

# Management Activity Linkages to Innovation Deconstruction: An Exploratory Study of the Furniture Industry in Croatia

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Corporate leaders often view innovation as a key contributor to superior profits, market sharing, and competitive positioning. However, confusion regarding the definition of innovation, how to create it, and how to implement it remains. In countries that are recent European Union members, little research has been done on innovation and how innovation is related to corporate management activities. In this study, the linkages were examined in the Croatian furniture industry. The first part of the study was to deconstruct innovation into three components: product innovation, production process innovation, and human resource innovation. The second part of the study evaluates the relationships between these innovation components and four company management activities/factors (research and development investments, company flexibility, export activity, and the Internet usage) were examined. Scale testing resulted in valid deconstruction measures of innovation. Hypothesized correlations between innovation components and company management factors were supported, although the results were not fully consistent with those of previous studies.

*Keywords:* Furniture industry; Innovation deconstruction; Management activities; Croatia

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## INTRODUCTION

Innovation has become the industry's 'religion,' beginning in the late 20<sup>th</sup> century. The rapid development of technology and flow of information have prompted many organizations to create innovation, *i.e.*, actively seeking new methods, ideas, and creative solutions to improve and/or develop new products, production processes, and business activities (Tan and Nasurdin 2011). There is a common misconception that the development of innovation is only possible in high-technology industries; however, innovations in low and/or moderately-low technology industries have been developed, which include the wood product sector industries (Maskell 1996; Mendonca 2009). According to Kirner *et al.* (2009), companies belonging to low-technology industries are able to develop and realize innovation at an equal level as companies belonging to industries with moderate or highly developed technologies.

Historically, research on innovation and innovative activities specific to the wood products industry has not been well reported in the literature (Stendahl and Roos 2008). In recent years, work has been focused on both the wood and forestry sectors (Nybbak *et al.* 2011). For example, exploring corporate growth of companies in the European and North

American wood industry, Korhonen (2006) divides innovative features of the company into two types: (i) the use or creation of incremental innovation, and (ii) research and the creation of radical innovations. These types complement each other, and it is important to emphasize that medium- to low-technology industries represent an extremely important and large part of the manufacturing sector of member countries of the Organization for Economic Cooperation and Development (OECD) (Hansen and Serin 1997; Kaloudis *et al.* 2005). These industries show excellent stability and employ a high proportion of the population (Kaloudis *et al.* 2005).

In addition to its importance for meeting domestic demand, the European wood industry, a medium-sized technology manufacturing sector, is also an important exporter (Maskell 1998). Worldwide, the European Union (EU) is the largest region for furniture consumption and manufacturing; however, in recent years, European manufacturers have been facing competition from developing countries, particularly China (Zhelev 2013; Centre for European Policy Studies 2014; UNECE/FAO 2015). Among the countries that joined the EU after its initial formation, Poland has developed a strong position in the furniture industry after joining the EU in 2004 (Burja and Mărginean 2013). Furthermore, Romania, which joined in 2007, also has a well-positioned furniture sector (Burja and Mărginean 2013). Over the last 10 years, the Bulgarian furniture industry has also improved its competitive position in the world's furniture markets, and it has experienced an overall upward trend in furniture exports (Zhelev 2013).

