WoodEMA, i.a. - International Association for Economics and Management in Wood Processing and Furniture Manufacturing

POSITION AND ROLE OF THE FOREST BASED SECTOR IN THE GREEN ECONOMY

2014

International Association for Economics and Management in Wood Processing and Furniture Manufacturing

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Proceedings of Scientific Papers

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Stanisław Borkowski	**Denis Jelačić**	**Hubert Paluš**
Yvonne Brodrechtová	**Matej Jošt**	**Ján Parobek**
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Edition: 110 copies

CONTENTS

PREFACE

This Proceedings of Scientific Papers is a collection of papers introducing recent research results of their authors. The title "POSITION AND ROLE OF THE FOREST BASED SECTOR IN THE GREEN ECONOMY" covers a broad range of areas in which the international experts and scientists can exchange and transfer knowledge as well as to discuss the issues regarding the present position, role, conditions, opportunities and new challenges of the forest based sector in the context of green economy. A particular attention is paid to the aspects concerning sustainable forest management, legislative and legal aspects of timber production and trade, woody biomass utilisation, "green" drivers influencing forest and wood products markets, innovations in forestry and wood processing industry, production organization and modelling, responsible purchasing, social responsibility, production of eco-friendly products, competitiveness of the sector e.c.t.

We believe that the thematic scope and scientific content of the scientific papers will inspire scientists as well as professionals dealing with these particular issues and help to initiate implementation of new ideas and knowledge.

Editors

MODELLING OF DECISION MAKING PROCESSES
BY THE METHOD OF PETRI-NETS

Patrik Aláč, Vojtech Demoč

ABSTRACT

Decision making methods and models are necessary for the optimization of logistics performances. Analyses of value chain should be focused on specification of so called bottle necks which mention those activities that disable to increase business margin. At the same time, these analyses show the inefficiency caused by oversized of some activities regarding to lower level of assurance and lower performance of other business activities.

Importance of multicriterion decion-making methods for evaluation of alternatives doesn´t lie in definite increasing of results objectivity although it should lead to that. It allows managers to arrange alternatives according to extensive file of criterions, it describes particular steps of solution and its logical sequence, this methodology also requires from managers to express their understanding of various criterions importance.

Key words: decision-making, Petri Nets, logistics, supply chain.

1 DYNAMIC MONITORING OF PRODUCTION PROCESSES

Complexity, extensiveness and variability of contemporary technical, social respectively combined objects requires application of such a methods that allow explicitly and objectively to handel, to project and further to manage those features which characterise synthesis of functional parts into one unit.

Requirements on systemic model can be gathered into the following items. So, for the systemic model it is necessary [5, 10]:

− to reflect systemic features of an object, so it means to take into account all parts, events and processes of an object which share on the generation of these features
− to simplify primary complexity of an objectin order to be technically managed
− to unify model heterogeneity of particular parts of an object and by that to allow application of formalised tools
− that the form of a model could allow quantification and metrics of monitored parameters.

Systemic features are universal features of the objects from real life. This term contains the following features of the objects:

− interaction the parts of a unit among themselves
− interaction of the object with an environment
− dynamics and goal focus of the object behaviour
− adaptability of the object on environmental changes and inside the particular object
− ability to save and to utilise experiences .

In order to detailed investigation of features result from system dynamics, there is established term "status" of a system or "dynamics". It is mentioned as the goal oriented behaviour represented by the sequence of statuses by which the development of a system comes through.

A choice of the process is managed by input setting and by internal assumptions. Petri Nets (PN) are suitable tools which can be characterised by the following [10, 11]:

net is created by two kinds of peaks:

− traditional set of peaks which describes status parameters – it means elements (situations) of a system
− untraditional set of peaks which describes transitions between various statuses of two near-by elements, respectively it causes the change of a status in the following element caused by the impact in the previous element.

transition (element from the non-standard set of elements) differs from situations. It is not associated as a one element feature but it is independent element like virtual item which initiates situation. It is also presentation of dynamic feature of a connection within the system structure. Transition is real holder of the element ability to change its status.

Report of the system structure is completed by modification of incident function [10]:

• connections which describe relation from the element to the transition – "transition" incident functions
• connections in oposite direction, it means coming from element back to transition (to that which caused the change of given element) – "feedback" incident functions.

On the base of the above mentioned process, Petri Nets can be described:

$$PN = \{P, T, F, B, M_o\} \qquad P \cap T = 0 \qquad (1)$$

where: P, T   - related sets of elements and transitions
       F, B   - incident transition and feedback functions
      M_o - initial system line-up

Implementation of transition and feedback incident functions allow to divide investigation of how elements are prepared for the realisation of transitions (matrix F) or how elements are prepared to accept incidents of transitions (matrix B). Both matrixes can be joined into one matrix E.

$$E \subseteq (PxT) \cup (TxP) \qquad (2)$$

Logistics systems in woodprocessing manufacturing are dynamic, with permanent adaptation to turbulent market environment and they integrate all functions of material management, starting with assessment of material and resources demands and ending with selling of final products [10, 11].

2 SUPPLY CHAIN MODEL ON THE DIVISION OF WOOD RAW MANUFACTURING

We had decided to solve supply chain by the model of Petri Nets. This tool is suitable because it perfectly expresses decision situations, describes the whole material flow and because of parametrisation and quantification of criterions expressed by transitions and elements (situations). We could use also other appropriate methods as CPM, PERT, Gantt chart and histogram for the capacity optimization. These methods could be used for the planning, co-ordination and time spending description of particular processes.

$P = \{P_1, P_2, P_3, P_4, P_5\}$ P_4 - timber warehouse

$T = \{t_1, t_2\}$ P_3 -saw

                   P_2 - manipulation and debarking

                   P_1 - warehouse of logs

                   P_5 - supplier of logs
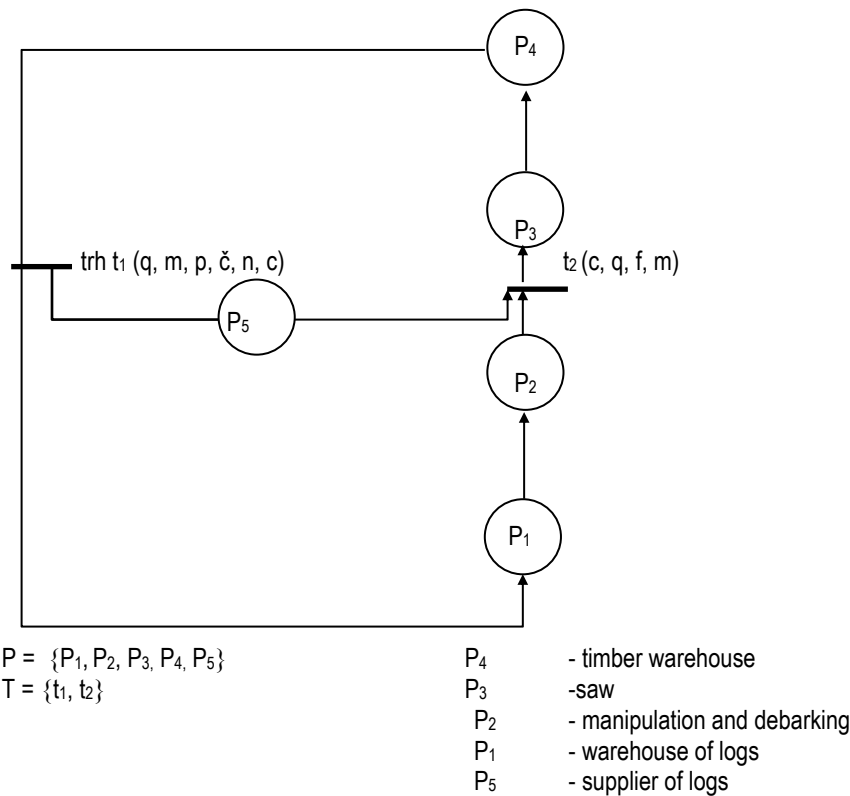
Figure 1. Model of logistics (supply) chain within the division of timber production [1]

<u>Knot P1, place – warehouse of logs</u>

The first knot of the chain is warehouse of logs. There is no decision making process here. We can see that there is no transition "t" before this knot. Inputs must be bought in the market from external supplier. Of course, it is necessary to make choice among suppliers what has further impact on the quality of production and final product, but this decision making is not under competence of "place"- warehouse of logs. Selection of suppliers is the business of Logistics and Sales department which find, monitor and select the most suitable suppliers for all departments. Is is necessary to assess some specific demanded parameters on inputs (wood raw or logs) in order to monitor and evaluate this process of warehousing.

Table 1. Criterions for the monitoring of knot "Warehouse of logs" [1]

Criterion	Agree	Disagree
Volume	over X m³	below X m³
Time of order	X days	less or more than X days
Safety stock	X m³	below X m³
Qualitative requirements	given by the standard	other than in standard
Inventory costs	over X Eur	over X Eur

<u>Knot P2, place – manipulation and debarking</u>

Every log which is moved to saw mill has to go through this place. Again, it must be assessed parameters of the process in order to monitor it, to evaluate it and to control it. Proposal is given in the following Table 2.

Table 2. Criterions for the monitoring of manipulation and debarking process [1]

Criterion	Agree	Disagree
Diameter ø	between X-Y cm	Out of interval X-Y cm
Time of the process	X min	X min
Length of a log	between X-Y m	Out of interval X-Y m
Costs	below X Eur	Over X Eur

Knot P3, place – saw mill

Before the entry of logs into saw mill, it is a transition „t_2 " where it is necessary to decide about the choice of logs. It is possible to take them from own capacity after the flow through the previous two operations or to buy debarked logs from external supplier. This choice depends on the meeting particular technological and economic criterions.

Table 3. Decision making matrix of the transition „t_2 " - Saw mill [1]

Criterion	Weight (importance) (v)	Own supply	External supply
Price (c)	0,30	X €, respectively given as a lower or higher than from external supplier	X €, respectively given as a lower or higher than from internal supplier
Quality (q)	0,30	Standard	Standard
Flexibility of a supply (f)	0,25	Over or below X days, hours	Over or below X days, hours
Volume (m)	0,15	Over or below X m³	Over or below X m³

Table 4. Final decision matrix for the transition "Saw mill" [1]

Criterion	Weight (importance) (v)	Own supply	External supply
Price	0,30	X points	Y points
Quality	0,30	X points	Y points
Flexibility of a supply	0,25	X points	Y points
Volume	0,15	X points	Y points
Total utility		**∑ X.v**	**∑ Y.v**

Table 5. Decision matrix of transition "Saw mill" for the choice between external suppliers [1]

Criterion	Weight (importance) (v)	External supplier No.1	External supplier No.2
Price	0,30	X €, respectively given as a lower or higher than from external supplier No.2	X €, respectively given as a lower or higher than from external supplier No.1
Quality	0,30	given by the standard	given by the standard
Flexibility of a supply	0,25	Over or below X days, hours	Over or below X days, hours
Volume	0,15	Over or below X m³	Over or below X m³

Table 6. Final decision matrix of transition "Saw mill" for the choice between external suppliers [1]

Criterion	Weight (importance) (v)	External supplier No.1	External supplier No.2
Price	0,30	X points	Y points
Quality	0,30	X points	Y points
flexibility of a supply	0,25	X points	Y points
Volume	0,15	X points	Y points
Total utility		**∑ X.v**	**∑ Y.v**

The most important operation within the timber manufacturing is operation of cutting. It is very important to deal with the selection, evaluation and monitoring of criterions which have impact the quality of this process. It should be necessary to monitor not only yield of the cutting and quality of a timber, but it is necessary to focus on costs and time of given process because these parameters highly affect satisfaction of a customer.

Table 7. Criterions for the monitoring of cutting process [1]

Criterion	Agree	Disagree
Yield	X %	less than X %
Time of the process	X mins	more than X mins
Timber quality	given by the standard	deviation from the standard
Costs of the process	Less than X Eur	More than X Eur

Knot P4, place – timber warehouse

The last knot in the logistics chain is timber warehouse. Company uses own warehouses with sufficient free space compared to production capacity. All products are made only for concrete order. So, the warehousing is used only for for the drying according to particular timber utilisation or customer´s demand. Every product must meet particular qualitative parameters given by the standard and these should be monitored and controled aslo in the final products warehouse.   Except of qualitative parameters it should be suggested also others like it is given in the following Table 8. Because of the simplyfication of the timber selection system we had used only 3 qualitative classes. Of course, this simplyfication did not impact presented results.

Table 8. Criterions for the monitoring of knot "Timber warehouse" and transition t_1 "market" [1]

Criterion	Class 1	Class 2	Class 3
quality (q)	given by the standard	given by the standard	given by the standard
Produced volume (per 1 day, per 1 shift, per 1 order) (m)	m³	m³	m³
% from the total volume (per 1 day, per 1 shift, per 1 order) (p)	X %	X %	X %
Average production time (including idle times) for the 1 m³ (č)	X hrs		
Average production time (without idle times) for the 1 m³	X hrs		
Costs (c)	X Eur / Y Eur	X Eur / Y Eur	X Eur / Y Eur

CONCLUSION

Proposed model of logistics chain is the complex of application the various methods. We had used method of decision tree, utility analysis method together with pair comparison and Petri Nets. Proposed model could be suitable tool for the supply chain managment. Management can be described as a sequence of decisions which are made on the base of information about managed system. There are important quality and objectivity of reached information which should support decision-making process. So, the question is not whether to decide or not but how to decide and which criterions are important. An important part of decision making process is methodology and evaluation of information.

Traditional procedure of decision making process was solved only intuitive and on the base of experiences and professional feeling for given situation. But at the same time we can say that intuitive decision making shoul also lead to very good results but this decision doesn´t take into account feedback from qualitative part of decisions. When it occurs a problem it is very hard to choose a particular step where the problem occured and what did it occur. Intuitive decision making is more subjective and above mentioned methods should decrease this subjectivity. One of the most important assumption for managers in his/her managerial work is to quantify results and to think in alternatives. All these above mentioned methods are helpful for quantification and also for alternative thinking of managers They should also increase objectivity of decision-making in order to decrease wrong, intutive and only forecasted results.

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Authors' address

Ing. Patrik Aláč, PhD., e-mail: alac@tuzvo.sk
Ing. Vojtech Democ, CSc., e-mail: democ@tuzvo.sk
Technical University, Faculty of Wood Sciences and Technology
Masaryka 24
960 53 Zvolen
Slovak Republic

INNOVATION PROFILES OF CROATIAN FURNITURE INDUSTRY COMPANIES

Andreja Pirc Barčić, Darko Motik, Maja Moro, Kristinka Liker

ABSTRACT

To be successful, a paramount task of a firm is to determine the perceptions, needs and wants of the market in order to create products with superior value. Firms should constantly scan the horizon for new opportunities to satisfy their customers, and be capable of innovating to provide solutions to changing market needs. In many business sectors today, innovation has become very important tool for firm competitiveness and long-term firm success will depend on firms' abilities to be innovative. Nowadays, when globalization occur new possibilities of technological and business development, Croatian wood industry indicates the needs for changes in the form of application new technologies, new products and new business activities. The aim of this paper is to define profiles of Croatian furniture industry companies regarding innovations.

Key words: furniture industry, innovations, companies, Croatia.

1 INTRODUCTION

Due to very dynamic and adjustable market nature it is almost impossible to find industry branch which does not include innovativeness and innovation (as a result of innovativeness) in its development, either continuous or occasional (Pirc Barčić and Motik, 2013a).

Firms should constantly scan the horizon for new opportunities to satisfy their customers, and be capable of innovating to provide solutions to changing market needs. Innovation is an important source of competitiveness, by which companies gain advantages through organizing and conducing value-adding activities in a new way.

Links between firm's innovative performance and their competitiveness are extremely complex because the intensity of innovation performance strongly depends on factors such as, involvement in exporting activity, the level of management training and skills, networking by firms, level of R&D capability, firms size, etc. (Dobrinsky, 2008). Organizations competitiveness and ultimate survival depends on its ability to develop and bring out new or innovative product and service (Drew, 1997). In many business sectors today, innovation has become very important tool for firm competitiveness and long-term firm success will depend on firms' abilities to be innovative (Leavengood, 2009). Nowadays, when globalization occur new possibilities of technological and business development, Croatian wood industry indicates the needs for changes in the form of application new technologies, new products and new business activities. Nevertheless, in last few years some changes have been made regarding product, process and business improvement and/or development in Croatian furniture industry. According to Pirc Barčić and Motik (2013b), in Croatian furniture manufacturing companies a one third of total revenue generated in 2008 and 2009 came from sales of new/improved products.

Given the multiplicity and heterogeneity of different measures on internal and external company factors regarding innovativeness, the aim of this paper was to define profiles (clusters) of Croatian furniture industry companies regarding innovations.

2 MATERIALS AND METHODS

2.1 Sample frame

Sample frame of 409 Croatian furniture manufacturers was randomly selected form furniture sector population. Based on research objectives a questionnaire consisted of three sections was developed and mail surveys were conducted. Only questions regarding three types of innovation (product innovation, process innovation, and business innovation) and competitiveness were focus of this work. Data collection started in March, 2010 and ended in June, 2010. Of the 409 surveys mailed, the total number of usable surveys received form furniture companies was 77. Adjusted Response Rate was 24.2%. Data were analyzed in Statistica 10.0.

2.1 Variables used for cluster analysis

After a series of preliminary cluster analysis a final solution was conducted. Internal and external company factors used for analysis are shown in table 1.

Table 1. Variables used for Cluster analysis

INTERNAL COMPANY FACTORS	EXTERNAL COMPANY FACTORS
Company revenue in 2009	Number of wood raw material suppliers
The percentage of costs in 2009 total company revenue	Number of customers
The percentage of 2009 company revenue that came from sales of new/improved products	Co-operation with customers in designing new products
The average age of company large capital item manufacturing machines	Co-operation with customers in improving design of existing products
The share of employees aged up to 30 years	Characteristics that companies advantage when choosing suppliers – delivery time; availability of material and high level of service
Categories of company's manufacturing processes	
Using computer programs in production costs planning	
Using the Internet in a variety of business activities	
Using of CNC (Computer Numerical Control) machines	
Using of CAD (Computer Aided Design) programs	
Using 3D visualization technology for product presentation to customers	

Other internal and external company factors were not included in cluster analysis because these factors didn't assure any difference between clusters.

3 RESULTS AND DISCUSSION

3.1 Three clusters of furniture producers

Final cluster analysis based on the above mentioned internal and external company factors distinguished there Clusters – there profile sets of furniture manufactures in Croatia. Due to lack of information's relevant for this analysis were excluded from clustering. According to table 2, thirty percent of the 71 respondents used in clustering were classified in a first type of cluster (Cluster 1). Forty five percent of the respondents were noted as part of Cluster 2, while 25% of them were classified to a third type of cluster (Cluster 3).

Table 2. Distribution of Clusters

Type of Cluster	Number of companies N	Percentage (%)
Cluster 1	21	29,6
Cluster 2	32	45,1
Cluster 3	18	25,4
Total in Clusters	71	100,0
Not used for analysis	6	
Total	77	

3.1.2 Cluster 1 – Small traditional companies

After a cluster analysis was employed results have shown that a furniture manufacturing companies which indicated affiliation to Cluster 1, generally have up to 10 employees (91%). In 2009 most of the respondents generated revenue up to a 1 million Kuna (cca. 0,1 million EUR). Seventy six companies in Cluster 1 indicated that their large capital item manufacturing machines are between 6 and 15 years old. More than 90% of companies noted that they have custom made production. In 62% of Cluster 1 companies share of total costs in company revenue (for 2009) was up to 75%. A small percentage of companies regarding Cluster 1 use CAD and CNC technology, as well as 3D technology in product presentations. Eighty six percent of Cluster 1 companies have less than 10 suppliers and 71% of them have up to 30 customers. Although, most of them have developed cooperation with customers in designing and improving products, they make it in a smaller percentage in comparison to companies belonging to Cluster 2 and Cluster 3.

3.1.3 Cluster 2 – Innovative companies

Furniture manufacturing companies which have shown innovative characteristic regarding internal and external company factors were represent in Cluster 2. All companies in the Cluster had up to 25 employees. Revenues in 2009th ranged up to 10 million Kuna (cca. 1.4 million EUR), although the majority of companies (51%) achieved revenue between 1 million and 5 million Kuna (cca.0,1 million

and cca.1,4 million EUR. About 96% of Cluster 2 companies indicated that they have custom made production. In the production process most of these companies use CAD and CNC technology, as well as 3D product presentation technology, and 53% of them noted that their large capital item manufacturing machines are older than 5 years. Seventy eight percent of companies belonging to Cluster 2 use service of less than 10 suppliers and more than 60% of them have more than 30 customers. All companies in Cluster 2 have developed and cooperate with their customers in designing and improving products. These companies are characterized by close collaboration with named (famous) Croatian and foreign designers.

3.1.3 Cluster 3 – Big furniture producers

Sixty on percent of companies in Cluster 3 have more than 100 employees and half of the companies generated revenue of more than 40 million Kuna (cca.5,5 million EUR) in 2009. Eighty three percent of the Cluster noted that their large capital item manufacturing machines are between 6 and 15 years old. The same percent (83%) of the respondents belonging to Cluster 3 indicated that they have more than 15 large capital item manufacturing machines in their production process, which is quite more than in the other two clusters. Most of the companies used CAD and CNC technology, as well as 3D technology for product presentation. Companies pertaining to the Cluster 3 noted that they have more suppliers and customers in comparison to the companies in Cluster 1 and Cluster 2. Although, Cluster 3 companies have developed cooperation with customers in improving and designing products, they have made it in a smaller proportion than the companies in the Cluster 2.

3.2 Innovations and Clusters

According to the results of the types of innovation (product innovation F = 3,651, p = 0,031; process innovation F = 7,168, p = 0,001and business innovation F = 4,753, p = 0,012) obtained Clusters were found to be significant at α=0,05 significance level, by applying One-way ANOVA (Table 3).

Companies in the Cluster 2 rebounded when regarding product innovation. These companies were significantly more innovative in comparison to companies in the Cluster 3 (p=0,013). The results regarding product innovation in Cluster 1 indicates no significant difference in comparison to companies in the Cluster 2 and Cluster 3 at α=0,05 significance level.
Companies in Cluster 1 indicated a low level of process innovation. When observing process innovation the results demonstrated that companies in Cluster 1 were found to be less innovative in comparison to companies in Cluster 2 (p=0,001) and companies in Cluster 3 (p=0,004) at α=0,05 significance level. However, no significant difference was found between process innovation in companies pertained to Cluster 2 and Cluster 3 at α=0,05 significance level.
As shown in Table 3 companies belonging to Cluster 2 achieved a significantly higher level of business innovation in comparison to companies in Cluster 1(p-value 0,004).

Table 3. *Post-hoc* Test (LSD test) of innovation in the three defined types of Clusters of furniture manufacturing companies

Type of innovation	Group 1 (I)	Group 2 (J)	Mean Diference (I – J)	Standard Error	Significance
PRODUCT INNOVATION	Cluster 1	Cluster 2 Cluster 3	-0,44395 0,21693	0,24723 0,28277	0,077 0,446
	Cluster 2	Cluster 1 Cluster 3	0,44395 **0,66088***	0,24723 0,259937	0,077 **0,013**
	Cluster 3	Cluster 1 Cluster 2	-0,21693 **-0,66088***	0,28277 0,25937	0,446 **0,013**
PROCES INNOVATION	Cluster 1	Cluster 2 Cluster 3	**-0,86458*** **-0,83333***	0,24353 0,27854	**0,001** **0,004**
	Cluster 2	Cluster 1 Cluster 3	**0,86458*** 0,03125	0,24353 0,25549	**0,001** 0,903
	Cluster 3	Cluster 1 Cluster 2	**0,83333*** -0,03125	0,27854 0,25549	**0,004** 0,903
BUSINESS INNOVATION	Cluster 1	Cluster 2 Cluster 3	**-0,59509*** -0,18571	0,20152 0,23049	**0,004** 0,423
	Cluster 2	Cluster 1 Cluster 3	**0,59509*** 0,40937	0,20152 0,21141	**0,004** 0,057
	Cluster 3	Cluster 1 Cluster 2	0,18571 -0,40937	0,23049 0,21141	0,423 0,057

*Differences are statistically significant at α=0.05 significance level.

4 SUMMARY

In this study three profiles (Clusters) of Croatian furniture manufacturing companies were defend. Along with small traditional companies (Cluster 1) and large furniture manufacturing companies (Cluster 2), one of three defined Clusters was characterized by innovative companies. These innovative companies have small number of employees (up to 25 people), revenue up to 1.4 million EUR. The majority of these companies have custom made production, using CAD and CNC technology and have good and close cooperation with their customers in designing new or/and improving existing products, as well as with designers. This research suggests that innovative companies in Croatian furniture industry exists, but due to excessive market opportunities and possibilities, managers, directors, and executive staff still do not recognize the right way which will take them to so desired step ahead of the competition.

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Authors' addresses

Andreja Pirc Barčić, Ph.D., e-mail: apirc@sumfak.hr
Prof. Darko Motik, Ph.D., e-mail: motik@sumfak.hr
Maja Moro, Ph.D., e-mail: mmoro@sumfak.hr
Faculty of Forestry University of Zagreb
Svetošimunska 25
10000 Zagreb
Croatia

Kristinka Liker, Mr., e-mail: kristinka.liker@pilana-mrkopalj.hr
Pilana Mrkopalj d.o.o.
Pilanska 6
51315 Mrkopalj
Croatia

THE CONCEPT OF SOCIAL RESPONSIBILITY IN THE WOODWORKING AND FURNITURE INDUSTRY AS A RESPONSE TO THE GREEN ECONOMY NEEDS

Stanisław Borkowski, Renata Stasiak-Betlejewska

ABSTRACT

Corporate social responsibility is a voluntary, going beyond the minimum legal requirements, taking into account social and environmental approach that concerns enterprises operations and relations with stakeholders. The basic idea of CSR is a responsible and ethical business conduct with respect to social groups, which interacts with the greatest possible respect for the natural environment. The article indicates some examples of CSR practices of the woodworking and the furniture industry, which takes into account the concept of sustainable development, and therefore need to take account economic dimension, social and environmental factors in order to meet the needs of not only the present but also for future generations.

Key words: corporate social responsibility, woodworking and furniture industry, sustainable development.

1 INTRODUCTION

The financial crisis and its effects (both for society and for the global economy) bring to businesses, governments and communities in Europe and around the world unprecedented challenges. As a result, the traditional approach to competitiveness, market survival and profitability of enterprises increasingly has began to question. In regard to this market situation there is a question of the corporate social responsibility importance and the trends of European businesses and stakeholders.

Corporate Social Responsibility is a concept which has its roots in the 60s of the last century. It assumes that companies voluntarily take into account the interests of society and the environment and treat them as a kind of investment. Socially responsible companies not only meet the formal legal requirements for the enterprise conducting, but also invest in the human resources, engage in various charitable actions and help protect the environment and take care of relationships with stakeholders.

The year 2012 was undoubtedly a difficult year in Europe, not only for the financial and the public sector, but also for enterprises. Employees, customers and suppliers at the local, regional and international levels began to feel the impact of the crisis. However, the changing situation does not mean the neglect of issues related to corporate social responsibility. On the contrary, it highlighted the need to develop a CSR strategy in enterprises, which will be genuinely engaged with the ongoing activities of the enterprise, and the need to engage in more dialogue with stakeholders in order to build mutual trust. In this context, over the last 12 months in 2013 organization CSR Europe reported an increased demand for services, especially those related to key elements of the practices and strategies of doing business. In addition, it was observed that more business leaders actively overcome barriers such as climate change, demographic change and the aging population, which is considered to be possible to overcome only through social innovation.

At the level of decision taking the growing interest in opportunities, which is created for entrepreneurs in the form of an innovative approach to CSR with the rising expectations of stakeholders towards responsibility and responsible business practices in Europe and the world, have become a

driving force for the European program on CSR. In October 2011 the European Commission published a Communication on a renewed strategy on CSR for 2011-2014. The message expresses the commitment of the European Commission in support of CSR and to recognize the potential contribution of CSR to sustainable development and competitiveness of enterprises in Europe.

2 CORPORATE SOCIAL RESPONSIBILITY IN THE ENTERPRISES ACTIVITIES

Corporate Social Responsibility (CSR) is defined as management strategy of companies which in their activities voluntarily take into account the social and environmental interests and relationships with various groups of stakeholders, in particular employees. In accordance to mentioned definition, being socially responsible means investing in human resources, the environment, relationships with the environment of the company and reporting on these activities, which contributes to the competitiveness of businesses and create conditions for sustainable social and economic development (PwC Polska, 2013). The increased interest in building a socially responsible business model is based on:

– the concept of sustainable development, stressing the need to take account of business, in addition to the economic dimension, the social and environmental factors in order to meet the needs of not only the present but also for future generations;

– development of civil society, demanding the increasing importance of human rights, gender equality, the right of labour relations, the care for the health and safety of workers, consumer protection, and reduce the impact of economic activity on the environment;

– business self-regulation in the direction of increasing the transparency of economic activity and its consequences, including reduced corruption and unethical behaviour in business and the use of so-called good practice in relations with stakeholders;

– the ongoing globalization process, which caused that companies have become an important actor of international economic and political relations, and voluntary initiatives on CSR is seen as evidence of compliance with good business practices.

The concept of CSR has been significantly expanded compared to the historical beginnings and still is the subject of public debate. The essence of CSR with a modern form has been faithfully reflected the norm on the corporate social responsibility ISO 26000 published in November 2010 by the International Standards Organization (International Standardization Organization, ISO).

In accordance to 26 000 ISO standard, the corporate social responsibility and the organization commitment to integration of social and environmental aspects into decision-making process and taking responsibility for the impact of their decisions and activities on society and the environment. It means a behavior which is both transparent and ethical, contributing to sustainable development, in accordance with applicable law and consistent with international standards. It also means that a social responsibility is built into the structure of the organization, practiced in its activities and takes into account the expectations of stakeholders [Stasiak-Betlejewska, R., Rumocka, A. 2014].

Modern and responsible business seeks synergies between economic, environmental and social aspects of the operation, building a comprehensive development strategy based on the assumption of CSR. Taking voluntary commitments to the principles of conduct which in many cases may allow the companies an abandonment of regulation, thereby leading to a reduction of administrative burdens for business. The activities carried out on CSR also lead indirectly to the achievement of a number of policy objectives, such as more integrated labour markets, increasing social cohesion, increase innovation and sustainable use of environmental resources.

3 ANALYSIS OF CORPORATE SOCIAL RESPONSIBILITY PRACTICE APPLYING AS A WAY OF THINKING – THE WOODWORKING INDUSTRY IN POLAND

CSR (Corporate Social Responsibility) as a corporate social responsibility is a way of doing business, which takes into account the needs of all groups of the environment - employees, customers, partners, and local communities. The CSR idea is recognized as a company policy on technology environmentally friendly.

One of the Polish woodworking industry enterprise Dompol takes a number of actions ensuring the sustainable development within corporate social responsibility. Dompol, taking care of the environment in the production process uses wood from renewable forests, derived from certified suppliers with PEFC (Programme for Endorsement of Forest Certification Schemes) and FSC (Forest Stewardship Council). In this way Dompol supports the principles of sustainable forest management. Dompol takes care for the environment what is also reflected in the waste management. The plant is heated by waste, e.g. the waste production of MDF/HDF. The PVC and PET waste are safely stored and then transmitted to a company processing this type of plastic. The environmental activities involve all employees of Dompol who work on their positions lead separate collection of paper, cardboard or stretch foil waste. All these materials do not pollute the environment, but go to the recycling companies.

As part of a policy of socially responsible business, the company Dompol has introduced a number of provisions to impact positively on the people. One of them is the introduction of flexible working hours, especially for women. Also noteworthy persons with disabilities who have become full members of the Dompol crew. Hiring people with disabilities is still not very popular, especially in large companies. The authorities of Dompol, however, give equal opportunities to all candidates for the job, so that in the analyzed company were employed several people with disabilities. Dompol also supports financially and materially workers and their families.

Another example of the woodworking industry company applying CSR policy is the company DLH that is one of the largest global suppliers of wood and wood products with 50 offices in 25 countries. The dynamic development of the Polish economy caused that the DLH Group chose Poland as a place of strategic investments. DLH began its activity in Poland in 1990, and has been for over 23 years focused on the use of two market segments: industry and market professional contractors. DLH employs approximately 800 people around the world. Its multicultural workforce is the cornerstone in the DLH house of values. With our global presence and activities in the local cultivate development, DLH company creates local employment opportunities and support local businesses and infrastructure. The nature of its business brings the company in a contact with a wide variety of people, local communities, indigenous peoples and organizations worldwide.

DLH company is involved in several social projects that are mostly related to supporting the UN Universal Declaration of Human Rights and the core ILO conventions on the elimination of forced labour, discrimination, abolition of the worst forms of child labour, minimum age for work, freedom of association, right to organize and collective bargaining and remuneration. Besides social projects, DLH creates a positive business and cultural relations as well as legal frameworks, regarding the respect and uphold of labour and human rights. Approximately 70% of DDLH sourcing activities are conducted in countries considered of risk. It is therefore DLH company responsibility to ensure that this company doesn't directly or indirectly benefit from, contribute to, endorse, or in any way facilitate violations of human and labour rights. In order to do so, analyzed company has further developed its Good Supplier Programme in 2010. The main purpose has been to make this tool more encompassing regarding labour and human rights. From 2011/2012, the new revised tool will allow the company to collect information on our suppliers' performance on social and human rights.

Responsibility with regard to care about the highest standards of business is crucial strategic element of Kronopol company, producer of laminated panels which was awarded by the Regional Forbes CSR Award. Kronopol deserved this award thanks to the interest of protecting the environment, respecting the rights and interests of employees, care for the local community, charity and sponsorship

activities as well as ethical and lawful approach to business. According to Forbes magazine, companies that care about Social Responsibility (CSR - Corporate Social Responsibility) faster manage with the crisis and they are better able to build lasting customer confidence in its products. According to the survey, as much as 76% of consumers take into account when choosing a product that is related to the company committed into CSR practices. It underlines the importance of CSR practice applying in the business activity that is supportive element both for the company image and the entire internal and external environment organization related to employees and suppliers as well.

4 THE FURNITURE INDUSTRY ACTIVITY ON THE CORPORATE SOCIAL RESPONSIBILITY

One of the most significant examples of activities on corporate social responsibility in the furniture industry is IKEA activity on CSR. The IKEA group culture is based on common values and ways of thinking about certain ideas. These values include: a sense of community and enthusiasm, the constant searching for new solutions, the cost awareness, a willingness to accept and transfer of responsibility, humility and strength of will, the modesty, the courage to be different, the determination to achieve the objectives, the lack of fear of faults committing. The official IKEA vision is to create a better everyday life for many people. More importantly, in the words of President and CEO Mikael Ohlsson "IKEA has a role to play in terms of responsibility for people and the environment". In addition, Ohlsson defined objectives of the strategy of the company sustainable development as inspiring millions of customers to a more balanced home life, bringing IKEA to independence in terms of raw materials and energy, and co-creating a better life for the people and local communities [Biegajewski, M. 2013].

