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SELECTED ASPECTS OF INNOVATION IN THE FURNITURE INDUSTRY – EMPIRICAL RESEARCH FINDINGS

A willingness to innovate and develop innovation potential are the basic conditions for competitiveness on domestic, as well as international, markets. The aim of this paper is to explore the perception of innovation within the furniture industry in Poland. Empirical research was conducted in two stages. In the first, based on the findings of analyses published by the Central Statistical Office, the innovation activity of furniture enterprises was evaluated in comparison with that of all Polish industry. The second stage comprised primary research, the aim of which was to collect opinions from furniture manufacturers on certain aspects of innovation activity. The analysis was conducted in 80 medium-sized and large furniture enterprises. The research tool was an interview questionnaire composed of 31 questions. From the primary research it was found that the greatest influence on an increase in demand for furniture was a price reduction of the product. The most significant factor influencing the decision on the part of entrepreneurs regarding the introduction of innovation was its economic justification. The main factor curbing innovation activity in furniture enterprises was a lack of funds.

Keywords: innovation activity, furniture industry, medium-sized and large furniture enterprises, empirical research

Introduction

Many studies have suggested that innovation has become fundamental for achieving competitive advantage [Cao and Hansen 2006; Pérez-Luño et al. 2007; Szostak and Ratajczak 2009, Smardzewki 2009; Kusumawardhani and McCarthy 2013]. A willingness to innovate and develop innovation potential are the basic conditions for competitiveness on domestic, as well as international, markets [Szostak and Ratajczak 2009]. Therefore, external connections stimulate internal innovation [Drayse 2011].

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The Polish furniture industry has been relatively successful in facing the challenges of increasing competition, which has encouraged it to develop its innovation potential in order to achieve success, irrespective of market differences [Grzegorzewska and Olkowicz 2013]. For this reason, furniture manufacturers in Poland – especially medium-sized and large ones – have improved their business structure and organisation in order to implement new competitive strategies, and to adopt innovation in products, processes and administrative systems. Moreover, the competitiveness of the Polish furniture industry depends on the level of plant technical equipment, the technologies applied, production innovativeness [Smardzewski 2009] and the quality of human resources [Hitka and Sirotiakovà 2011]. Furthermore, manufacturers of wood furniture may, by favouring a more customer-oriented product development and manufacturing, exploit a number of competitive factors in their attempt to achieve success in the marketplace [Pakarinen 1999]. To compete on the global marketplace, furniture firms need to sell high-quality products, offer diverse styles, ensure quick delivery, and provide personalised customer service [Drayse 2011]. Nevertheless, it should be noted that the furniture industry is not only a commodity-type manufacturing sector, but also a fashion-sensitive business [Cao and Hansen 2006].

The furniture industry plays a very important role in the Polish economy and since 1990 has been one of the fastest growing manufacturing industries in Poland. Trade in furniture generates the largest trade surplus of all the industries in Poland, ca. 30 billion PLN in 2014, which signifies that it is the most specialised business of the Polish economy. This industry employs approximately 166 thousand people [Polish Chamber... 2015] and concentrates ca. 24 500 companies actively engaged in economic activities. Approximately 91.2% of the total number of enterprises consists of micro-companies, 6.8% – small, 1.6% – medium-sized and only 0.5% large enterprises [Więckowska 2014]. However, the sold production of the large and medium-sized entities constitutes on average 80% of the total sold production of the furniture industry [Polish Chamber... 2015]. This industry has great potential not only for domestic but also international trade. In the global market, Poland with a 4.5% share of world exports in furniture, is one of the biggest furniture exporters in the world, alongside China, Germany and Italy [Grzegorzewska and Stasiak-Betlejewska 2014; Polish Chamber... 2015]. The Polish furniture branch sells 90% of its production abroad [Grzegorzewska and Stasiak-Betlejewska 2014] and has the highest trade volume of any low-technology manufacturing industry. This is especially surprising considering the rapid globalization of the labour-intensive furniture industry. As a rule, the furniture industry's relatively good situation is due to big export volumes and an exchange rate of zloty to euro and dollar which is periodically favourable for exporters [Smardzewski 2009].