Since the Croatian War of Independence (after 1995), sales and employment in the Croatian wood furniture sector have steadily declined, primarily attributed to weakening exports. Although 2008 marked the beginning of a recession in the Croatian economy, the nominal revenue in the secondary wood products sector, including furniture, was increasing and a trade imbalance continued to prevail (Jelačić *et al.* 2008; Motik *et al.* 2009). According to Pirc *et al.* (2010), in the year 2000, the Croatian furniture industry production was estimated to be valued at 291 million euros, increasing 77% to about 512 million Euros in 2008, while Pirc Barčić and Motik (2013) estimated a decline of 16% in 2012 at 432 million Euros. Manufacturing of chairs and seats generated around 60% of total furniture production in terms of quantities and around 65% of total furniture export in terms of values in 2011 (Motik *et al.* 2013). In 2012 the share of Croatian furniture consumption in total share of EU furniture consumption was 0.4% (CSIL and CEPS 2014). Additionally, in the period from 2009 to 2013, share of furniture production in Croatian GDP structure, on average, was 0.3% (Statistical Yearbook of the Republic of Croatia 2015). In 2012 the furniture production sector numbered 585 companies, of which 49 accounted for almost 80% of total furniture production sector revenue (Industrial Strategy of the Republic of Croatia 2014). Total investments of furniture industry companies in research and development activities were around 100.000 Euros in 2010. The most important Croatian furniture exporting markets are: Germany, Slovakia, Slovenia, Italy, and Austria. In July of 2013, Croatia became the youngest member of the EU, with furniture production valued at 416 million euros. In 2014, the furniture industry exports accounted for 5% of Croatia's total exports in terms of value (Statistical Yearbook of the Republic of Croatia 2015). Jelačić *et al.* (2008) noted that in 2007, innovation potential of Croatian wood processing and furniture manufacturing enterprises (CWFE) was not on a satisfactory level. Additionally, research showed that managers in CWFE should improve their knowledge in the areas of: collection of innovative ideas, ability to assess innovative ideas, teamwork, innovation culture, continuous education, and innovation efficiency monitoring.

The aims of this study were to deconstruct an innovation model for the Croatian furniture industry into three components: product innovation, production process innovation, and human resource innovation and to present relationships between deconstructed innovation components and respondent's management activity elements (R&D investments, flexibility, exporting, and Internet usage).

## **THEORETICAL BACKGROUND**

### **Innovation**

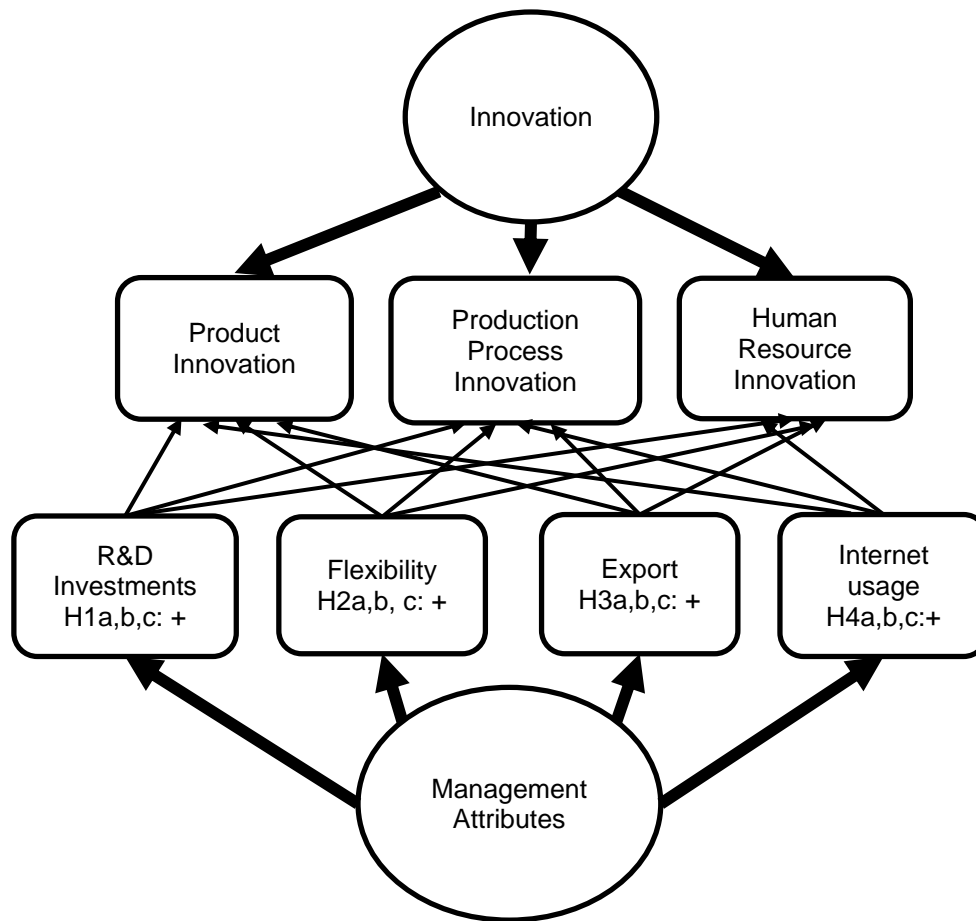
Modern innovation theory began with Josef Schumpeter (1934), who defined innovation as the “infrequent introduction of completely new products/services or creating new combinations of existing products/services” (Kubeczko and Rametsteiner 2002). More recently, the European Commission (EC) (1996) in the *Green Paper on Innovation* (1995) describes innovation as “improving and expanding the scope of products and services; the establishment of new methods of production, supply, and distribution; or the introduction of new changes in management, organization, and working conditions of employees”. However, innovation spans much more than this. Innovation springs from the minds of creative individuals working in an environment that spawns and encourages innovation and where people in many fields contribute to its implementation (Stanleigh 2015).