One of the foundations of IKEA Group 's business model is to create a better life for many people. IKEA stakeholders group includes: suppliers, subcontractors, customers and employees. Characteristic feature of the Swedish company is to build long-term relationships with their suppliers. Admission to cooperation is sharing the same values as the company founded by Ingvar Kamparda. IKEA Group partners are required to be provided by these goods, services and materials which were not produced to the detriment of the environment. The main rules mandatory for Swedish company contractors are related to the code IWAY. IKEA imposes on providers need to comply with regulations and standards of national and international law. It particularly focuses on regulations and international conventions relating to environmental protection, juvenile workers and work conditions. The criteria make an initial cooperation enshrined in the IWAY code are: no child labour, no forced labour, a prohibition of serious environmental pollution, non-endangering safety, respect of the working hours and wages, compulsory insurance against accidents at work. In terms of economic theory, the most important group of stakeholders, because the company profit and market presence, are clients that are also the largest and most diverse group, which has an impact on the decisions taken by the management company. Corporate social responsibility strategy adopted by IKEA focuses primarily on the health and safety of customers with high quality products. Therefore, IKEA cooperates with independent laboratories and centres test and fitness machines. They eliminate the defective products sale and environmentally unfriendly products. In addition, strength tests allowing to evaluate and work on optimizing the products quality. A striking example of this type of activity are changes made in the design of one of the furniture, which resulted in the elimination of formaldehyde from the glue and a reduction of this compound in MDF by 40%. These levels are significantly lower than the EU regulations. The focus on safety and stability of the products is of particular importance during the testing of goods intended for the youngest clients. Willingness to minimize the impact of IKEA activities on the natural environment meant that during the entire process, from the design phase to the final phase of the product life, in application there is a special value chain. It is based on four issues of particular importance. The areas covered by the special attention should be paid to design

environmentally friendly, sustainable water management, climate change mitigation and sustainable sourcing of raw materials [Borkowski S., Jelacic D., Stasiak-Betlejewska D. 2010].

The responsibility management responsibility is included also in daily tasks of the one Polish furniture industry company Martela. In the CSR Martela meaning the responsibility is a part of the value, work rules and strategy. In all the company activities Martela strictly complies with the provisions, international agreements, commitments and recommendations relating to the furniture industry and related business. The analyzed company has adopted the following international commitments: Universal Declaration of Human Rights, The basic ILO conventions on the workers' rights, OECD Guidelines for Multinational Enterprises, Initiative of the United Nations Global Compact (the UN). By following standards and international regulations, the company has identified specific management principles as guidelines for its actions relating to liability, and the most important guideline is the code of conduct.

Responsibility is the key value of Martela company, its operational strategy and daily work at all levels of the entire organization. Responsibility means to Martela: a transparency, a sustainable development, a respect for the environment, taking into account the life cycles and uncompromising, an user-oriented approach to design and production. It also means services that extend the products life, a compliance with international agreements and recommendations and the constant care of the employees and partners of the company.

Responsibility is perceived through the prism of the company's vision which is: Inspiring Spaces. Passion for innovation, which helps the company to create more and more inspiring workplace for clients. It also helps to build a better future for all. In this way the technology to enhance productivity, efficiency and well-being support the responsible actions of people and organizations.

One of the crucial field of the social responsibility for Materla is a human resources management. At the end of the year, the Martela Group employed 773 people, 16 of whom were on unpaid leave. The number of personnel increased by 60. Most of the employees were permanent and worked full-time. Temporary employees such as summer workers and temporary agency workers were also recruited to help with seasonal peaks. An important aim is to ensure that the number of employees is never disproportionate to the company's goals, which is why considerable attention is given to managing the number of employees. This is monitored on a monthly basis, and each new employee must be approved in advance. Employment relationships are typically long at Martela, with 20+ years in service being typical in Finland and Sweden. In Poland the employment relationships are shorter, but even there 26% of the workforce has 11-15 years of service. Office employees were the largest personnel group in 2012. The gender split was 39% women and 61% men. The largest age group was 40-49 year-olds. Martela's oldest employee in Finland turned 66 during the year. The proportion of employees under 30 increased to 12% from the 2011 figure. In 2012 the Martela Group's Board of Directors comprised seven members (one woman and six men). The Group Management Team had nine members (one woman and eight men). Of the office employees in Finland, 55% were men and 45% women, while 69% of factory employees were men and 31% women.

Significant operational changes such as restructuring, outsourcing or acquisitions may have an impact on the personnel. In these cases Martela follows the standard negotiation procedures and, in the case of dismissals, the minimum notice period defined by the law or collective agreements in each country. The negotiation procedures vary according to the country in question and commonly depend on the size of the company, the number of employees and the type of contract. There are also some differences in minimum notice periods. For example, the notice period for employees who have worked for Martela for 3 years is 1 month in Finland, 2 months in Sweden and 3 months in Poland.

5 CONCLUSIONS

The CSR strategy of the majority of companies results from the understanding that business and society need each other, and running a business is only possible thanks to the natural environment and the people "created" such a possibility. Using natural materials, existing technology, knowledge or natural forces and principles of the organization of society - businesses incur some kind of debt impossible to pay off only by offering the sale of products manufactured or services. It is the responsibility of the company and its moral commitment is at least not alter the existing balance, but also take measures providing for the needs of future generations.

As the analyzed examples of CSR identifies three basic categories of responsibility: responsibility for the raw materials, including energy used for production; responsibility for the local community through employment and interdependent ecological factors of the company and responsibility to consumers. All fields of responsibility should be met in accordance to the customers, market and suppliers requirements what guarantee the final product quality.

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Author's address

prof. n. techn. i n. ekonom. dr hab. inż. Stanisław Borkowski
dr inż. Renata Stasiak-Betlejewska, e-mail: renatastasiak@wp.pl
Czestochowa University of Technology
Institute of Production Engineering
Al. Armii Krajowej 19 B
42-200 Częstochowa
Poland

TIMBER TRADE IN LEGISLATION AND STRATEGIC DOCUMENTS – A HISTORICAL OVERVIEW

Zuzana Dobšinská, Yvonne Brodrechtová

ABSTRACT

Last 23 years of institutional upheaval in Slovakia did significantly shape its green economy in general and the forest products industry particularly. Precisely, the timber trade had been challenged the most as till 1989 the state authorities controlled trade and competition was all but absent. This was also reflected in relevant legislation and strategic documents. Accordingly, the transformation process brought besides the general institutional changes also alterations of formal institutions affecting timber trade. One might therefore ask question: which legislation and which strategic documents challenged forestry and wood processing sector between 1989 and 2013? The goal of the proposed paper was to investigate the institutional context in which the timber trade takes place. In particular, the formal institutions were identified and subsequently characterized in respect to timber trade. This all was done with assistance of document characteristics of legislation and strategic documents of Slovakia.

Key words: timber trade, formal institutions, document analysis, Slovakia.

1 INTRODUCTION

The goal of green economy is to not only to advance human well-being and social equity, but also to reduce environmental risks and ecological shortages (Anonymous, 2011). In other words, "a green economy can be thought of as one which is low carbon**,** resource efficient and socially inclusive" (Anonymous, 2011: 16). The Green Economy Initiative urges governments of member states to invest into the environment, which together with the international policy development, market infrastructure and national policy reforms should secure the transition to an economy that ensures growing wealth, decent employment, successfully solves poverty problems and mitigates ecologic and climate risks (National Program for the use of the Wood Potential in Slovakia, 2013). The transition to a green economy in Slovakia is ongoing and slow process, which was in the past mainly influenced by institutional upheaval and might be still driven by policies. Particularly, due to transition process that went on after 1989, the planned economy changed into market economy (Child and Czeglédy, 1996; Verdery, 1991). Furthermore, the trade in forest products that could support economic growth and the low-carbon economy among others, has been exposed to the novel economic and institutional environment. Especially external factors enforced mainly by legislation and various political documents had impact on the trade in forest products, particularly timber. The goal of the presented paper is therefore to provide an overview of these formal institutions that challenged timber trade. It is beyond the scope of this paper to illustrate the international influences on timber trade (for information see Paluš, 2013), therefore, we focused only on legislation and strategic documents of Slovakia between 1989 and 2013.

Based on insights of the institutional theory (North, 1990) the concept of formal institutions was applied to better illustrate the institutional context in which timber trade takes place. Institutions consist of formal rules and informal constrains (North, 1990). Helmke and Levitsky (2004: 5) define formal institutions as "rules openly codified, in the sense that they are established and communicated through channels that are widely accepted as official." "Formal institutions are legally introduced and enforced by state institutions, which are embedded in state operations based on laws that are enforced and

monitored by the government" (Ranganathan et al., 2010: 17). We defined formal institutions according to Zenger et al. (2002: 3) as "rules that are readily observable through written documents or rules that are determined and executed through formal position, such as authority or ownership".

Stable formal institutional framework is a pre-condition for sustainable forest management supplying timber market with necessary resources and thus development of green economy. In the following, the formal institutional context of timber trade in Slovakia is identified and subsequently characterized.

2 MATERIAL AND METHODS

Within applied case study approach (Yin, 2003) a qualitative description of documents was used. The target sample consisted of two types of documents: legislation and strategic policy documents. Legislation included legal acts as laws passed in Parliament and Governance Regulations and Ordinances of Slovakia. For the definition of strategic documents we took the definition of Krott (2001: 123) stating that public policy programmes are documents containing statements on societal level about aims and measures in specific sectorial policies. Sampling of legislation and strategic policy documents was based on following criteria: the time of issue between 1989 until 2013 and the sectorial character of policies (e.g. forestry, wood-processing industry, energy sector).

3 INSTITUTIONAL CONTEXT OF TIMBER TRADE IN SLOVAKIA

Institutions that create stability and predictability are the cornerstones of any well-functioning economy (Zenger et al., 2002). From the year 1989 several strategic documents regarding timber trade have been elaborated. In the next section are presented the results on formal institutions in historical order and according to sectorial reference.

3.1 Forestry sector

Changes introduced after 1989 lead to change of forest ownership structure, forest management and forest policy. The restitution laws introduced in 1991 promised the transfer of ownership and user rights back to initial owners and users. Sustainable forest management based on the balanced use of economic, ecological and a social function was supported. The principles of sustainability and close-to nature forest management have a long tradition in Slovak forest management and were anchored in forest legislation (table 1) and strategic documents (table 2). The act on forests changed only twice between 1989 and 2013. The principles and the main goal concerning wood production remained the same. Explicitly, forests should provide sustainable wood resources for the national economy according to § 1 Act no. 61/1977 and on § 1 (1)d Act no. 326/2005. The other laws, which do not have directly mention timber trade, but has been central to Slovakian forestry are: The Nature and Land Protection Act No. 543/2002 and the Fire Prevention Act No. 562/2005.

Table 1. Forestry legislation

1977	Act no. 61/1977 of the Coll. On Forests
2005	Act no. 326/2005 of the Coll. On Forests

There was no change in the overall forest policy goals during the decades. Generally, strategic documents do not define timber trade but rather state goals for forestry development under preservation of sustainable timber supplies for wood processing industry. The basic long-term goal of state forest

policy as declared in the Principles of State Forest Policy from 1993 in Slovakia is to ensure sustainable forest management based on appropriate use of its economical, ecological and social functions for the society and rural areas. Global strategic goals of forestry in Slovakia are principles of long-term development of forests. The most important are the five strategic goals: support to ecological management of forests, improvement and protection of environment, improving the quality of life, increasing long-term competitiveness, enhancement of cooperation, coordination and communication.

Table 2. Strategic forest policy documents

1993	Strategy and Conception of the Forest Economy Development
1993	Principles of State Forest Policy in Slovakia
1994	Program of afforestation of agriculturally unused non forest soil
1996	Project of Forestry Development
1999	Program of Forest Economy Development in SR up to 2010
2000	Concepcion of Slovak Forest Policy till 2005
2006	Concepcion of Agriculture Development in 2007 – 2013 – forestry part
2007	National Forest Programme of the Slovak Republic
2007	Prognosis and visions of the development of Slovak agriculture, food economy, forestry and rural areas
2008	Indicative action plan of the National Forest Programme of the Slovak Republic
2008	Strategy of Forestry Development
2008	Forestry Strategy
2009	Vision, Prognosis and Strategy of the Slovak Forestry Development

3.2 Wood processing industry

The wood processing industry was in the transition period fully privatized and experienced market liberalization shock (Brodrechtova, 2009). The period until 2000 was difficult for the industry as many companies switched owners several times and were forced to end their activities (Paluš, 2013). The entrepreneurial environment of the industry started improving with adoption of the program "Wood - the raw material of the 21st century" for 2000 - 2005 and with set up of SARIO agency (Greppel et al., 2009). The program was elaborated by The Ministry of Economy and The Ministry of Agriculture in 1999. The goal of the program was to enhance an effective use of the Slovakia's wood potential. Specifically, the final processing and use of wood in the wood processing industry should increase at least by 1m m^3 (by almost 20 %) annually till 2005 (Anonymus, 2001). In the same year, the Program for the Support of Processing and Usage of Wood Resource was introduces. Main focus of the program was on support for specific projects of entrepreneurs operating in the wood processing and utilization of raw wood materials in Slovakia. The adoption of the Joint Conception of Forest and Wood Policy of Timber Production, Processing and Use in SR in 2000 was foreseen by the two previous documents. Its goal was to eliminate the unbalanced relationship between the forestry and the wood-processing industry. At the same time it should helped enterprises in how to select appropriate development strategies for wood-based products or how to attract foreign partners into industry. The National Program of the Wood Potential Use in Slovakia was adopted recently and its strategic focus is on improvement of the competitiveness of the sector, on increasing added value, on encouraging domestic demand for wood products and on increasing production of forest biomass and side-products for energy production.

Table 3. Strategic document targeting wood-processing sector

1999	Wood the raw material of the 21st Century
1999	Program for the Support of Processing and Usage of Wood Resource
2000	Joint Conception of Forest and Wood Policy of Timber Production, Processing and Use in SR
2013	National Program of the Wood Potential Use in Slovakia

Strategic documents do not directly define timber trade, but rather define actions and conditions for functioning of wood processing industry. Similarly to documents targeting forestry, timber trade is grasped in the monetary terms (e.g. prices, revenues).

3.3 Energy sector

Prior 1989 Slovakia relied mostly on nuclear energy for their electricity production (Basaan, 2003). When the transition begun the main goal of energy policy was to diversify energy importers and fuels, to increase national sovereignty and energy security. The EU accession was an important milestone for the energy policy, because Slovakia among other countries set the increasing energy efficiency and renewable energy sources as a priority in a national energy policy (Urge-Vorsatz et al., 2006). Introduction of new legislation followed (table 4).

Table 4. Legislation in Energy Policy

2001	Act no. 276/2001 on regulation in network industries
2004	Act no. 656/2004 on power industry
2004	Act no. 657/2004 Z. z. on heat energy
2006	Act no. 24/2006 on environmental impact assessment
2007	Government Ordinance no 317/2007 on rules for energy market functioning
2009	Act no. 309/2009 on the support of renewable energy sources and highly effective combined production
2009	Notice of the Ministry of Economy no. 599/2009 on execution of the Act no. 309/2009
2009	Notice of the Regulatory Office of Network Industries no. 490/2009 on the specifications for the support of RES
2011	Notice of the Ministry of Economy no. 373/2011 on the implementation of the act no. 309/2009
2011	Notice of the Ministry of Economy no. 372/2011 stating the calculation of annual heat production by energy production from biogas acquired by anaerobe fermentation
2011	Notice of the Ministry of Agriculture and Rural Development no. č. 295/2011 implementing § 19b / 2 of the act no. 309/2009
2011	Notice of the Regulatory Office of Network Industries no 219/2011 stating price regulation in heat energy
2011	Notice of the Regulatory Office of Network Industries no 225/2011 stating price regulation in electro energy
2012	Act no. 251/2012 on energy as amended

Forest biomass has been considered as a perspective source for generating energy (Halaj, Brodrechtova, 2014). Thus, the contribution of the domestic available potential of woody biomass for energy generation on total annual consumption of primary energy sources will increase in the near future (Halaj, Ilavsky, 2009). According to the strategic documents (table 5), Slovakia should in the future focus more on biomass utilization. The energy policy reflected this trend in strategic documents

and relevant legislation (tables 4 and 5). Renewable energy sources has been considered as an important component of energy sources, however, their potential to replace other energy sources will still remain limited in the following years (Energy Policy of the Slovak Republic, 2006). Generally, documents targeting energy sector do not define timber trade, however, they form institutional framework for opportunities for forest biomass and indirectly its trade.

Table 5. Strategic documents targeting energy sector

1993	Energy Conception of SR do until 2005
1997	Actualized Energy Conception of SR until 2005
1999	Program of Decreasing Energy Intensity and Alternative Energy Sources Utilization including Support and Development tin this Area
2000	Energy Policy of the Slovak Republic
2003	Concepcion of Renewable Energy Resources Utilization
2004	Concepcion of Agricultural and Forest Biomass Use
2004	Concepcion of Agricultural and Forest Biomass Use for Energy Purposes
2005	National Program of the Biofuels Development
2006	Energy Policy of the Slovak Republic
2007	Strategy oh the Higher Utilization of Renewable Energy Resources in SR
2007	Conception of Energetic Effectiveness of the SR
2008	Action Plan for Biomass Utilization 2008-2013
2008	Strategy of Energy Security
2010	National Action Plan for Energy from Renewable Sources
2013	Concepcion of Electricity Production Development from Small Renewable Energy Sources

4 CONCLUSIONS

The changing framework conditions after the societal changes in 1989 have influenced the institutional context in which timber trade takes place. New legislation and new strategic documents were adopted. In particular, 47 legislation and political documents introduced between 1989 and 2013 were identified. Most of these formal institutions were proposed in the context of energy sector. Majority of the documents' focus was on opportunities of biomass use for energy generation. This indirectly implied the policy driven aspect of the rapidly developing bioenergy market, which in turn has impact on timber trade in general. In contrast, only few documents targeting wood processing industry were identified. Based on the results, the focus of these documents was mainly on efficient use of timber resources and thus encouraging higher demand of wood based products. This indirectly indicated factors that shape or could influence timber trade. However, although the term "timber trade" has been identified in the legislation and policy documents, in none of them was timber trade defined, described or further specified. In contrast, usually the term "timber trade" was used as heading or as introduction phrase to informations on felling or sales volume, timber prices or revenues. This was especially the case of policy documents targeting forestry and wood processing industry. Consequently, legislation and documents mostly stated how could be timber as a strategic renewable resource used in the wood processing industry or the energy sector.

Taking together, the results must be interpreted with caution as more elaborative analysis needs to be undertaken before final conclusions could be drawn. Further research should apply document analysis and results should be compared with others studies dealing with similar research. Despite these shortcomings, the paper provided the first overview of the formal institutions challenging timber trade between 1989 and 2013 in Slovakia.

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Authors' addresses

JUDr., Mgr. Zuzana Dobšinská, PhD., e-mail: dobsinska@tuzvo.sk
Dr., Ing. Yvonne Brodrechtová
Technical University in Zvolen
Masarykova 24
960 53 Zvolen
Slovakia

ADVERGAMING IN FURNITURE COMPANIES

Katarína Ďurková

ABSTRACT

Changes in society, new technologies and communication saturation are the factors that enabled the creation and development of non-traditional forms of marketing and communication. In recent years the media consumption has undergone a tremendous change, and although traditional tools still have their place in marketing brand communication, there is a growing group of consumers who are more difficult to reach by using traditional communication. Companies are therefore looking for new ways to target the groups, new ways to engage and deepen the relationship with the brand. This presented contribution is devoted to innovative forms of marketing communications furnishing businesses – advergaming.

Key words: innovation in marketing communication, new trend in marketing, advergaming.

1 INTRODUCTION

Confirming the importance of marketing communications while building a brand value in the case of KRAFT in the 90s caused a strong increase in its use. [1] While in 1996 the money inserted into the communication were counted as an expense after this year many companies started to consider them as an "investment." On the other hand the interest of companies to communicate with their customers caused information blindness by flooding the media with commercial messages. This situation, together with the development of new technologies brings a desire to search for new and non-traditional approaches for reaching the market.

1.1 Innovation in marketing communication

Last 10-15 years produced a large number of innovations in the field of marketing communications. Product placement, guerilla marketing, viral marketing have been known tools for marketers already for decades, their increased use, however, came with internet development. Significantly increased the importance of integration of the various instruments has significantly increased as well. [2]

Today it is hardly possible to imagine the activities as individually planned and implemented communication activities. The need for new approaches brought as well changes in communication technologies and consumption of media. Smart phones with Internet access, expanding use of social media and multitasking reduced the effectiveness of traditional media perception. One possible way of increasing the effect of consumer communication intervention is the use of product placement. Attractive product connection with lives of the main movie characters has brought many benefits for brands. [3]

Even in this case, however, it is more of a passive way of receiving the message of the brand. Improving technologies and Internet domestication encouraged the companies to look for other ways to find a connection with the customer, while the experiential marketing is gaining into prominence. In this case computer games are where technology meets the experience. [4]

1.2 Advergaming

Advergaming is juxtaposing two English expressions - 'advertisement and gaming. We might as well express it as promoting by means of game. It indicates all activities - online / offline games, game applications that carry the advertising message. They were made either for the purpose of promoting companies, brands, products, or increasing the attraction of websites. Targeting a wide range of users and using a human desire for fun at any age; advergaming became a regular marketing technique that is used in promoting various brands and products. [5]

Development of advergaming was allowed by a number of factors:

- expansion of the Internet
- expansion of online and mobile technologies,
- increasing the speed and availability of technology
- changes in leisure time, changes in social behaviour.

There is a wide range of using the advergaming within the process of communication strategy. It can be used for the following objectives [6]:

- Information on the new product or brand: by using a game a company may communicate the existence of the product, its use, strengths, and characteristics and so on. Use of the product may be part of the tactics of the game.
- Creating a positive image of the company: the player enjoys playing the game and the positive feeling transfers to the perception of the brand
- Expanding brand awareness: consumers spend much more time by playing games on company´s website than when viewing other information, active use of the product in the game strengthens the relationship to the brand ,
- Supplementary tool for advertising campaigns: supplements other communication tools,
- Direct marketing tool: through the registration and tracking of playing the game the company can gain quite interesting overview of the players which can later help in setting the advertising goals, or other communication tools.
- The starting point for promotion through games: interactive games are an important part of online promotion. Winning any price increases interest and attractiveness of the game from the perspective of the player ,

Allows to reach a much larger group of players than it was in offline games. The main advantages of the advergaming use can be viewed from the perspective of the producer as well as from the consumer's perspective.

Figure 1. Brand in Tour de France game

From the manufacturer perspective is the biggest advantage that the user specifications of brand or specific product are not taken negatively. Actually in the case of well-known brands it is more desirable to use correct brand´s name rather than it´s substitute. Development of own brand game increases the websites traffic and as well promotes the brand inside and outside the game. In addition to direct advertising advergaming contributes to optimization through search engines.

Games tend to interest the consumers much longer than it is at a different advertising message (5-35 minutes). The consumer approaches the game voluntarily, with interest, and thus the perception of the commercial message is in other dimensions than it is when watching other ad formats.

Games can very well use the potential of viral marketing through online connections with thousands of other players.The advantage is to receive the message during pleasant moments. Consumers understand this form of advertising as the price for fun. Advergaming influences large groups of users; games do not know age limit. The average age of a player is around 30 years. The advantage of games is the fact that they blur linguistic and ethnic barriers, since their operation is simple and intuitive. Interesting and responsible game attracts the attention of the media.

1.3 Using the advergaming within the furniture companies

Games market is currently very large and opportunities will still grow. Are games possible to use in the furniture industry? What brands are used within the games? For what ages are they primarily meant?

Home Decoration is an activity with which each person actively or passively comes into contact several times in life. The approach of people and their involvement in this activity is different. The selection process of interior equipment depends on several factors - imagination, style, the importance factor that the investor puts into the furnishings, past experience and financial possibilities.

For most people, this activity is exciting on one hand and stressful on the other hand. The fact is that this type of purchase is not an unplanned spontaneous purchase, but it is preceded by a phase of finding inspiration, market research and considering various options. With the increase of general computer literacy, the market has created a place for programs and applications for room visualization that the customer wants to change. These programs, which visually represented customer needs, can be seen as forerunners of advergaming in this area.

In the past the interior visualization programs required excellent graphical skills and were designed for professional designers within the field. Later a non-commercial license could be used by graphically capable individuals. Programs such as Google SketchUp, LIVE CAS, Sweet Home 3D, Envisioneer Express, Room Arranger, 3D Home Archytect, FloorPlan 3D are used worldwide and many of them also exist in various language versions. [7] Most of them still use illustrative pictures of various interior components without the possibility of a direct link with a particular company offering the goods.

Progress in connecting the interior with specific brands were represented by programs such 3D Furnish (company BoConcept) and planning programs IKEA (IKEA Home Planner) for different parts of the interior, eventually for their furniture collections. This scheduling software's allowed customers a better orientation in their offer as well allowed to establish the number of product variants to compare the overall look of the interior and price.

By this step IKEA, on one hand enabled customers to plan interior according to customer´s preferences and on the other hand actually moved the responsibility to the customer. Customers cannot now say that the given layout of the kitchen furniture is not suitable for them because they designed it according to their wishes at that time.

The company offers consulting with professional advisors, their task is to answer customer questions, direct them in case of doubt and act only in the role of disinterested adviser. By this the company saved finances for human resources, but more important step of this strategy is however, the transfer of responsibility to the customer while enhancing the image of a customer-oriented company.

A concrete advergaming, as indicated in theory we may consider incorporation of the brand IKEA into game SIMS. The first version of the game was introduced to the market in 2000, the last one is version number 4. The game is called "life simulator", allows players to experience real life in its virtual form.

Although the primary targeted audience of this game still does not have its own funds for housing, young consumers are very receptive and create important part when deciding on purchasing products which were previously the domain of adults. This category covers as well purchasing furniture, especially if it relates to purchasing furniture to their rooms.

Figure 2. IKEA in Sims 2.

The target group of the mentioned game are children and young people 12 +, for whom it is typical noticing such environment, like type of housing, equipment, or own ideas of the future housing. Through this game IKEA brand comes to the future consumer at the moment:

- When they can partially make decisions about their housing
- When it comes to changing the children's rooms to students due to the age of children

Also this strategic step increases the value of the IKEA brand and strengthens the brand image. The mentioned game was as well complemented with the "luxury brand" associated with Diesel.

1.4 Research methodology

Based on previous lines, we decided to carry out research about perception of the brand IKEA by children and young people aged 8-25 years. The research was done as a qualitative interview with the group of 7 members aged 8, 10, 14, 17, 20, 23 and 25 years. The sample is not a representative sample of the Trnava population which could affect the answers to some questions. The selection depended on the Sims game. Neither of the questioned people own house, they live with parents, the oldest two live independently but not in their own houses.

In the interview we sought answers to many research questions for purposes of this article; however, we select only the following: Do you know any furniture companies? Do you go with your parents to furniture stores? Can you choose the furniture for your room yourself? Do you play the game Sims? On what basis did you pick furniture to "your" house in the game?

All questioned people answered the question "Do you know any furniture companies?" as first brand IKEA and the second Kika. Two participants were able to continue with mentioning more brands such as Sconto and Decodom. We indeed expected this since in their replies we could see "brand" orientation of their parents and as well the distance to Bratislava. For the brand IKEA the position "top of mind" is an excellent starting point.

You go to furniture stores with your parents? All questioned went/ go with their parents to a furniture store. We can however see more varied responses. A visit to IKEA they often do not perceive as a visit with shopping objective, rather as a way of spending free time. When visiting other stores they don´t see much fun. If a visit to the shop is associated with another room than their room, they consider it as an interesting moment just for a while. *"I hate warnings - do not sit, do not touch - in furniture store. How else do you know if the product satisfies you? "*(Respondent 23)

Could you choose the furniture to your room by yourself? The answers were an obvious compromise between the choices of respondents and their parents' choices. They all liked the room, although only one of them saw a desire for changing the room. A 10 year old respondent, whose room was done by an interior designer, would not like to have different furniture in her room. For others, there were answers like "Tuli bag", better / bigger bed.

All questioned respondents played the game Sims. Four of them said that it is furnishing the house that they like most in the game. *"I want such house in the future. In the meantime my preferences have shifted somewhere else but it was fun. However, when I look back today, what all I had in that room I have to laugh. But the fact is that I learned how to recognize IKEA collections „*said the oldest respondent.

Her answer actually stated objectives with which companies enter into partnership by means of a game.

2 CONCLUSION

While the use of advergaming is constantly increasing in many sectors it still can be considered as not sufficiently used tool. When setting the target group in this research we used a trend, according to which young consumers without their own income have and increasingly stronger word when deciding on products whose purchase was previously the domain of adults. To reach out to young consumers in a peaceful, playful way is to invest in the perception of brand value. Despite the advantages that the advergaming offers, this tool is considered to be very promising in the field of furnshing industry.

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Author's address

PhDr. Katarína Ďurková, PhD., e-mail: katarina.durkova@gmail.com
Univerzita sv. Cyrila a Metoda v Trnave
Fakulta masmediálnej komunikácie
Nám. J. Herdu 2
917 01 Trnava
Slovak Republic

IMPLEMENTATION OF QUALITY MANAGEMENT SYSTEMS INTO WOOD PROCESSING INDUSTRY IN SLOVAKIA AND CZECH REPUBLIC

Pavol Gejdoš

ABSTRACT

Article discusses about the process of implementation and certification of quality management systems in the wood processing industry in Slovakia and Czech Republic. It refers to the real situation in the area of certification in the industry, describes the advantages and disadvantages of holding the certificate from the perspective of individual companies operating in the market of timber and timber products in Slovakia and Czech Republic.

Key words: certification, quality management systems, implementation, wood processing industry.

INTRODUCTION

Quality management system can assist organizations in enhancing customer satisfaction. Customers require products with characteristics that satisfy their needs and expectations. These needs and expectations are expressed in product specification and collectively referred to as customer requirements. Customer requirements may be specified contractually by the customer or may be determined by the organization itself. In either case, the customer ultimately determines the acceptability of the product. Because customer needs and expectations are changing, and because of competitive are driven to improve continually their products and processes.[6]

1 QUALITY MANAGEMENT BASED ON ISO 9000

To lead and operate an organization successfully, it is necessary to direct and control it in a systematic and transparent manner. Success can result from implementing and maintaining a management system that is designed to continually improve performance while addressing the needs of all interested parties. Managing an organization encompasses quality management amongst other management disciplines.

The quality management system approach encourages organizations to analyse customer requirements, define the processes that contribute to achievement of a product which is acceptable to the customer, and keep these processes under control. A quality management system can provide the framework for continual improvement to increase the probability of enhancing customer satisfaction of other interested parties. It provides confidence to the organization and its customers that it is able to provide products that consistently fulfil requirements.

Eight quality management principles have been identified that can be used by top management in order to lead the organization towards improved performance:

- Customer focus – organizations depend on their customers and therefore should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations.

- Leadership – leaders establish unity of purpose and direction of the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organizations objectives.
- Involvement of people – people at all levels are the essence of an organization and their full involvement enables their abilities to be used for the organizations benefit.
- Process approach – a desire result is achieved more efficiently when activities and related resources are managed as a process.
- System approach to management – identifying, understanding and managing interrelated processes as a system contributes to the organizations effectiveness and efficiency in achieving its objectives.
- Continual improvement – continual improvement of the organizations overall performance should be a permanent objective of the organization.
- Factual approach to decision making – effective decisions are based on the analysis of data and information.
- Mutually beneficial supplier relationships – an organization and its suppliers are interdependent and a mutually beneficial relationship enhances the ability of both to create value. [4]

3 SITUATION OF THE IMPLEMENTATION OF QUALITY MANAGEMENT SYSTEMS INTO COMPANIES OF WOOD PROCESSING INDUSTRY IN SLOVAKIA AND CZECH REPUBLIC

The next section of this paper will present the results of research that was conducted in the first half of 2014, in the wood processing industry in Slovakia and Czech Republic. Collection of information is conducted electronically. The next section of this paper presents selected results of the research.