In the wood sector (but also compared to other processing industries), furniture companies are the most modern and most active in the area of

innovation [Szostak and Ratajczak 2009]. Unfortunately, their level of innovativeness is still unsatisfactory [Smardzewski 2009; GUS 2014]. The characteristics of the wood-furniture industry, e.g., that it is less dynamic, involves little technology, its innovations are buyer-driven and it lacks collective support from public and private institutions, might inhibit radical innovation [Kusumawardhani and McCarthy 2013]. The tendency of furniture manufacturers to introduce incremental innovation rather than radical innovation may be related to the subcontracting characteristic of the relationship between actors in the wood-furniture industry. Moreover, the furniture sector is considered a low-technology industry [Drayse 2011; Wziątek-Kubiak 2010; Kusumawardhani and McCarthy 2013], and this may be the reason why this industry is unwilling to invest in technology. However, furniture firms are swift to team up and open to change, which could provide them with opportunities to develop new competitive strengths [Cao and Hansen 2006].

It is worth noting that in the last decade, Poland more than doubled its furniture production values from 4393 million EUR in 2003 to 8323 million EUR in 2012, which accounted for 2% of world furniture production. Similar results in this period were also achieved by Brazil – from 3168 million EUR in 2003 to 7970 million EUR in 2012 (also 2% of world furniture production) [CSIL 2014]. Due to the similar dynamics of the development of the furniture industries in Poland and Brazil, reference was made in this publication, among other things, to research on furniture industry innovativeness carried out in Brazil.

Peter et al. [2013] studied the innovativeness in micro and small Brazilian furniture businesses (the Brazilian production system comprises a large majority of micro and small enterprises and only a few big local players). Their conclusions indicated that the adoption of innovation in product development was the most important aspect of the furniture companies surveyed. It was also found that they sought to adopt innovation with the objective of entering new markets. However, the main barriers to adopting innovation were identified as lack of skilled labor, a shortage and / or a lack of access to technology and financial difficulties.

Literature review

Innovation has a broad array of definitions. The first was published in 1934 by Schumpeter. He emphasised that innovation is the core of entrepreneurship. He was also one of the first scholars to argue that innovation is the fundamental endeavour of entrepreneurial organisations to develop new products or invent new processes [Sundbo 1998; Kurz 2008]. After Schumpeter, numerous innovation studies have been conducted over the century. The literature typically states that innovation embraces investments in R&D and technology [Dosi 1982; Lev 2001; Epstein et al. 2010] new processes, new products, innovation in terms

of marketing and organization, and investment in the training of human resources. Another approach divides innovations into two categories: radical and incremental [Dosi 1982; Freeman 1988]. The first are qualitatively very new and have different elements which change an entire field. The second are small improvements which occur continually through the introduction of smaller new elements. The innovations can also have different characters: technological (e.g. objects), intellectual (consultancy), physical movements which are not technology (e.g. new transport), and behavioural (e.g. new strategy) [Sundbo 1998]. On the other hand, innovativeness also indicates the ability of an individual or organisation to innovate [Röttmer 2011].

Today according to the third edition of the Oslo Manual [OECD, Eurostat 2005], innovation is defined as the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations. This implicitly identifies four types:

1. **Product innovation**: the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, component materials and incorporated software.
2. **Process innovation**: the implementation of a new or significantly improved production or delivery method including significant changes in techniques, equipment and/or software.
3. **Marketing innovation**: the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.
4. **Organisational innovation**: the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations.

Innovative firms can introduce one or more types of innovation, as they are not mutually exclusive. The level of innovation may vary depending on the characteristics of the firm and the performance achieved by the company [Kusumawardhani and McCarthy 2013]. Many new product opportunities come about through a serendipitous synergy between multiple disciplines [Bingham 2003].