The two main internal prerequisites for developing an innovative single economic entity are characteristics of the organization itself (research infrastructure, production infrastructure, communication/IT/technology infrastructure, *etc.*) and of its members (competent, educated, skilled workers, *etc.*) (Hadjimanolis 1999). The creative companies, which are characterized by high levels of incentives for innovation by supervisors and management, enable the creation of a dominant position in the sector in which they operate (Crespell *et al.* 2006).

Damanpour (1991) defined that, among other factors, a positive managerial attitude toward flexibility facilitates innovation. Regardless of how innovation is ultimately defined, in its various forms, it has long been a key factor in achieving a competitive advantage (Scarborough and Zimmerer 2002).

### **A Model of Innovation**

Based on Boer and During (2001), the suggested division of innovation was divided further into: product innovation - related to the introduction of new or enhancement of existing products; and process innovation - related to the introduction of new or improving existing activity in the manufacturing process. Additionally, human resource innovation encompasses idea generation (Mumford 2000; McAdam and McClelland 2002) and furthers the implementation of those ideas into new products, and/or new technological processes, and/or new business procedures (Farr and Ford 1990). For many companies, idea generation is tied to rewarding employees if an innovative practice results in an increased profit margin (Tan and Kaufmann 2008). Associating these constructs with previous research conducted by the authors (Pirc Barčić *et al.* 2011), we developed a model and a set of hypotheses that link three deconstructed components of innovation and four corporate management activities (Fig. 1).



**Fig. 1.** Model of hypotheses tested

### Management Attributes

The following management activities regarding company business elements were examined: research and development activities, export, flexibility, and Internet usage.

#### *Research and development (R&D) activities*

The term 'research' is conventionally associated with the creation of new knowledge, while 'development' is achieved through applying knowledge; these two elements of research and development (R&D) use usually intended to lead to the improvement of existing or the development of new products and/or process (Bečić and Dabić 2008).

Chesbrough (2003) suggests that many companies desire innovation but invest very little in internal research and development. Cohen and Levinthal (1990) reported that companies often focus on external sources for R&D, hoping that such a focus will lead to internal innovation. According to Bečić and Dabić (2008), industries with minimal technology often have lower levels of investment in R&D, and development is often based on the application of internal imbedded knowledge.

Regardless of the level of R&D investment, it is important to maintain these investments over time in order to have a better chance of leading to innovation (Mansfield 1984; Berginc *et al.* 2011). Parisi *et al.* (2006) found that companies that developed product

innovation, invested more in R&D than companies that directed their activities towards the development of process innovation.

### *Flexibility*

Flexibility can be defined as the ability to change or adapt to a changing environment (Georgsdottir and Getz 2004). Flexibility is an important and necessary precursor for innovation to occur (Bolwijn and Kumpe 1990; Jaušovec 1994; Chi 1997; Thurston and Runco 1999). Oke (2005, 2013) discusses a mix of company areas where flexibility can have a positive influence on innovation in manufacturing companies, which include product modularity, labour skills, process technology, supply chains, information technology, and labour flexibility. Georgsdottir and Getz (2004) noted that flexibility is an important dimension for organizations because it allows a higher level of innovation, thus reducing vulnerability and increasing opportunities for growth. Georgsdottir and Getz (2004) noted that when company managers favour conservative thinking, regarding flexibility issues within the organization, they stifle creative thinking and restrict idea generation. A positive effect of creative thinking leads to more flexible activities, enhancing innovation (Isen 2002). Malhotra *et al.* (1996) and Tatikonda and Rosenthal (2000) also support the notion that company flexibility can positively influence innovative processes.