The first question concerned the sector in which businesses operate as you can see from Figure 1 and Figure 2.
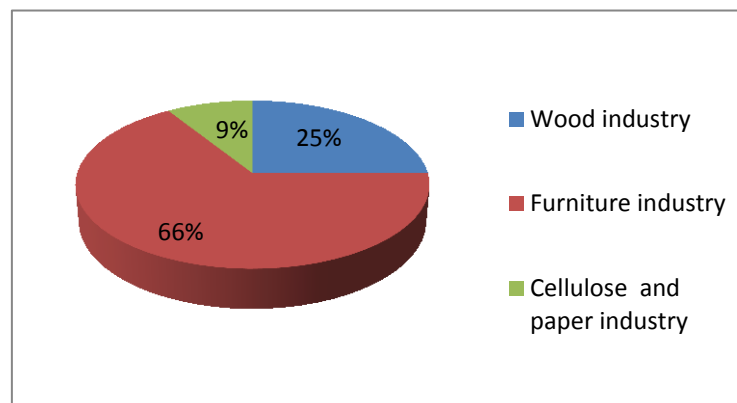
Figure 1. Structure of the wood industry enterprises involved in research in Slovakia
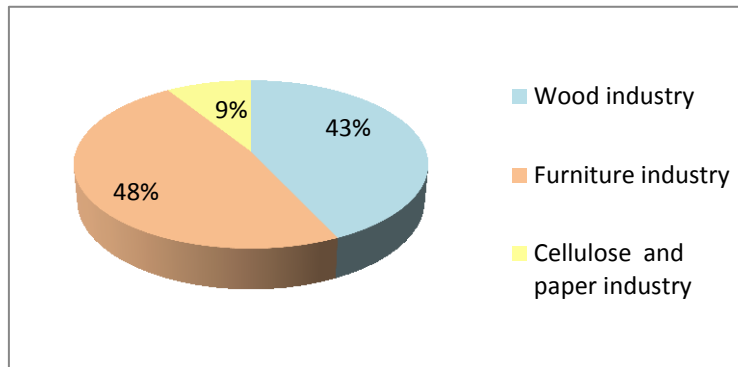
Figure 2. Structure of the wood industry enterprises involved in research in Czech Republic

Another classification of the questions in the questionnaire was the question of the size of the business, and we are given the characteristics of the individual groups defined threshold number of employees in the company. The results you can see from Figure 3 and Figure 4.
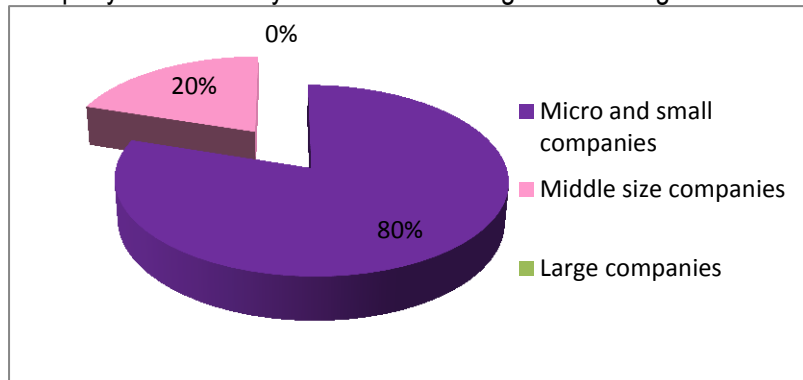
Figure 3. Structure of the wood industry enterprises involved in research by number of employees in Slovakia
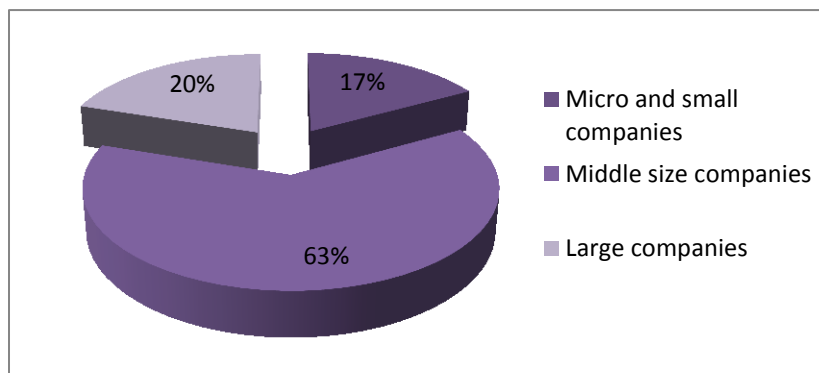
Figure 4. Structure of the wood industry enterprises involved in research by number of employees in Czech Republic

These first two questions were relevant to the interpretation of the results obtained between countries. It is logical that the results will be different in small companies and large companies.
The next question was aimed about ownership of certificate of Quality management system (QMS). As you can see Slovak companies have a higher share of enterprises having introduced and certified QMS compared to Czech companies. (Fig. 5)
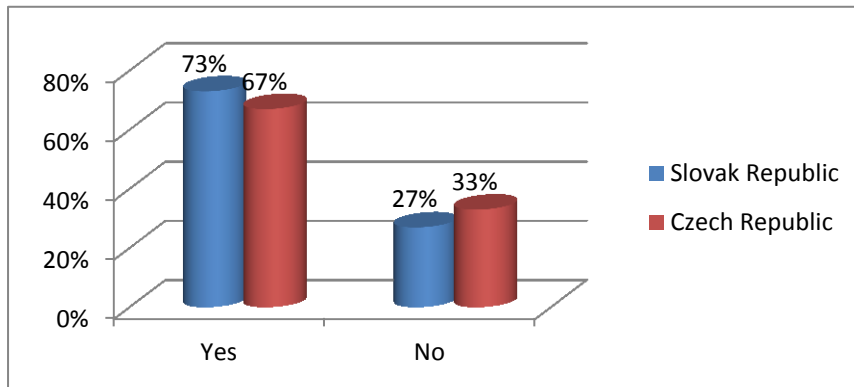
Figure 5. Implementations of QMS into wood processing companies in Slovakia and Czech Republic

Another area that we were interested in was to give reasons why companies have decided to introduce QMS(Fig.6). As we can see from the graph fundamental differences between the two countries are mainly the reasons such as improving the quality of where this ground in Czech Republic favors almost twice as enterprises in Slovakia, the result is the same reason for such a company's competitiveness and market position.
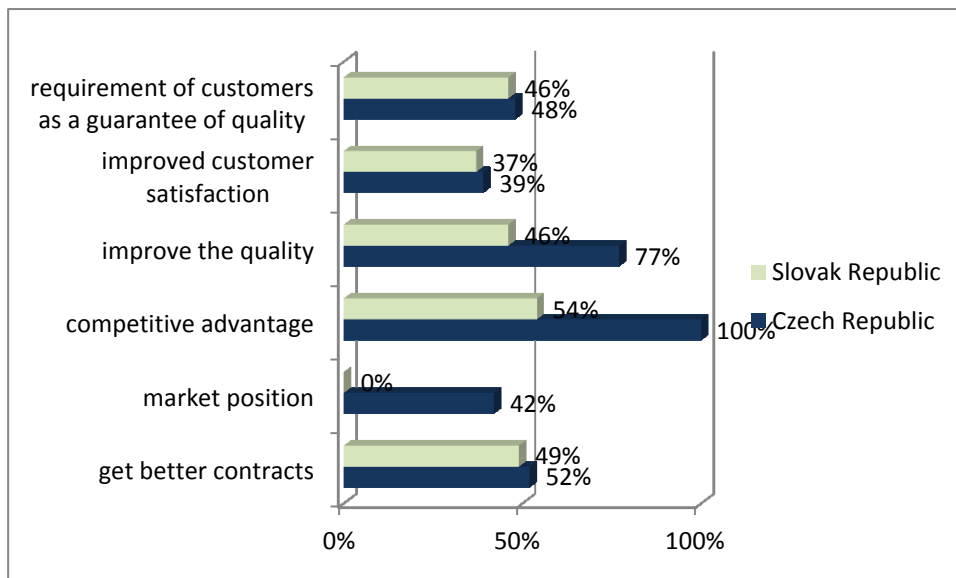
Figure 6. Reasons for the introduction of QMS in the wood processing enterprises in Slovakia and Czech Republic

Another issue concerns the benefits brought by the enterprises established and certified QMS. Identified benefits are presented in Figure 7.
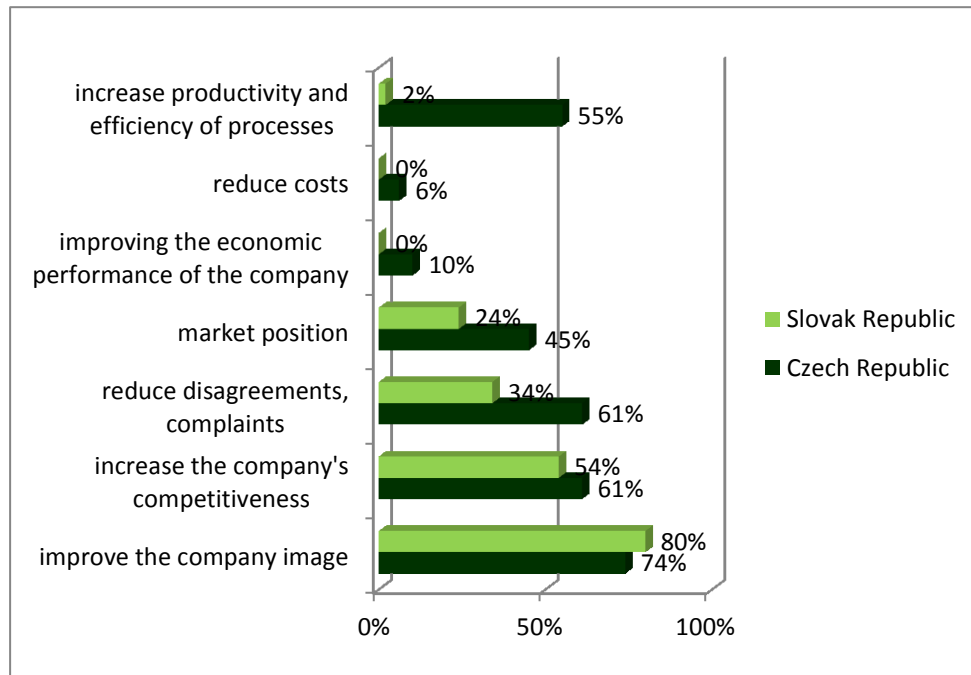
Figure 7. Benefits from the introduction of QMS in the wood processing enterprises in Slovakia and Czech Republic

From the Figure 7 we can see the same but also different results Slovak and Czech companies. As the most common response by the respondents improves the image of the company, the benefit is for 80% of Slovak enterprises that have implemented QMS and for 74% of Czech respondents. The second most important was termed in both enhancing the competitiveness and increase sales, in the case of Czech companies and less production of non-conforming products and reduce the number of complaints by customers. Conversely 55% of Czech respondents who have implemented QMS indicated that benefit is increased productivity and efficiency of processes, and that option indicated only 2% of Slovak enterprises.

Introduction of QMS in companies not live normally hassle associated with it various obstacles and challenges. Businesses, we therefore asked whether encountered in implementing QMS any problems. Of the total number of respondents Slovak enterprises that have implemented QMS only 5 % of companies indicated that they had problems with the implementation. The reasons stated problem systematically making and increased administration. In the case of Czech companies was the result of a surprising 42% of businesses reported that they encountered in implementing QMS problems. Problems of Czech companies can be summarized as follows:

- administrative burden – evidence of non-conformities, complaints , costing the complaint and the like,
- a problem with employees - beliefs about the usefulness of the system introduced , different views on the implementation of systems , internal reluctance to change, lack of understanding of staff,
- financial costs of the system introduced.

Another question we asked our respondents the question of the length of time the process of implementation of QMS in enterprises (fig.8).
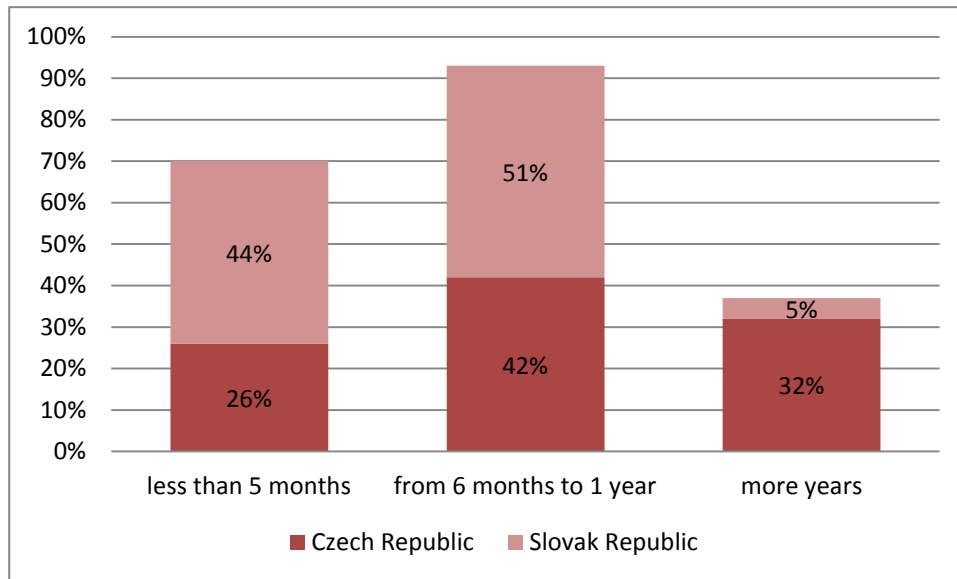
Figure 8. The time required for the implementation of QMS in place in the wood processing enterprises in Slovakia and Czech Republic

Another question in the questionnaire was aimed at certification namely whether firms experience problems during the process of certification of QMS, whether we were interested in how it challenges facing society in the certifications. In the case of Slovak enterprises only 5% of companies indicate that they had a problem during the certification process and how to build awareness of the problems mentioned and remove formality. In the case of Czech companies had higher frequency, 39% of companies said that they have problems with certification, and as a fundamental problem reported increased costs during the implementation of QMS (fig.9).
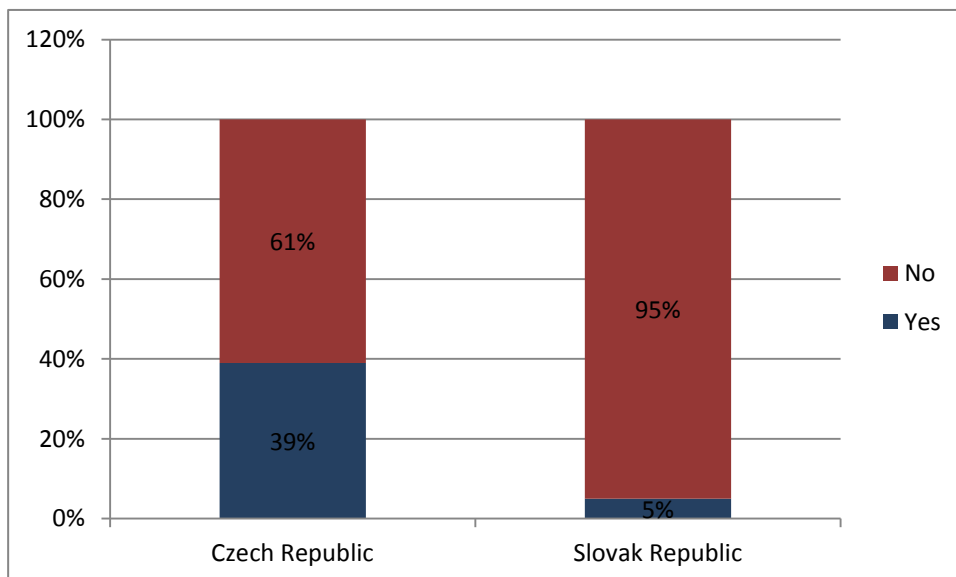

Figure 9. Problems during the certification process in the wood processing enterprises in Slovakia and Czech Republic

CONCLUSION

According to our survey conducted on a sample of Slovak and Czech enterprises DSP we came to certain facts which can be summarized as follows.

In the case of Slovak companies, we arrive at the following fact:
- 96% of companies consider quality as an important aspect of the success of the enterprise,
- 73 % of companies have implemented QMS,
- the most frequently mentioned reason for the introduction of QMS is to gain competitive advantages and strengthen the competitiveness of the company , provide better further downstream contracts and the requirement of customers,
- enterprises accounted for the largest share of the furniture industry , micro and small enterprises and businesses that are on the market for over 10 years,
- frequently termed benefits of implementing a QMS certification is to improve the image of the company , then it is strengthening the competitiveness and increase sales,
- only 5 % of businesses had a problem of implementation and certification of QMS,
- 51 % of companies implement a system from 6 months to 1 year, while only 5 % said they took the introduction of several years.

Results of Czech companies can be summarized as follows:
- enterprises accounted for the largest share of the timber industry had a slightly lower proportion of companies furniture industry , businesses , and even large companies responded ,were mainly companies that are on the market for more than 10 years,
- 93 % of respondents consider quality as an important aspect of the success of the enterprise,
- 67 % of companies have implemented QMS , all have it implemented the ISO,
- the most frequently mentioned reason for the introduction of QMS is to gain competitive advantages and strengthen the competitiveness of the company , which identified all companies with established QMS , it was further improve the quality of its own products and improve their own operations,
- frequently termed benefits of implementing a QMS certification is to improve the image of the company , then it is strengthening the competitiveness and increase sales and lower production of non-conforming products,
- up to 39 % of enterprises reported that they had difficulties in implementing QMS
- 42 % of companies mislead SMK from 6 months to 1 year, but only 32 % of respondents said they mislead SMK several years.

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Author's address

Ing., PhD., Pavol Gejdoš
Technical university in Zvolen
Masarykova 25
96053 Zvolen
Slovakia
E-mail: gejdosp@tuzvo.sk

TIMBER MARKET SET AGAINST THE ACTIVITIES OF WOOD SECTOR ENTERPRISES IN POLAND

Emilia Grzegorzewska

ABSTRACT

The article presents the characteristics of timber market in Poland in the context of the activities of wood sector companies. The paper covers the division of economic subjects of wood sector into particular branches and according to the Polish Classification of Economic Activities there have been singled out the following industries: wood, pulp and paper, and furniture. Moreover, an analysis regarding the obtaining of wood raw material according to the assortment in Poland has been carried out as well as it has been analysed what percentage of demand for wood is covered by the domestic forest resources. The change trend in timber price has also been included, which has a major influence on economic profitability of the production in the sector. An important element of the research are the statistics regarding export and import of wood in the domestic and international context.

Key words: Poland, wood sector, enterprises, wood material.

1 INTRODUCTION

Wood sector plays a significant role in Polish economy. Its distinctive feature is its basic natural material that is the wood. Restricting natural resources of wood material is one of the greatest problems of both Polish and world wood industry. There is a rising demand for the use of wood for energy and raw material inputs. Forest-based industries continue to demand a reliable supply of raw material inputs. At the same time, the use of wood for energy is intensifying to meet ambitious renewable energy targets. However, mobilising enough wood to satisfy this growing need could come at a significant environmental, financial and institutional cost [The European Forest…, p. 3]. One cannot, however, disregard the use of wood material in the production process that is for the industrial purposes. Companies functioning in the wood sector are burdened with the risk related to timber market, demand and supply relations in the domestic and international context. Undoubtedly, an important aspect of the analysis of the condition of wood sector enterprises are also the change trends in wood prices.

2 SIGNIFICANCE OF WOOD SECTOR FOR POLISH ECONOMY

According to the Polish Classification of Economic Activities (PKD) wood sector belongs to the C section – "Industrial Processing". This sector comprises: manufacture of wood, cork, straw and wicker products (section 16.0), manufacture of paper and paper products (section 17.0) and furniture manufacture (section 31.0). Table 1 presents the division of wood sector into different branches. In the 16.0 section, next to the manufacture of wood, cork, straw and wicker products, there has also been singled out the manufacture of sawmill products. The 17.0 section, apart from the manufacture of paper, paper products and cardboard, also comprises the production of pulp. Companies dealing with this manufacture come under the pulp and paper industry. In the production of furniture there has been singled out the manufacture of: office and shop furniture, kitchen furniture and other furniture. This

section comprises also the production of mattresses, which from the point of view of wood material is disregarded in the analyses of wood industry.

Table 1. Division of wood sector into separate branches according to Polish Classification of Economic Activities

Section	Groups and classes
16.0 Manufacture of wood, cork, straw and wicker products	16.1. Manufacture of sawmill products
	16.2. Manufacture of wood, cork, straw and wicker products ▪ 16.21 Manufacture of veneered and wood based boards ▪ 16.22 Manufacture of assembled parquet floors ▪ 16.23 Manufacture of other joinery and carpentry products for building industry ▪ 16.24 Manufacture of wooden packaging ▪ 16.29 Manufacture of other wood products; manufacture of cork and straw products and materials used for weaving
17.0 Manufacture of paper and paper products	17.1 Manufacture of pulp, paper and cardboard ▪ 17.11 Pulp manufacture ▪ 17.12 Manufacture of paper and cardboard
	17.2 Manufacture of paper and cardboard products ▪ 17.21 Manufacture of corrugated paper, corrugated cardboard and paper and cardboard packaging ▪ 17.22 Manufacture of household articles, toilet and sanitary articles ▪ 17.23 Manufacture of stationery ▪ 17.24 Wallpaper manufacture ▪ 17.29 Manufacture of other paper and cardboard products
31.0 Furniture manufacture	31.0 Furniture manufacture ▪ 31.01 Manufacture of office and shop furniture ▪ 31.02 Manufacture of kitchen furniture ▪ 31.03 Mattress manufacture ▪ 31.09 Manufacture of other furniture

Source: own study on the basis of www.gofin.pl

The importance of wood sector for Polish economy is borne out by research conducted by the Central Statistical Office and published annually in the "Statistical Yearbook of Industry". It needs to be highlighted, however, that the analyses comprise only those economic subjects that employ more than 9 people and run account books. In 2005 the value of sold production in industrial processing was at the level of 571.6 billion PLN, 10% of which was generated by the wood sector. For the wood industry the values were at the levels, respectively: 20.1 billion PLN for manufacture of wood, cork, straw and wicker products, 16.7 billion PLN for manufacture of paper and paper products and 21.7 billion PLN for the furniture industry. As regards the year 2012 the value of sold production for industrial processing companies increased by over 70% and amounted to 985.3 billion PLN. The greatest gain in the field was noted in paper and paper products manufacture – over 75%. In other branches of wood sector an increase in the value of sold production was observed as well: by 47% for the manufacture of wood, cork, straw and wicker products and by 33% for the furniture branch.

From table 2 it follows that the dynamic of sold production as regards industrial processing in the years 2006-2012 was positive, with the exception of the year 2009. As a result of crisis events commenced in 2007 in the United States it was a difficult year for most sectors of Polish economy. Most companies operating in the wood industry were faced with the harsh situation. In that period in the manufacture of furniture and wood products there was a decrease in the value of sold production by 4.5% and 0.2% respectively. In 2010 in the furniture branch another unfavourable tendencies were

observed – the value of sold production was lower by 5.8%. In manufacture of paper and paper products the negative dynamic was observed in 2008.

Table 2. Dynamic of sold production for particular branches of wood sector compared to industrial processing [%]

Itemisation	2006	2007	2008	2009	2010	2011	2012
Manufacturing	113.8	112.4	104.0	96.1	109.9	108.7	100.7
Manufacture of wood, cork, straw and wicker products	106.4	112.9	101.8	94.5	107.6	103.0	102.5
Manufacture of paper and paper products	105.5	109.2	96.0	105.7	118.3	106.3	103.3
Furniture manufacture	110.0	109.5	104.1	99.8	94.2	115.4	93.6

Source: own study on the basis of Statistical Yearbook of Industry 2013, pp 108-109.

3 TIMBER MARKET IN POLAND

Timber is a basic material used in the production process in wood sector companies. For that reason it is important to determine the potential of wood and in particular analyse the area of forest resources. Poland is in the European lead as regards the area of forests. They constitute almost 30% of the country's territory. The forestation of Poland is similar to that of other countries. A significant percentage share of forests in the area in total was noted in the countries such as: Gabon (85%), Finland (73%), Japan (69%), Sweden (69%), Zambia (67%) or Congo (66%). The lowest level of forestry was typical of: Kazakhstan (1%), Iran (7%) and Turkmenistan (9%) [Forestry 2013, p. 271]. In 2012 woodland area in Poland comprised 9370 thousand ha, 80% of which made up forest areas. It needs to be noted that most of them are state forests and 75% of the area of forest resources that is to say 7079.4 thousand ha is governed by the State Forests National Forest Holding.

Taking into consideration the regional context, in 2012 the following voivodeships had the most forests: Masovian (826.9 thousand ha), West Pomeranian (833.4 thousand ha), Great Poland (786.5 thousand ha) and Warmian-Masurian (766.5 thousand ha). The opposite situation was observed in provinces such as: Opole (256.7 thousand ha), Świętokrzyskie (334.8 thousand ha) and Łódź (393.5 thousand ha). The greatest forestation in Poland is characteristic of the following voivodeships: Lubusz (49.1%), Subcarpathian (37.8%) and Pomeranian (36.3%). The lowest percentage share of forests in the area in total was noted in Łódź (21.2%) and Masovian voivodeships (22.9%) [Forestry 2013, p. 36]. They are the areas with great urbanization, great population density and developed industry.

According to the analysis by the Central Statistical Office (GUS) it follows that in the years 2000-2012, regardless of the kind of assortment, the acquisition of wood material in Poland increased from 27659 thousand m³ to 37045 thousand m³ (table 3). The acquisition of large timber in Poland increased by 46% in the analysed period, of which the acquisition of coniferous wood increased from 19540 thousand m³ to 26042 thousand m³, and non-coniferous rose from 6485 to 8936 thousand m³. The acquisition of slash also increased by over 25%. It has to be noted that there was a significant rise in the acquisition of timber per 100 ha of forest areas. In 2000 the ratio was at the level of 293.6 m³, and in 2012 - 381.7 m³. Moreover, in the analysed period the size of large timber per capita also increased. In 2000 the ratio was 0.68 and in 2012 it was at the level of 0.91.

In the regional context, in 2012 the most timber was acquired in the following voivodeships: West Pomeranian (4069.9 thousand m³), Warmian-Masurian (3363.2 thousand m³), Great Poland (2998.2 thousand m³) and Pomeranian (2875.4 thousand m³). The least wood material was obtained in Łódź (1093.6 thousand m³), Świętokrzyskie (1170.4 thousand m³) and Opole (1216.4 thousand m³) provinces.

Table 3. Acquisition of wood material according to assortment in Poland [thousand m³]

Itemisation	2000	2005	2009	2010	2011	2012
Large timber from this	26025	29725	32701	33568	34877	34978
Coniferous	19540	21919	24529	25579	26278	26042
Non-coniferous	6485	7806	8172	7989	8599	8936
Slash	1634	2200	1928	1899	2303	2067
Stump wood	0.3	0.2	0.2	0,1	0,1	0,1
Total	27659	31945	34629	35467	37180	37045

Source: own study on the basis of Forestry 2013, p. 105.

As regards safety of functioning in the wood sector, its significant element is satisfying the demand for timber with the use of domestic forest resources. For balance on the timber market, the problem of little flexibility of wood supply is typical determined by natural long-term determinants of the production process and the demand created in the result of market mechanism and short-term cycles dictated by the economic situation [Ratajczak 2013, p. 85]. According to the data in table 4 in the years 2000-2011 the use of wood in Poland in total exceeded the acquisition of domestic wood. In 2000 the use of wood material was at the level of 28.1 million m³ and exceeded by 0.4 million m³ the quantity of the acquired material. Similar tendencies were noted in the whole analysed period. In 2012 the domestic use was at the level 38.7 million m³ and was by 10 million m³ higher than at the beginning of the analysed period. At the same time it has to be emphasized that the change pace of the domestic use in total was at that time 38% whereas the pace of increase of wood acquisition was slower and was at the level of 34%. Over the analysed period a rise in the export volume was observed from 0.3 million m³ to 1.9 million m³. As regards the demand for domestic resources in total the tendencies were reversed. In 2000 it was at the level of 97.5% and in the analysed period it was gradually decreasing. In 2011 it amounted to 91.2% which implies it was by 6.3 percentage points lower than at the beginning of the analysed period. From the presented data it follows that meeting the demand for wood with the use of domestic resources is still substantial. Still, on account of an increase in the demand for wood, both in wood and energy sectors, it is predicted that in 2015 the timber market will face a deficit amounting to 7.7-11.4 million m³. It refers to wood coming straight from forest resources. Taking into account the predicted level of the acquired wood it would be 20.5-28.5% [Ratajczak 2013, p. 87].

Table 4. Meeting the demand for wood with the use of forest resources in Poland in the years 2000-2011

Itemisation	2000	2005	2009	2010	2011
Wood acquisition [mln m³]	27.7	31.9	34,6	35.5	37.2
Consumption in all Poland in total [mln m³]*	28.1	33.3	35.5	36.1	38.7
Export [mln m³]	0.3	0.6	1.1	1.7	1.9
Demand satisfaction together with the use of domestic resources [%]**	97.5	94.0	94.4	93.6	91.2

Source: own study on the basis of E. Ratajczak, The forestry and wood sector in the green economy, Institute of Wood Technology in Poznań, Poznań 2013, 175.
*Wood acquisition including import and excluding export.
**Relation of wood acquisition with the exclusion of export and domestic consumption altogether.

Demand for wood is strictly connected with products manufacture from the wood sector (table 5). In the years 2000-2012 the greatest increase in the production volume was noted in the dining and living room furniture. Its level rose by 260% from 7749 thousand to 20457 thousand pieces. A significant increase in the production level was observed as regards fibreboards (from 216 to 602 km²) as well as

kitchen furniture (from 645 to 1331 thousand pieces). However, it has to be emphasized that the number of pieces of the manufactured kitchen furniture was 15 times lower than the number of pieces for the dining and living room. Attention must also be paid to the significant, almost double increase in the production volume of cellulose and paper branch from 1934 thousand t w 2000 to 3822 thousand t at the end of the analysed period. On the other hand, there was a little increase (15%) as regards wood pulp.

Table 5. Manufacture of chosen products of wood sector in Poland.

Itemisation	2000	2005	2009	2010	2011	2012
Wood and wood products						
Sawnwood in dam	3392	3360	3850	42240	4422	4267
Particle board and similar board of wood or ligneous materials in dam	3031	3940	4704	4684	4917	4879
Fibreboards of wood or ligneous materials in km²	216	416	466	501	491	502
Paper and paper products						
Soda or sulphate chemical wood pulp in thous. ton	751	802	826	881	894	868
Paper and paperboard in thous. ton	1934	2732	3275	3700	3756	3822
Furniture						
Wooden units for fitted kitchens in thous. units	645	2454	1661	1622	938	1331
Wooden furniture for dining and living room in thous. units	7749	12285	17826	19616	20196	20457

Source: own study on the basis of Statistical Yearbook of the Republic of Poland 2011, p. 498, 502; Statistical Yearbook of the Republic of Poland 2013, p. 513, 517.

Next to the availability of wood material, the price of wood is of great significance for enterprises operating in the timber industry. According to the data by the Central Statistical Office in 2000 an average price of wood for one cubic metre was 127.96 PLN (table 6). In the three consecutive years the price was gradually decreasing, and in 2003 it reached 107.70 PLN. Next years brought an increase in the price of wood for one cubic metre to the level 152.53 PLN. In 2009 entrepreneurs had to pay 136.54 PLN for one cubic metre of wood, which was 11% less than a year ago. A record price of wood was noted in 2011 and it amounted to 186.68 PLN and was by 21% higher than in the previous year.

Table 6. Price of wood for one cubic [PLN] and change pace [%] in the years 2000-2012.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Price [PLN]	127.96	126.07	111.21	107.70	120.40	131.35	133.70	147.28	152.53	136.50	154.65	186.68	186.42
Change pace [%]	-1.48	-11.79	-3.16	11.79	9.09	1.79	10.16	3.56	-10.51	13.30	20.71	-0.14	-1.48

Source: own study on the basis of Forestry 2005, p. 28; Forestry 2013, p. 111.

An important element in the assessment of the economic situation on the timber market is the analysis of the level of export and import of wood in the value context. As it follows from figure 1 there was a significant, almost double increase in wood value sent abroad from 4975 million PLN to 11652 million PLN. In the analysed period the dynamic of the value of wood export was generally positive, taking into consideration the annual changes. The years 2005, 2008 and 2009 were an exception. It was then that the category decreased: 2%, 10% and 1%, respectively.
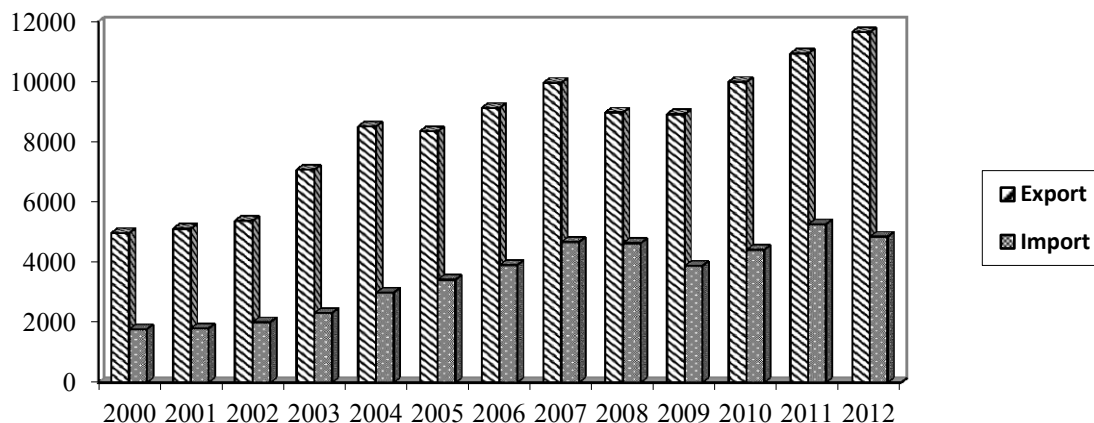
Figure 1. Value of export and import of wood and wood products in Poland in the years 2000-2012 [million PLN]
Source: own study on the basis of Forestry 2013, p. 50-51.

As regards the value of import of wood and wood products in the analysed period there was a significantly lesser growth: from 4674 million PLN to 4855 million PLN. It implies that the change pace of import value was at the level of 3.9% and was significantly lower than in the case of export – where the pace of change was 134.2%. As regards wood and wood products coming from abroad, negative pace of change was observed in the years 2008-2009. It needs to be noted that trade balance for wood in the rough shows reverse tendencies. For instance, in 2012 the value of export in that period was 656 thousand PLN, and import was at the level of 409 thousand PLN. In the lead of wood exporters there are the following countries: Belarus (43%), Slovakia (16%) and Ukraine (12%) [Yearbook of Foreign Trade Statistics 2013, p. 271]. In the quantitative context the deficit of trade balance of wood in the rough in that period amounted to the level 584.8 thousand t [Yearbook of Foreign Trade Statistics 2013, p. 273].

4 SUMMARY

Wood industry is an important part of Polish economy. According to the Polish Classification of Economic Activities wood sector comprises: manufacture of wood, cork, straw and wicker products, manufacture of paper and paper products as well as furniture manufacture. In view of the particular character of the material used in the production process, wood potential of a given country has a great influence on the activities of economic subjects operating in the sector.

Forestation in Poland is similar to the world levels (around 30%). In 2012 forests area constituted 9182 thousand ha, 75% of which is governed by the State Forests National Forest Holding. According to the analyses by the Central Statistical Office it follows that in the years 2000-2012 the acquisition of wood material in Poland increased by over one third (1/3) to the level of 37045 thousand m^3. A significant increase in the acquisition of timber per 100 ha of forest areas was observed (381.7 m^3 in 2012).

For the stability of economic subjects functioning in the wood industry it is important to cover the demand for wood material. From the analyses it follows that in the years 2000-2011 the consumption of wood in total in Poland exceeded the acquisition of domestic wood. Meeting the demand for wood in total with the use of domestic resources decreased from 97.5% to 91.2%. For instance, a trade balance deficit in wood in the rough in 2012 was at the level of 584 thousand t.

It needs to be emphasised, however, that in the analysed period there was a significant increase in the volume and production value as regards the manufacture of furniture for the dining and

living room (by 260%), manufacture of fibreboards (by 179%) and kitchen furniture (by 106%). It implies significant development of wood sector enterprises in Poland. It is undoubtedly linked with the increasing demand for wood material which is a natural and limited material.

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Author's address

Emilia Grzegorzewska, PhD
Faculty of Wood Technology
Warsaw University of Life Sciences – SGGW
Nowoursynowska 159
02-787 Warsaw
Poland
E-mail: emilia_grzegorzewska@sggw.pl

CHANGES IN MOTIVATION AND STIMULATION SYSTEM IN A WOOD PROCESSING COMPANY

Denis Jelačić, Josip Faletar, Marko Previšić

ABSTRACT

The best time to make changes in any business is the time of crisis. Wood processing companies are forced to make changes within their work awarding systems. Motivation and stimulation system in a company was changed and it brought some good results for workers within the plant, so they get motivated to try to work better and to help company to get out of the crisis.

Key words: motivation, stimulation, work awarding system.

1 INTRODUCTION

Motivating the employees has the key importance for providing their efficiency and quality of work. This especially applies for employment in the conditions of economic crisis, where the growth of de-motivational factors can be recognized, which has negative influence on the motivation of the employees. The employees are experiencing insecurity and some other additional fears (i.e. fear of losing a job, fear of lower wages etc.) In order for the companies to avoid all of the stated and other problems, they need to focus on seeking opportunities for sales increase and cost reduction on one hand, and on the other hand they need to establish conditions for more efficient work. The latter is strongly connected with the way the employees are motivated. It is a fact that the motivational strategies that worked in the past are not so efficient in current difficult economic conditions. If the managers continue to treat the employees in the same way, their already low motivation for work will decrease even more. In wood processing and furniture manufacturing companies the recent researches discovered an organizational culture, where the primary objective is not to motivate the employees, which can present an additional problem in current conditions. The management of the companies can count on satisfactory working results and satisfied workers mostly if they insert motivational factors into the working environment. We can say that practically all motivators are in the hands of the management. The only question is if they know how to use them.