Research methodology

The primary aim of the research was to evaluate the determinants of innovation activity in wood industry enterprises. In the first stage, the innovation activity of the companies in question was compared to that of all industry. The reports entitled 'Innovation activities of enterprises' and published annually by the Central Statistical Office (GUS) were the basic research source. According to the Central Statistical Office methodology, the research covered industrial

companies which conduct activities corresponding to the following sections of the Statistical Classification of Economic Activities in the European Community (NACE – PKD): section B (Mining and quarrying - divisions 05-09), section C (Manufacturing – divisions 10-33), section D (Electricity, gas, steam and air conditioning supply – division 35), section E (Water supply, sewerage, waste management and remediation activities – divisions 36-39). The timeframe of the research comprised the years 2010-2014. The analyses cover the percentage of both innovatively active and innovative companies. According to the Central Statistical Office terminology, an innovatively active company is one that, in the period analysed, introduced at least one product or process innovation or realised at that time at least one innovative project which was suspended or abandoned in the period analysed (failed to succeed) or was unfinished at the end of that period (i.e. it was still on-going). However, as regards an innovative enterprise, it should have launched at least one product or process innovation (a new or significantly improved product or a new or significantly improved process) [GUS 2015]. Moreover, from the perspective of the effectiveness of the innovation activity, what is of great importance is its impact on the companies' economic performance. Consequently, the analysis also comprised the share of revenues from new or significantly improved products within the total revenues from sales, as well as the size of the capital outlay made on the activity in this field. Within the second stage, empirical research was conducted, the aim of which was to collect opinions from furniture manufacturers on selected aspects of innovation activity. The research tool was an interview questionnaire composed of 31 questions divided into 4 parts:

I – information on the enterprise,
II – development and innovation of the enterprise,
III – technology for refining wood-based panels
IV – information on the respondent.

The survey research was conducted on 80 medium-sized and large furniture enterprises in the months September and October 2015. It should be emphasised that in the analysed period, 462 companies operating within the furniture market had a level of employment exceeding 49 employees, so the research covered 17% of the population.

Results by issues

From the research conducted by GUS, it was found that in the years 2010-2014 there was an increase from 17.7% do 18.6% in the percentage of industrial companies which were innovatively active (tab. 1).

Similar tendencies were observed as regards innovative subjects, that is those ones which introduced at least one innovation. At the end of the analysed period, the percentage of these companies averaged 17.5%, 1 percentage point higher than four years previously. As regards the furniture industry, the situation

was dissimilar – there was a decrease in the number of innovatively active and innovative enterprises. In the years 2012-2014, the ratios amounted to 14.0% and 13.6%, respectively, 4.6 and 4.8 percentage points lower than the initial values.

Table 1. Selected aspects of innovation activity in the furniture industry as compared to the whole industrial sector in the years 2010-2014

Specification	Furniture industry			Total industry		
	2010/2012	2011/2013	2012/2014	2010/2012	2011/2013	2012/2014
Innovatively active enterprises [%]	18.6	17.7	14.0	17.7	18.4	18.6
Innovative enterprises [%]	18.4	16.3	13.6	16.5	17.1	17.5
Enterprises which introduced new or significantly improved products [%]	11.9	12.1	8.4	11.2	11.0	11.7
Enterprises which introduced new or significantly improved processes [%]	14.3	10.3	10.3	12.4	12.8	12.9
Enterprises which introduced organisational innovations [%]	10.0	7.4	7.4	10.3	8.3	8.4
Enterprises which introduced marketing innovations [%]	13.2	10.2	6.1	10.2	7.5	7.6
Revenues from sales of new or significantly improved products as the share of total revenues from sales [%]	8.1	9.1	9.7	9.2	8.6	8.8
Expenditure on innovation activities [million PLN], incl.:	no data	701.5	751.0	21535.4	20958.9	24621.6
Own funds [million PLN]	no data	485.7	481.9	15868.7	14897.8	17032.2

Source: own study on the basis of GUS reports [2013, 2014, 2015] entitled 'Innovation activity of enterprises in 2010-2012', 'Innovation activity of enterprises in 2011-2013', 'Innovation activity of enterprises in 2012-2014'.