### *Export*

Companies that are not focused on international marketing are less likely to be focused on developing innovations, and their degree of innovation may be significantly lower than those companies participating in the exportation of goods (Hirsch and Bijaoui 1985; Cao and Hansen 2006). Basile (2001) supports this concept in a study exploring the relationship between innovation and exporting of the Italian companies. Companies that serve export markets are more likely to focus on production and business processes in order to offer these markets new, improved, and different products and/or services that differ from those offered to domestic markets (Alvarez and Robertson 2004).

### *Internet usage*

A significant number of processes and product innovations have been developed by the practical application of information and communication technologies (Bassellier and Benbasat 2004). The role of the Internet in the development of innovation, particularly in the development of product innovation, is manifold. For example, Internet applications can provide powerful tools to conduct market research, better understand competitor positioning (Teo and Choo 2001), aid in the design and manufacturing process of products (Waurzyniak 2001), and raise awareness among potential customers about a new product (Bickart and Schindler 2001).

Sawhney *et al.* (2005) led a debate about the role of the Internet in the development of innovation, stating that within individual businesses, the systematic use of the Internet and its possibilities is a basis for cooperation, interaction, and communication with customers, which can ultimately result in an improvement of the existing and/or the development of new company products. Ozer (2004) believes that the role of the Internet is positive in relation to successful product innovation.

## OBJECTIVES AND HYPOTHESES

The research objectives were as follows: (i) to deconstruct innovation into three segments: product, process, and human resource; and (ii) to test the hypotheses of innovation relationships to management activity factors (R&D activities, flexibility, exporting, and Internet usage). Based on the previously cited literature, the relationship between the four management activity factors and the three subcomponents of innovation were hypothesized as follows:

H<sub>1a,b,c</sub>: There is a positive relationship between company R&D activities and product innovation, process innovation, and human resource innovation;

H<sub>2a,b,c</sub>: There is a positive relationship between company flexibility and product innovation, process innovation, and human resource innovation;

H<sub>3a,b,c</sub>: There is a positive relationship between company export activity and product innovation, process innovation, and human resource innovation;

H<sub>4a,b,c</sub>: There is a positive relationship between company Internet usage and product innovation, process innovation, and human resource innovation.

## EXPERIMENTAL

### Sample Frame

The sample frame was a census of 409 furniture manufacturing companies in Croatia. The mailing list was taken from the Register of Business Entities online database, supervised by the Croatian Chamber of Commerce. The mailing list included companies that, according to their core business activities, were classified in the field *C 31 – Furniture manufacturing*, based on the *National Classification of Activities* (NCA 2007). All survey recipients were identified by the official name of the company, title (owner or president), and company address. A mailed survey, based on methods recommended by Dillman (2000), was the approach used in this study. This approach was selected because it was deemed the most cost-effective for surveying (Dillman 2000) and also ensures data collection over a wide geographic area and a low-cost data conversion (Zahs and Baker 2007).

### Questionnaire Design

Based on the research objectives, a questionnaire was developed. The first part consisted of questions to gather basic companies' general profiles and employee's structure. The second part asked questions about companies' operations, while the third part asked questions regarding markets and marketing.

The basic constructs (company management factors and innovation) were measured with multiple-item Likert scales based on Churchill's (1979) observations that no single item is likely to provide a perfect representation of the general idea. The item scales were reported on a scale of 1 (strongly disagree) to 5 (strongly agree) or 1 (very unimportant) to 5 (very important). In addition, other, non-construct questions were multi-choice measures; according to Thorndike (1967) (cited by Lewis-Beck *et al.* 2004), they can be superior to a single, straightforward question. Finally, binomial, Yes/No questions

were used. The questionnaire was developed to solicit information from respondent companies, including general profiles, employees' profiles, operations, markets, and marketing. The framework for the questionnaire design was based on the OECD (2005) *Oslo Manual* and Eurostat (2006) *Community Innovation Statistics*.

