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## ASSESSING THE INNOVATION POTENTIAL OF THE FURNITURE INDUSTRY VALUE CHAIN IN BULGARIA

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**Abstract:** The dynamic changes in the global environment have a strong impact on value chains in terms of both the economic and innovation performance of individual enterprises and the growth potential of the regions in which they are located. The main goal of the report is to analyse the innovation potential of furniture manufacturing companies in Bulgaria from the perspective of their global value chain (hereinafter GVC) participation. A review of the scientific literature is presented in the first part of the paper, where information regarding the current status, challenges, and opportunities for the innovativeness of the furniture industry is studied. In addition, factors related to the innovation potential of enterprises are outlined, which could have an impact on the GVC by strengthening and expanding their effect to gain new opportunities for national and regional competitiveness. Primary data analysis from a questionnaire survey among furniture manufacturing companies in Bulgaria is presented in the second part of the paper. Emphasis is put on the possibility for adaptation of the innovation potential of furniture manufacturers to the value chains and globalization. These analyses will serve as a basis for further studies on the link between innovativeness and GVC participation in forestry.

**Keywords:** global value chain, furniture manufacturers, innovation potential

### 1. INTRODUCTION

Global value chain participation is generally seen as an important avenue for companies to access new markets and diversify exports, add value to local industries and gain a competitive advantage. It provides opportunities to access knowledge to enhance learning and innovation capability. However, many companies do not directly integrate into GVCs but rather into regional value chains (hereinafter RVCs) or local value chains (hereinafter LVCs). The aim of this paper is to examine and compare the drivers for involvement in GVC in stimulating knowledge acquisition and innovation upgrading in the context of the furniture industry. We distinguish between different types of innovation activities. We argue that value-added outcomes depend crucially on value chain governance: the power balance and interactions between the lead firms and suppliers. We draw on a survey among the companies in the furniture industry, which was conducted in Bulgaria. These novel firm-level data allowed us to study innovation drivers in value chains at the firm level. In a multivariate analysis, companies with strong GVC participation develop capabilities via interactions with their client and supplier firms. Yet, GVC participation is not the only avenue for innovation capability building; we

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similarly observe knowledge acquisition and innovation activities at the company level. Innovation potential is generally and strongly enhanced by trust-based governance of the client-supplier relationship. In contrast, in GVCs, control-based governance additionally promotes competitive advantage specifically in information technology-related domains.

## **2. INNOVATIVENESS OF THE FURNITURE INDUSTRY IN TIMES OF GLOBALIZATION**

Globalisation is not a new phenomenon by which national economies, i. e. markets and production in different countries are becoming increasingly interdependent due to the dynamics of trade in goods and services and the flows of capital and technology, through sustained and open commerce (Paceskoski and Nikoloski, 2021). Globalization brings dynamism, networking, openness, cross-organizational cooperation, and free diffusion of knowledge and skills, and it requires performing processes of innovation development and implementation (Pachura, 2015). As globalization has already formed conditions for the easy transfer of knowledge, resources, products and services, organizations in specific sectors such as forestry must identify their strengths and use them to develop their innovation potential. The innovation potential, generally studied at the national level, is related to the development of economic growth and stability at the regional and country level. Fagerberg et al. (2018) emphasize that domestic capability (innovation potential) is a relevant factor, required for a broad framework of knowledge transfer and better participation in the global value chain (a particular form of openness to trade) for economic development. Moreover, Chiu (2014) suggests that a diversity of suppliers in the value chain supports businesses when searching for new products, thus enabling the use of new knowledge and technologies. In this respect, global value chains generate significant economic benefits for both participating companies and the national and regional economies where they are located. It is considered that the forestry sector is “low-tech”, mature, declining and less innovative (Weiss, 2011, p. 3; Hansen et al., 2021). The sector’s innovations are primarily incremental, with fewer investments in R&D (Pinkard and O’grady, 2016; Stefanov, 2020). In terms of forestry, essential consequences of the globalization process are primarily noticeable in countries with large forest areas (Suchomel et al., 2012). The sector is indirectly affected by the internationalization of forest-based industry and in this respect through the “globalizing” (Rametsteiner et al., 2007). Given the fact that globalization has economic, political, social and cultural dimensions of the concept, for the current study, it is considered in terms of the integration of economic activities. Four major sectors comprise the EU forest-based industries – woodworking; furniture industry; pulp and paper industry, and printing industry. Dzian et al. (2021, p. 6) argue that there is a significant relationship between the furniture trade and globalization development. Without neglecting the other industries, the main object of analysis in the current study is only the furniture industry. The global furniture market is estimated to be worth \$850.4 billion by 2025. Such growth is considered due to the COVID-19 impact and rearranging the business operations (Furniture Global Market Report, 2021). Still, the furniture industry is traditionally labour-intensive SMEs predominates and has a fragmented supply chain. Many phases are often outsourced (Study