Motivation means that somebody does something because he wants to and all we need to do is to stimulate that person. A motivation is a process of challenging (awakening) a person's activity, their focusing on certain items and regulation in order to reach a certain objective, overcome possible obstacles and achieve the set objective. We could say that motivation covers all factors (enthusiasm, wish, intention, persistence etc.) that either encourage or direct our behavior.

2 FORMER WORK AWARDING SYSTEM IN A COMPANY

In the company in case the existing work awarding system was based entirely on the number of hours spent at the working place. Although the coeficients for job difficulty existed for each particular working place, and although they were included in the work awarding system for each particular working place in the company, they were not connected to qualification structure required for those working

places, nor they were connected to the real job difficulty for particular work places, but they existed just as a calculating value.

According to job difficulty, work places were devided in 5 large groups of coeficients with 36 (thirtysix) different coeficients for the range 1,00 – 3,00. All the work contracts with particular empolyee was connected to individual working place, so it means that each individual employee was signed for the job difficulty coeficient estimated for that working place. Since there is endless amount of different coeficients, it is to be expected for many senceless situations to occur. Categorization of the coeficients into 5 groups was done according to the classic qualification framework created long time ago, but still existing in Croatian companies, consisting levels from I to VII/1.

So, in group I, there were 3 coeficients for simple jobs (1,00 to 1,10), in group II, for midium complex jobs, were 5 coeficients (from 1,15 to 1,35). Group III consisted of 7 coeficients (1.40 to 1,70) for complex jobs requiring some independence and creativity, and group IV, which required more independence and creativity in jobs, had 11 coeficients from 1,75 to 2,35. Group V was asking for high creativity and independence in work, and the range for 10 coeficients was from 2,40 to 3.00. Additional to that, there was a system of bonuses for special work conditions for particular working places (6 of them).

Such complicated set of coeficients and work awarding system for particular working places, practicaly gives the opportunity for two workers, who do the same job, with the same qualification level, but with the different coeficients in their work contracts and special work condition bonuses, to have a significantly different salaries, regardless their work results. It is obvious that the work awarding system was not motivating at all.

Besides the complication of the system itself, with many senceless differences for the same level of responsibilities in the plant, that kind of system significantly complicates the everyday work in plants, especially when it comes to internal transfer of employees from one working place to another, or from one plant (profit center) to another within the same factory because of the specific demands from the market or necessity of the work. It also complicated the way of calculating the salaries of each employee. So, it was common situation for the employee who was doing the same job, at the same working place, with the same work results, to have a different salary each month.

Also, becaues of a different coeficients for each particular working place, and because of temprorary transfer of employees from one working place to another, in the salary calculation for individual month ot was possible to find a „jungle" of coeficients calculated on the fourth decimal (for instance 1,1025 or 1,4175). That makes it more complicated because one could find even 50 (fifthy) different coeficient just for the range from 1,00 to 2,00, or even 59 coeficients for the range 1,00 – 2,85.

Since the valid Branch Collective Contract defines „salary for the month" for the average of 22 working days, because of the salary system it is obvious that company was paying their employees less money for 6 months (especially for February), and more money for other 6 months, and they were practically breaking the law.

Except the bonuses for better work given by individual foreman in the plant to particular employee on their working places, no additional motivation or stimulation system was introduced in the company.

3 NEW WORK AWARDING SYSTEM

Main goal of this change was to establish new work awarding system which will be much more simple, transparent, flexible and more appropriate to qualification framework and job difficulties at the particular work place. Also, it was necessary to establish such work awarding system which would meet all law requirements, such as obligatory minimum salary for minimal coeficient 1,00, obligatory bonuses connected to work condititons at work places and others.

First main change was to create work awarding system according to Branch Collective Contract, who already defined minimal salary based on coeficient for job difficulty 1,00, and not according to number of working days within the month. That kind of work awarding system made a positive change in several demands such as:

a. Salary is based on the coeficient which makes the basic salary for the same employee on the same work place, with the same work conditions and same work results, the same for each month, and that makes salary more stabile for the employee.
b. Branch Collective Contract demands are met in full for all 12 months in a year, and not just for the months which work days are 22 or more.
c. Stabile basic part of the salary gives the opportunity for more options for variable part of the salary.
d. Total coeficient of the salaries on the company level is balanced for each month, which makes planning of financial assets for salaries easier throughout the year.

Second main change was to create 7 main coeficients instead of 5 groups of over 50 coeficients. Those 7 main coeficients were set according to job difficulties on each level and working place, according to qualification standard required for doing the job on particular working place and according to number of employees who should have such a coeficient. Special attention was given to demand that basic coeficient should open space for more options for variable part of the salary, which should motivate and stimulate each employee to be more efficient and work in higher quality level, no matter is he working on individual working place or in a group. Those 7 fix coeficients were 1,00; 1,15; 1,40; 1,60; 2,00; 2,40; 2,70.

The third main change was to cancel all the existing contracts with employees, which were made on a certain coeficient for individual employee. That way, if it was necessary to move individual employee from one work place to another one because of market order demands or simply because organizational necessities, was very hard to do. New work contracts were prepared for each employee, with the fix coeficient, so they all started to „compete by more efficient work results" for the working places with higher level of difficulty and responsibility, because that was the only way to get higher coeficient and higher salary.

Fourth main change was to establish new motivation and stimulation system in a company.

4 MOTIVATION AND STIMULATION SYSTEM

To find out what motivates the employees in the company, the questionnaire with 22 questions was prepared. Top 5 motivating factors were established and they were: posibility of permanent employment, social conditions, human relations within company, free tima organization and satisfying salaries.

To meet those factors, and others which employees considered important, we established following motivation system:

a. Permanent work contracts were prepared for all employees, except for those who just started to work. But, for those employees the probation period was shortened.
b. Company will put effort to make social conditions of employees outside the company better, including permanent accommodation, quality transport to and from work, posibilities to enroll children in kindergardens or schools, etc.
c. Better human relations are based on better information flow. Also, some kind of team-building activites are suggested at least once a year on a plant or profit center level.
d. Acknowledgment for a good idea or suggestion, for work place improvement and for higher efficiency of work was established on 2 levels – plaque and financial award. Also, the institution of the „employee of the month" was established, with the bonus up to 20 % on

the salary. Employee of the month is considered to be sent to some kind of extra award activity, such as complementory higher qualification education, free seminars, free visit to the most popular fairs, etc.

The best way to motivate individual employee is to invest to human potentials within the company. Investment to human potentials is the posibility for each employee to progress in his own job, to the working place with higher level of responsiblity, which can satisfy more necessities of each employee. Therefore, company will organize seminars and courses for internal qualifications, send employees to schools to get higher qualifications, to get extra knowledgment, once every 2 years or even more frequently.

Stimulative factors of variable part of salary depend on work results of each employee established regarding time standards, quantity standards, quality standards and other demands created by market or by company. To establish such work results several different documents can be used such as work order, weekly, monthly, quarterly or yearly plans, due date plans or some other documents prepared to establish work efficiency of each employee.

Basically, stimulative part of the salary is the bonus on the salary in a percentage in which the employee was more efficient then required by set quantity in set time and set quality. Therefore, if the results achieved by employee are in the required time and required quality and better in quantity, that employee should be stimulated financialy in the same percentage to basic salary. The stimulation for employees at workng places in the plan, by the machines, was relatively easy to establish.

The stimulation for foremen, technologists and low-level managers directly connected to the work in plants, were directly bonded to results of the team they were managing or to the results of the all plant they were managing. Each of those employees is making some kind of plans, so their stimulation depends on the results over or under the plan they made.

There are working places in the plants who have quantity of products strictly set by order from the market. For these working places work results can be given in time for the set quality. That means, those employees can do some job quicker then required. Then the bonus on the salary can be given in financial means or in time (meaning, they could get extra free days or extra free time as a bonus).

There are working places for which exact objective measurements of their work results do not exist. For those employees (logistics, development, IT, human potentials, legal matters, etc.) direct manager is responsible to give some kind of evaluation, as objective as possible, on a monthly basis. But, there, as well as in the plant directly, every kind of rationalization is welcome, and it should be awarded by some bonus on a salary.

5 SOME RESULTS BY IMPLEMENTING NEW SYSTEM

The new work awarding system was impolemented in the company starting January 1st 2014, so it is still new. But, it already started giving some positive results. Here are some:

Table 1. Poistive outcomes of implementing new work awarding system into the company

Old work awarding system	New work awarding system
Salaries were calculated by work days in a month, so 4-5 months during the year lowest salary was bellow the minimum salary set by Branch collective contract. The salary was different each month, regardless work results	Salaries are calculated by responsiblities at the work place and qualification level, it is according to the law and it is balanced throughout the year, which allows employees and company to plan further in advance. For the same work results, salary is the same each month
36 basic coeficients (sometimes even up to 59 different coeficients calculated on 4 decimals)	7 fix coeficients as the calculating base for all employees

Everyting in the basic salary, so employees are not motivated to do better or more	Basic salary a bit lower, higher addition to salary within motivating and stimulating factors
Very low motivation among employees in the plants	Higher motivation so 70 employees got the same or a little bit lower salary (out of 590 employees in plants – 12 %), 50 employees got up to 5 % higher salary (8 %), 100 employees got 5-10 % more (17 %), 300 employees got 10-20 % higher salary (51 %), and 70 employees got more then 20 % higher salary
Working atmosphere was a bit low, since there was nothing to change it, no motivation	Working atmosphere is better, employees are more satisfied and motivated for better results
Productivity was almost constant and depended only on orders from the market	Productivity increased, only in primary sawmill it increased up to 10 % in first two months
Very difficult to transfer employees from one work place to another, fix contracts and coefficients prevent them to go to another work place in another plant	Easy to transfer employees from work place to work place, because salary depends only on their work results and motivation. Employees compete for higher valuated work place by their own results

6 CONCLUSION

The new work awarding system, with lower basic salary and higher motivation and stimulation variable part of the salary was created to motivate employees on all levels in the company to do better, in higher quality, to increase the productivity, and consequently to increase the results of the company all together, so the employess could feel it in their salaries. Each employee now much more depends on his/her own work results, he/she is better motivated, the satisfaction with his/her own work results and salary is increasing, which consequently helps company to grow and prosper on the market.

Productivity in company increased up to 10 % in average for all 4 plants, 88 % of employees received higher salaries as the result of their own work and involvment. Even the employees, who worked at the 100 % level, increased their work results up to 10-15 %, because now they are motivated and stimulated to do so. Employees in the plants are competeing by their results to be transfered to the work place with the higher level of responsibility to get higher basic level of salary. That competition itself can help increase the work results of the plants all together.

Satisfaction among employees increased, which is obvious in everyday conversation and communication on all levels, from employees on the work places by the machines up to medium and top menagement levels. Motivated, stimulated and satisfied employee is the only way for company to prosper and grow on the market nowadays. No plan and improvement can provide better results then satisfied and motivated employee.

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Authors' addresses

Prof.dr.sc. Denis Jelačić, e-mail: djelacic@sumfak.hr
University of Zagreb
Faculty of Forestry
Svetošimunska 25
HR-10000 Zagreb
Croatia

Josip Faletar, MSc.
Spačva, d.d.
Vinkovci
Croatia

Marko Previšić, BSc.
Vinkovci
Croatia

COMPETITIVENESS EVALUATION OF THE SLOVAK FOREST INDUSTRY

Martina Kalamárová, Ján Parobek, Erika Loučanová, Peter Trebuňa

ABSTRACT

The paper deals with competitiveness of the Slovak forest industry and the explanation of comparative analysis as a tool for analysing the competitiveness of the forest industry (especially the most important wood products as sawnwood, wood base panels and paper) among different countries. We apply a comparative analysis of the primary wood products´ prices in the foreign trade. For this purpose price levels of Slovak trade partners were expressed relatively to price level of Slovakia. The results confirm the competitiveness of the wood processing industry as a sector in the national economy, as well as the position of the chosen wood products on the European market.

Key words: forest industry, comparative price levels, foreign trade.

1 INTRODUCTION

The issue of competitiveness of countries in world markets is the most recent theory, which is base of the international trade and economic growth. This theory represents new aspects of innovation, realistic utilisation of resources and economic development compared with classical and neoclassical theory of international trade. With new theory approaches of international trade occurs a new perspective on classical and neoclassical comparative advantage, which is based on the principles of comparative costs. In this theory Krugman (1986) specifies intra-sectors trade as a representative form of trade among countries. On the other hand there is Heckscher, Ohlin (1991) theorem, which is based on common identity of each country's factor than comparativeness or differences. On the one side the comparative advantage can be define as quantitative understanding of the production factors and goods, on the other hand, competitive advantage is mainly defined in terms of qualitative factors. Bobáková a Hečková (2007) analysed in their paper the competitiveness of manufacturing industry, where they divided the markets into four segments based on the indicators of the competitiveness and analysed the competitiveness of industry for each of them. Forest industry has a several evident comparative advantages in comparison with the other sectors. For instant, enough inputs based on renewable resources, or the possibility of using recycled material. From the perspective of the national economy, this sector is able to utilise high proportion of input based on domestic resource (Lagana et al. 2008).

At the present time significant changes in the political, social and economic areas are reflected in the use of domestic renewable resources. Wood production has a long tradition in the Slovak Republic. Nowadays wood as a significant renewable resource is closely linked with many other sectors of the national economy. Competitiveness of each sector depends on the process of restructuralisation and modernisation of production facilities as well as the process of specialisation of production (Palus, Supin, 2004).

2 METHODOLOGY

A method of the research is a systemic, comparative and logical analysis of the comparative price level. Comparative price level for the analyses is defined as the ratios of purchasing power parities to market in each analysed country. The main trade partners of Slovakia, as Austria, Poland, Germany, Hungary and the Czech Republic were analysed during processing the research. The results give a measure of the indicators of price level differences across analysed countries and tell us how many currency units a given quantity of wood products in different countries. Using this methodology is necessary convert expenditure expressed in national currencies and to eliminate the effect of currency among countries. International FAO databases were used to count over prices in the US dollars. Purchasing power parities are obtained by comparing price levels (CPL) for a basket of comparable quality of wood products (sawnwood, wood – base panels and paper), that are selected to be representative of consumption patterns in the various countries. Purchasing power parities make it possible to produce meaningful indicators (based on either price or volume) required for cross-country comparisons, truly reflecting the differences in the purchasing power of.

Material necessary for processing this paper was obtained in secondary research, based on analysis of the available scientific literature and internet sources, which discussed the issue of sectors and countries competitiveness.

Price level indices may be used as a starting point for analysing price convergence, therefore the coefficient of variation of price level indices across any number of countries (in that paper for main trade partners of the SR) is calculated. A decreasing coefficient over time indicates that price levels are converging. Eurostat (2014) publishes an annual estimate of price convergence based on the temporal development of the coefficient of variation. Comparative price levels are calculated as:

$$CPL = E_{OC}/E_{SR} \qquad\qquad [1]$$

where:
E_{OC} - export price of wood products produced in the other country as the SR,
E_{SR} - export price of wood products produced in the SR.

This analysis has been applied for forestry industry. The following categories of wood products were analysed:
- sawnwood, coniferous and non-coniferous,
- wood base panels,
- paper.

CPL indices for the Slovak Republic trade partners are expressed relative to the average price level for the Slovak Republic. If the price level index of a given countries is above 100 %, then prices in that analysed country are, on average, higher than in the SR as a whole. On the other hand, a price level index below 100 % shows that prices are, on average, lower than in the SR as a whole:
- if CPL ≤ 1 the competitiveness of compared country is higher than the competitiveness of the Slovak republic
- if CPL ≥ 1 the competitiveness of the Slovak Republic is higher than the competitiveness of compared country

3 RESULTS

Based on the data of Eurostat (2014), foreign trade prices of analysed wood categories were calculated according to the methodology. Price levels of main Slovak trade partners as Austria, Poland, Germany, Hungary and the Czech Republic were expressed relatively to price level of Slovakia, which represents the average price level, i.e. absolute number "1". If the price level index is higher than value 1, the country is considered to be relatively expensive compared with Slovakia and conversely, if the price level index is lower than value 1, then the country is relatively cheap in comparison to Slovakia.
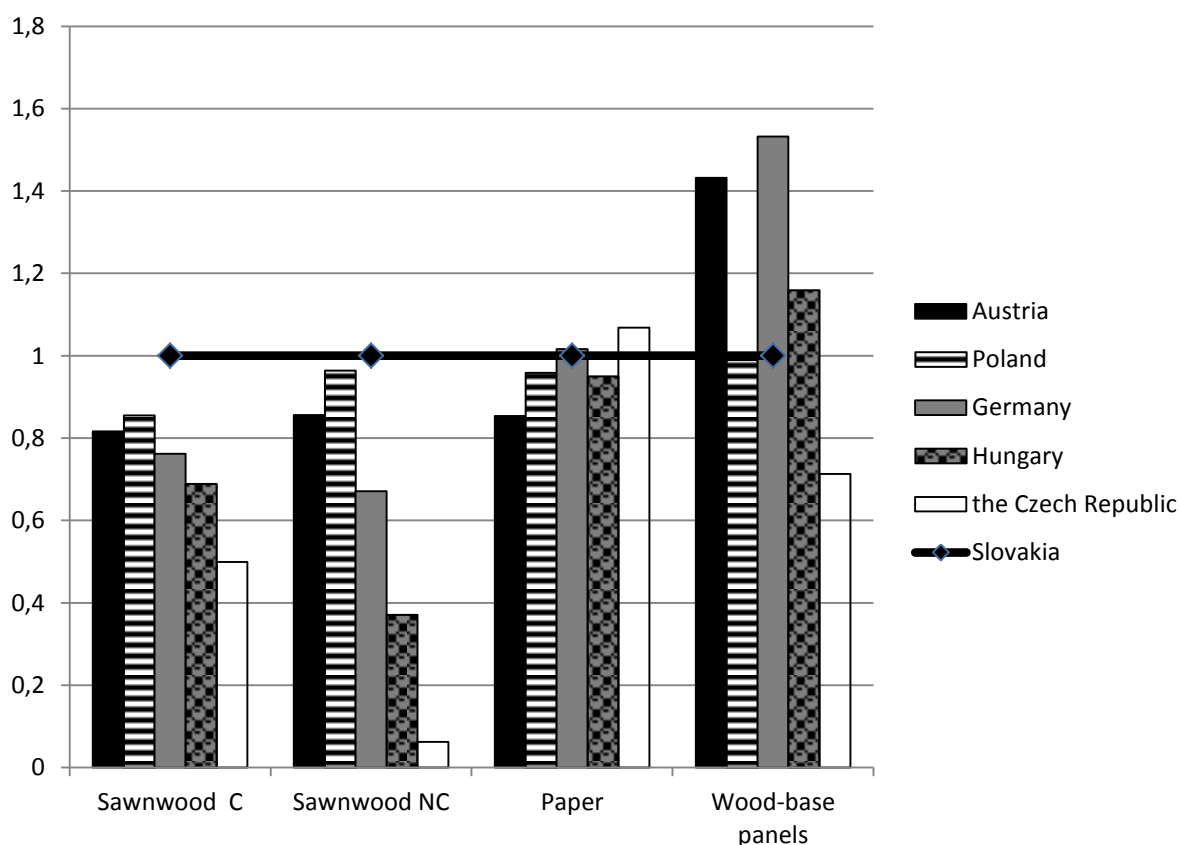
Figure 1. Comparative price levels of sawnwood (coniferous and non-coniferous), paper and wood-base panels
Source: Own elaboration

Price levels of Slovakia trade partners are expressed relatively to the average price level of Slovakia. The price levels of sawnwood, coniferous as well as non-coniferous, are under the average price level (i.e. 1), what means that the prices are lower than in Slovakia and it points out that all analysed countries are more competitive in sawnwood export than the Slovak Republic. The figure 1 illustrates levels of sawnwood, paper and wood base panels foreign trade prices.

Among the analysed countries the Czech Republic has the lowest prices of the sawnwood, 50 % below the average for coniferous sawnwood and 94 % below the average for non-coniferous sawnwood. This implies that the Czech Republic has the highest competitiveness in export of sawnwood from all analysed countries.

With regard to price levels of paper, the price levels of all analysed countries are almost at the same level, even Germany has the same price levels as Slovakia and only the Czech Republic shows higher prices than Slovakia (7 % above Slovak price). This trend implies that all analysed countries have

the same level of competitiveness in average, except mentioned the Czech Republic with higher competitiveness.

Significantly above the average are prices of wood base panels. The prices differ from 16 % above the average at Hungary to 53 % above the average at Germany. Only the Czech Republic´s prices of wood-base panels are below the average at the level of 29 % below Slovak price. Based on these results of price levels the Czech Republic shows the highest competitiveness in export of wood base panels.

4 SUMMARY

The price level of analysed wood products is a widely used and important concept in forestry and its determination is one of the most important tasks of forest statistics. The paper deals with the analysis of foreign trade prices for wood products of the Slovak Republic and the main trade partners, as Austria, Poland, Germany, Hungary and the Czech Republic. Price levels of Slovak trade partners were expressed relatively to price level of Slovakia, which represents the average price level. Price levels were applied for wood processing industry especially for chosen wood products (sawnwood, wood – base panels and paper).

This article highlights the different foreign trade prices for wood products in the Slovak republic and their trade partners. An understanding of the differences in price levels of wood products is important in the comparison of economic data, because higher relative prices could make an economy look healthier than it really is. Observing price level differences is also important in the analysis of the development of the EU's single market for goods and services.

In 2013, price levels for wood products differed widely across analysed European countries. Wood products consist of many different categories, like sawwood, wood base panels (OSB, MDF etc.), as well as group of chemical wood product (pulp and paper) and energy products, differences in tree species, wood quality causes also great variation in categories and then in price levels in every country.

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Aknowledgement

Authors' addresses

Ing. Martina Kalamárová, PhD., e-mail: martina.kalamarova@tuzvo.sk
Ing. Ján Parobek, PhD., e-mail: parobek@tuzvo.sk
Ing. Erika Loučanová, PhD., e-mail: loucanova@tuzvo.sk
Department of Marketing, Trade and World Forestry
Technical University in Zvolen
Masarykova 24
960 53 Zvolen
Slovakia

Assoc. Prof. Peter Trebuňa, PhD.
Department of Industrial Engineering and Management
Faculty of Mechanical Engineering
Technical University in Kosice
Nemcovej 32
04 200 Košice
Slovakia

ARCHITECTS AND WOOD AS A CONSTRUCTION MATERIAL: A CASE OF SLOVAKIA

Vladislav Kaputa, Hubert Paluš

ABSTRACT

This paper deals with the attitudes of architects towards wood as a construction material and towards wood-based constructions in general. It presents selected results of a pilot survey based on the questionnaires carried out on the sample of active Slovak architects. Using a structured questionnaire the architects were asked to express their attitudes towards wood. The topics introduced in this paper relate to a typology of buildings and examine what is the role of wood as a construction material in projecting of architects as well as to their preferences towards different construction materials in projecting residential buildings.

Key words: architects, wood, construction material, buildings.

1 OBJECTIVE AND METHODS

The construction of wood framed houses has been showing an upward trend in Slovakia, but the market share is at a very low level comparing to substitutive building materials. Small country which produces over 5,2 mil. cubic metres of industrial timber (Parobek et al., 2011) has for decades unused potential to produce high value-added products what wooden buildings and constructions definitely are.

The objective of this paper is to examine attitudes of architects towards wood as construction material and towards wood-based constructions generally. It presents selected results of a pilot survey based on the questionnaires spread out within a sample of the active Slovak architects.

A structured questionnaire contained closed questions. The answers were structured in a 5-points Likert scale. Except of the age, no demographic data were gathered. The data about age were gathered to find out if any differences in attitudes between generations of architects could be found. The content of the questionnaire, terms and key issues had been pre-discussed with an architect from academic environment. It resulted in determination of the following topic:

- Typology of buildings (introduced in Figure 1), where architects marked how often they project wood as a construction material for every type.
- Preferences for different types of construction materials in projecting of residential buildings. Alternative materials (straw, clay, wood pulp, cork, and wool) were also surveyed among other/classic materials (as brick, concrete, wood).
- Recent state of wood-based constructions' building in Slovakia.
- Level of knowledge about the utilisation of wood in architecture provided during university studies.
- Quality of cooperation between the architects and constructors in building of wood-based constructions
- Qualitative evaluation of different attributes of wood as a construction material.
- Preferences for using certified wood (from sustainable managed forests) in wood-based constructions.

The paper discuss about the results of selected (first two over mentioned) issues of the study.
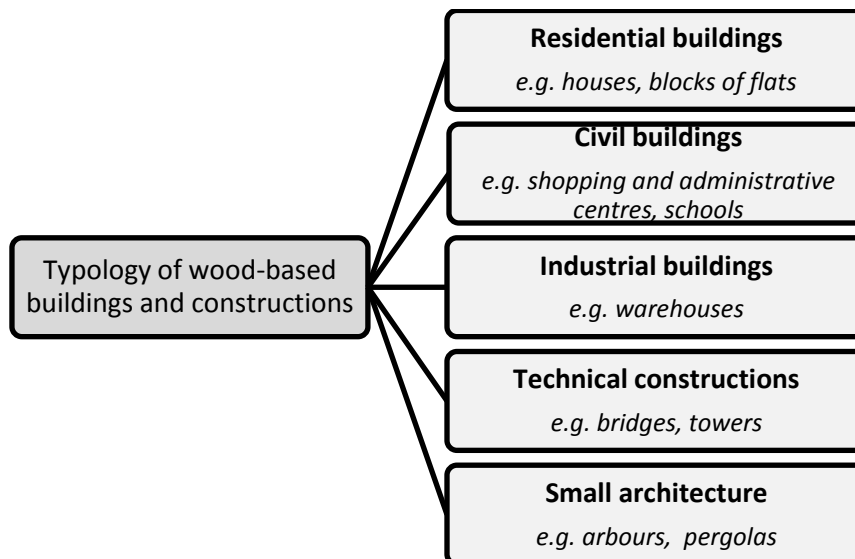
Figure 1. Typology of buildings

The survey was transformed to electronic version and distributed electronically using Google Drive Service. Personal contacts were used to spread out questionnaire among the architects. The obtained data were processed using frequency analysis due to the obtained sample size.

2 RESULTS

This pilot study was carried out by means of an e-mail survey among the Slovak architects. The survey process included just one survey mailing where a link to online questionnaire was spread out within personal contacts of the architect from academic sphere. Completed responses were received from 25 respondents and after reducing of one-not fully filled questionnaire, the final sample consisted of 24 respondents.
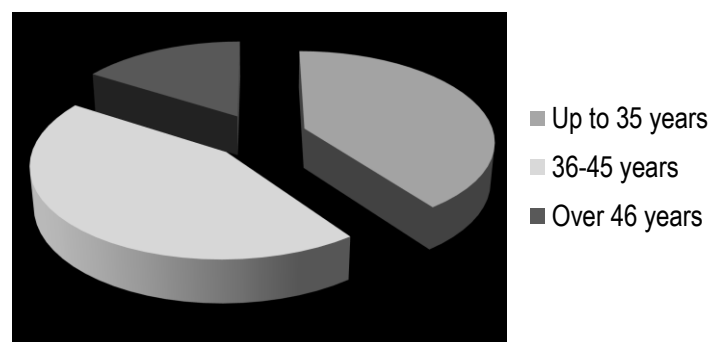
Figure 2. Age structure of respondents

This sample consisted of 40% of respondents up to 35 years old, 44% of all are between the age of 36-45, and 16% over 46 years old (Figure 2). The paper describes just the relations between the answers and first two age groups of respondents due to the low number of respondents over 46 years old. The sample size has been maintained.

Projecting of wood in different categories of buildings or constructions

Figure 3 shows in which category of buildings or constructions the architects use wood as a construction material in their projects and what is their share. Regarding the interpretations of the results it needs to be pointed that not every responded architect had professional experiences (order) with projecting specific category of building or construction.
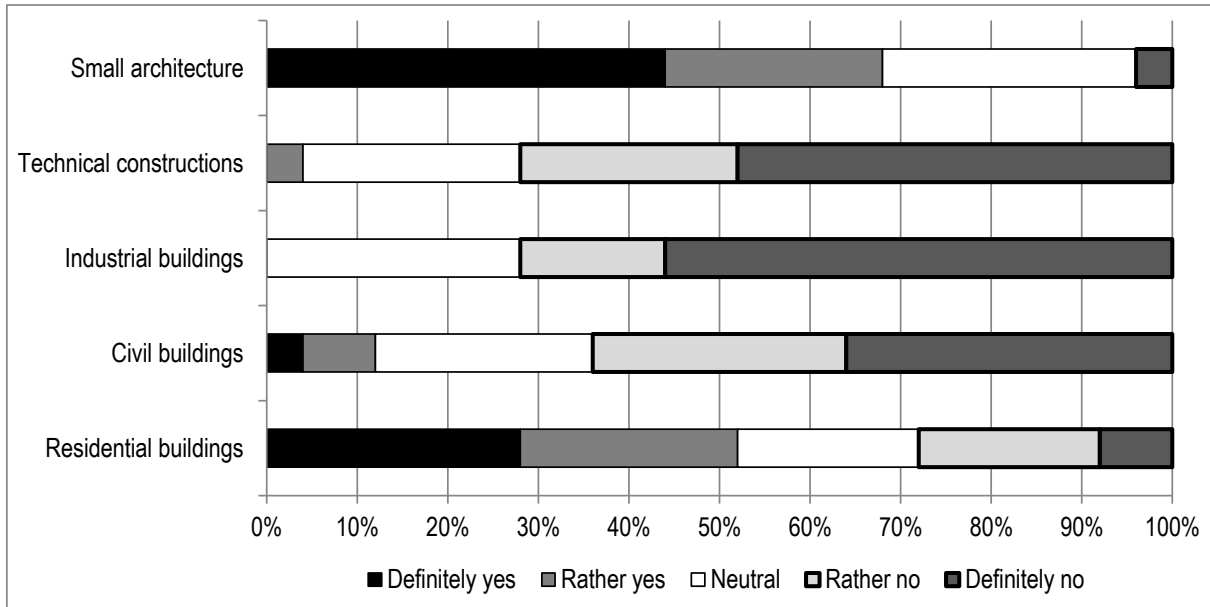
Figure 3. Categories of buildings or constructions where the architects use wood as a construction material in their projects

Wood is most frequently applied in small architectures as garden arbours, pergolas, marquises, sheds and porches etc. Up to 68% of respondents utilised wood in such projects. Moreover, in this category, there was the highest share of marginal positive attitudes (definitely yes) and only 4% of negative answers. Residential buildings represented the following category where up to 52% of the respondents incorporated wood as a construction material. The opposite situation was in projecting of wood in technical constructions and industrial buildings. Up to 72% of respondents did not design wood as construction material here at all. The industrial buildings even had not any representative use of wood in their projects. Generally, for this region of Europe, a potential seems to be also hidden in the application of wood in civil buildings, but the results of pilot survey do not support this idea since only 12% of architects apply wood in their projects. Considering 64% of negative answers the question is if the government, regional authorities (e.g. self-governing regions), NGO's or the market should solve this issue.
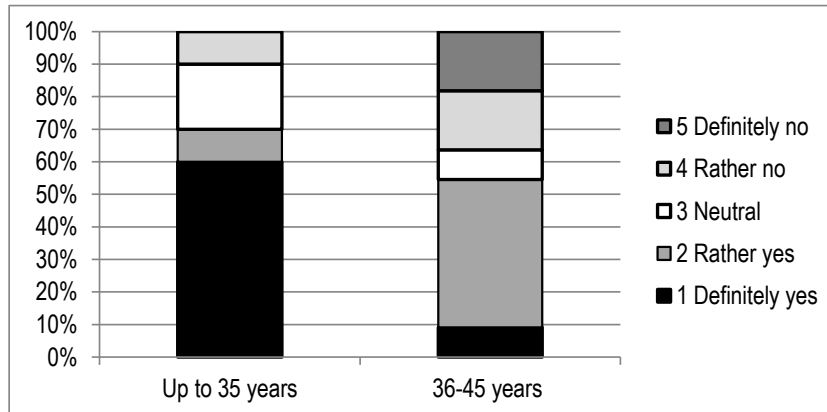
Figure 4. Projecting of wood in residential buildings according to the age groups (without the oldest group)

The difference between the two selected age groups of architects is shown in Figure 4. Up to 70% of the younger generation was projecting wood in residential buildings while 60% expressed it marginally – definitely yes. An older generation (36-45 years old) did not present such a marginal attitude and together about 55% of them design wood as construction material in their projects. Further comparisons also indicate this difference between the both generations, especially in a case of civil buildings and small architectures. In case of technical constructions and industrial buildings a younger generation had at least lower share of respondents with negative attitudes.

Preferences for different types of construction materials in projecting residential buildings

Frequency analysis pointed out the fact that a brick is undoubtedly the most favourite material used in residential buildings among the responded architects with a share of 80% (Figure 5). The brick material is followed by concrete and aerated concrete (44% of preferences) and wood and wood products (28% of preferences) while both of these two materials (concrete and wood) have the same share of negative attitudes (28%).
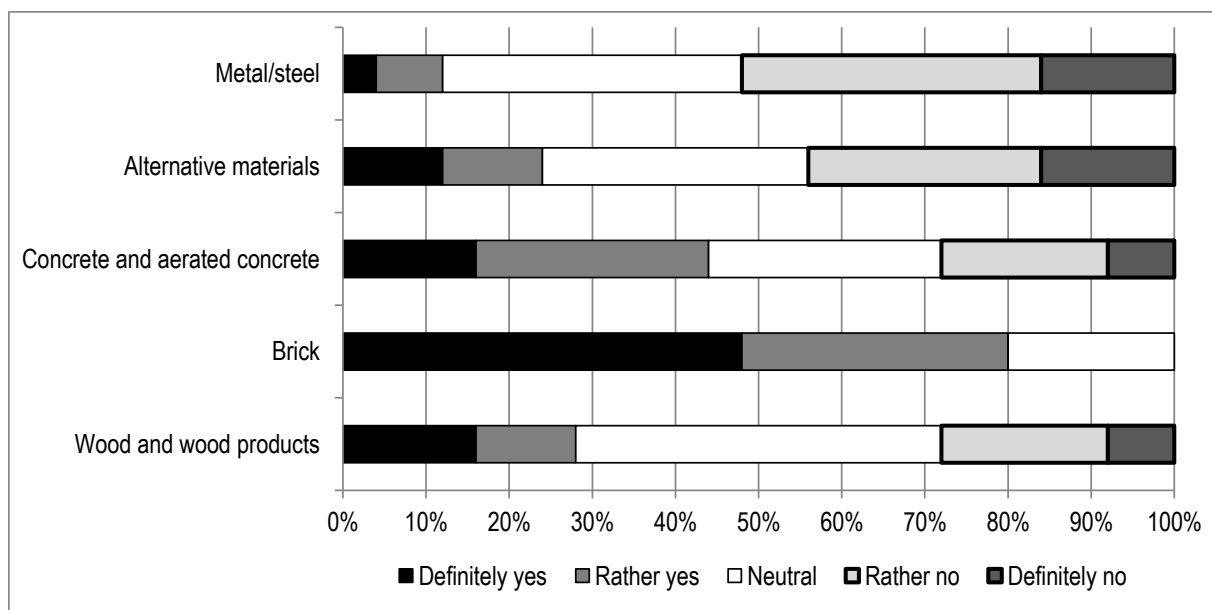
Figure 5. Preferences for different types of construction materials in projecting residential buildings

Alternative materials (as straw, clay, wood pulp, cork, and wool) seemed to be products for niche markets (probably not just in the case of residential buildings), but with a share of 24% they are not significantly less preferred by respondents comparing to wood. Metal as a material is rather important in other than residential buildings.