### **Sampling and Data Collection**

A draft version of the questionnaire was pre-tested with ten randomly selected companies from the list. Based on the pre-testing responses, comments, and suggestions, the questionnaire was revised and a final survey was developed. Following Dillman's (2000) *Total Design Method*, pre-notification postcards, notifying companies of the study and requesting their cooperation, were sent. One week later, packets containing a questionnaire, cover letter explaining the importance of the research study, and self-addressed postage-paid return envelope, were sent to the company. The following week, reminder postcards were sent. Finally, four weeks later, a second mailing was sent to all companies that had not previously responded. The survey process ended in the summer of 2010.

### **Response Rate**

Of the 409 surveys mailed, 99 were undeliverable and/or unusable. The unusable surveys were those companies who were no longer in the furniture business and/or companies that were not interested into survey participation, and/or companies in which their main business activities were not in the furniture manufacturing business. The total number of usable surveys received was 77, with an adjusted response rate of 24.2%. The adjusted response rate was calculated using the following equation:

$$\text{Adjusted response rate} = \frac{\text{Usable surveys}}{\text{Total sample} - (\text{Undeliverable} + \text{Unusable})} \times 100\% \quad (1)$$

### **Data Analysis**

Using statistical software, STATISTICA 12 for MS Windows software (Dell Inc., Tulsa, USA, 2015), principal components analysis (PCA) (exploratory) and factor analysis with orthogonal varimax rotation were conducted to reduce the survey items into innovation constructs or factors (also called latent variables). The objective of a principal component factor analysis is to account for as much variance as possible in the data (Kim and Mueller 1978). The latent root criterion, following Keiser's rule (eigenvalue  $\geq 1$ ) (Tinsley and Tinsley 1987; Floyd and Widaman 1995; Abdi and Williams 2010; Minimol and Makesh 2014), was used in extracting factors. Orthogonal varimax rotation was used to disperse the factor loadings to achieve a more interpretable solution (Field 2000; Abdi and Williams 2010). An iterative process resulted in the reduction of 12 items to 11 items, with significant factor loadings that were in turn segmented into three factors/dimensions.

### **Non-Response Bias**

In survey research, the non-response bias is often a common concern because the respondents might be systematically different from those who did not respond. An extremely high response rate could limit this concern, and bias may still exist even with a high response rate (Nybakk and Jenssen 2012). Non-response is a problem in any survey because it raises the question of whether those who did respond are different in some important way from those who did not respond (Dillman 2000). Non-response bias can be evaluated by comparing those who responded to the initial mailing with those who

responded because of subsequent mailings. This practice assumes that there is a continuum from early respondents to late respondents, and the late respondent can be used as a proxy for non-respondents (Armstrong and Overton 1977; Lahaut *et al.* 2003). Accordingly, second-mailing respondents, as a proxy for non-respondents, were compared with first-mailing respondents for 131 questions in the survey instrument. Categorical variables were analysed using chi-square test of independence, while two-tailed *t*-tests for independent samples were employed, and Levene's test was performed to test for equal variances between respondent groups regarding numerical variables. In the one variable analysis, where the significance value of the Leven's test was significant ( $P < 0.05$ ), the *t*-test assumed an unequal variance ( $t = 2.32$ ;  $P = 0.023$ ). In addition, non-response bias was not a major factor in the study, with no significant differences found between the first and second mailing respondents.

However, we must point out that, with respect to the year in which the company was established (years in business), there were significant differences found between the 318 non-respondent companies (data provided by the list provider) and 77 respondent companies (combined from both mailings). The mean year in which companies were established for respondents was 1996 (the mean number of years in business was 14 years), and the mean year in which companies were established for non-respondents was 1988 (the mean number of years in business was 22 years). According to Ramani (2002), companies that are more active in biotechnology research are likely to be younger, which is possibly the reason why respondents in this research area were characterized as young businesses. Additionally, although this was the lone significant difference, no significant difference was found between relatively young versus old companies for any of three suggested types of innovation, development, and adoption.