In the analysed period, favourable tendencies were noted in the innovative activity of industrial companies as regards products and processes. This is borne out by a slight increase in the percentage of innovative subjects in these areas. In the years 2012-2014, the ratio amounted to 11.7% and 12.9%, respectively. As regards organisational and marketing innovations, however, there was a fall.

At the end of the analysed period, 8.4% and 7.6%, respectively, of industrial enterprises introduced at least one innovative solution in terms of organisational and marketing innovations. In the furniture industry, unfavourable tendencies were observed in the context of all types of innovations. The greatest fall in innovative enterprises concerned marketing innovations. At the end of the analysed period, the ratio amounted to 6.1%, twice as low as in the years 2010--2012. At that time, in the field of products, every 10th company was innovative, and as regards processes, every 12th enterprise was said to be innovative.

More optimistic findings for the furniture industry derive from the economic evaluation of innovation activity. Despite a significant decrease in the field of innovation, the companies noted an increase in the share of revenues from sales of new or greatly improved products within total sales. In the analysed period, the ratio rose from 8.1% to 9.7%. In industrial enterprises there was a slight decrease to 8.8%.

Another measurement used in the economic evaluation of the innovation activity of enterprises is the financial outlay made on the activity in the area of product and process innovation. In 2014, the size of the outlay made by industrial enterprises equalled more than 24 billion PLN, 14% higher than two years previously. As regards furniture companies, they spent 751.0 million PLN. In addition, from the research it can be seen that between 60 and 70% of the funding for innovation activity came from the companies' own capital. As a rule, the funds were destined for the purchase of machines and technical devices, R&D activities as well as buildings and structures.

In the second stage, empirical research was carried out with the primary aim of ascertaining the determinants of innovation activity according to furniture producers. From the analyses, it was found that the enterprises under analysis had experience on the furniture market: this was exemplified by the fact that half of them had been in operation for at least 10 years, while less than 5% of the companies analysed had been operating in the furniture industry for less than 5 years. Over half of the manufacturers represented the medium-sized companies sector, employing between 50 and 249 personnel, while those remaining belonged to the large-sized companies sector employing over 250 people. It should be emphasised, however, that in the latter group almost 10% of the companies employed over 500 workers. The research also showed that 70% of the companies were operating on the European market, almost 20% were operating on the Polish market and 10% of the companies were global players. Seven out ten producers were funded through domestic capital as regards the structure of ownership, and one company in five was financed by foreign capital. Mixed capital was present in only 10% of the enterprises analysed. The enterprises under analysis were mostly capital companies – 83% of those surveyed provided this answer. Only 20% of the companies were partnerships. Every fourth company was based in a city with a population of between 100 and

500 thousand inhabitants, while one company in five was operating in a place populated by between 50 and 100 thousand inhabitants.

Decisions whether to undertake innovation activity are connected with the expectations of the final buyers. One of the key factors determining the introduction of innovation is the demand for new or significantly improved products. According to the respondents, the greatest influence on an increase in demand for products was firstly a price reduction (fig. 1). This answer was provided by up to 85% of the subjects. The next most important factor was better quality (62.5%). In addition, according to the respondents, the purchasing decision may be influenced by greater durability (58.8%). Half of those surveyed indicated environmentally-friendly materials and technology as a significant factor in an increase in demand. Mass and/ or volume reduction was cited by 48.8% of the respondents, while a unique design was mentioned by 41.3%. The least significant factor proved to be the application of rare and unique materials in the production of furniture. This answer was cited by only 15% of the respondents.