3 CONCLUSIONS

Based on the study results and reflecting the development on the market, following comments can be concluded. Alternative materials (often combined with wood) as rediscovered natural products are slowly finding their place on the market and should be targeted at specific users segment usually represented by young families living close to nature or by individual innovators.

Wood products appointed for building purposes have recently probably the best opportunity to attract architects (besides the small architecture applications) in the field of residential buildings. In spite of that fact there is still an undiscovered potential of wood to become much more favourite material of Slovak architects also in other categories of buildings. For example, foreign countries with a similar rich share of wood resources show us that a great potential is within the category of civil buildings such as schools, kinder gardens or health, administrative, holidays and cultural centres. Those countries are examples of good practice and, unfortunately, too long a kind of benchmark how to utilise renewable resources in a way beneficial for the local economy and responsibly to the environment and the society.

Considering the results of the pilot study, the following predictions for future research could be formulated. The results suggest that there are differences between generations of architects in the attitudes towards wood as the construction material. It would be interesting to verify if the difference lies in the experiences or in work routine and habits. A future research should go further in investigation of relationships between the architects and investors to find out what is the role of architects in negotiations and decision making about the chosen materials. Consequently, their potential to promote wood and wood products on the Slovak building market should be assessed. Further, barriers for larger utilisations of wood as a constructive material should be identified and solutions how to overcome those barriers should be suggested.

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Acknowledgement

Authors' addresses

Ing. Vladislav Kaputa, PhD., e-mail: kaputa@tuzvo.sk
doc. Ing. Hubert Paluš, PhD., e-mail: palus@tuzvo.sk
Department of Marketing, Trade and World Forestry
Faculty of Wood Sciences and Technologies
Technical University in Zvolen
Masarykova 24
960 53 Zvolen
Slovak Republic

IMPLEMENTATION OF THE CONCEPT OF COMPETENCIES IN WOOD-INDUSTRY SECTOR

Jože Kropivšek, Matej Jošt, Anton Zupančič

ABSTRACT

Education and training of employees is the key to ensuring their competence for the job, which in turn leads to their increased motivation and greater efficiency and quality of work. Broader and yet more in-depth knowledge and enhanced skills of employees are also key to ensuring innovation in the development of the company (and industry), the search for new and better solutions and increasing competitive advantage. It leads to more agile business. The study is therefore based on a conceptual model development for key jobs / profiles and verification of the model in practice. For this, the method of personal evaluation with evaluation form was used. The analysis included 817 employees from several Slovenian wood-industry companies. The results show the most important deficits in competencies for key jobs and profiles, what was the basis for developing appropriate training plan for them.

Keywords: competence, wood-industry sector, training plan, learning organization.

1 INTRODUCTION

Training and education of employees is very important at ensuring their competence for the job, which in turn leads to their increased motivation, greater efficiency and quality of work. Broader and more in-depth knowledge and greater competencies of employees are key to ensuring innovation in the development of the company (and sector), search for new and better solutions and increase competitive advantages. In that manner also reward systems, career tracks, selection systems, and the structure of organizations need to change to focus on competencies; in the global competitive environment the competency-based approach and the capabilities that individuals need to acquire and develop should be the major focus (Lawler, 1994).

Competence is understood as "knowledge, ability, dexterity, know-how, experience and other personal characteristics necessary to successfully performance of specific tasks" (Svetlik, 2005). The concept of competency can include the traditional knowledge, skills, and abilities, but also go beyond these characteristics. Specifically, effective performance includes not only capability, but also the motivation or desire to perform (Woodruffe, 1992). Kochanski (1996) offers a simple description of competencies as the success factors in an employee's organization and profession. Similarly, Kennedy and Dresser (2005) recently defined competencies as anything employees have or acquire that contributes to organizational success. In sum, employee competencies are characteristics associated with successful performance (Cardya, Selvarajanb, 2006).

In the literature, competencies are classified into several categories / groups (Kohont, 2005, Cardy, Selvarajanb, 2006, Thornton and Byham, 1982; Dulewicz, 1989). For the purposes of this research, we designed the following sets of competencies:
- generic competencies are transferable and are not tied to a specific job or task,
- professional competencies are linked to formal education and

- job-specific competencies are related to business, organizational and technological requirements or restrictions on individual jobs.

With the term competency the phrase competency model is often used in the literature. Mansfield (1996) defines competency model as a detailed and behaviourally specific description of the characteristics employees need to be effective. A competency model might be considered as a set of competencies associated with a job or role in an organization.

In addition to establishing competency model, its efficient implementation in practice is also very important too. Implementing employee competencies requires that they are used as standards which drive employee evaluation and development. If the competencies are really to make a difference in the day-to-day routine of how the work of the organization is performed, they need to be translated into criteria for assessing and developing employees (Cardya, Selvarajanb, 2006). In practice, this means ensuring the so-called learning organization, which includes continuous, lifelong learning of all employees. Learning, for both individuals and the entire organization, covers the knowledge gained at different stages of (formal) education and skills gained through various forms of (informal) training (Možina et al., 2002). Effective implementation of competencies into practice is closely associated with the concept of business agility, which means the ability at adapting the organization to changes in the environment quickly and effectively. It corresponds to the concept and mentality of "agile", adaptable, learning, committed and self-motivated people who are ready to participate, to take innovation and look for opportunities for their contribution to the success of the company (Narasimhan, Swink, Kim, 2006).

Providing agility is often a problem in practice, mainly because of the low level of knowledge and/or inadequate competencies of employees. This is a major obstacle in the wood-industry companies, where the basic educational structure is relatively low (Kropivšek et al, 2009). Competency model development for the wood industry is therefore necessary, but its implementation in job classification and human resources management (HRM) is even more important. In the framework of a larger project (Kropivšek et al, 2013) a sectorial model of competence for wood-industry were developed, which covers the needs and diversity of large, medium and small companies and considers the specifics of their activities.

The purpose of the article is to check the state of competencies at various jobs and profiles based on competency model and to provide required content of education and training to improve identified lack of competencies at different jobs and profiles.

2 METHOD

Based on competency model for the wood-industry sector a thorough analysis of the achievement of competencies for different jobs and profiles was performed and designed according to the level of complexity and similarity of tasks and duties in the workplace:

    Profile 1 - Production workers on simple and less demanding jobs in the woodworking industry,
    Profile 2 - Joiners and operators of complex woodworking machinery and technological lines,
    Profile 3 - Leaders of organizational units and groups in woodworking production,
    Profile 4 - Technologists, designers and constructors of wood products and furniture,
    Profile 5 - Purchase and sales commercialists of wood products and furniture,
    Profile 6 - Middle and top managers and professionals in other fields.

The lack of competencies of jobs and profiles was measured with the method of personal evaluation using the evaluation sheet / questionnaire, which was implemented in MS Excel using macros in order to manage the complexity of the model effectively and later easier analysing. It was sent to 18 wood-industry companies of different sizes, in which 817 employees from all profiles were analysed.

The evaluation sheet was designed to investigate the level of achievement of competencies of each employee. In the evaluation phase, the evaluators are enrolling in the form currently level of development of individual competencies. Level of development of individual competence was graded from 1 to 4:

Grade 1 - Competence not reached
Grade 2 - Competence partially reached
Grade 3 - Competence mainly reached
Grade 4 - Competence reached in full-range

The evaluation process was conducted by HR manager with the participation of at least one professional co-worker (in most cases, a leader of the evaluated employee).

In the analysis, as a criterion for determining the achievement of competencies, the relative proportions of individual assessments of all assessments were used. It is shown in the following formula:

$$\% \text{ of grade X} = \frac{\text{number of grades X}}{\text{total of all grades}} \cdot 100$$

Legend:
% of grade X   - relative share of individual grades (scale of 1 to 4) of all grades for competency
number of grades X - the number of individual grades (scale of 1 to 4) for the evaluated competency
total of all grades   - the total number of grades for evaluated competency

$$\% \text{ of grade 1} + \% \text{ of grade 2} + \% \text{ of grade 3} + \% \text{ of grade 4} = 100\%$$

The relative share of ratings 1 and 2 have been grouped, because both represent a deficit or strong non-achievement of expected level of competence, what was then the source data to develop a training summary plan for profiles. For this purpose, the matrix of training-competence for each profile was used.

3 RESULTS AND DISCUSSION

Evaluation of employees' competence in Slovene wood-industry companies was conducted in April and May 2013. It involved 817 employees from 18 companies, of which 592 (70%) were men and 225 (30%) women. The average age of the evaluated worker was 42 years. The base unit of further analysis represent profiles or jobs. Figure 1 shows the number of evaluated employees according to different profiles.
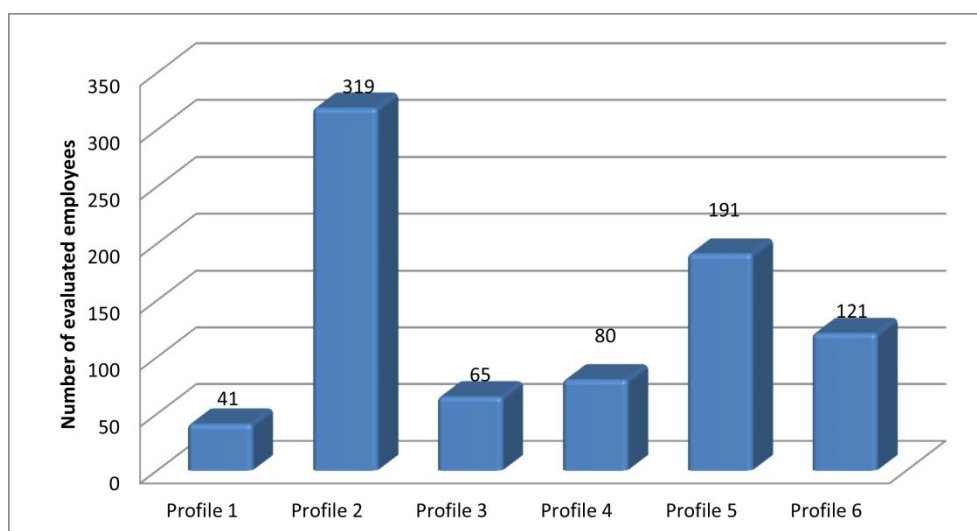
Figure 1. Number of evaluated employees by profiles (n = 817)

The achievement of the level of all 91 competencies within the three different sets were assessed in the analysis. It was found out that the share of grades 1 and 2, which represent a deficit or strong non-achievement of expected level of competence, was the highest on average in the generic competences (37.2%), while the highest value of grades 1 and 2 belongs to one competence within the set of professional competences. In the frame of professional competence set there was the highest number of different competences and the median of this set had the highest value.

From the content point of view, within the set of generic competences the biggest lack of competence was in foreign languages, health protection and safety at work and the (team) work management and organization. Within the set of professional competences marketing and sales competencies, competencies associated with the use of specialized software tools, project management and business process management were exposed. In the case of job-specific competences, the largest deficit was found in competencies related to the energy efficiency products evaluation and restoring of wooden cultural heritage.

Furthermore, the achievement level of all 91 competencies according to the profiles and jobs were determined. An example of the assessment for achievement of different competencies for profile 1 is presented in Table 1.

Table 1. An example of achievement of different competencies for "profile 1" (Production workers on simple and less demanding jobs in the woodworking industry)

ID_KOM	COMPETENCY (is trained for)	Profile 1 Share of grades 1+2 together
2	decision-making and problem-solving	42.4
5	quality control	46.3
7	communication	36.6
9	health protection and safety at work	58.5
10	environmental protection	19.5
11	preparation of job	71.1
12	perform simple work in the production	66.7
13	perform less demanding work in the production	69.6
14	basic maintenance of work equipment	43.9
16	implementation of internal transport (eg pallet trucks, forklifts, cranes, etc.)	37.5
23	quality control in production (selfcontrol, interphase control)	100.0

With the decline of large-scale production in the past, wood-industry companies has to change their internal structure in terms of increased agility. This is most obvious at blue-collar workers (Profile 1 and 2), who has to have developed wide competencies to perform work in different jobs, so-called multitasking competency. A large part of these competences is related to technical and computer skills. Due to the circulation of production workers between different jobs, the need for the acquisition of competences from the field of ecology, health protection and safety at work has also increased.

Leaders of organizational units and groups (profile 3), in addition to technical and technological competences must also have competencies concerning leadership and organization. Due to the increasingly "fragmentation" of the production, as a result of requirements for increased range of products and reducing size of the production lots, competences from operational (resources) planning of production, technological optimization and complex technological problems solving are very important. It was found out that employees who have been classified in profile 3, have in particular a lack of competence in the field of leadership and organization, business process management, the use of specialized computer skills, legislation and standardization. The analysis shows the need for additional trainings for CNC technology management and performance of complex manufacturing activities.

Profile 4 represents a very heterogeneous group of professional staff, therefore a set of competencies that were evaluated for this profile is also very wide. According to the fact that working on projects is increasing in a sector, it is not surprising that the analysis indicates the need to develop competencies for project work, both in terms of their management, implementation and monitoring. Linked to the project work, which is often carried out abroad, the expressed need for upgrading language skills is reasonable. Also, the expressed need to develop skills for working in a team is understandable, since the development of both products and technologies is typically organized as teamwork. The need to develop competencies in the field of safety at work is related to the fact that technologists and developers are tightly involved in the technological development of the production process. The knowledge of risk management at work is crucial for ensuring safety of production workers.

As it was expected the results for the profile 5 show the need for upgrading the language and communication skills. An important segment of the results represent the lack of knowledge in the field of online marketing (e-commerce management, development and maintenance of websites), the use of special computer software tools, and information and communication technologies (ICT) and services. Especially in smaller companies the role of sales staff is often associated with the field of technology and production, so the employees from that profile should also have some competencies from that fields. The analysis for profile 5 also shows a need to develop skills in leadership, organization and planning, teamwork, ecology, health protection and safety at work.

Profile 6 combines the most diverse professions, as it includes middle and senior managers and professionals of other fields (finance, accounting, HRM, informatics, quality etc.). Competencies assessed for this profile are very heterogeneous. The largest deficit was observed in the competences of planning, leadership and organization, teamwork and language skills. The need for development of competences in the field of environmental protection and evaluation of opportunities for reducing environmental impacts should be understood as required trainings of responsible employees to activate their engagement in sustainable development contents.

To achieve greater transparency of the training plan, the single trainings were combined into six areas: (1) professional knowledge, (2) computer skills, (3) foreign languages (4) soft skills (5) ecology and safety at work, and (6) conferences and fairs. Table 2 shows the classification of the trainings for these areas according to the number of planned inclusions in trainings.

Table 2. Planned number of inclusions in different training areas by profiles

Training area (planned number of inclusions)		Profiles						
		Profile 1	Profile 2	Profile 3	Profile 4	Profile 5	Profile 6	Total
1	Professional knowledge	41	324	90	94	229	173	951
2	Computer skills	1	179	24	58	156	88	506
3	Foreign languages	0	11	11	35	125	58	240
4	Soft skills	1	13	38	25	157	80	314
5	Ecology and safety at work	90	860	94	85	105	79	1313
6	Conferences and fairs	0	0	1	1	1	10	13
	Total	133	1387	257	297	772	478	3324

The training program is very comprehensive and covers 3324 inclusions of employees from wood-industry companies of different sizes. Overall, we can conclude that the highest values of included employees is for the trainings in the field of environmental protection and safety at work. These trainings are provided primarily for production workers (Profile 1 and 2), which are due to their nature of work, highly exposed to danger at work and have a direct impact on the environment with their activities, so the development of their environmental awareness is very important. The next there are professional trainings, which are crucial for high quality and efficiency. The increasing role of information and communication tools and services at ensuring of effective business, requires a number of trainings from this field, which are different regarding to the depth and complexity of content for different profiles. Soft skills and foreign languages are especially important for profiles 3, 4, 5 and 6. In these profiles it is very important to ensure knowledge of leadership and communication on the one hand, and active speaking of (more) foreign languages, as a result of involvement in global business networks, on the other hand.

4 CONCLUSION

A detailed analysis of the achievement of competences for jobs and profiles has been carried out, based on competency model for wood-industry sector. The main focus was on deficits of competencies. It was found out that the companies, included in the study, have a relatively small proportion of unskilled employees (15%), which is quite below the sector average (compare with Kropivšek et al, 2009). This gives the studied companies sufficiently good basis for further improvements in the learning organizations and / or for the introduction of a competence model into the practice. The largest deficits of competencies have been identified in the area of professional knowledge, environmental protection and safety at work, which was expected due to production orientation of wood-industry companies. Therefore, in these areas over 2/3 inclusions are planned, especially for blue-collar workers. Many inclusions is planned for profile 2, due to a larger number evaluated employees within this profile, and their larger lack of certain competencies on the other hand. Many inclusions are planned in sections 5 and 6, slightly less in the other three profiles.

It can be concluded that the competencies in Slovenian wood-industry companies are relatively well developed, but in certain areas, there is a lot of space for improvements. Special emphasis should be put on upgrading professional knowledge in all fields of work, on foreign languages, basics knowledge of information technology and communication, and leadership skills for managers/leaders. Only with the systematic measurement of deficits of competencies, development of appropriate training and their implementation in the context of a learning organization, the wood-industry companies should be able to perform agile operations, achieve higher added value and business success.

Acknowledgments

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Authors' address

Assist. Prof. Jože Kropivšek, PhD., e-mail: joze.kropivsek@bf.uni-lj.si
Assist. Matej Jošt, PhD.,
Anton Zupančič, BSc.
University of Ljubljana
Biotechnical Faculty
Department of Wood Science and Technology
Rožna dolina C. VIII/34
1000 Ljubljana
Slovenia

COMPETITIVENESS VS. GREEN ECONOMY? CONFRONTING TRADITIONAL AND "GREEN" INDICATORS OF THE COMPETITIVE POSITION OF THE FOREST – AND WOOD-BASED INDUSTRY IN POLAND

Wojciech Lis, Leszek Wanat

ABSTRACT

Research on competitiveness has now become extremely fashionable and this applies not only to economic sciences. The notion of competitiveness has also made a spectacular career in the scientific literature. The pro-competitive research perspective become more significant in the context of economy based on knowledge. The traditional view of competitiveness is confronted, on one hand, with innovative economy and with more and more significant so-called green economy on the other hand. The discussion relates to development and determinants of competitiveness also in relation to the economy trades and sectors. Referring both to theoretical assumptions and a case study, this paper constitutes a reflexion upon trends of research on competitiveness of a trade based upon forestry and timber, which is located nearly in the very centre of green economy.

Key words: competitiveness, green economy, forest- and wood-based industry, mesoeconomics.

1 INTRODUCTION

The forest- and wood-based industry is a special sector of economy. Both ecological and economic problems interpenetrate within it. In the light of the power energy crisis and, recently, the world financial crisis, they challenged the traditional model of economy. They discerned a need to look for economic growth scenarios based on the so-called green path of development. Questions have arisen relating to social responsibility of the present generation for conditions and quality of living of future generations. The Polish and foreign literature tackles issues relating to various aspects of green economy relatively frequently. The studies are more and more reproductive than scientific character. The research on processes in the forest- and wood-based industry is also still dominated by economic practice needs over theoretical reflections.

The notion of sustainable development originates straight from forestry. It was coined by Hans Carl von Carlowitz. Originally, the notion characterised the method of development of forest resources involving harvesting of only such quantity of trees (timber) for production purposes, which can be naturally renewed. They meant to preserve natural ability for renewal of forest area in order not to allow for destruction of forest. The concept propagated (at the beginning of the 19th century) by German-speaking academic centres, was adopted in Europe as *Sustained Yield Forestry*. The term "*sustainable*" was adopted by the ecological movement of the eighties of the last century and introduced into the political debate. As a result, the theory of sustainable development founds its way into economic sciences relating both to economic spheres and various aspects of social life [see: Mantel 1973].

2 THE FOREST – AND WOOD-BASED INDUSTRY IN GREEN ECONOMY

The concept of green economy developed on the basis of the concept of sustainable development. This idea may be presented in the form of a chain of interactions, namely environment – economy – society [see: Fig.1 and Radermacher 2011]. Basic integral elements of green economy include environmental protection, economic development and social development. As regards the forest- and wood-based industry, which seems to be located in the centre of green economy, it has a particular significance for at least several reasons.
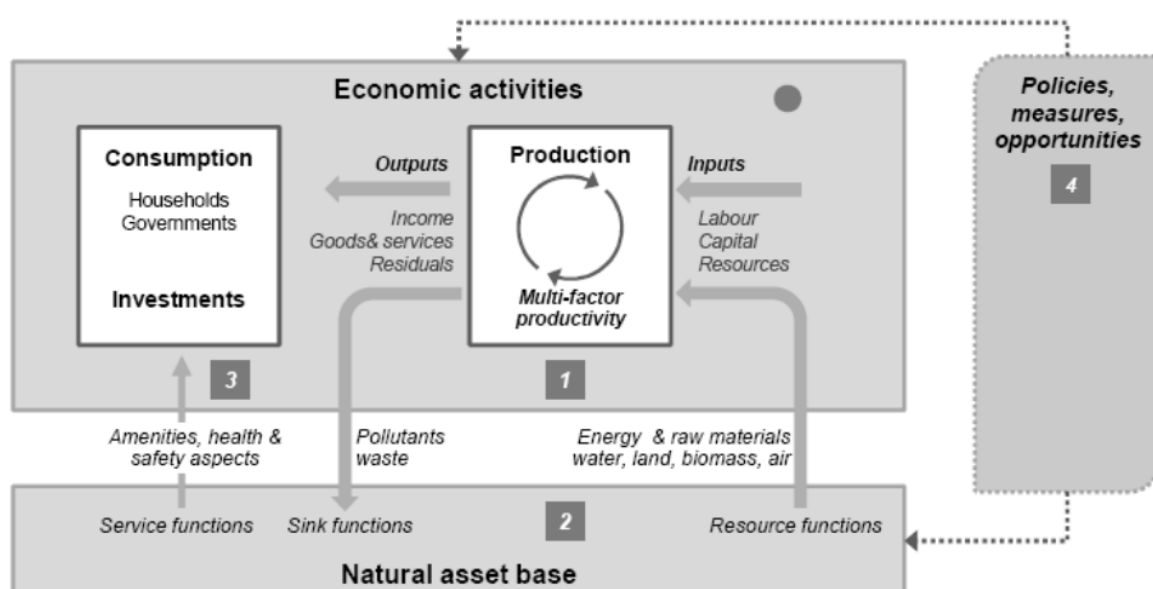
Figure 1. Framework for green growth indicators
Source: [Radermacher 2011 and http://www.oecd.org/greengrowth/greengrowthindicators.htm, accessed: 21.04.2014].

Table 1. Overview of OECD proposed indicator groups and topics covered (see: Fig.1)

OVERVIEW OF OECD PROPOSED INDICATOR GROUPS AND TOPICS COVERED		
1	The environmental and resource productivity of the economy	* Carbon and energy productivity; * Resource productivity: materials, nutrients, water; * Multi-factor productivity;
2	The natural asset base	* Renewable stocks: water, **forest**, fish resources; * Non-renewable stocks: mineral resources; * Biodiversity and ecosystems;
3	The environmental dimension of quality of life	* Environmental health and risks; * Environmental services and amenities;
4	Economic opportunities and policy responses	* Technology and innovation; * Environmental goods and services; * International financial flows; * Prices and transfers; * Skills and training; * Regulations and management approaches;
	Socio-economic context and characteristics of growth	* Economic growth and structure; * Productivity and trade; * Labour markets, education and income; * Socio-demographic patterns.

Source: [http://www.oecd.org/greengrowth/greengrowthindicators.htm, accessed: 21.04.2014].

The first reason is the idea (system) of forest economy, which is to ensure regeneration of forest areas in the light of dominating production function of forests. Obviously, it would be a grave mistake to reduce usable functions of forests to production qualities only. However, dominance of this function is undisputable. The other reason is the observed constant growth of demand for timber products. It is connected with the need of rational and effective use of timber, which may be a renewable raw material, but only in the long (many years') run. The third reason is a particular meaning of off-production function of forests. Forests fulfil natural and social functions both in regional and local aspects in rural areas) and on a global; scale (preventing climate changes). The act on forests provides for identical treatment of the production, recreation and protection functions. The act states that the main purpose of forest economy is to ensure durability of forests and continuity of its multifunctional role in spatial development of Poland [The Forest Act of 1991]. Unfortunately, this demand is difficult to realise in practice, as it is contrary to the narrowly understood economic interest of the forest administrator.

Considering green economy as a trade or sector of economy, one has to distinguish between some aspects. **The green economy sector** (*environmental industry*, *eco-industry*) combines all forms of economic activities with their common characteristic involving activities aimed at satisfaction of demands connected with proper functioning of natural environment [see: OECD 1996; Kulczycka et all 2010]. On the other hand, **green sectors of economy** are fields, which substantially burden natural environment to a relatively small extent. They include, but not limited, to, farming, fishing and forestry as well as renewable energy production, processing based on raw material saving (*lean manufacturing*), recycling etc. [see: *Trade and Green Economy* 2011, p.4] and bioeconomy [OECD 2009].

As a natural source of timber and, at the same time, trades (industries) based upon timber, forest resources not only originate from, but are also closely connected with natural environment. Their strong point is continuous renewability of resources and ecological character of economic chain at each stage of timber use (ranging from timber harvesting to disposal of the same). The recent years' growth of significance of timber as renewable (green energy) carrier raised questions about new research methods, technologies and products and assessment of impact upon the environment.

The dynamic development of trade market operating within green economy makes that is becomes dependent, to a large extent, on economic policy tools, including legislative policy. Shaping of the competitive position of the forest- and wood-based industry should be considered in the light of the sustainable development concept as a basis determinant of strategic aims relating to forests and forest economy [Graczyk 2005, p. 85-86]. The point of reference is the green economy idea, which realises the theory of sustainable development in practice. Thus, the key task of forestry and the entire forest- and wood-based industry becomes optimisation of contribution of social, economic and cultural functions of the forest into a permanent sustainable development of economy and society with preserved renewability of the forest resources and environmental protection [Ratajczak 2013].

3 THE RESEARCH VIEW OF COMPETITIVENESS OF THE FOREST – AND WOOD-BASED INDUSTRY

The term "forest- and wood-based industry" may seem an obvious term. However, it turns out that, so far, they have not worked out any commonly adopted definition of this trade of economy and borders determining its contents. Some definitions attempt to determine trades on the basis of homogeneity of products [Marshall 1972], which, in the examined case, should rather refer to homogeneity of raw materials for production. The indicated criterion of homogeneity of timber (round timber) may constitute a starting point for delimitation of the trade. In Ratajczak's [2013] opinion, the forest- and wood-based industry creates so-called timber chain with its links being forest-timber-market. The research perspective should consider situation of the trade as regards its interaction with other separated levels of economic analysis.

Theoretically, competitiveness refers to a market method of regulation. It is identified with an ability to compete: attainment and maintenance of competitive advantage and, at the same time, activity and preservation in a competitive environment. The competitiveness may be interpreted as <u>an attribute or result</u> (resulting competitiveness) or a <u>process</u>, which aims at attainment of competitiveness (activity-related competitiveness).

Principally, the trade analysis uses two research approaches, namely total and systemic approaches [Jankowska 2005; Janasz 2006]. This results from the fact that the branch is located on an intermediate level, i.e. between a microeconomic and macroeconomic level as well as assumption that it constitutes one of economic subsystems [Otta 1987]. The intermediate level is referred to as a mesoeconomic level relating to heritage of a relatively new subdiscipline of economic sciences, i.e. mesoeconomics or a branch of mesoeconomics referred to as trade economics. Apart from research activity relating to trade (mesoeconomic) perspective, the systemic approach considers influence of t=other economic systems. An examined trade is treated not only as a whole, but also as a collection of elements, interdependences and mutual relations (interactions) between them.

Literature distinguishes between the following economic systems, namely a system of global economy, economic megasystems (feudal, capitalistic or socialistic economies), economic macrosystems (i.e. national economies), economic mesosystems (i.e. economic regions or large segments of national economy), economic minisystems (enterprises or households) [Wilkin 1995]. Another classification indicates to existence of a global, macroeconomic, mesoeconomic, microeconomic and micro-microeconomic system [Gorynia 1993a, 1993b]. The last level distinguished by Leibenstein [1985] includes households and sole traders. The classifications constitute objects of numerous polemics among researchers. If one was to assume that indication of a "micro-micro" level relating to competitiveness of the smallest economic units and individual goods or services is justified, then preserving mathematical order of the terminology used, one should identify the competitiveness on a nano scale or nano-competitiveness. This reflection is a voice in a discussion on the need to implement a new research area of the smallest structures in economic sciences, which may be referred to as *nanoeconomy*. It is also possible that with development of interplanetary communications and arising of an opportunity to conduct economic activities in the aerospace, we will have to face a new broader analytical level. The level may be referred consistently as a giga scale competitiveness whole searching new theoretical references within *gigaeconomy* (interplanetary economy).

As regards green economy, functioning of the smallest economic systems (e.g. one-person households) seems to be particularly important. This refers particularly to consumption and independent production (presumption) of renewable energy. What is more, one may risk and assume that development of green economy may constitute a determinant in shaping of an economy of the future in the aerospace. This gigaeconomic perspective will certainly be determined by development of renewable energy, recycling and global environmental policy. Will economy on a giga scale also include the forest- and wood-based industry?

Assessment of competitiveness of a trade usually includes competitive position, competitive potential (referred to as competitive ability) and competitive strategy. A starting point for an analysis of competitiveness is competitive position (*ex post*), and, next, competitive potential and competitive strategies. Assessment of the competitive position and potential may result in formulation of trends of activities in order to improve the competitive position (*ex ante*) in the market [Gorynia 2000]. On the other hand, the competitive advantage is defined as a result of use of competitive potential, which results in attaining of a competitive position better than that of competitors in the sector and ensuring of added value [Pluciński 2001, s.68]. Literature still discusses the definition of competitiveness of a trade, which would be more adequate for making research analyses. One of trends determines competitiveness as an ability to attain competitive advantage over a specified time. From this perspective, competitiveness of a trade is something more than merely an average total of competitive advantages obtained by entities participating in a trade on various levels of its functioning. It is either not

a simple sum of obtained competitive advantages, but rather their function, which depends on sources of competitiveness identified on separated levels of economic analysis.

4 FORESTRY IN THE LIGHT OF GREEN ECONOMY CHALLENGES – A CASE STUDY

Forest environment is a space friendly both to society and economy. As results from research conducted in the Faculty of Economic Sciences of the University of Warsaw [Giergiczny 2006, Bartczak et all 2014], profits obtained by the society from recreation function of forests is much greater than from sale of timber. More than half of the Polish population visits forests at least twice a year. Among most popular there are old, mixed and diversified forests, which do not have any traces of tree cutting. Questionnaire surveys relating, in particular, to the Puszcza Białowieska revealed that more than 80 percent of the respondents for to forests for strolling, 44 percent for mushroom picking and as many as 33 percent in order to observe the forest nature. Further, nearly 12 percent of respondents practice sports in forests and more than 11 percent picks blueberries. The respondents were also asked about other reasons for visiting forests. Their answers proved surprising. More than 4 percent take pictures and twice as more go to forests to make love (1.4%) rather than hunt (0.7%).

Economists are usually interested in a narrowly understood use value. The forest value is identified with market value of raw materials, which may be obtained and sold (e.g. timber, animals, mushrooms, herbs etc.). Economic sciences may consider significance of other value, however, if these are not objects of marker transactions, they are rarely taken into account. They did not know how to estimate and calculate the values. The research made by Harold Hotelling, who used a method of calculation of travel costs, helped them. Each visit to a forest or national park is connected with some costs (transport, time value). Hotelling came to a conclusion that the cost may be treated as a price, which we are ready to pay for the opportunity to visit a national park. However, knowing the relation between travel costs and frequency of visits, one may estimate a recreation value of given resources. Economy is an anthropocentric science, as it places a human being in the centre of interest. Value has all that serves to satisfy human needs. However, this does not mean that it is materialistic as well. The fact that off-production benefits are not objects of market transactions, does not make them less important than market-related benefits, e.g. on account of harvesting and sale of timber. Optimum economy within the economic meaning is an economy, which maximises the sum of benefits and not only those benefits, which result from off-production functions. How much are the off-production functions of forests worth?

Czajkowski, Bartczak and Giergiczny [2014] estimated recreation benefits provided by the Polish forests in 2011 as approx. PLN 3.3 bln annually, which constitutes approximately PLN 360 per one hectare of a forest. To compare, revenues from the National Forests for sale of timber amounted to PLN 6.5 bln. However, the two values cannot be compared directly. The amount of PLN 3.3 bln is a sum of net benefits resulting from visiting forests (without costs connected with a trip to the forest). How can this be explained? For example, a readiness to pay EUR 5 for a coffee results, following purchase of the same for EUR 3, in obtaining of a net benefit resulting from drinking coffee in the amount of EUR 2. Thus, the amount of PLN 3.3 bln is a sum of benefits, which the Poles obtain from recreation in forests. However, the amount of PLN 6.5 bln constitutes revenues of the National Forests, where the profit, i.e. net benefit, is only a small part of the same. In 2011 the profit amounted to nearly PLN 800 mln (usually amounting to approx. 200-300 mln). One should also consider that costs of the National Forests also include expenses for forest protection, education and remuneration for foresters. Thus, it turns out that the Polish forests provide great recreation advantages for the society. Tourist infrastructure (barbecue spots and educational paths) proved the most important determinant of competitiveness in this respect. Another important determinants include natural characteristics – old and mixed forests, forests of various gages, with irregular borders and average quantity of dead timber are most popular and the

more species of trees, the better for visitors. On the other hand, the more visible traces of timber harvesting or other forestry works, the lesser recreation attractiveness of forests.