### **Limitations**

A major limitation of this study is that it examines one country at a specific point in time. However, a similar study deconstructing innovation in the U.S furniture manufacturing industry resulted in similar findings (Pirc Barčić *et al.* 2011). An additional limitation deals with the respondent interpretation of the survey questionnaire instrument and of management activities. Specifically, qualities of management activates were self-reported from company managers and other employees. Nybakk and Jensen (2012) and Patterson *et al.* (2004) noted that some studies have shown that managers (many of the key respondents in this study) view their working climate as more innovative than do other employees.

## **RESULTS AND DISCUSSION**

### **Firm Characteristics**

According to results conducted in this research a little over half of respondents (51 percent) noted that their company headquarters were located in the larger urban areas (population up to 50,000 people) of the Northwest of Croatia. Thirty four percent of companies were located in Zagreb, the capital city of Croatia. The oldest respondent company was established in 1927, while the youngest one was established in 2008. Over all respondents, the mean of the years in business was 17. With regards to corporate ownership, 96 percent of respondent companies were Croatian owned. In addition, all respondents were representatives of privately owned enterprises.



About half of responding companies (57 percent) were employing up to 10 people, 20 percent of respondents were employing between 11 and 50 people, with the remaining employing between 51 and 250 people (17%), and more than 250 people (6%). The demographic structure for all respondents, was as follows: 80 percent of total employees were men and 20 percent were women; 56 percent, on average, aged up to 40 years old and 70 percent of employees, on average, had some high school education level. Additionally, on average for all respondents, 47 percent of company permanent employees were between 41 and 60 years old; 22 percent of employees, on average, received some college degree, while only 2 percent of respondent employees completed an advanced degree (Master's and/or Ph.D.)

### **Firm Markets and Marketing**

Sixty one percent of respondents reported that their company total gross sales were up to 650 million euros or less in 2010. Additionally, regarding the export activity, 60 percent of respondent companies were not exporters. Only 9 percent of respondents, on average, indicated that 5 percent or less of their company annual total gross sales was achieved on international markets in 2010.

Companies reported a wide product range, on average, dominated by 69 percent of bedrooms furniture manufacturing and 64 percent by office furniture manufacturing (multiple response was possible). Apart from bedrooms and office furniture manufacturing, companies reported being involved in children's/nursery room furniture manufacturing (58 percent), dining rooms manufacturing (58 percent) and hall furniture manufacturing (53 percent). Other important activities making up, on average, 62 percent of respondents' business included equipping facilities.

Manufacturing activities within about three quarters (78 percent) of respondent companies were based on the 'one of a kind' type of production. Additionally, seventy percent of respondents reported being involved in all stages of products manufacturing. Among large capital item manufacturing machines (*e.g.* non-handed power tools), companies noted that 71 percent were machines up to ten years old used in manufacturing process. Over all respondents, 43 percent of companies owned Computer Numerical Control (CNC) machines.

Over all respondents the average intensity of total revenue in research and development activities was as follows: 5 percent in 2008; 6 percent in 2009, and 6 percent in 2010. As the furniture industry by the intensity of R&D investments belongs to low-technology industries in which the upper limit of R&D investments on annual basis doesn't exceed 3 percent (OECD 2005) or 2.5 percent (Som and Kirner 2015) of the total revenue, the results regarding the intensity of total revenue in R&D activities in this study should be seen on a limited basis.

### **Innovation Deconstruction**

Significant factor loadings that were segmented into three factors/dimensions explained 70.35% of the variance in the model, which, according to Field's approach (2000), is considered to be reasonable. The minimum number of items in each innovation factors was three, which according to Costello and Osborne (2005), presents one of requirements for 'clean' factor structure. The cut-off point for interpretation of the loadings following Hair *et al.* (1998) guideline was + 0.55 (Table 1).