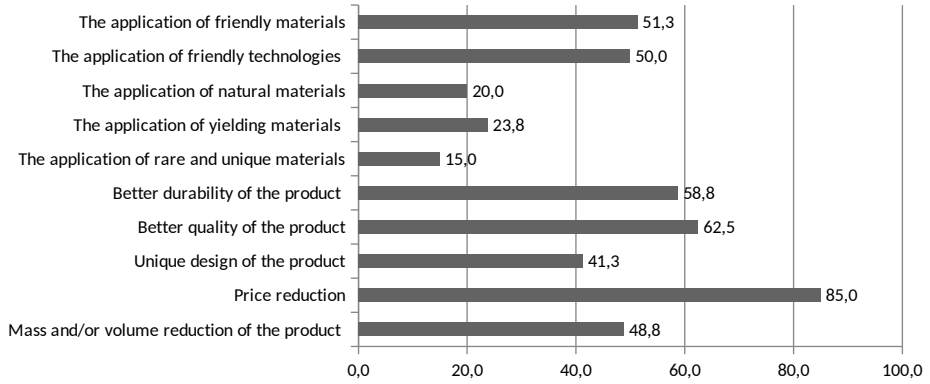

Fig. 1. Determinants of increased demand for company services as indicated by respondents [%]

Of the furniture manufacturers under analysis, 70% confirmed that in the previous few years they had introduced innovative solutions as regards products and processes. A negative answer to the question was given by 30% of respondents. In comparison to the research conducted by GUS, the percentage of innovative furniture companies was significantly greater. Nevertheless, it should be emphasised that only medium-sized and large companies took part in the research survey. Their innovation activity is, as a rule, greater than in small and micro-sized enterprises. Moreover, in the analyses by GUS, the timeframe for the introduction of innovation was five years, not three.

The introduction of innovation is often very time-consuming and devours a vast amount of capital. It also entails a lot of risk. On account of this, a number of industrial manufacturers, including producers of furniture, do not implement

innovation. Nevertheless, if it did not require a significant change or the introduction of new technologies on which the whole production process was based, six out of ten respondents would be interested in the implementation of such innovations. Undoubtedly, the innovation activity of companies is an intentional and justified action. Among the more important purposes of introducing innovation there is an increase in market share and improvement in production efficiency (fig. 2). Such answers to the questions were provided by 35% and 30%, respectively, of those surveyed. It should be noted that a greater market share was the most oft-cited purpose. Other important reasons were financial matters, that is, an increase in profit (18.8%) and the reduction in costs dependent on it (17.5%). Besides techno-production factors, that is a shortening of the technological process (17.5%) and an improvement in products offered (15.0%), other factors cited were the fulfilment of ecological requirements (3.8%) and an increase in company competitiveness (5.0%). The small number respondents who cited an increase in competitiveness is surprising in comparison to the great percentage of respondents who named an increase in market share as the primary goal of undertaking innovation activity.

Fig. 2. The aims of introducing product and process innovation in the enterprises under analysis [%]

According to the respondents, the primary factor curbing innovation activity in the companies under analysis was a lack of funds (fig. 3). This answer was cited in almost 70% of cases. This choice is reflected in the research findings conducted by GUS in 2014. The lack of funding for company innovations from internal and external sources was mentioned by 28.4% and 18.4% of the respondents, respectively. Among other barriers to innovation implementation was the lack of qualified personnel (36.3%). In the GUS research, 10% of the companies under analysis cited this. Furthermore, other factors that curb innovation in furniture companies were insufficient knowledge and lack of experience in the field of implementing innovation e (25.0%). Moreover, 20% of the respondents indicated a reluctance to take risks as innovation activity is

burdened with a great level of uncertainty. 20% the respondents recognized the low level of innovation profitability or deficiencies in a proper machinery park as significant limitations to innovation activity. One respondent in six cited the limited cooperation between science and industry as a reason for less innovation activity. As regards the research by GUS, however, it was found that a lack of partners for cooperation was a significant factor curbing innovation activity. This answer was cited by 12% of the respondents. The following factors were cited as having the least negative influence on innovation activity: little knowledge of patents and standards, as well as little state outlay on research and development. These were mentioned by 5% and 7.5% of the respondents, respectively. This signifies, then, that in the companies analysed these factors did not have a significant influence on limiting innovation activity.