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on the EU furniture market situation and a possible furniture products initiative, 2014, p.17). In terms of innovations, investments by furniture manufacturers are made for augmented reality technologies (such as a virtual 3D model of furniture in a real room in real-time) that support the marketing, sales, and customers in decision-making (Furniture Global Market Report 2021). Studies in the field are indicative that companies in the furniture manufacturing spend more money on purchasing machinery and equipment rather than on R&D, changes in the design of goods or services, and purchasing of intangible assets (licenses, patents, software) (Chobanova et al., 2018, p. 193 ). A restriction to the innovation development in furniture enterprises is considered to be the restricted access of the company to the market including a lack of cooperation with the main supplier (Biolcheva, 2017, p. 126-127). Foreign customers and suppliers, as well as local ones, are among the significant sources of innovative ideas for new projects and technological innovations. However, newly purchased equipment or materials from local manufacturers are seen as sources of innovation rather than newly purchased equipment or materials from foreign manufacturers (Chobanova et al., 2018, p. 172). The focus of the scientific studies does not fully cover the symbiosis between geographical location, sectoral affiliation and innovation potential. If the analysis of the innovation potential is applied to the global value chain the effects of the previously mentioned factors could support the development of new opportunities for the national and regional competitiveness.

## **2. RELATION BETWEEN INNOVATION POTENTIAL OF BULGARIAN FURNITURE MANUFACTURERS TO THE VALUE CHAINS AND GLOBALIZATION**

### **2.1. Data collection and methodology**

In our empirical analysis of the furniture industry, we examine to what extent different types of innovation and learning drivers within the value chain are associated with trust-based and/or control-based modes of governance in supplier-client relationships. We distinguish domains of learning and competitive advantage that have been identified as important in the sector: the transfer of professional knowledge, learning of business culture and practice, IT learning, and more general information exchange. Subsequently, we examine if these associations differ for firms in GVCs compared to firms in LVCs and RVCs. We identified 3980 firms operating in Bulgaria with the subject of activity according to the NCEA-2008 code 31 – Furniture manufacturing. They were identified based on available data from the Bulgarian business register and information gained from a questionnaire survey. Of all those 3980 firms 330 were selected for the representative study. Due to missing information on some variables used in this study or the company has stopped working the number of firms included in the analysis is further reduced to 85 firms. We verified that non-response was not likely to bias findings, as the proportion of respondents was not quite different under firms engaged in the domestic market and firms engaged in international markets. Self-selection bias is unavoidable in this kind of survey, yet being involved in sample results could be assigned to stimuli for active participation, and interpreted in the context of intentions of companies (CEO and managers) to

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be active participants in GVC integration. In this context, it is most likely to be a mark of strong organizational culture and good management practices aligned in this venue. The survey was made based on questionnaires distributed on the spot during the months March-April 2022. Our focal dependent variable is innovation capability in value chains. We identified specific innovation domains that the literature pointed out as critical to capability building in the furniture sector. We tested these domains in a preparatory phase of the study using expert interviews to ensure that the domains were clearly understood, and the terminology widely shared across the actors in the industry.

## 2.2. Results and discussions

A key indicator to measure GVC upgrading potential or capability is the innovation activity of companies in terms of product and process innovation with particular attention to the collaborative innovation projects. Regarding product innovations, out of 85 companies, 80 (94.1%) have developed new products during the last year. Out of them, 66 (83.5%) of the companies have developed new products with their own company resources, and the rest, 13 (16.5%) – are in collaboration with external companies. As for the process innovations, 53 (62.4%) of the companies have introduced new improved production methods and technologies. Out of them, 41 (77.4%) have implemented new process practices with their own resources, and the rest, 12 (22.6%) – are in collaboration with external companies. In the field of sales and marketing innovations, 34% of the companies have developed either new product packages or new sales and distribution practices. Most of the innovations have originated out of customers, traders, and suppliers' requirements (about 56% for product innovations and 51% for process innovations, equally in partnerships and company dimensions). Most of them are related to media/Internet/exhibitions and similar information channels (for product innovations 38% in partnerships and 50% in the company; for process innovations – 41% in partnerships and 51% in the company). The next most important sources for learning and knowledge transfers are customers and suppliers (for product innovations 36% in partnerships and 28% in the company; for process innovations 30% in partnerships and 30% in the company). Innovation drivers related to competitive advantage factors reveal a greater variability both for product and process innovations, both in partnerships and company dimensions. In the partnership dimension, and not surprisingly, the leading part is played by the quality of products (for product innovations 38% in partnerships and 2% in the company; for process innovations – 26% in partnerships and 22% in the company). Next most important are trained labour force, design/ergonomics of products, company image, and competitive price. Included in the analysis is a sample of 63 companies. Assuming that this was a random sample, the following hypotheses can be tested:

*H1: GVC participation of a company is positively related to its size.*

*H2: GVC participation of a company is positively related to its age.*

*H3: GVC participation of a company is positively related to its revenue.*

The null hypothesis, in this case, would be that GVC participation of a company is not related to the size or age or revenue of the company. In addition to the above, it is possible to test for

the interaction effect of age and size on the GVC participation of a company. One of the interaction hypotheses is given below:

*H4:* The size of a company interacts with its age in determining GVC participation such that the effect of size on GVC participation of a company increases with the age of the company. In other words, bigger and older companies have better GVC participation than bigger but newer companies.

When testing for interaction effects, it is advisable to build models such that we enter all the main effects in one model first and then enter interaction effects in another model. Thus, the hierarchy of variables in our example will be to enter the main effects of size and age in Model 1 and enter the interaction effect of size and age in Model 2. The classification table summarizes the results of our prediction about company GVC participation based on the size, age, and revenue of a company. Our model can correctly predict 98.1% of the company's participation in product innovations. Overall, our model predicts 81% of the companies correctly. This gives the percent of cases for which the dependent variable was correctly predicted given the model. In this part of the output, this is the null model (51 out of 63). Values of the coefficients in the logistic regression equation for predicting the dependent variable from the independent variables are in log-odds units. The prediction equation is

$$\log(p/1-p) = -1.858 + 0.006*Size + 0.025*Age + 0.000*Rev,$$

where  $p$  is the probability of being in GVC participation. These estimates show the relationship between the independent variables and the dependent variable, where the dependent variable is on the logit scale. These estimates tell the amount of increase (in our case) in the predicted log odds of the outcome being a case (GVC participation) that would be predicted by a one-unit increase in the predictor, holding all other predictors constant. The Beta coefficients in logistic regression are to be interpreted as follows. Positive Beta coefficients for size and age mean that with increasing size and age of a company, its chances of having a GVC participation improve. In our case, a value of 1.025 for Age indicates that for a one-year increase in the age of the company, the odds of a company having a GVC participation increases by a factor of 1.025. The beta coefficient for the number of employees is 1.006, and indicates that for a unit increase in the Size of the company, the odds of a company having a GVC participation increases by a factor of 1.006. The beta coefficient for operating revenue has a value of 1, indicating no influence on the dependent variable. Beta coefficients are the odds ratios for the predictors. Odds are defined as the ratio of the predicted probability of being a case (GVC participation) to the predicted probability of not being a case. They are the exponentiation of the coefficients. For probabilities greater than 0.5, the logit is positive and the odds greater than one. The overall goodness of model fit is estimated by Cox & Snell Index (0.022) and Nagelkerke Index (0.037). The calculated deviance measure of model fit, expressed in standard notation ( $-2 \log$ -likelihood) is equal to 56.938. The logistic regression model is suited to the properties and error structure of binary outcome data in our study of company GVC participation.

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### 3. CONCLUSIONS

Our study finds that GVC participation is not the only avenue for innovation capability building, as we also observe innovation potential at company and local level. We find that learning and knowledge transfer is significantly enhanced in all value chain configurations if the partners' interactions are on trust. When producers are integrated in GVCs and supply more sophisticated markets, client control becomes more important and can facilitate adherence to international standards, which has been argued to be one of the main channels of GVC interaction. Value chain learning also has important consequences in terms of an increased probability that companies are able to develop new technology and process innovations. Availability of skilled and trained manpower is integral to building professional knowledge and innovation potential. Applied technology, like the adopted ERP, CRM, CAD/CAM, 3D, and product development software, digital applications and platform, are found to affect the quality, cost and associated risks of the delivery of the product and facilitate innovative solutions. These findings contribute new insights to the expanding literature on the importance of (global) value chain involvement for small and medium sized companies from various industry sectors, and suggest a number of policy implications.

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