Nicholls, D. L. (2020). Sustainable practices in furniture design: A literature study on customization, biomimicry, competitiveness, and product communication. *Forests*, 11(12), 1–16. <https://doi.org/10.3390/f11121277>
- Fransiska Natalia Ralahallo, E. G. T. A. S. (2022). Supply Chain Management Performance of the Furniture Industry in Ambon during the Covid-19 Pandemic. *Budapest International Research and Critics Institute-Journal*, 5(2), 9159–9170. <https://bircu-journal.com/index.php/birci/article/view/4704/pdf>
- Puspita, L. E., Christiananta, B., & Ellitan, L. (2020). The effect of strategic orientation, supply chain capability, innovation capability on competitive advantage and performance of furniture retails. *International Journal of Scientific and Technology Research*, 9(3), 4521–4529.
- Ratnasingham, J., Khoo, A., Jegathesan, N., Wei, L. C., Latib, H. A., Thanasegaran, G., Liat, L. C., Yi, L. Y., Othman, K., & Amir, M. A. (2020). How are small and medium enterprises in Malaysia's furniture industry coping with COVID-19 pandemic? Early evidences from a survey and recommendations for policymakers. *BioResources*, 15(3), 5951–5964. <https://doi.org/10.15376/biores.8.3.5951-5964>
- Ruse district administration, 2014. The report on major job creators in Ruse district (*Оригинално наименование: "Община Русе. Основни работодатели (фирми) в община Русе. Средносписъчен брой на персонала към 31.03.2014 г."*) Available online https://obshtinaruse.bg/uploads/files/Investment/D_1.pdf
- Slavova, P. (2021). Trends in business processes management in the furniture industry in Bulgaria. *SHS Web of Conferences*, 120, 02012. <https://doi.org/10.1051/shsconf/202112002012>
- Todorova, A., Boneva, M. (2021). *E-COMMERCE IN A STATE OF EMERGENCY – ONE YEAR LATER* 13. 4(3), 237–245 <https://conf.uni-ruse.bg/bg/docs/cp21/bp/bp-34.pdf>.