Fig. 3. Factors constraining innovation implementation as cited by respondents[%]

According to half of the respondents, the most significant factor influencing the decision to implement product or process innovation was its economic justification (fig. 4). For a third of those surveyed, the following proved to be essential: the need to follow competitors (33.8%) and access to a machinery park (30.0%) or technology (28.8%). The respondents cited the following, among others, as factors of medium importance: available technology (55.0%) and access to a machinery park (52.5%), as well as greater environmental performance (52.5%).

Some of the respondents decided that issues pertaining to ecology had little meaning for the implementation of innovative solutions. 36.3% of those surveyed were of this opinion. Additionally, for every third individual a change in consumer preferences also had little significance for innovation implementation. This means that according to the respondents the management staff focused their attention more on the internal factors than on the needs of the final purchasers.

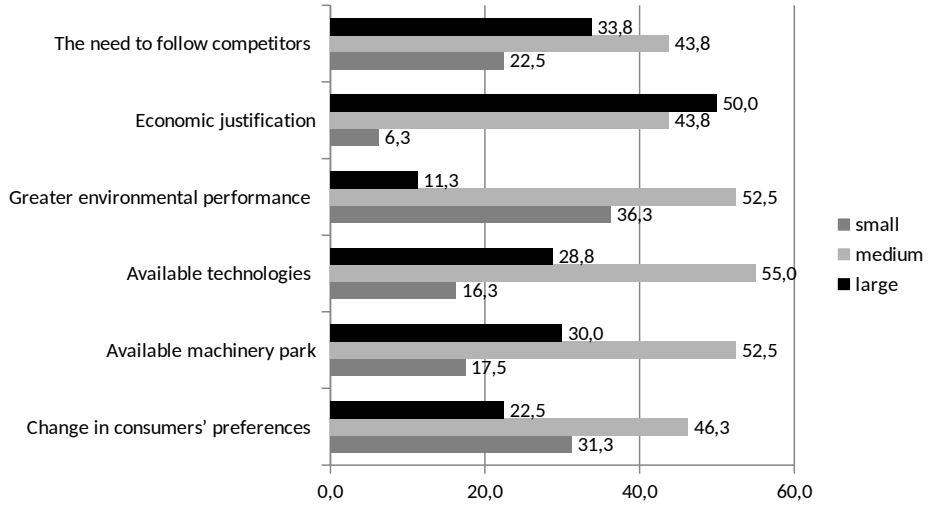

Fig 4. The significance of determinants influencing innovation implementation as cited by respondents [%]

Conclusions

The scale and economic effectiveness of innovation activities are factors influencing the level of a company's competitiveness on the market. These factors are of particular significance for industries with strategic meaning for the Polish economy. One of those industries is the furniture branch. Confirmation of the important role of the Polish furniture industry both at home and on the international market is its trade surplus exceeding 30 billion PLN, and its high position in the world ranking of furniture exporters. On account of this, the following publication deals with the innovation of furniture enterprises.

Empirical research was conducted in two stages. In the first, based on the findings of analyses published by GUS, the innovation activity of furniture enterprises was evaluated as compared to that of all industry. The second stage comprised primary research, the aim of which was to collect opinions from furniture manufacturers on certain aspects of innovation activity. The analysis was conducted in 80 medium-sized and large companies in the furniture industry.