5 CONCLUSIONS

Forest environment is a space friendly both to society and economy. It turns out that demand for environmental goods grows faster than inhabitants' incomes. Thus, one may state that significant of off-production functions of forests will grow. Obviously, the significance of timber as an ecological raw material also grows. A key challenge for development of the forest- and wood-based industry is economic policy. The role of forest administration, which combines their production, recreation and protection function skilfully, is growing. There may be a Polish act on forests in force, which guarantees, at least theoretically, sustainable development of forest economy and promotes multifunctional forestry, however, it is difficult to realise these assumptions in practice for objective reasons. 83 percent of the Polish forests are owned by the state. It is a classic example of public good. However, the economic calculation does not leave any doubts. Presently, the National Forests make profit only from sale of timber. They do not have any real incentive in order to realise the protection or recreation function at a socially optimum level. Direct legal regulations will be necessary for attainment of this aim.

Thus, the competitiveness of the forest- and wood-based industry is determined by a strong conflict between the production, recreation and protection function. If the National Forests are to contribute to creation of a strong green economy sector, they have to accommodate with contrary expectations. On one hand, they have to provide timber, if competitive position of trades based on timber depends, above all, on prices and availability of timber. On the other hand, in order to realise production tasks of forests, it will be necessary to implement appropriate strategies of competitiveness and efficient management. It seems that an attempt to address the indicated problems may prove much more specialist than presently, both in forestry and timber industry. There is a demand for such a model of forestry, in which functions will be separated spatially. On one hand, separation of forests, which are intensely used for economic purposes, is necessary. On the other hand, in forests with high natural potential and in the vicinity of large concentrations of population (city forests), main activities should be subject to realisation of off-production functions. A mesoeconomic analysis and regional typology of the Polish forest- and wood-based industry may be an answer to improvement of its ex ant competitive position whilst preserving conditions of green economy stringent for the industry.

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Authors' addresses

Prof. Wojciech Lis, PhD, Eng., e-mail: wlis@up.poznan.pl
MSc. Leszek Wanat, Eng., PhD Candidate, e-mail: leszek.wanat@up.poznan.pl
Poznan University of Life Sciences
Wojska Polskiego 38/42
60-627 Poznan
Poland

CORPORATE COMPETIVE ADVANTEGES AND COMPARATIVE ADVANTEGES IN THE CONDITIONS OF THE SLOVAK WOOD PROCESSING INDUSTRY

Hana Maťová, Jan Dvořáček

ABSTRACT

In our study we focus on corporate competitive advantages and comparative advantages of the Slovak republic in condition of the wood processing industry. Comparative advantage would be based on intangible resources such as history, tradition, identity industry and tangible resources e.g. wood resources in our country. But it can be done only if these resources are rare, valuable and difficult to imitate resources and well and strategically organized. If these resources will be associated with these four attributes our industry, country can obtain sustained comparative competitive advantage.

Key words: corporate competitive advantages, comparative advantages, wood processing industry.

1 CORPORATE COMPETETIVE ADVANTEGES

Corporate competitive advantage must be associated with the following four attributes:
1. it must be valuable for the company – it means for example that corporate advantage neutralise threats in a firm's environment,
2. it must be rare on the market and among competitors,
3. it must be difficult to imitate
4. a company must be well organised and must be able to use and to exploit valuable, rare and difficult-to-imitate resources of the competitive advantages (Barney, 1991).

The resources of the corporate competitive advantages are tangible and intangible. Among tangible resources we can find e.g. technological, physical etc. As Arrighetti, Landini, Lasagni (2014) mentioned in their study intangible assets include internally produced assets – e.g. designs, brand equity, in-house software etc. and assets from external environment – e.g. technology licenses, patents, copyrights etc. We think that intangible resources of the competitive advantages originate in human resources of the firm and also come from the environment of the company. We agree with Abrat and Kleyn (2012) that reputation, brand name and other components of the corporate identity are very good resources of the sustainable corporate advantages.

As for corporate identity (CI) components we agree with Melewar and Karaosmanoglu (2006) that CI has many components such as: Corporate structure (e.g. brand structure), Corporate strategy, Corporate culture (corporate philosophy, values, mission, principles, history, country of origin etc.), Corporate behaviour (e.g. employee behaviour), Corporate Design, Corporate Communication, Industry identity (external factor). Every mentioned component has some sub-items.

In our study we focus on sub-items such as: country of origin, industry identity because we think that these items can contribute to creation of comparative competitive advantages of the country or the state. Country of origin and the industry identity is very difficult to imitate that's why we think that these items are suitable to become comparative competitive advantages. We focus on wood processing industry in Slovakia.

We conducted survey during the year 2008. The main aim of our study was to investigate what is percieved in organizations as the "Corporate identity". The purpose of the study was to find out about: CI definitions, CI components, CI management, CI benefits, CI target audience among wood processing companies in Slovakia.

The premises of the study were: company identifies corporate identity with corporate design or corporate image, company perceives CI as a tool of marketing communication, company doesn't perceive employees as a target group for CI. We decided to carry out this study to verify this premises.

2 THE RESULTS OF THE SURVEY (2008) AND IMPLICATIONS ON ADVANTEGES

The questionnaire contained 10 questions related to corporate identity and questions about general company's information. Some questions in our study originate from Podnar's study (2005). 300 enterprises were contacted, from which 80 (26,60 %) answered questions, and 59 (19,67 %) were taken into consideration. Questionnaire contained close-ended and open-ended questions. Some questions were multiple-choice questions.

For our study we choose the question 5 (table 1) and 7 (table 2) from this survey to point out the opinion of the wood processing companies about understanding of term corporate identity and to point out the most known benefits which strong identity can bring. Question 5: "What are the components (elements) of the CI?"

Table 1. Answers to Q5

Elements	Absolute frequency	Relative frequency (%)
Corporate design	50	84,75
Marketing communication	39	66,10
Corporate philosophy	30	50,85
Marketing strategy	27	45,76
Corporate core values	26	44,07
Organizational communication	25	42,37
Corporate vision	20	33,90
Corporate strategy	20	33,90
Corporate mission	18	30,51
Management behaviour	18	30,51
Employee behaviour	17	28,81
History of the company	17	28,81
Ethic standards	16	27,12
Corporate goals	16	27,12
Indirect communication	14	23,73
Organizational structure	9	15,25
Brand structure	9	15,25
Industry Identity	9	15,25
Nothing	3	5,08
Others	1	1,69

This question was designed as an indirect question. The main goal of this question was to reveal the most known and important elements of the CI and also to reveal "definition of the CI". According to results the companies understood CI as a corporate design, marketing communication. But in these results we can see not only tangible components but also intangible components of the CI (Corporate philosophy, corporate core values etc.). These results support our premise that intangible elements can be considered as potential resources of the competitive advantages of the firm. The Industry identity is considered as part of the firm's identity only by 15,25 % of the respondents. This result can mean that respondents see industry identity as a part of something bigger, something what

they cannot influence but they have to respect it. That's why Industry identity can be seen as a competitive advantage of the industry in specific country or state.

Question 7 "What are the benefits of Corporate identity for the company (in your opinion)?"

Table 2. Answers to Q7

Benefits of the CI	absolute frequency	relative frequency (%)
Unity of visual presentation	36	61,02
Image and reputation formation	36	61,02
Recognition, Visibility	34	57,63
Market position support	27	45,76
Customer relation support	27	45,76
Staff motivation, identification	26	44,07
PR support	24	40,68
Marketing communication support	21	35,59
Financial efficiency	20	33,90
Brand support	17	28,81
Attracting new staff	16	27,12
Influence on corporate values	14	23,73
No benefits	1	1,69
Others	0	0,00

Companies want many benefits of the corporate identity. They expect benefits which can't be achieved only by "corporate design and marketing communication". If they want to achieve these benefits (table 2) they must admit that corporate identity is a multi-component term and not only the corporate design or corporate image or marketing communication. More than 61 % of the respondents see image and reputation formation as one of the most important benefit of the CI. It means that they accept intangible benefit which is rare, valuable and also difficult to imitate. We can say that corporate image and reputation is possible sustained competitive advantage (if it is organized properly), so respondents know that these intangible benefits are possible sources of the competitive advantages. The question is: Do they know that good image and reputation of each wood processing company create good image and reputation of the whole wood processing sector? Industry sector is a part of the whole industry in specific country and also can create and influence the country's image and reputation, so we think that if strong good image and reputation can be considered as competitive advantage for the single firm, then image and reputation of the industry can be considered as comparative advantage of the specific country.

Every specific country has also history. History cannot be imitated and it's also rare and valuable. As for wood processing industry in Slovakia, this industry sector has long history and tradition. More than 40 % of our country is covered by forests, and it means that we have enough tangible resources for wood processing companies.

We think that government of the Slovak republic must take into consideration these facts and prepare appropriate industry policy to gain comparative competitive advantages of wood processing industry. This comparative advantage would be based on intangible resources such as history, tradition, industry identity and tangible resources such as enough of wood resources in our country.

3 CONCLUSION

The traditional markets for wood products are saturated and the market opportunities are in Middle and Eastern Europe, China, Asia and Africa. There is a high probability that the other producing regions will concentrate their efforts to these markets (Parobek, 2005). In our study we proposed that comparative advantages can be found also in intangible resources among wood processing companies

e.g. good image and reputation of this industry. But government and its industry policy must be aware of this facts and must take into consideration that comparative advantages are also intangible not only tangible.

Companies must create products which have specific attributes, that attract consumers and which are able to exceed customer expectations (Loučanová, Parobek, Paluš, 2014), that's why we think that also countries or industries must create comparative advantages which are not so traditional but unique.

Acknowledgement

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Authors' addresses

Hana Maťová, PhD., e-mail: matova@tuzvo.sk
Jan Dvořáček, PhD., e-mail: dvoracek@tuzvo.sk
Department of Marketing, Trade and World Forestry
Faculty of Wood Sciences and Technology
Technical University in Zvolen
Masarykova 24
960 53 Zvolen
Slovakia

EMPLOYMENT TRENDS IN THE CROATIAN WOOD INDUSTRY AND FORESTRY

Maja Moro, Darko Motik, Andreja Pirc Barčić, Ksenija Šegotić, Branko Liker

ABSTRACT

This paper focuses on an analysis of labour resources in the Croatian wood industry and forestry. On the basis of established values in the period 1996 - 2012, the paper discuss a possibility to predict employment trends in the sector. The data of the number of employees in Wood processing and Furniture manufacturing are gathered from Croatian Bureau of Statistics and Ministry of Finance and Financial Agency. The dynamic economic analysis of time series data was performed, and two types of time series models were built: models based on average rates of change (models A) and linear trend models (models B). Prediction is limited to year 2020, because of turbulences in this market and the length of analyzed time series.

Key words: employment, wood industry, time series models, forecasting.

1 INTRODUCTION

Wood Processing and Furniture manufacturing, as a significant segment of a forest-based industry in Croatia, is characterized by numerous changes which carries a modern business world. Knowledge of the market situation directly affects on all companies in the sector, their development, growth and business success in the future (Motik and Pirc, 2008). Intense competition, which comes as a result of globalization and the recently entry into the full membership of the European Union, leads us to the necessity of looking at the current market situation, in order to predict the situation in the future. The European Union has committed to the principle of sustainable development as its policies and actions, based on balanced economic growth, price range of stability, strengthening the internal market, research and development, innovation, education, competitive social market economy and a high level of protection and improvement of environmental quality (Lučić, 2009). According to Samuelson and Nordhaus (2003), economic theories are dynamic by nature and now we are witnessing almost everydays changes that are caused by the penetration of IT and computer science revolution. In this new and dynamic conditions it is necessary to strive for a new standards using economic theory for the qualitative and quantitative analysis of markets. The key to survival and growth in the market is in organization's ability to adapt its strategy to the rapidly changing environment (Kotler, 2001).

Interpreting economic data and forecasting the future economic values are under the influence of environment and government policies, starting from the basic economic theories that operate in the market (Fair and Case, 1989). Specific developments in some key macroeconomic variables, such as employment, production, imports, exports, the exchange rate of national currency, etc., characterize different turbulent periods of Croatian history (Lovrinčević, 2001).

This paper discuss a possibility to predict the number of employees in Croatian wood industry sectors, on the basis of established values in the period 1996 - 2012. Because of turbulences in this market and the length of analyzed time series the prediction is limited to the year 2020.

2 MATERIAL AND METHODS

Analysis follows the time course of an employment in the Croatian wood industry sectors for period 1996 -2012. The data for analized period were gathered from database of Croatian's State Bureau of Statistics (DSZ) and Ministry of Finance and Financial Agency (FINA). The data are shown in Table 1.

Table 1. Number of employees per year in the Croatian wood industry sectors for period 1996 – 2012

Year	Furniture manufacturing (**EFM**)	Wood processing (**EWP**)	Total (**ETL**)
1996	12.641	11.223	23.864
1997	12.116	11.577	23.693
1998	10.973	11.908	22.881
1999	11.515	11.287	22.802
2000	11.611	11.495	23.106
2001	11.627	10.833	22.460
2002	11.719	11.376	23.095
2003	10.348	11.780	22.128
2004	10.563	11.584	22.147
2005	10.851	11.404	22.255
2006	10.638	12.014	22.652
2007	11.386	12.842	24.228
2008	11.603	12.819	24.422
2009	9.637	11.501	21.138
2010	9.676	11.050	20.726
2011	9.357	10.839	20.196
2012	8.887	11.072	19.959

This paper focuses on an analysis of recent trends of an employment in the forest-based industry of Croatia. Variable EWP represent the number of employees per year in Wood Processing (sector C16), Variable EFM represent the number of employees per year in Furniture Manufacturing (sector C31), and Variable ETL represent the number of employees per year in Wood processing and Furniture manufacturing together, for period 1996 – 2012.

For the purposes of forecasting future trends in the indicator of market condition (number of employees per year), the dynamic economic analysis of time series data was performed. Two types of time series models were built: models based on average rates of change (models A) and linear trend models (models B).

It is known that future projections of development can not predict the detail movement of market indicators, such is the number of employees. They are only a rough indication of the future course, assuming that the macroeconomic policies won't change significanty (Hanke and Reitsch, 2001). According to Rozga and Grčić (2002), by using models we got a picture of what happened in the (near) past, what is the current situation, and planned and future course of events, i.e. the movement of an employment indicator in the near future.

3 RESULTS AND DISCUSSION

Descriptive statistics were determined for the number of employees in the Croatian wood industry sectors for period 1996 – 2012. Average number of employees in both sectors is approximately equal for analized period, 10.891 workers in Wood processing and 11.565 workers in Furniture manufacturing. The coefficients of variation of the number of employees for all variables are relatively small (EWP 9,56%; EFM 5,03% and ETL 5,89%), so the arithmetic mean is representative indicator for the number of employees in the observed sectors. Results are given in Table 2.

Table 2. Descriptive statistics for the number of employees for period 1996 – 2012

Descriptive Statistics	Variable		
	Furniture manufacturing (**EFM**)	Wood processing (**EWP**)	Total (**ETL**)
Valid N	17	17	17
Minimum	8.887	10.833	19.959
Median	10.973	11.495	22.652
Maximum	12.641	12.842	24.422
Sum	185.148	196.604	381.752
Mean	10.891	11.565	22.456
Std.Dev.	1.041	581	1.323
Coef.Var. (%)	9,56	5,03	5,89
Confidence -95%	10.356	11.266	21.776
Confidence +-95%	11.426	11.864	23.136

The basic indices ($I_{b=2009}$) for all variables are presented with a common reference year (currently 2009 = 100) and belonging rates of change ($S_t = I_{b=2009} - 100$), also chain base index (V_t) and belonging rates of change (S_t * = V_t - 100). Results of these analysis for the number of employees in Wood processing (EWP) and for the number of employees in Furniture manufacturing (EFM) are given in folowing tables (Table 3 and Table 4).

Table 3. Employment indices and rates of change for Wood processing for period 1996 – 2012

Year	EWP	$I_{b=2009}$	S_t (%)	V_t	S_t^* (%)
1996	11.223	97,6	-2,4	-	-
1997	11.577	100,7	0,7	103,2	3,2
1998	11.908	103,5	3,5	102,9	2,9
1999	11.287	98,1	-1,9	94,8	-5,2
2000	11.495	99,9	-0,1	101,8	1,8
2001	10.833	94,2	-5,8	94,2	-5,8
2002	11.376	98,9	-1,1	105,0	5,0
2003	11.780	102,4	2,4	103,6	3,6
2004	11.584	100,7	0,7	98,3	-1,7
2005	11.404	99,2	-0,8	98,4	-1,6
2006	12.014	104,5	4,5	105,3	5,3
2007	12.842	111,7	11,7	106,9	6,9
2008	12.819	111,5	11,5	99,8	-0,2
2009	**11.501**	**100,0**	**0,0**	**89,7**	**-10,3**
2010	11.050	96,1	-3,9	96,1	-3,9
2011	10.839	94,2	-5,8	98,1	-1,9
2012	11.072	96,3	-3,7	102,1	2,1

Table 4. Employment indices and rates of change for Furniture manufacturing for period 1996 – 2012

Year	EFM	$I_{b=2009}$	S_t (%)	V_t	S_t^* (%)
1996	12.641	131,2	31,2	-	-
1997	12.116	125,7	25,7	95,8	-4,2
1998	10.973	113,9	13,9	90,6	-9,4
1999	11.515	119,5	19,5	104,9	4,9
2000	11.611	120,5	20,5	100,8	0,8
2001	11.627	120,6	20,6	100,1	0,1
2002	11.719	121,6	21,6	100,8	0,8
2003	10.348	107,4	7,4	88,3	-11,7
2004	10.563	109,6	9,6	102,1	2,1
2005	10.851	112,6	12,6	102,7	2,7
2006	10.638	110,4	10,4	98,0	-2,0
2007	11.386	118,1	18,1	107,0	7,0
2008	11.603	120,4	20,4	101,9	1,9
2009	**9.637**	**100,0**	**0,0**	**83,1**	**-16,9**
2010	9.676	100,4	0,4	100,4	0,4
2011	9.357	97,1	-2,9	96,7	-3,3
2012	8.887	92,2	-7,8	95,0	-5,0

The average rate of change for the number of employees in Wood processing for period 1996 - 2012 was negative (-0,0857%), also as the average rate of change for the number of employees in Furniture manufacturing (-2,178%).

For the number of employees in the both wooden sectors (ETL), the basic indices ($I_{b=2009}$) are shown in Figure 1, and the chain indices (V_t) in Figure 2.
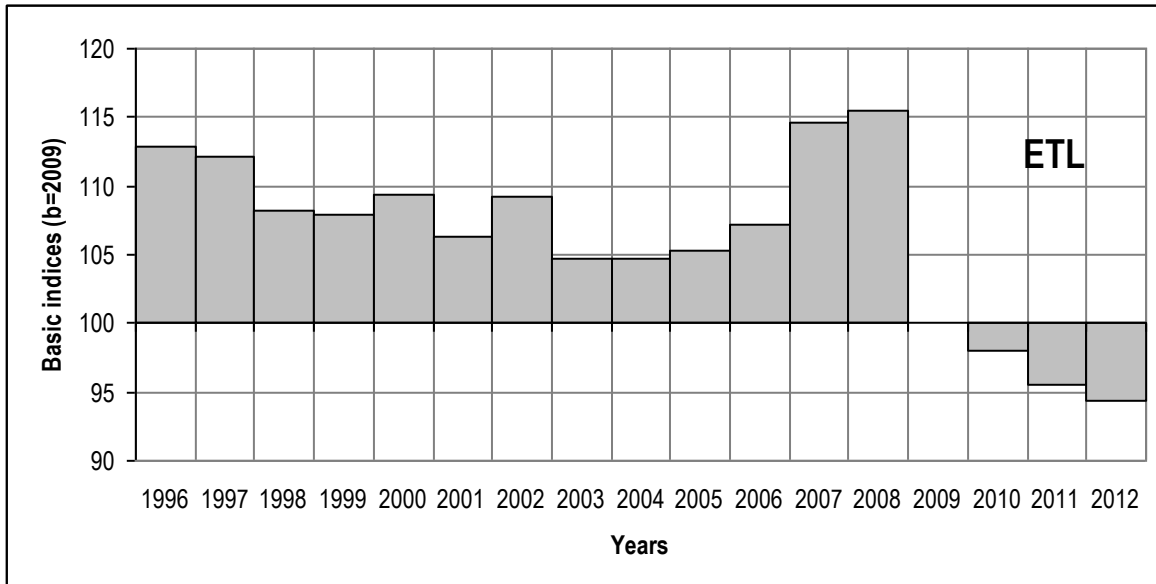
Figure 1. Basic indices for the number of employees in whole wooden sector for period 1996 – 2012
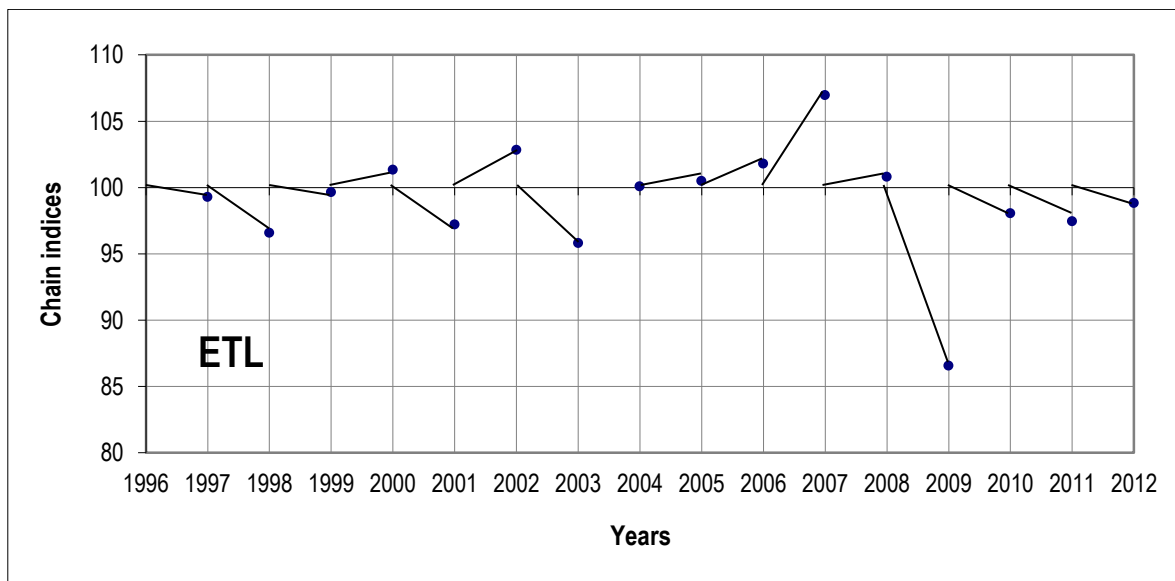
Figure 2. Chain indices for the number of employees in whole wooden sector for period 1996 – 2012

The average rate of change for the number of employees in Wood processing and Furniture manufacturing (ETL) for period 1996 - 2012 was also negative (-1,111%).

When the rates of change in successive time periods are approximately equal, and assuming that the average rate of change will not change, with the average rate of change can be predict variable values in future periods (Blažević, 2007). Based on the average rates of change for EWP, EFM and ETL in the observed period, models A for prediction of future values of the number of employees in Wood processing and Furniture manufacturing were developed.

Correlation analysis to determine the degree of correlation between the values of the number of employees as dependent variables, and time (t) as independent variable was used for models B.

92

Pearson's linear correlation coefficient (r) which describes the direction and strength of the correlation relationship was negative and high in two cases, r = -0,8195 for EFM and r = -0,6283 for ETL. Correlation relationship for EWP was positive, but extremly low (r = 0,0374).

In all models, t is mark for the time, where t = 0 compared to year 1996, t = 1 for year 1997; ... , t = 16 to year 2012, etc. Models predict values in the number of employees. Constructed models A and models B for predicting the future values of the number of employees in Croatian wood sectors are shown in Table 5.

Table 5. Models A and models B for calculating the future number of employees in Croatian wood sectors

Wood industry sector	Model A	Model B
Wood processing (**EWP**)	$A_1(t) = 0,999^t \cdot 11223$	$B_1(t) = 4,34 \cdot t + 11530$
Furniture manufacturing (**EFM**)	$A_2(t) = 0,978^t \cdot 12641$	$B_1(t) = -168,95 \cdot t + 12243$
Total (**ETL**)	$A_3(t) = 0,989^t \cdot 23864$	$B_1(t) = -164,61 \cdot t + 23773$

According to the linear trend models (models B), the expected linear increase in the annual value of the number of employees in Wood processing is only 4 workers. The expected linear decrease in the annual value of the number of employees in Furniture manufacturing is 169 workers, and for whole wooden sector, expected linear decrease in the annual value is 165 workers.

The predicted values of the number of employees in Wood processing using model A and model B, are graphically compared in Figure 3, in Figure 4 are compared the predicted values in Furniture manufacturing, and in Figure 5 are compared the predicted values for whole wooden sector.
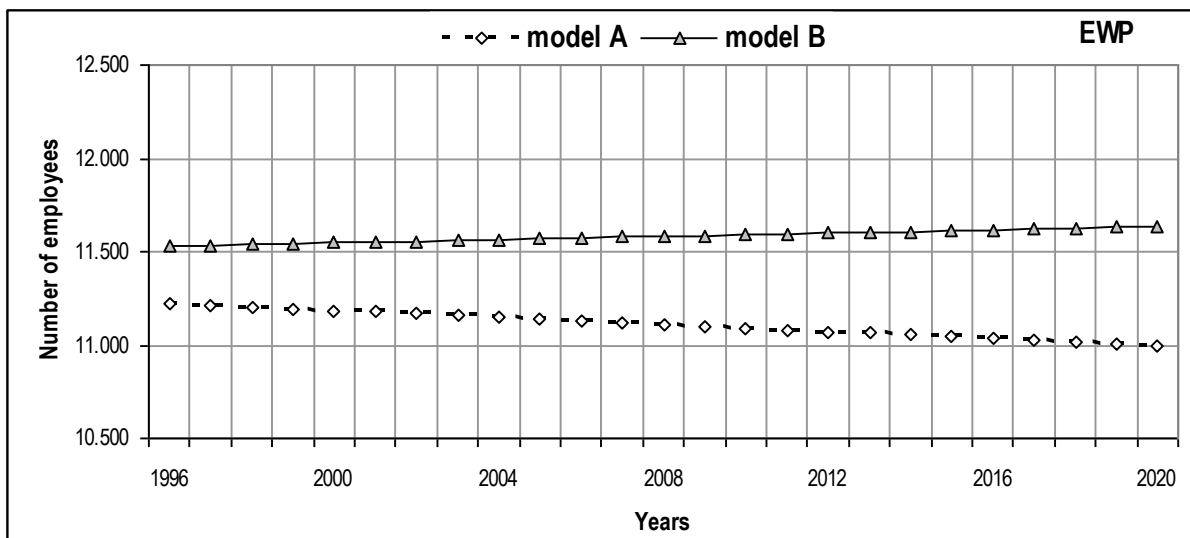
Figure 3. Comparison of the predicted values of the number of employees in Wood processing
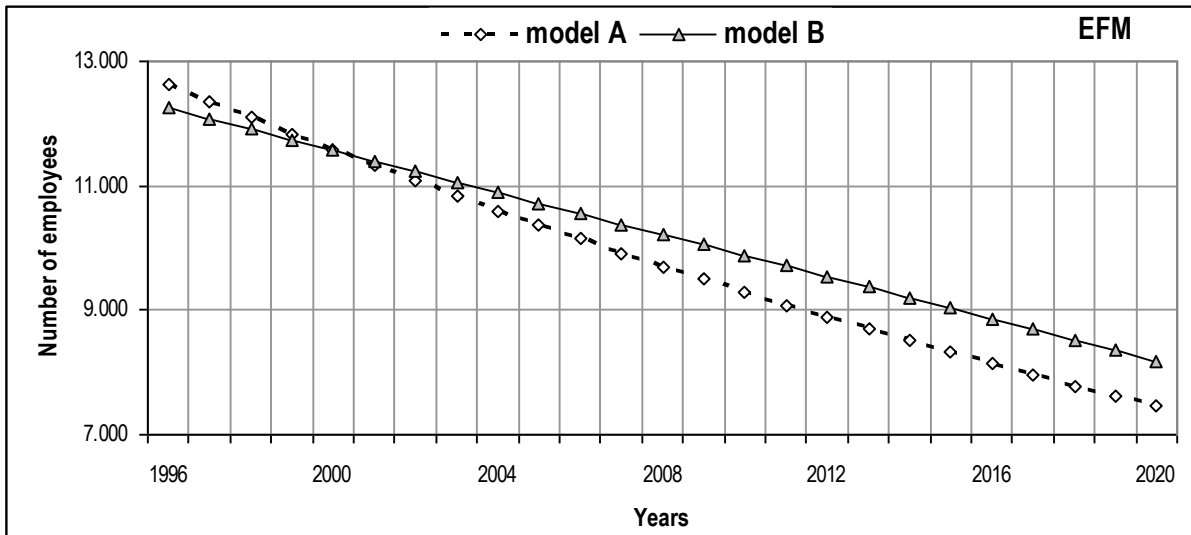
Figure 4. Comparison of the predicted values of the number of employees in Furniture manufacturing
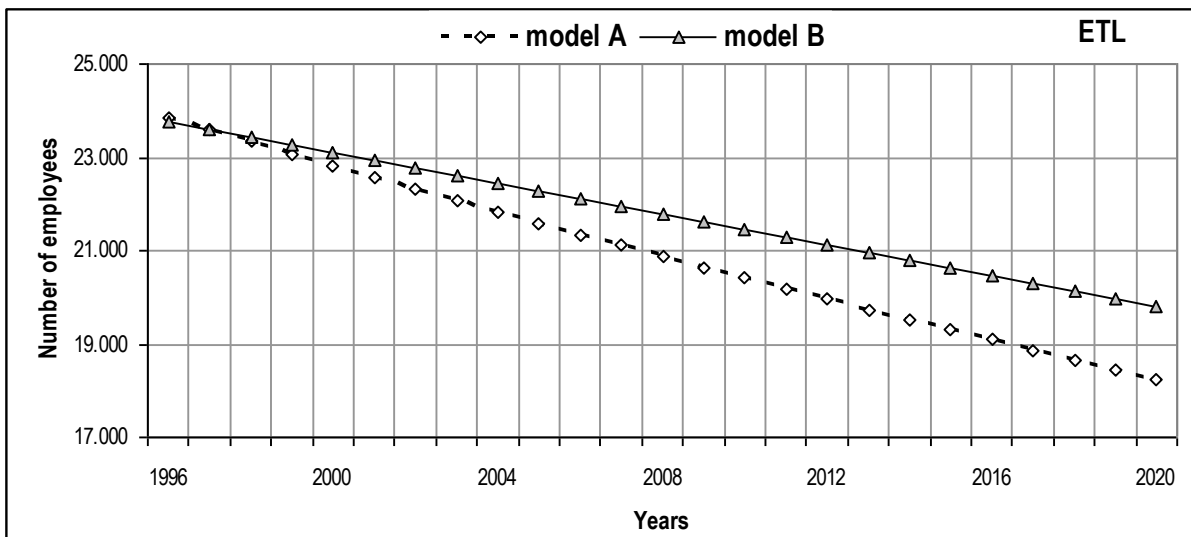
Figure 5. Comparison of the predicted values of the number of employees in whole wooden sector

Testing the differences between predicted values by using model A and model B with actual values of the number of employees was left for further research.

4 CONCLUSION

Applying methods that have not been traditionally used could be help at the strategic, tactical and/or operational planning level and decision making in the managing of a wood sector, and businesses entities of our timber industry. Assuming that the macroeconomic policies will not be altered, and assuming that the models for predicting the number of employees satisfy all statistical and theoretical terms, constructed models A and models B could become a great help for a future actions.

Using time series models for forecasting the number of employees in the future, companies in the wood-based industry will be able to define the future business strategy. The paper could also help to research institutions for decision-making and strategy development.

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Authors' addresses

Assist. Maja Moro, PhD, e-mail: mmoro@sumfak.hr
Prof. Darko Motik, PhD, e-mail: motik@sumfak.hr
Assist. Andreja Pirc Barčić, PhD, e-mail: apirc@sumfak.hr
Prof. Ksenija Šegotić, PhD
University of Zagreb
Faculty of Forestry
Svetošimunska 25
10000 Zagreb
Croatia

Operational director, Branko Liker, e-mail: branko.liker@drvenjaca.hr
"Drvenjača" d.d.
Donje Selo 62
51322 Fužine
Croatia

INDICATORS OF SOCIAL RESPONSIBILITY IN THE WOOD PROCESSING INDUSTRY IN TERMS OF QUALITY MANAGEMENT

Renáta Nováková, Katarína Ďurková, Vladimír Ovsenák

ABSTRACT

Measurement and monitoring of social responsibility of organizations working in the woodworking industry requires the creation of new business relative concept, which was established in the application of standardized procedures. An example of a standardized procedure may be the implementation of ISO 26000, which is designed for organizations of private and public sector, irrespective of their size and location, and the role of the standard is enhance responsibility for the behavior of these organizations in the field of business activities and simultaneously strengthen and enlarge their share of the sustainable development. In our contribution we will focus on activities in this area at the national level and provide information on some indicators pointing to an active application of the principles of social responsibility.

Keywords: social responsibility, normalization, small and medium-sized enterprises in the woodworking industry, European standards, quality management.

1 INTRODUCTION

In the SR Government Programme Declaration for the years 2012 - 2016 is said about the business environment, with state of economic policy commits it to operate more effective and efficient coordination of all activities. The government wants apriori focus on unifying the rules and terms and conditions with respect to European standards and practices of the industrialized countries of the EU. Furthermore wants to significantly involved in transnational production networks and small businesses. Precisely in the woodworking industry is currently in our country found a variety of small and medium-sized enterprises, which are, in this context, also the subject of governmental interests.

If we want to talk about social responsibility, we also fined the concept of sustainable development. We will help us with the definition of the World Commission on Environment and Development (WCED). That understands sustainable development as "***development that meets the needs of the present without compromising the ability of future generations to satisfy their own needs.***"

Main objective of the sustainability of is considered to harmonization of economic development with protection of nature. I would argue that the wood industry is one of the sectors of the national economy, which is closely linked with the environment protection and rational use of natural resources. All this should work in maintaining the principles of sustainable development. It must be emphasized that every human activity in this sector is carried out in a particular social, cultural, political and economic environment. There are typical factors and conditions that activity to some extent limit. Current developments in the pulp and paper industry has seen a new trend, which is based on the creation of a relatively new business concept. It includes also the creation of standardized procedures, which are linked to total quality management.