**Table 1.** Factor Analysis - Construct and Items of Product, Process, and Human Resource Innovation

	Factors		
	Product Innovation	Production Process innovation	Human Resources innovation
Computer capabilities of employees	0.248	0.484	0.468
Knowledgeable sales people	<b>0.551</b>	0.104	0.109
Encouraging employees for suggesting technology improvements	<b>0.828</b>	0.104	0.109
Rewarding employees for implementing technology improvements	<b>0.887</b>	-0.058	0.219
Encouraging employees for suggesting organizational improvements	<b>0.916</b>	0.176	0.031
Rewarding employees for implementing organizational improvements	<b>0.905</b>	0.067	0.076
Unique products not found elsewhere in the market	0.036	-0.048	<b>0.902</b>
Cutting-edge designs	0.324	0.379	<b>0.622</b>
Award winning designs	0.359	0.169	<b>0.555</b>
Production software has improved over past 3 years	0.104	<b>0.897</b>	0.077
Information technology has improved over past 3 years	0.007	<b>0.836</b>	0.113
Production equipment has improved over past 3 years	0.108	<b>0.852</b>	-0.037

Bold values indicate significant factors; extraction method: principal component analysis; rotation method: Varimax with Kaiser normalization

Additionally, scale testing was conducted with resulting Cronbach's alpha values for the multi-item variables. Cronbach's alpha (Cronbach 1951) is a measure of internal consistency, that is, how closely related a set of items is as a group. Cronbach's alpha is a coefficient of reliability (Davicik 2014); it's not a statistical test. As seen in Table 2, for process (production) innovation and human resource innovation, Cronbach's alphas were 0.82 and 0.91, respectively, whereas Cronbach's alpha for product innovation was 0.66. Cronbach's alpha values between 0.6 and 0.7 are considered to represent a lower limit for acceptability (Nybakk and Jensen 2012); however, Nunnally (1967) (cited by Cortina 1993) suggests that lower values may be acceptable. Table 2 also includes homogeneity (average inter-item corr.) analysis of observed items.

**Table 2.** Scale Reliability (Cronbach's Alpha) and Homogeneity (Average Inter-Item Corr.) for the Analysis of Product, Process, and Human Resource Innovations <sup>a</sup>

	Innovation		
	Product	Production process	Human resource
Cronbach's alpha	0.66	0.82	0.91
Average Inter-item correlation	0.41	0.53	0.66
<i>n</i>	77	77	77
No. of items	3	3	5
mean	3.6	3.7	3.8
Standard deviation	0.9	0.9	0.9

Scale of agreement: 1 (strongly disagree) to 5 (strongly agree) or 1 (very unimportant) to 5 (very important) anchored on importance to company success

A discriminant validity test and the correlations among the constructs: product innovation, process production innovation, and human resource innovation, are presented in Table 3.

**Table 3.** Correlation Matrix for the Constructs (n=77)

	Mean	Std. dev.	Correlation			DV*	
			PI	PPI	HRI	PI	PPI
Product Innovation (PI)	3.6	0.9	1				
Process (Production) Innovation (PPI)	3.7	0.9	0.27*	1		+	
Human Resource Innovation (HRI)	3.8	0.9	0.47*	0.21	1	+	/

\*Discriminant validity (DV): + (variable passed the discriminant validity ( $p=0.017$ ,  $p=0.000$ ); / (variable didn't passed the discriminant validity ( $p=0.076$ ))

Two of three variables, product innovation and human resource innovation, passed the discriminant validity test, meaning that the constructs were clearly different from each other at the  $\alpha = 0.05$  significance level (Campbell and Fiske 1959) (cited by Fornell and Larcker 1981). On the other hand, the construct, process (production) innovation, did not pass the discriminant validity test at the  $\alpha = 0.05$  significance level ( $P = 0.076$ ); however, according to Burdette and Gehan (1970) (cited by Royall 1997), statistical significance at this level (0.10) is acceptable for inclusion in the model.

### Testing the Model

As shown in Table 4, of the twelve hypotheses tested, eight were directionally as hypothesized and statistically significant. Two hypotheses for directionally were hypothesized, but they were not found to be statistically significant: export activity and production processes innovation ( $r = 0.078$ ); Internet usage and product innovation ( $r = 0.046$ ). Findings regarding Internet usage and innovation relationship in one part support Kaufman *et al.* (2003) who did not support the view that only companies in specific sectors like high-technology sectors were able to benefit from the Internet using in their innovation process than mature manufacturing industry companies.