Petter et al. [2013] studied the innovativeness in micro and small Brazilian furniture businesses. Their conclusions indicated that the adoption of innovation in product development was the most important aspect in the companies surveyed. It was also found that they sought to adopt innovation with the objective of entering new markets. However, the main barriers to adopting innovation were identified as a lack of skilled labour, a shortage and / or a lack of access to technology and financial difficulties.

From the research conducted by GUS, it was found that in the years 2010--2014, the percentage of industrial enterprises which were innovatively active rose from 17.7% to 18.6%. As regards the furniture business, there was a decrease in the share of innovatively active and innovative companies. In the years 2012-2014, the ratios amounted to 14.0% and 13.6%, respectively, 4.6 p.p. and 4.8 p.p. lower than their initial values. As regards the type of innovations implemented in industrial enterprises in the years 2010-2014, they remained at a steady level in the case of product innovations (11%), while there was an increase by almost 1 p.p. in the case of process innovations (12.9%). As regards organisational and marketing innovations, there were decreases, from 10.3% to 8.4% and from 10.2% to 7.6%. In the furniture business, unfavourable tendencies were observed in all types of innovations. The greatest decrease pertained to marketing innovations. In the period under analysis, the ratio halved from 13.2% to 6.1%.

From the primary research conducted on 80 medium-sized and large furniture enterprises, it was found that the greatest influence on the increase in demand for furniture was, first of all, a price reduction of the product (85%), better quality (62.5%) and better durability (58.8%). The least significant factor determining demand for furniture was the use of rare and unique materials for furniture production (15%).

It should be noted that the findings of Pettera et al. [2013] research conducted in micro-sized and small companies indicated that the greatest motivator for the introduction of innovation by furniture producers was the opportunity to enter new markets. Only 10% of the medium-sized and large furniture manufacturers under analysis in Poland claimed the same. For these companies, the main aim of introducing innovation proved to be an increase in market share (35%), followed by an improvement in production efficiency (30%). The least significant, however, turned out to be: the fulfilment of ecological requirements (3.8%), as well as an increase in the competitiveness of the company (5.0%). The small number of respondents citing an increase in company competitiveness is surprising in comparison to the considerable percentage of respondents who cited an increase in market share as the primary aim of implementing innovation. This fact may indicate that furniture manufacturers do not associate introducing innovation, which most often entails an increase in market share, with gaining a lasting competitive advantage on a given market. The innovation introduced is to serve the furniture manufacturers more as a means of winning new customers or increasing sales rather than as a way of standing out from competitors and building the brand or becoming market leader. Additionally, referring to the research by Petter et al. [2013], it may be claimed that medium-sized and large furniture enterprises eagerly invest in the markets that they already know. On the one hand, they avoid the risk connected with failure of the enterprise, but on the other hand, they may minimize their chances of expanding their activities. Micro and small-

-sized furniture manufacturers think differently – the implementation of an innovation in order to enter new markets is burdened with risk which is worth taking. The benefits derived from this action outweigh the disadvantages. However, the main barriers to adopting innovation identified by Petter et al. [2013] are a lack of skilled labour, a shortage and/or a lack of access to technology and financial difficulties. The findings of this research coincide with the findings of the research conducted on medium-sized and large furniture companies in Poland. The main factor curbing innovation activity in furniture enterprises was, according to 70% of the respondents and GUS [2014], a lack of funds. The research indicated that the second barrier was a lack of qualified personnel (36.3%), followed by insufficient knowledge and lack of experience (25.0%).

The most significant factor influencing the decision on the part of entrepreneurs to introduce innovation is its economic justification. This factor was cited by half of the companies surveyed. The research findings indicated that the implementation of innovation by furniture companies was dictated more by internal factors than by issues that might prove important from the perspective of the final buyers.

The field of enterprise innovation, which in turn impacts the innovativeness of the economy is a meaningful research issue. In particular it pertains to industries of considerable significance for the economy, including furniture manufacturing. Therefore, further research in the field is recommended.

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