2 CORPORATE SOCIAL RESPONSIBILITY IN QUALITY MANAGEMENT

Background information for this chapter are part of research in the area of social responsibility of organizations in general. Found the following facts:

➔ The main factor in the development and goals of our civilization is the quality of work, production and life
➔ Quality arises in various processes and manifests itself in relations between entities that are part of them
➔ Quality assessment of the sensual and intellectual activity, which we find key added value and importance of quality parameters at a specific time and space
➔ Quality of work, production and life is a development factor and objective of social responsible organizations (1)

According to the report from Line and Braun in 2007 were generated following results achieved in the area of social responsibility in Slovakia:

a) Legal and political environment

Slovakia is quite developed in this area. Government has developed a strategy for sustainable development and has enacted specific legislation to widespread adoption of good CSR practices The government has so far not been his own issues of corporate responsibility and has not yet been made a separate government bureau that deals with social responsibility.

b) Civil society context

The existence of international and national organizations that promote socially responsible business. Such an organization like Pontis Foundation, which focuses on networking and information exchange between companies. Strengths are universities that offer specific courses and courses on social responsibility and is also supported by the research in this area, which is supported by the major national mass media means.

c) Reporting

A very small number of organizations have to issue structured reports on corporate social responsibility. It is also not so common formal disclosure issues and data about socially responsible business second-level companies. It must be said that since 2007, also in this area made huge strides forward, and the situation has hanged to more positive direction.

d) Standards

Practicaly, it is a supporting of the development of good management practices at the level of awareness and subsequent monitoring and measurement of social responsibility at regional level. In this area we could actually mention the recent initiatives of the Office of Standards, Metrology and Testing based in Bratislava, which declared the 1st year of the Slovak National Prize for social responsibility in the year of 2014. The competition can be involved as well as small and medium-sized organizations operating in the woodworking industry, because the mission of the competition is to involve as many organizations from the business environment in the promotion and visibility of the principles of social responsibility. These principles should already be part of the strategies of registered entities and the

competition will be judged aspects of sustainable development: economic, environmental and social. The evaluation is based on the content structure of ISO 26000 which was noted later.

As an indicators measuring the social responsibility, we can classify following:

a) The behavior of the organization as responsible entity:
- Providing information concerning the social responsibility of the Regions
- Business practice that allows equal opportunities for all
- Impact on the local and national economy
- Relations with relevant government authorities
- Ethical behavior

b) Involvement in the region in which the organization operates:
- The involvement in education and training activities
- Support for the provision of health and social care
- Promotion of sport and recreational activities
- Volunteering and philanthropy

c) Actions to reduce and prevent inconvenience and damage that an organization can cause their activities, or during the lifetime of their products:
- Reducing health risks and accidents
- Reduce noise and odors
- Reduce safety hazards
- Reduction or total elimination of pollution and toxic emissions

d) Communicating its activities to help maintain and sustain resources:
- Modal choice
- Environmental impacts
- The reduction and elimination of waste and packaging technology
- Substitution of raw materials or other inputs
- Use of resources such as gas, water, electricity, new and recycled materials and the others

The motivation for SMEs in wood processing industry on the application of corporate social responsibility, should not be the only certificates from various national and international competitions, but first of all it should be the following benefits:

➜ Greater ability to gain and retain quality employees
➜ Increase customer loyalty and so consequently increase sales turnover
➜ Reduce the risks and costs of risk management
➜ Improve the company's image
➜ Retention in a competitive environment and so on.

3 ISO 26000 AND ITS HISTORY

At the end of this article we mention the ISO 26000, which was precursor to European standard SA 8000:2001. ISO 26000 is part of the international standards issued by the International Organization for ISO standardization. It is intended for organizations of private and public sectors, regardless of their size or site of action. The aim is to strengthen the organizations responsible for their behavior and business activities and thereby increase their share of sustainable development. Standard includes guidelines for improvement in three areas of responsibility, so called Triple Bottom Line.

The first initiatives for the final form of the standard began back in 1992 at the World Summit of the Earth held in Rio de Janeiro, and later it was the World Summit on Sustainable Development, held in South Africa in 2002. His central theme was ***"Social responsibility is the basis for the sustainability of any organization."***

Later in 2003, the ISO Council found a Strategic Advisory Group on Corporate Social Responsibility (SAG - Strategy Advisory Group). Here we have already identified the main areas that should be standard include in ISO. In January 2005, members of the ISO approved a new work item for the creation of an international ISO standards. Use of standard is voluntary and is not intended or appropriate for certification, regulatory or contractual goals. It is intended to help organizations that want to achieve mutual trust among stakeholders by improving, compliance with and implementation of social responsibility. Government authorities may this standard use as a guide for the   setting of policy in the field of social responsibility.

Second edition of fourth working draft of ISO 26000 is divided into 7 chapters with Annex on initiatives relating to corporate social responsibility and literature. Content is as follows:

- ➔ Concepts and definitions related to social responsibility
- ➔ Background, trends and characteristics of social responsibility
- ➔ Principles and practices related to social responsibility
- ➔ Key subject matter and themes of social responsibility
- ➔ Integration, implementation and promotion of socially responsible dialogue throughout the organization
- ➔ Identification and involvement of stakeholders
- ➔ Communicating commitments, performance and other areas related to social responsibility.

4 CONCLUSION

Corporate social responsibility has become a new degree of evolution in the field of quality management. The motive of social responsibility is part of different models of excellence such as EFQM (European Foundation for Quality Management Model of Excellence), MBNQA (Malcolm Baldrige National Quality Award Model). Special was established in 2006 by the European Alliance of social responsibility organizations EACSR (European Alliance for Corporate Social Responsibility). In our contribution we would like to point out the connection of quality management systems with social responsibility and sustainable development, which practically covers these activities. Organizations active in the woodworking industry have the opportunity to use all the indicators, which are also indicators of quality management, to better establish themselves in a competitive environment and permanent improvement in the area.

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Authors' addresses

doc. Ing. Renáta Nováková, PhD., e-mail: re.novakova@gmail.com
PhDr. Katarína Ďurková, PhD., e-mail: katarina.durkova@gmail.com
Mgr. Vladimír Ovsenák, e-mail: vladimir.ovsenak@gmail.com
Univerzita sv. Cyrila a Metoda v Trnave
Fakulta masmediálnej komunikácie
Nám. J. Herdu 2
917 01 Trnava
Slovak Republic

PRODUCTS QUALITY IN THE AREA OF WOOD PROCESSING INDUSTRY AS PART OF ECO-EFFICIENCY

Renáta Nováková, Eva Habiňáková

ABSTRACT

In the submitted paper the authors deal with quality of products in the area of wood processing industry as part of green economy. The source of information for us is the National Quality Programme of the Slovak republic for the period 2013-2016. The mentioned program emphasizes the quality of life which is conditioned by increasing the quality of products (goods and services) through certification, brands of quality, introduction of goods on market following the required procedures for assessing conformity and control of their use.

Key words: quality of products, woodworking industry, green economy.

1 INTRODUCTION

Slovak office of standards, metrology and testing in Slovakia has issued the National Quality Programme of the Slovak Republic for the period 2013 – 2016. The mission of this strategic document is to *"support the development of work, production, promotion and service quality for a sustainable quality of life and competitiveness in all social spheres in Slovakia.*

The basic goal is: **the growth of quality of life in Slovakia**, part of which is providing the sustainable growth of economy competitiveness. It should use the sources economically and effectively, divide costs and revenues justly and accept the aspect of social responsibility.

Strategic plans are defined on the basis of analyses and assessments of NPK SR (National Quality Programme of the Slovak Republic) for 2009-2012. In this context following priority areas have been generated:

- Competitiveness of industrial and construction business subjects
- Quality of food and agricultural materials
- Quality and consumer protection
- Quality in tourism, hotel industry, spa industry and gastronomy
- Quality in environment
- Quality in education
- Quality in business
- Quality in health care, labour and social affairs
- Quality in public administration

For the purposes of our article we do not need do deal with all areas. We will pay attention to those which are related to our topic and we will focus on closer identification of Business (all areas and types of business). It includes:

- Improvements in business environment, using competitiveness of the Slovak economy
- Increasing the interest in small and medium-sized businesses on the EU market
- Raising attractiveness of the Slovak Republic for foreign investors
- Socially responsible business – connecting economy, environment and ethics in relation to all involved parties, raising business culture
- Verification of product quality – certification, brand of quality

- Using technical norms
- Quality improvements in relations with customers
- Improvements in human resources care
- Initiation of innovation activities in organizations,
- Competitiveness (model of excellence EFQM, Balanced Scorecard, Six Sigma, Benchmarking)
- Introduction of goods on market having kept all required procedures of assessing conformity and control of their use and operation
- Security and health protection of employees

All these areas are interconnected and create conditions for accomplishing the main goal which is raising the quality of life in Slovakia. Before we start dealing with the quality of products in wood processing industry as part of green economy we have to explain the content of the term *eco-efficiency.*

2 ECO-EFFICIENCY versus SUSTAINABLE DEVELOPMENT

In professional literature we often see that the terms sustainable development and eco-efficiency are often made identical. Originally was eco-efficiency defined as follows:
"*Eco-efficiency represents efforts to produce more products using smaller amount of sources and producing less waste and pollution.*"

This definition appeared in 1992 in the work of S. Schmidheini and WBCSD "Change of direction" modified and in 1993 the WBCSD work group adopted new work definition:
„*Eco-efficiency is reached when price-competitive products and services are offered. They satisfy human needs and bring quality into life and gradually reduce ecological impacts and intensity of using resources during life cycle to the level which is in accordance with the estimated capacity of the Earth.*"

To cover the topic compactly we would like to emphasize that the inventors of the complicated term eco-efficiency perfectly expressed the relation of both perspectives: ecology and economy. If we want to speak about assessing products based on the symbiosis of environmental and economic views, we have to consider impact on the environment (i.e. drawing natural resources and pollution of environment) to economic values ratio, which is most frequently expressed by share indicators of financial effect called **eco-efficiency indicators – EEI.**

Most known eco-efficiency indicators are two types of indicators:

1. **EEI = value/impact on environment**
- This indicator was designed and used in WBSCD publications and it is most frequently used to assess eco-efficiency of products. It expresses turnover to consumption unit.

2. **EEI = impact on environment/value**
- This indicator is used by OECD, UNCTAD, ISAF and the ISO norm 14054 refers to it. It expresses consumption to 1 Euro of added value.

When using both indicators we have to proceed from knowledge about creation, assessment and interpretation of efficiency indicators.
To be able to define the numerator and denominator in both types of indicators better, we have to understand everything what we should imagine under the term **value** and **impact on environment**.

Value is classified as:
- Added value
- Earning before interest and taxes (EBIT)
- Sales
- Turnover
- Economic result for accounting period
- Amount of goods or services (expressed in number, weight, etc.)

Under the term impact on environment we understand (UNO recommendation for all businesses):

- Energy consumption
- Material consumption
- Water consumption
- Greenhouse gases emissions
- Emission of substances damaging the ozone layer
- Quantities specific for a particular branch.

Deficiency in this case is the fact there is no unambiguous view on indicators and measures in the area of eco-efficiency. Often are recommended those which have hardly anything in common with this term and are used only for limited assessing of environmental profile such as using eco-design, publishing environmental news, product toxicity, etc.

This was the reason why the authors Huppes and Ishikawa analyzed common designation eco-efficiency on the basis of four different indicators. For more details see Chart 1 Analysis of common designation eco-efficiency on the basis of 4 different indicators:

	Decisive is the product or production	Decisive is the improvement of environmental profile
Financial quantity divided by environmental quantity	Production value to unit environmental impact Environmental productivity	Expenses on unit improvement of environmental impact Expenses on environmental improvement
Environmental quantity divided by financial quantity	Environmental impact on unit value of production Environmental intensity	Environmental improvement to unit expenses Environmental expenses efficiency

Source: HUPPE, G. – ISHIKAWA, M.: An introduction to quantified eco-efficiency analysis. Springer Verlag, 2007

3 CONCLUSION

In our paper we have pointed out the connection between the quality of products produced in wood processing industry and eco-efficiency is integral and important part of sustainable development. Products assessed on the basis of quality must meet certain criteria related to perspectives stated in the National Quality Programme for 2013 – 2016. That is the only way ho to preserve all these facts and make the products in wood processing industry competitive in global and local environment of international markets.

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Authors' addresses

doc. Ing. Renáta Nováková, PhD., e-mail: re.novakova@gmail.com
PaedDr. Eva Habiňáková, PhD., e-mail: eva.habinak@gmail.com
Univerzita sv. Cyrila a Metoda v Trnave
Fakulta masmediálnej komunikácie
Nám. J. Herdu 2
917 01 Trnava
Slovak Republic

USEFUL METHODS FOR DIAGNOSING ENVIRONMENTAL CONDITIONS IN THE WORKPLACE IN WOOD INDUSTRY

Leon Oblak

ABSTRACT

In the recent years the environment-friendly way of thinking has started to penetrate into areas where its opponents initially seemed to be most strong - to the economy and industry. Environmental challenges are so complex that they must be dealt with systematically. Systematic company management with respect to environmental protection, however, cannot be ensured overnight. It requires target-oriented, step-by-step and continuous effort. Only methodological approach to the solution of environmental problems and some useful methods can provided an answer to the question of whether ecology in wood industry is expenditure or strategic goal and investment which will yield a return. This paper deals with two useful methods – ABC analysis and Multi-criteria decision-making method - that can be used to diagnose the environmental conditions in the workplace in wood industry.

Key words: wood industry, ABC analysis, Multi-criteria decision-making method, environmental conditions.

1 INTRODUCTION

The pollution of natural environment increases daily. This problem has caught our attention at a very late stage. For a long time, the prevailing opinion was that environmental protection measures were too costly. In some places, this attitude persists to this day. Companies mainly regard government measures in the form of restrictions, licences, subsidies and so on as facts to which they try to adapt optimally in the course of carrying out their activity. The realization of the aims of environmental protection is always in conflict with some other business objectives, such as short-term profitability, cost reduction, increase in productivity etc., but one should be aware that the latter are just short-term economic objectives. Companies which follow a different concept, on the other hand, try to incorporate in advance the environmental protection objectives into their basic objectives. The ultimate and final aim of any company is without any doubt long-term profitability, preservation or enhancement of company's economic strength and competitiveness which ensures company's success in the long run. A company which has realized, on the basis of its experience and anticipation of future changes, that the field of environmental protection is one of the key areas for success will consequently try to see environmental protection as a source of new business possibilities (Oblak and Kropivšek, 1997).

The question of environment-affecting impacts is a pressing one, both in developed European countries and in countries in the process of transition. In the case of the latter, in particular, economic changes should not be carried out in the absence of concurrent environmental protection measures. A miraculous solution to these problems is not available. But it is also unreasonable to complain all the time about the scarcity of financial resources for such purposes. Environment-affecting impacts should be seen as a task which demands constant attention - not just as a welcome topic of politics (Oblak, 2007).

Although it may seem that the decision for environment-friendly company is a business necessity, a company will only integrate environmental protection objectives into its business strategy in the case if it estimates that the care for clean environment is not just an additional financial burden for

the company but primarily a market opportunity, and that such objectives may contribute to the making of greater profit. Good environmental conditions in the workplace are one of these objectives (Winter, 1993).

If we want to create a productive workplace, first and foremost, we must create an atmosphere that is respectful of people. This allows everybody to feel accepted and able to participate to their fullest. If you respect people, they will respect you and be more likely to cut you some slack when times get rough. A positive work environment makes employees feel good about coming to work, and this provides the motivation to sustain them throughout the day. One of the important factors welfare workers is also a job that does not have negative environmental impacts on employee.

Indoor environmental quality (IEQ) refers to the quality of a building's environment in relation to the health and wellbeing of those who occupy space within it. In the wood industry IEQ could be determined by many factors, including temperature, moisture, air quality, movement of air, dust, vapour, noise, lighting, vibration. Workers are often concerned that they have symptoms or health conditions from exposures to contaminants in the buildings where they work. One reason for this concern is that their symptoms often get better when they are not in the workplace.

2 METHODS

2.1 ABC analysis

When establishing a system of environment protection, we encounter a great deal of ecological parameters in the company. This demands a large scope of work, but also causes lack of clarity over the whole action. Thorough following and analysis of all ecological parameters would also cause high expenses, surely not in proportion with the results that we can expect form it. It is therefore necessary to determine the critical ecological parameters and prioritize them in the procedure (Oblak et al., 1998).

ABC analysis enables this. It is a very widely applied method that was used for many years only for economic studies, but in this research we modified it also for solving environmental problems in companies. The method is based on Parrett's principle of cause-consequence interdependence, which says, that approximately 20% of causes is responsible for approximately 80% of consequences or effects. If we transfer this to the environmental field, this means that 20% of environmental parameters cause 80% of environmental problems in the companies (Starbek et al., 2000).
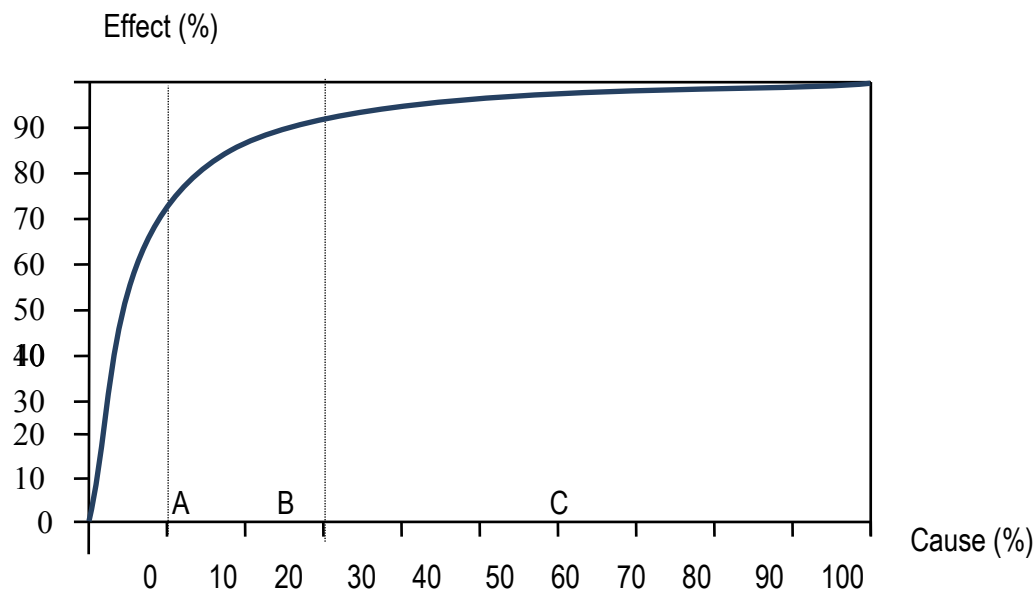
Figure 1. Relation of cause and effect according to the theory of ABC analysis

With this method we categorize all environmental parameters in three typical groups. Group A is for 5-10% of ecological parameters that are responsible for the major share (70-80%) of environment pollution, the group C consists of the major share of less important environmental parameters (60-70%) that cause only a minor, less important pollution share (5-10%), while the middle group B consist of 20-30% of environmental parameters that influence the pollution with a 10-25% share (Zadnik Stirn et al., 1999). The relation of cause and effect according to the theory of ABC analysis is shown in Figure 1.

Therefore the group A contains those effects to the employee that demand immediate action, the group B contains the noticeable effects that will be resolved in middle terms, and the group C contains those effects that are of secondary importance and do not cause any significant effect to the employee.

2.2 Multi-criteria decision-making method

Decision-making is a process where we need to choose from more than one alternative (possibility, variant, option) the one that best suits the set goals or demands. If we want our decision to be optimal, we need to consider a wide range of factors influencing the quality of our decision. In such cases, the decision-maker can help himself with various methods and computer programmes for decision-making support (Triantaphyllou, 2000).

One of these methods successfully being used in practice for solving demanding decision-making problems is the method of the multi-criteria decision-making. The essential element of this method is to break the decision-making problem into smaller sub-problems, which are later dealt with individually. These options are then separated into individual parameters and are evaluated separately. By combining these evaluation marks, we get the final mark, which is the basis for choosing the best option (Ishizaka and Nemery, 2013).
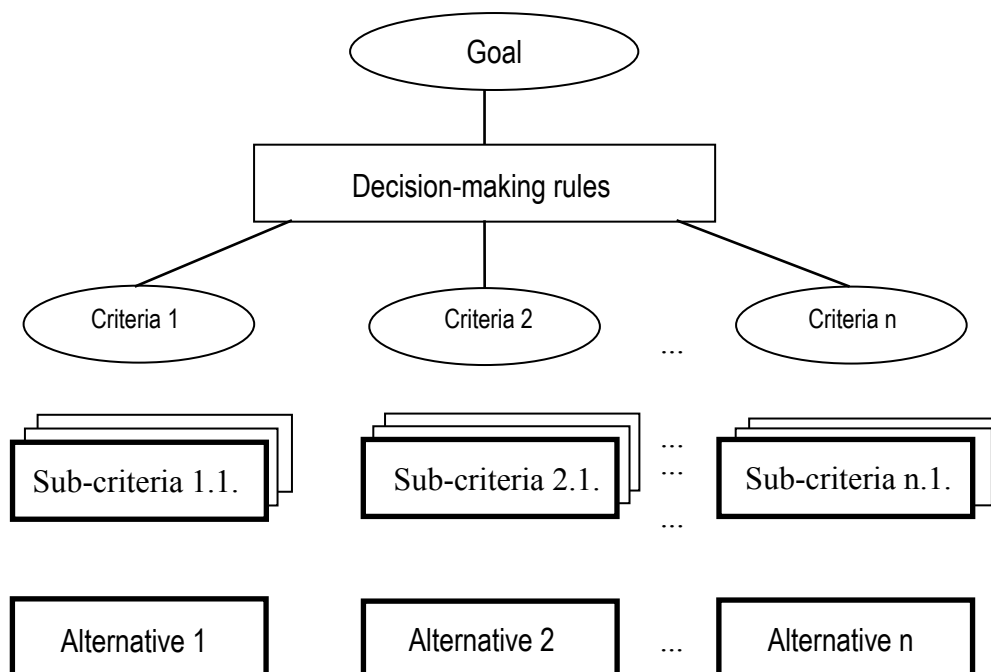
Figure 2. Multi-criteria decision-making model

This method can be also used in determining the environmental situation (state) in the workplace in wood industry. First, we need to determine and produce a list of criteria we consider to be relevant. These criteria need to be structured for the purposes of the model, i.e. they need to be hierarchically arranged where mutual dependency and contextual links need to be considered. Thus, we get a diagnostic tree of criteria. Each criterion in this tree is given a measuring scale i.e. an estimated value it can take in evaluation.

3 RESULTS

When trying to analyse, structure and evaluate the key environmental parameters in the workplace in wood industry companies, a diagnostic tree of pollution factors, desired to be included in ABC analysis, must be prepared. An example of such a tree is shown in Figure 1. A diagnostic tree which is developed for the purpose of diagnosing the ecological conditions in the workplace in wood industry companies is shown in Figure 3. The lower level branches represent the basic events - nine environmental parameters (temperature, moisture, quality of air, movement of air, dust, vapour, noise, lighting, vibration), which can be measured or can be determined descriptively. Composite events on the next branch of the diagnostic tree (microclimatic parameters, other parameters) are reached by means of implications, that is, by operations of logical inference written down in the form of logical rules. In this way, on each branch of the tree the environmental conditions in the workplace can be determined and the critical points can be established. The top of the tree represents the diagnosis relating to environmental conditions in the workplace in wood industry company concerned.
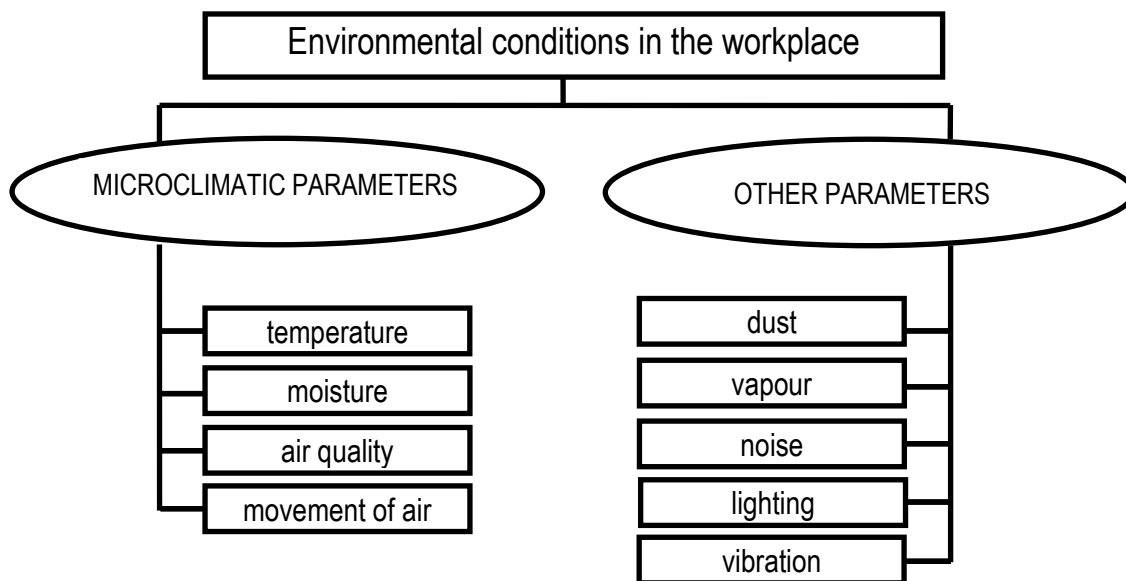
Figure 3: A diagnostic tree used in determining the environmental conditions in the workplace in wood industry companies

Then we need to estimate environmental parameters at a specific workplace. We estimate only the parameters on the lower branches of a diagnostic tree. Table 1 shows the evaluation of individual environmental parameters from the diagnostic tree for hypothetical workplace. Each individual parameter should be classified into one of the groups - A, B or C - with regard to the environmental effects to the employee (evaluation of measurements or expert opinion).

Table 1. Evaluation of individual environmental parameters

ENVIRONMENTAL PARAMETER	ABC analysis
temperature	A or B or C
moisture	A or B or C
quality of air	A or B or C
movement of air	A or B or C
dust	A or B or C
vapour	A or B or C
noise	A or B or C
lighting	A or B or C
vibration	A or B or C

Parameters on the lower branches of a diagnostic tree are measured or assessed and classified into one of three classes – A, B or C. Noise, for example, could be classified in class A, if the value is more than 85 dB, in class B, if the value is between 70 and 85 dB and in class C, if the value is less than 70 dB.

The next step is defining the utility functions i.e. the decision-making ("*if-then*") rules. The rules need to be developed for all the criteria, which have a dispersed structure underneath themselves in the decision-making tree. This means all except the criteria on the lower branches of the decision-making tree. In our case the rules need to be developed for three criteria: »Environmental conditions in the workplace«, "Microclimatic parameters" and "Other parameters". We can present them in the form of a table for each group of criteria. What we need to be careful about when developing the decision-making rules is the consistency between the defined rules for certain combinations of the criteria values. Decision-making rules formed for the top level of our decision-making tree are presented in Table 2.

Table 2. Decision-making rules for the top level of decision-making tree

	Microclimatic parameters	Other parameters	Environmental conditions in the workplace
1	A	A	unacceptable
2	A	B	unacceptable
3	A	C	unacceptable
4	B	A	unacceptable
5	B	B	bad
6	B	C	acceptable
7	C	A	unacceptable
8	C	B	acceptable
9	C	C	good

We can say that these two methods are very useful for diagnosing environmental conditions in the workplace in wood industry. The results of diagnosis indicate which environmental parameters are the causes of unacceptable or bad environmental conditions at workplace.

4 SUMMARY

Environment preservation and protection belong to the greatest challenges the world has set for the next decade. The consequence is an increasing number of environmental protection organisations, environmental standards, legislative regulations and limitations forcing companies into production that impacts the environment as little as possible. Furthermore, the customers are becoming more ecologically aware and are deciding on purchasing products whose raw materials, production; usage

and removal do represent less impact on the environment. To realize the objectives of environment-friendly economic development, what is needed are dynamic, flexible and profit-making companies and the willingness of these to meet the ecological challenges. Many companies have already realized that economic development and environmental protection are not and will not be conflicting objectives in the future but must become a combined task.

The ecology movement has in the recent years gained in strength throughout the world and will undoubtedly lead to market changes of such scope and pace as have never before been observed. Some companies oppose these developments, but they cannot slow them down.

In the paper, a methodology for diagnosing the existing environmental conditions in the workplace in wood industry was developed. The combination of the ABC analysis and Multi-criteria decision-making method is an excellent tool for solving environmental problems in the wood companies and ensure favourable conditions of work.

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Author's address

Prof. dr. Leon Oblak, e-mail: leon.oblak@bf.uni-lj.si
University of Ljubljana
Biotehnical Faculty
Department of Wood Science and Technology
Rožna dolina
Cesta VIII/34
1000 Ljubljana
Slovenia

THE ROLE OF FOREST CERTIFICATION
IN THE EUROPEAN TIMBER REGULATION

Hubert Paluš, Ján Parobek, Vladislav Kaputa

ABSTRACT

This paper describes the role of forest certification in the European Timber Regulation. Certification schemes as third-party verification programmes can be used as effective tools for assessment and mitigation of risk associated with sourcing of illegally harvested timber. The paper explains how and under which conditions the certification schemes can be used for the purposes of the Regulation and it describes in details the mechanism used by the PEFC certification system that can be implemented by companies in order to meet the requirements of the Regulation.

Keywords: European Timber Regulation, illegal logging, forest certification, PEFC.

1 INTRODUCTION

Illegal logging is a global problem that incorporates the harvest, transportation, purchase or sale of timber in violation of laws. The harvesting procedure itself may be illegal, including using corrupt means to gain access to forests; extraction without permission or from a protected area; the cutting of protected species; or the extraction of timber in excess of agreed limits. Illegal activities may also occur during transport, such as illegal processing and export; fraudulent declaration to customs; and the avoidance of taxes and other charges. Illegal logging causes enormous damage to forests, local communities and to the economies of producer countries. The World Bank estimated in a March 2012 report that illegal logging generates up to $15 Billion a year for criminal gangs involved in the activity [1]. Although exact figures are difficult to state, illegal logging occurs most especially in open and vulnerable areas – the Amazon Basin, Central Africa, Southeast Asia, the Russian Federation.

Illegal logging contributes to deforestation and by extension global warming, causes loss of biodiversity and undermines the rule of law. These illegal activities undermine responsible forest management, encourage corruption and tax evasion and reduce the income of the producer countries, further limiting the resources producer countries can invest in sustainable development. Furthermore, the illegal trade of forest resources undermines international security, and is frequently associated with corruption, money laundering, organized crime, human rights abuses and, in some cases, violent conflict. In the forestry sector, cheap imports of illegal timber and forest products, together with the non-compliance of some economic players with basic social and environmental standards, destabilize international markets. This unfair competition affects those European companies, especially the small and medium sized companies that are behaving responsibly and ready to play by fair rules.

Recognizing the economic importance of trade in timber and forest products and technical difficulties in the identification of illegally logged or traded timber, major international timber consumer countries, such as the EU, have implemented legal means to halt the import of illegally sourced forest products.

2 EUROPEAN TIMBER REGULATION

The EU Timber Regulation (EU TR) (Regulation No 995/2010 of the European Parliament and of the Council of 20 October 2010) lays out the obligations of operators and traders who place timber and timber products on the European market. The Timber Regulation has three key components [2]:

- It prohibits the placing of illegally harvested timber and products derived from illegally harvested timber on the EU market;
- It requires the "first placer" of timber products on the EU market to exercise due diligence; and
- It requires traders who deal in timber products after the first placing to keep records enabling basic traceability of supply chains.

The Regulation covers a wide, but not exhaustive, range of timber and wood products, including fuelwood, plywood, raw timber, sawnwood, pulp and paper, furniture, joinery, and barrels. It does not cover musical instruments, printed materials (i.e. books and newspapers), or wood products imported by individuals for personal use, among other categories.

"Due diligence" in the EUTR context requires operators to undergo a process to minimize their risk of placing illegally harvested products on the EU market. It is a prescriptive system with specific steps that must be followed. The core of the "due diligence" notion is that operators undertake a risk management exercise so as to minimise the risk of placing illegally harvested timber, or timber products containing illegally harvested timber, on the EU market [3]. The three key elements of the "due diligence system" (DDS) are:

- Information: The operator must have access to information describing the timber and timber products, country of harvest, species, quantity, details of the supplier and information on compliance with national legislation.
- Risk assessment: The operator should assess the risk of illegal timber in his supply chain, based on the information identified above and taking into account criteria set out in the regulation.
- Risk mitigation: When the assessment shows that there is a risk of illegal timber in the supply chain that risk can be mitigated by requiring additional information and verification from the supplier.

3 THE ROLE OF FOREST CERTIFICATION

While there is no automatic "green light" for certified products as the European Commission cannot formally endorse non-regulatory instruments, the EUTR however recognizes the added value of certification as a potential tool for risk assessment and mitigation. The EUTR states that in order to recognize good practice in the forestry sector, certification or other third party verified schemes that include verification of compliance with applicable legislation may be used in the risk assessment procedure.

The European Commission advises that companies may rate credibly certified products as having negligible risk of being illegal, i.e. suitable for placing on the market with no further risk mitigation measures, provided that the rest of the information gathered and the replies to the risk assessment questions do not contradict such a conclusion [4].

EUTR states that DDS shall contain the risk assessment procedures enabling the operator to analyse and evaluate the risk of illegally harvested timber or timber products derived from such timber being placed on the market. Such procedures shall take into account the basic information on tree species and origin as well as relevant risk assessment criteria, including:

- assurance of compliance with applicable legislation, which may include certification or other third-party- verified schemes which cover compliance with applicable legislation,
- prevalence of illegal harvesting of specific tree species,

- prevalence of illegal harvesting or practices in the country of harvest and/or sub-national region where the timber was harvested, including consideration of the prevalence of armed conflict,
- sanctions imposed by the UN Security Council or the Council of the European Union on timber imports or exports,
- complexity of the supply chain of timber and timber products.

Except where the risk identified in course of the risk assessment procedures referred above is negligible, DDS shall include risk mitigation procedures which consist of a set of measures and procedures that are adequate and proportionate to minimise effectively that risk and which may include requiring additional information or documents and/or requiring third party verification.

The EUTR Guidance document [5] states that certification or other third party verified schemes may be taken into account in the risk assessment and risk mitigation procedures where they meet the following criteria:

a) they have established and made available for third party use a publicly available system of requirements, which system shall at the least include all relevant requirements of the applicable legislation;

b) they specify that appropriate checks, including field-visits, are made by a third party at regular intervals no longer than 12 months to verify that the applicable legislation is complied with;

c) they include means, verified by a third party, to trace timber harvested in accordance with applicable legislation, and timber products derived from such timber, at any point in the supply chain before such timber or timber products are placed on the market;

d) they include controls, verified by a third party, to ensure that timber or timber products of unknown origin, or timber or timber products which have not been harvested in accordance with applicable legislation, do not enter the supply chain.

PEFC as a worldwide forest certification scheme meets the above required criteria, namely [6]:

- PEFC's system of requirements is publicly available and requires compliance with all relevant requirements of the applicable legislation.
- PEFC requires certification bodies to undertake annual checks, including field visits, to verify compliance with certification requirements, including the applicable legislation.
- PEFC's Chain of Custody certification, which is verified by certification bodies, traces timber and forest products through the entire supply chain. All timber must be harvested in accordance with applicable legislation, originating either from sustainably managed, PEFC-certified forests or from forest management activities that are considered as non-controversial and in compliance with applicable legislation.
- PEFC's Due Diligence System, which is an integral part of Chain of Custody certification, provides controls to ensures that the risk of timber from controversial sources (including illegal harvesting) entering the supply chain is minimised.
- PEFC certification is compliant with the relevant ISO guides. Furthermore, PEFC is officially affiliated with ISO, the International Accreditation Forum (IAF) and the European co-operation for Accreditation.
- 2013 PEFC Chain of Custody standard specifically considers the availability of substantiated comments or complaints as part of the PEFC Due Diligence System.
- In line with the applicable ISO requirements, PEFC certification is verified by third-party certification bodies that are accredited by independent national accreditation bodies. Accreditation bodies must be members of the International Accreditation Forum (IAF).