Additionally, two hypotheses were not as hypothesized and not statistically significant: export activity and product innovation ( $r = -0.183$ ) and export activity and human resource innovation ( $r = -0.095$ ). This result did not support Baldwin and Gu's (2009) findings conducted in the Canadian manufacturing industry noting that the presence to foreign markets to a company encourages innovation and has a positive effect on innovation development.

One possible reason for the negative correlation could be that the export-oriented companies were more intensely directing their business activities towards the satisfaction of the customer, in terms of the product quantity versus the required quality (which are necessary to participate in export markets), while managerial activities are less focused on the adoption and/or development of product innovation. Furthermore, Croatian furniture manufacturers that are involved in exportation, manufacture according to the customer's pre-defined technical specifications. In addition, exporting-oriented companies will employ persons who have experience working in foreign markets, where activities focusing on human resources innovation are less prevalent.

**Table 4.** Pearson's Correlation Coefficients for the Relationships between Management Activities and Innovation Constructs (n=77)

		Innovation		
		Product	Production process	Human resource
H <sub>1a,b,c</sub>	R&D investments	+	+	+
	Pearson correlation (r)	0.366	0.608	0.332
	P-value	0.009*	0.000**	0.018*
H <sub>2a,b,c</sub>	Flexibility	+	+	+
	Pearson correlation (r)	0.428	0.250	0.459
	P-value	0.000**	0.032*	0.000**
H <sub>3a,b,c</sub>	Export activity	-	+	-
	Pearson correlation (r)	-0.183	0.078	-0.095
	P-value	0.110	0.50	0.413
	Internet usage	+	+	+
H <sub>4a,b,c</sub>	Pearson correlation (r)	0.046	0.316	0.244
	P-value	0.689	0.005*	0.032*

\*Statistically significant at  $\alpha < 0.05$ ; \*\* Statistically significant at  $\alpha < 0.000$

+: Directionally as hypothesized; -: Not directionally as hypothesized

This study was undertaken to gain a better understanding of the importance of management activities in furniture industry companies in Croatia. For instance, Pirc and Vlosky (2010) showed that applying innovation are becoming more and more important activities in Croatian furniture companies. Pirc *et al.* (2014) revealed that, along with small traditional companies, innovative companies in Croatian furniture industry exist, but due to excessive market opportunities and possibilities, managers, directors, and executive staff still do not recognize which way will take them to one step ahead of the competition. However, none of this studies engaged management activities that may help furniture industry companies in developing and/or improving production, production process and human resource innovation.

## CONCLUSIONS AND IMPLICATIONS

### Implications

In this study an innovation model in the Croatian furniture industry was deconstructed into three components: product innovation, production process innovation, and human resource innovation. The deconstructed model was tested for correlations between these sub-constructs and four company management activities/factors (R&D investments, company flexibility, export activity, and Internet usage). Most of the hypothesized correlations with company management activities were supported:

- R&D investments correlated the most to production process innovation elements;
- Flexibility in the terms of ability to openness and support to continuous improvements had a positive effect on production process and human resource innovation elements;
- Furniture industry companies were able to benefit from using the Internet in their production process innovation and human resource innovation.

Study results suggest that relationships between deconstructed innovation elements and business practices may help furniture manufacturing companies to better understand the importance of management activities in developing and/or improving production, production process, and human resource innovations.

Although, in 2014, the furniture industry sector has been listed as one of the drivers of Croatian national industry development, considerable progress in this sector has not yet started. Innovation goes beyond technology and requires collaboration from many areas to achieve success. Ultimately, the authors hope that results from this study would encourage considerable government support for the furniture sector companies and wood sector in Croatia. Additionally, according to the European Commission (2011), a key European Union (EU) priority is to generate regional innovation, innovation performance, and innovativeness that will directly contribute to the Europe 2020 strategy. However, in some EU regions, especially in new member countries, the design and development of innovation measures is still a relatively novel concept. Because the study was conducted in Croatia, we suggest that furniture sectors in other new EU member countries may also benefit from aligning overall management activities to innovation.

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Article submitted: November 16, 2015; Peer review completed: February 13, 2016;  
Revised version received and accepted: February 29, 2016; Published: March 17, 2016.  
DOI: 10.15376/biores.11.2.3987-4005