3.1 PEFC Chain of Custody Standard and EUTR

The actual PEFC COC standard (PEFC ST 1002:2013 Chain of Custody of Forest Based Products – Requirements) [7] describes a process of how to get from the information about the origin associated with the procured raw material to the information about the origin which is attached to the company's products. This standard specifies two optional approaches for chain of custody, namely the physical separation method and the percentage based method. This standard also specifies the minimum management system requirements for the implementation and management of the chain of custody process. In addition this standard includes minimum requirements on health, safety and labour issues.

PEFC Chain of Custody standard with its integral PEFC Due Diligence System (PEFC DDS) is fully aligned with the EUTR. As all PEFC-certified companies were required to implement the 2013 Standard, PEFC Chain of Custody certification represents an efficient tool to demonstrate compliance with EUTR requirements along the entire supply chain.

3.2 PEFC Due Diligence System

The PEFC DDS system is based on risk management techniques to minimise the risk that the procured material originates in controversial sources. The system shall be implemented for all input forest based material covered by the company's PEFC chain of custody with the exception of recycled material and material originating from species listed in Appendices I to III of CITES. The system shall be implemented in three steps relating to:
a) gathering information,
b) risk assessment and
c) management of significant risk supplies.

As certification requirements go beyond legal requirements, companies shall not include any restricted forest based material originating from countries which are covered by applicable UN, EU or national government sanctions restricting the export/import of such forest based products, conflict timber, material from genetically modified forest based organisms, and wood based material originating in conversion of forests to other vegetation type, including conversion of primary forests to forest plantations.

The PEFC DDS is based on information provided by the supplier. The company shall have access to the following information:
a) identification of the material/product, including its trade name and type;
b) identification of tree species included in material/product by their common name and/or their scientific name where applicable;
c) country of harvest of the material and where applicable sub-national region and/or concession of harvest.

Except of PEFC certified material and other material claimed and supplied by a supplier with PEFC recognised chain of custody certificate the company shall carry out the risk assessment of procuring raw material from controversial sources. This assessment shall be carried out based on an evaluation of:
a) the likelihood that activities defined under the term controversial sources occur in the country / region of the supply or for the tree species of the supply (likelihood at the origin level) and;
b) the likelihood that the supply chain has not been able to identify a potential controversial source of supply (likelihood at the supply chain level).

The risk determination is carried out on the basis of combination of the likelihood at the origin level and the likelihood at the supply chain level, in order to classify all supplies as "significant" risk where one or both levels are assessed as having high likelihood (Figure 1).

		Likelihood on origin level	
Likelihood on supply chain level	High	Significant Risk	Significant Risk
	Low	Negligible Risk	Significant Risk
		Low	High

Figure 1: Risk categories

A list of indicators for "low" likelihood on origin and supply chain level is shown in Table 1. If the supplies can be characterized by indicators indicating "low likelihood" on the supply chain level or the origin level this always overrules a high "likelihood" indicator on the same axis.

Table 1. List of indicators for "low" likelihood on origin and supply chain level (negligible risk)

Indicators
Supplies: a) certified material/products delivered with a claim by a supplier with PEFC recognised certificate, b) other material/products delivered with a claim by a supplier with PEFC recognised chain of custody certificate.
Supplies declared as certified against a forest certification scheme (other than PEFC endorsed) supported by a forest management or chain of custody certificate issued by a third party certification body.
Supplies verified by governmental or non-governmental verification or licensing mechanisms other than forest certification schemes focused on activities covered by the term controversial sources.
Supplies supported by verifiable documentation which clearly identifies • country of harvest and/or sub-national region where the timber was harvested (including consideration of the prevalence of armed conflict) • trade name and type of product as well as the common name of tree species and, where applicable, its full scientific name • all suppliers within the supply chain and • the forest management unit of the supply origin • documents or other reliable information indicating compliance of those timber and timber products with activities referred to by the term controversial sources. Special attention shall be given to documentation which is produced by a governmental body of the country with TI CPI below 50.

Lists of indicators for "high" likelihood on origin and supply chain levels are shown in Table 2 and 3.

Table 2. List of indicators for "high" likelihood on origin level

Indicators
The actual corruption perception index (CPI) of the country presented by Transparency International (TI) is lower than 50.
The country / region has a prevalence of armed conflict.
The country/region is known as a country with low level of forest governance and law enforcement.
Tree species included in the material/product is known as species with prevalence of activities covered by the term controversial sources.

Table 3. List of indicators for high likelihood on supply chain level

Indicators
Actors and steps in the supply chain before the first verification by a verification system accepted as indicator for low risk in this risk matrix are unknown
Countries/regions where the timber and timber products have been traded before the first verification by a verification system accepted as indicator for low risk in this risk matrix are unknown.
Tree species in the product are unknown
Evidence of illegal practices by any company in the supply chain

The risk assessment shall be carried out for the first delivery of every individual supplier. It shall be reviewed and if necessary revised at least annually. The company shall ensure that substantiated concerns provided by third parties concerning supplier compliance with legal requirements and other aspects of controversial sources are promptly investigated and, if validated, result in (re-)assessment of the risks associated with the relevant supplies. In case of substantiated concerns material originally excluded from the risk assessment shall undergo a risk assessment.

For supplies identified as "significant" risk, the supplier shall be requested to provide additional information and evidence, if possible, which allows the company to classify the supply as negligible risk. The supplier shall ensure that:
a) it will provide the company with necessary information to identify the forest management unit(s) of the raw material and the whole supply chain relating to the "significant" risk supply.
b) it will enable the company to carry out a second party or a third party inspection of the supplier's operation as well as operations of the previous suppliers in the chain.

The company shall establish a second or third party verification programme for supplies classified as "significant" risk. The verification programme shall cover:
a) identification of the whole supply chain and forest management unit(s) of the supply's origin;
b) on-site inspection whenever relevant and
c) risk mitigation, corrective and preventive measures as required.

The company shall require, from all suppliers of "significant" risk supplies, detailed information on the whole supply chain and forest management unit(s) of the supply's origin. The information submitted shall allow to plan and execute on-site inspections. On-site inspection may be substituted with documentation review where the documentation provides sufficient confidence in the material origin in non-controversial sources.

The number of verified supplies shall be determined by using sampling. The on-site inspections shall cover the direct supplier and all previous suppliers in the supply chain and the forest owner / manager of the forest management unit of the supply origin.

The company shall define written procedures for implementing corrective measures for non-compliance for suppliers identified by the company's verification programme. The measures shall include clear communication of the risk identified with a request for addressing the risk identified within a specific timeline, requiring suppliers to define risk mitigation measures or cancellation of any contract or order for timber or timber product until the supplier can demonstrate that appropriate risk mitigation measures have been implemented. Timber known or reasonably suspected as coming from illegal sources shall not be processed and, shall not be traded and/or shall not be placed on the market unless appropriate documented evidence has been provided and verified which allows the timber supplied to be classified as presenting "negligible risk".

4 CONCLUSION

The serious consequences of illegal logging have resulted in the implementation of legislative measures by different countries and regional unions. The most recent EU legislation deals with the

requirements for operators placing timber on the EU market to exercise due diligence. Such a system is based on information and procedures allowing minimise the risk of sourcing timber from illegal sources. Forest certification schemes, as third-party verification systems, can play a significant role in the process of risk assessment and risk mitigation. PEFC Chain of Custody certification is therefore a viable option also for currently uncertified companies that are subject to the European Timber Regulation.

Aknowledgement

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Authors' addresses

Assoc. prof. Hubert Paluš, PhD., e-mail: palus@tuzvo.sk
Ján Parobek, PhD., e-mail: parobek@tuzvo.sk
Vladislav Kaputa, PhD., e-mail: kaputa@tuzvo.sk
Department of Marketing, Trade and World Forestry
Technical University in Zvolen
Masaryka 24
960 53 Zvolen
Slovakia

SLOVAK FOREIGN TRADE WITH INDUSTRIAL ROUNDWOOD

Ján Parobek, Hubert Paluš, Martina Kalamárová, Erika Loučanová, Anna Dovčíková

ABSTRACT

The internationalization of competitiveness in different sectors influences also the forest industry. This paper deals with the explanation of quantitative methods, including comparative analysis as a tool for the competitiveness analysing of the Slovak industrial roundwood production and foreign trade. A comparative analysis of wood prices in foreign trade was used to compare price levels between Slovakia nad its main trade partners, namely Poland, Austria, the Czech Republic and Hungary. The results illustrate the competitiveness of the Slovak coniferous and non-coniferous industrial roundwood export at the European market.

Key words: industrial roundwood, competitiveness, foreign trade.

1 INTRODUCTION

Significant changes in the political, social and economic areas are reflected in the use of domestic renewable resources. Wood production has a long tradition in the Slovak Republic. Nowadays wood as a significant renewable resource is closely linked with many other sectors of the national economy. Competitiveness of each sector depends on the process of restructuralisation and modernisation of production facilities as well as the process of specialisation of production (Paluš, Šupín, 2004). The forest industry is one of the sectors in which the Slovak economy may at least partly influence the European markets with maximum utilization of own resources. The optimal utilization of wood resources appears problematic. There is an effort to increase added value and to support domestic consumption of wood commodities. This effort and development of forest industry depends on society-wide interest in the broad context as well as in the narrow context on different stakeholders entering the wood product chain (Paluš et al., 2009). A phenomenon of forest industry development is disposal of the products on the global market, increasing added value and more efficient utilization of wood and therefore the higher wood products finalization, respectively invention and innovation in all areas related to finalization of wood products (Loučanová, 2005). Above mention facts represents complex of different relationships, problems and limitation for each company of the forestry sector. Those factors vary under different conditions. At the present time, besides pulp and paper industry, forest industry producing higher added value e.g. (final wood commodities such as furniture, wood construction, etc.) is still unable to compete on the European markets. Therefore, production and export of roundwood is important part of income for the Slovak forest industry.

2 METHODOLOGY

Material necessary for elaboration of this paper was obtained by secondary research, based on analysis of the available scientific literature and internet sources focusing on the issue of sectors and countries competitiveness. A method of the research is a systemic, comparative and logical analysis of the comparative price level. This analysis has been applied for forestry sector especially for the particular commodities - industrial roundwood, coniferous (C) and non-coniferous (NC).

A comparative price level for the analysis is defined as the ratio of purchasing power parities (PPPs) in each analysed country. The main trade partners of Slovakia - Austria, Poland, Germany, Hungary and the Czech Republic were involved in the analysis. The results give a measure of the indicators of price level differences across analysed countries. This analysis is able to describe how many currency units are given to the same quantity of wood in different countries. Using PPPs it was necessary to convert expenditure expressed in national currencies (the Czech Republic – koruna, Poland – zloty etc.).

Price level indices may be used as a starting point for analysing price convergence. According to the FAOSTAT databases (year 2012) the price has been calculated as ratio value of export in USD and amount of export in cubic meters. For this purpose, the coefficient of variation of price level indices across any number of countries (for main business partners of the SR) was calculated. A decreasing coefficient over time indicates that price levels are converging. The Eurostat publishes an annual estimate of price convergence based on the temporal development of the coefficient of variation.

Comparative price levels were calculated as:

$$CPL = P_f/P_d \qquad\qquad [1]$$

where:
P_f- price of roundwood produced in the SR,
P_d- price of roundwood produced in other country

Based on the data of Eurostat, foreign trade prices for the selected wood categories were calculated according to the methodology mentioned above. The price levels of Slovak trade partners were expressed relatively to price level of Slovakia, which represented the average price level, in our case 100 %. If the price level index was higher than value 1 (100 %), the country concerned was considered to be relatively expensive compared to Slovakia and conversely, if the price level index was lower than value 1 (100 %), then the country was relatively cheaper compared to Slovakia.

3 RESULTS

The research dealt with the analysis of foreign trade prices of roundwood of the Slovak Republic and the main trade partners - Austria, Poland, Germany, Hungary and the Czech Republic. This analysis has been applied for forestry sector especially for industrial roundwood (coniferous and non-coniferous). According to the official international statistics wood fuel foreign trade is negligible.

Figure 1 illustrates the levels of roundwood foreign trade prices. Price levels of Slovak business partners are expressed relatively to the average price level of Slovakia (100%). As it follows from the graph price levels of roundwood differ from 45 % below the average to 163 % above the average.
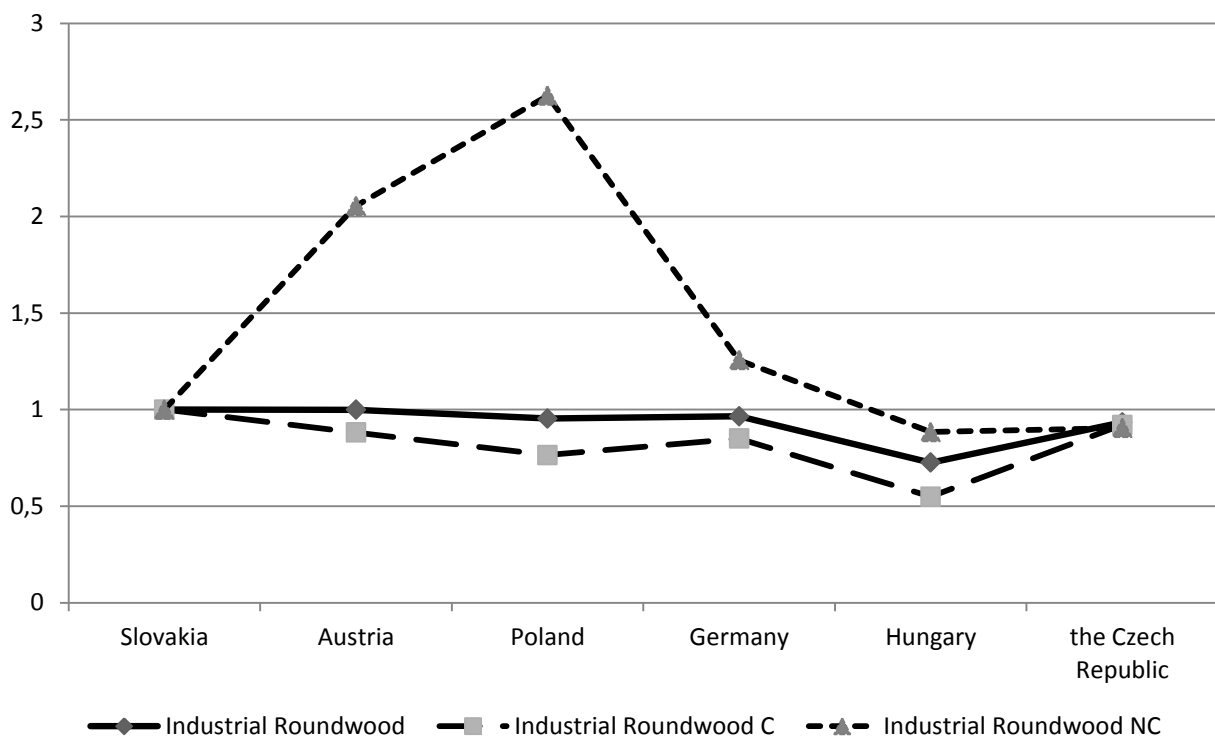
Figure 1. Comparative price levels of industrial roundwood, coniferous and non-coniferous
Source: Own elaboration

Concerning industrial roundwood, the prices of all analysed countries are lower than the price of Slovakia, except of Hungary, which has the lowest prices of industrial roundwood at all, 27 % below the average. Based on these results, price levels in Hungary show the highest competitiveness in export of industrial roundwood.

The differences in price levels are evident when we focus on the classification of roundwood to the coniferous and non-coniferous ones. While all analysed countries have lower prices of coniferous roundwood than Slovakia (8 to 45 % below average price), price levels of non-coniferous roundwood differ from 12 % below the average to 163 % above the average in comparison with the Slovak price levels. Poland shows the highest prices of non-coniferous roundwood, at the level of 163 % above the average. This implies that Poland has the lowest competitiveness in export of non-coniferous industrial roundwood.

The trend of total roundwood price levels follows the coniferous roundwood price levels. It can be pointed out that all the analysed countries are more competitive in industrial roundwood export than the Slovak Republic. It should also be noted that industrial roundwood is a group of different wood assortments and prices are just average, which may be distorting.

4 SUMMARY

This paper highlights the different foreign trade prices for roundwood in the Slovak Republic and their trade partners. The understanding of the differences in price levels of roundwood is important in the comparison of economic data, such as, economic grow and gross domestic product, because the higher relative prices could make an economy look healthier than it really is. Observing price level

differences is also important in the analysis of the development of the EU's single market for goods and services.

In particular, this paper dealt with the analysis of foreign trade prices for roundwood of the Slovak Republic and the main trade partners - Austria, Poland, Germany, Hungary and the Czech Republic. The price levels of Slovak trade partners were expressed relatively to the price level of Slovakia, which represented the average price level.

Aknowledgement

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Authors' addresses

Ing. Ján Parobek, PhD., e-mail: parobek@tuzvo.sk
Assoc. Prof. Hubert Paluš, PhD., e-mail: palus@tuzvo.sk
Ing. Martina Kalamárová, PhD., e-mail: martina.kalamarova@tuzvo.sk
Ing. Erika Loučanová, PhD., e-mail: loucanova@tuzvo.sk
JUDr. Anna Dovčíková, e-mail: dovcikova@tuzvo.sk
Department of Marketing, Trade and World Forestry
Technical University in Zvolen
Masaryka 24
960 53 Zvolen
Slovakia

INTELLECTUAL CAPITAL AND FINANCIAL PERFORMANCE OF WOOD PROCESSING ENTERPRISES IN REPUBLIC CROATIA

Ivana Perić, Tomislav Grladinović, Krešimir Greger

ABSTRACT

This paper deals with theoretical and empirical identification of interdependencies and impact of intellectual capital on the profitability of wood processing enterprises in the Republic of Croatia. The profitability of an enterprise depends on many external and internal factors. One of the key factors, if not the most crucial one, is its development and perspective. This problem can be analysed from the management standpoint, which leads to the hypothesis that the profitability and market position of an enterprise largely depends on its intellectual capital. The performance measures used were net profit margin, organization efficiency, return on assets (ROA), return on equity (ROE), Intellectual Capital efficiency, whereas IC efficiency was measured using value added intellectual coefficient (VAIC™).The empirical part of this study was based upon yearly financial reports of Croatian wood processing enterprises listed on http://www.biznet.hr/.

Key words: Wood Processing, Enterprises Intellectual capital, VAIC™, ROE, ROA.

1 INTRODUCTION

In today's turbulent business environment, where various crises are alternated, there is a reason to wonder what should, in such circumstances, be the goal of business.

Industry awareness of the need for further reports on all available resources and their contribution to the overall value creation is increasing, despite numerous existing numerical reports on business performances, thus realistically expressing the value of the overall business and properly manages the entire process.

The basis of the measurement system that would fit the new business environment is the value, so it is logical, and so far the only understandable solution that the business results in the knowledge economy is an added value (Jurczak, 2008). By that, on one hand business ability of the enterprise is visualised, and on the other hand a bridge between intellectual capital, as intangible resource, and monetary sphere is created (Ross and etc., 2005).

While companies in the old economy were dependent on tangible assets, such as real estate and factories, today's new economy is based on a new type of companies that are dependent on intangible assets such as information and knowledge (Kolaković, 2003). Knowledge is what creates value (Perić and etc. 2010).Internet provides instant dissemination of knowledge throughout the world. The more people are involved in the sharing of knowledge it has greater value, because it increases, broadens and deepens (Kolaković, 2003).

Creating value refers to the creation of new knowledge and exploiting its value (Janošević and etc. 2013). The most important asset is intellectual property that has no physical feature. While traditional economic theory studied capital as physical items (land, factories, equipment and money), economists have recently expanded their views. As Lief Edvinsson (2002) says: „the invisible hand of the economy, of which Adam Smith speaks, has become even more elusive".

This concept has numerous advantages, and in addition it does not replace the existing measuring instruments, but complements them. Added value is completely objective indicator of business performance as both categories that form it, the output and input, are taken from market

relations. In comparison, the profit is an indicator that is derived from a multitude of subjective, internal transactions and calculations. Furthermore, added value shows the company power in creating wealth (Pulić and Sundać, 2001).It is simply calculated at all levels, from the process in the wood processing enterprise, on the level of processing group, and it can be calculated on the regional and national level. Thus, the added value is one universal dimension that connects the entire economy. In addition, it can be calculated as needed, as well as current business reports: weekly, monthly, quarterly, annually.

It is a measure that indicates how employees and management contribute to the creation of value. Using the added value can be an important first step towards motivating employees to participate, with their contribution, in increasing created enterprises wealth. Evidently, this must be reflected in their salary. Greater added value with higher employee salaries provides greater dividends to investors - shareholders, higher payments to the state and investment in future growth. This measure does not differentiate participants in the economy, as it was the case in all previous economic systems; rather it connects them with a common goal: the creation of greater value.Generally speaking, the role of measurement is to allow us to focus on things that we want to observe.Therefore, the measurement provides a strong management tool that will affect organizational behavior and work (Kolaković, 2003).

Various authors (Bontis, 1996, Edvinsson and Malone, 1997; Sveiby, 2001; Sulivan, 2000, Chen ant etc, 2004.) have presented some definitions of intellectual capital, such as:

- Intellectual capital is the sum of the collective knowledge, experience, expertise, abilities and skills of the company on how to achieve greater results, provide better services or create other intangible value for companies;
- Intellectual capital is the knowledge that exists within the company and which can be used to create a competitive advantage - in other words, it is the sum of everything that all employees know and what sharpens competitive advantage of the company;

In essence intellectual capital represents knowledge as a dynamic human process, but only when the knowledge and intelligence are applied and transformed into something of value for the company and its customers, knowledge becomes a valuable asset, that is, intellectual capital of the enterprise. Otherwise, this knowledge remains merely unused intellectual potential (Kolaković, 2003).

1.1 Methods for measuring and managing Intellectual Capital

The best-known methods, which are now used for the measurement and management of intellectual capital are: EVA® (Stewart, 1991;1994), Balanced Score Card (Kaplan&Norton, 1996), Skandia Navigator (Edvison & Malone, 1997), Intangible Assets Monitor (Sveiby, 1997), ICE (Ross, 1997) and VAIC™ (Pulić, 1999). Business performance of each company, according to the author of the method for calculation, shows the efficiency of intellectual capital.

1.2 VAIC analysis

The VAIC™ model was developed and implemented by Ante Pulić (1998, 2004). Basically, it is a calculation of VA, as an indicator of a enterprises efficient use of IC. The basic idea behind this approach lies in determining the contribution of all enterprise resources (human, structural, and physical) to the creation of VA, which is calculated as:

VA = OUT- IN

Outputs (OUT) represent total sales realised on the market. Inputs (IN) entail all the costs of managing the company, except for those related to human resources, which are viewed in this model as

an investment. Further steps involve calculating intellectual and physical capital efficiency coefficients. A enterprises IC comprises HC and SC. Calculation of HCE starts with employee salaries and wages, HCE is therefore calculated as:

$$HCE = VA / HC$$

Here, HC denotes total salaries and wages during one fiscal year. In this manner, the model describes the relative contribution of human resources to the creation of VA. The next component of IC, SC, represents everything that stays in the office when employees go home. SC comprises hardware, software, organizational structure, patents, trademarks, and all other factors that support or increase EP (Bontis,2001). SCE is calculated as:

$$SCE = SC / VA$$

SC represents the second component of an IC. The aforementioned equation indicates that SCEis inversely related to HCE. ICE is obtained by summing the partial efficiencies of HC and SC:

$$ICE = HCE + SCE$$

In the context of the research value of the IC by method VAIC ^{TM} is defined as an indicator of how efficiently intellectual capital creates value (Lolić, 2011).

1.3 Research Objectives and Hypothesis

This paper examines the relationship between IC and the financial performance of wood processing enterprises in the Republic of Croatia. Based on described problem, following hypothesis is set:
H1: The efficiency of intellectual capital affects the profitability of wood processing enterprises in Croatia.

2 MATERIALS AND METHODS

Empirical research included 32 small wood processing enterprises in Republic of Croatia. According to the 2007 National Classification of Activities, these enterprises fall into categories C16 - wood processing and C31 - furniture production, whose yearly financial reports were listed on http://www.biznet.hr/ for a period from 2010 to 2012. Data were analysed with the help of a software package Excel and Statistica. To be able to evaluate whether the size of some indicators are satisfactory or not, it is necessary to compare these indicators to specific sizes, which in fact represent a base of comparison.
Net profit margin (NPM) = Net profit / Sales earning
Indicator ofreturn on assets (ROA)= Net Profit / Assets
Indictor of return on equity (ROE)= Net Profit / Equity
The economic indicators (EI) = Total Income / Total expenses
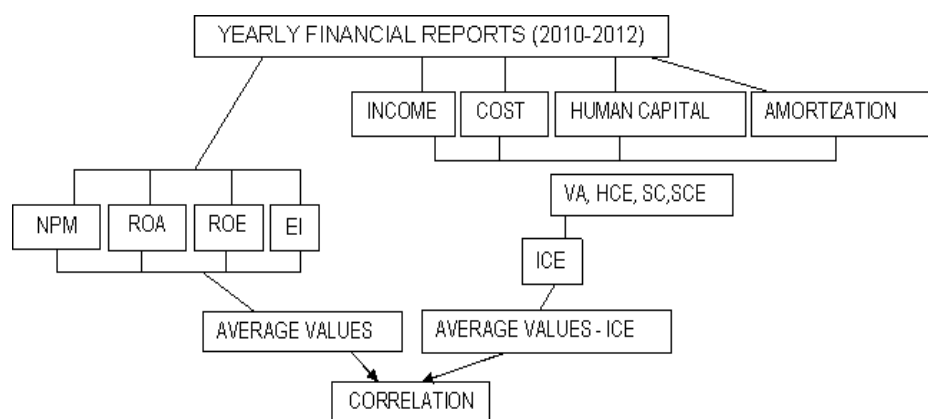
Figure 1. Conceptual model of the research

Procedure of correlations between variables was performed by extracting average profitability and efficiency of IC, for each company individually, and a linear correlation between these averages was conducted, for all companies. A correlation between the business efficiency and ICE was conducted.

3 RESEARCH RESULTS

Mean values give us an insight into the overall correlation of parameters and their mutual influence on company business. Through the correlation of the mean values of indicators of all companies, as the most important element this paper hypothesis is tested.

The descriptive statistics is shown in Table 1, which includes minimum values, maximum values, values for means for all variables, and standard deviation for each variable. The data refer to the analysed period from 2010 to 2012.

Table 1. Basic data of descriptive statistics profitability and business efficiency with average values ICE wood processing enterprises

Variable	Descriptive Statistics (WOODEMA_STATISTICA_2014)							
	Valid N	Mean	Median	Minimum	Maximum	Variance	Std.Dev.	Standard Error
NPM	32	1,8372	1,10275	-6,1546	13,1776	10,9912	3,3153	0,5861
ROA	32	2,9968	1,49479	-4,7745	19,1365	23,6301	4,8611	0,8593
ROE	32	10,1214	5,47256	-13,4755	49,0837	180,3197	13,4283	2,3738
EI	32	1,1518	1,01608	0,7922	5,4526	0,6183	0,7863	0,1390
ICE	32	2,0719	1,58231	0,7971	16,0881	6,7054	2,5895	0,4578

Table 2 presents the results of correlation analysis. They indicate no correlation between ROE and bussines efficiency (correlation coefficient 0,65517 and -0,05407). In case of NPM and ROA, there is strong correlation with ICE (correlation coefficient 0.0,655 and 0,63055)

Table 2. The correlation of the average values of indicators of profitability and business efficiency with average values ICE wood processing enterprises

Variable	Correlations Marked correlations are significant at p < ,05000N=32			
	NPM	ROA	ROE	EI
ICE	0,6552	0,630557	0,246750	-0,054077

Figure 2 Net profit margins correlates with ICE and the highest correlation coefficient is 0, 6552. The correlation between the indicators with statistical significance at the 5% (p = 0.05) level and of that intensity is considered to be a strong connection.
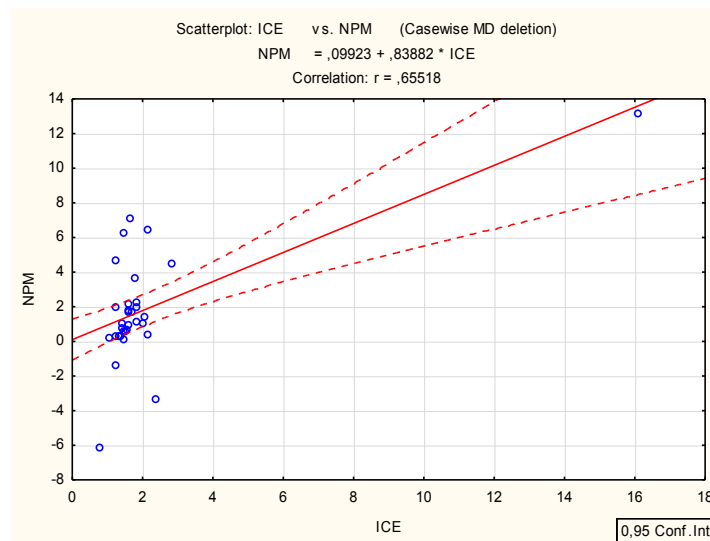
Figure 2. Correlation between mean values of ICE NPM

Figure 3 Correlation coefficient of the average values of ROA and efficiency intellectual capital in the reference period from 2010 to 2012, for 32 companies, amounts to 0.63056; such a correlation is positive and high.
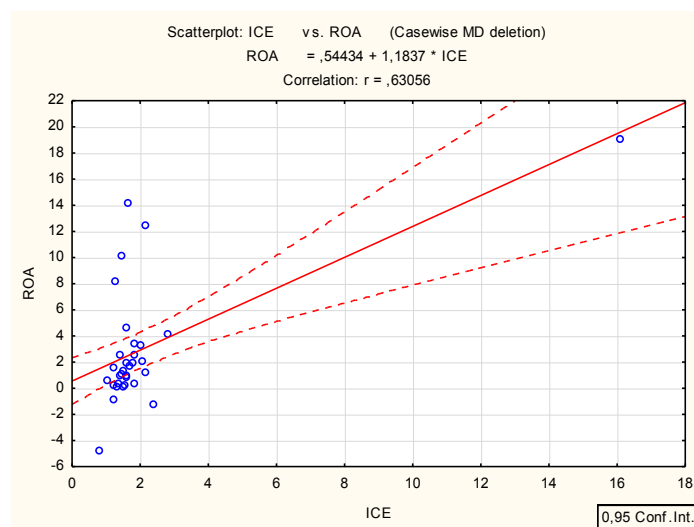
Figure 3. Correlation between mean values ICE and ROA

Figure 4 Correlation of return on total equity and ICE is 0.24765, which is positive and very weak, thereof the conclusion is that there is no connection.

Business efficiency correlates with ICE in very low intensity, which is negligible at the level of -0.0541. (Figure 5).

Scatterplot: ICE   vs. ROE (Casewise MD deletion)
ROE = 7,4703 + 1,2796 * ICE
Correlation: r = ,24675

Figure 4. Correlation between mean values ICE and ROE

Scatterplot: ICE   vs. EI (Casewise MD deletion)
EI = 1,1858 - ,0164 * ICE
Correlation: r = -,0541
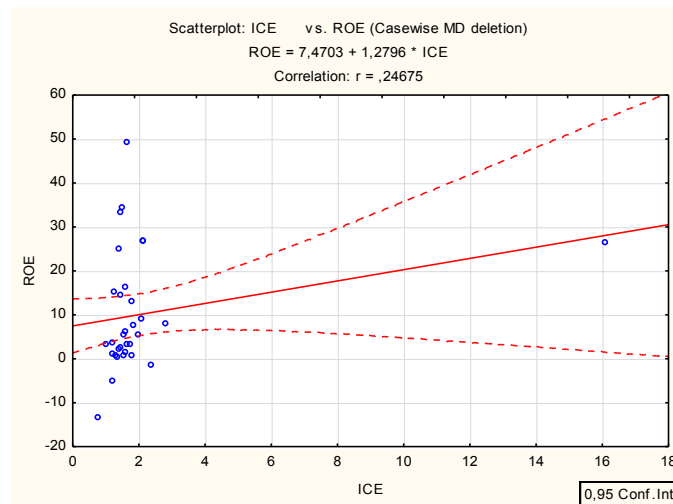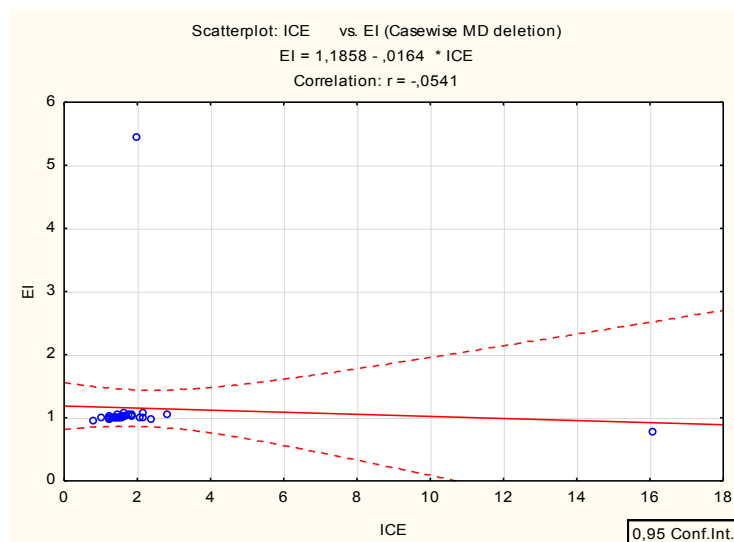
Figure 5. Correlation between mean values ICE and EI

4 CONCLUSION

The intellectual capital efficiency and the need for quantifying insufficiently defined concepts introduced us into the sphere of intangible assets to which a numerical value was assigned to in this paper, and thus determine its importance. The study establishes the role and impact of IC efficiency as one of the key resources in creating new values and in company management. In assessing the importance the significance of human capital should not be underestimated. For this reason, this model was chosen, based on the annual financial statements and suitable for a comparative analysis of the enterprises. The profitability of the company is shown through three indicators of profitability, which are considered the most representative.

By testing set hypothesis about the impact of the intellectual capital efficiency on the profitability of the company for 32 wood processing enterprises in the Republic of Croatia, the results were

obtained, from which we can conclude that the hypothesis is partially confirmed. There are connections between variables and they are positive (NOM and ROA), however, depending on the indicator of profitability the intensity varies. Distinct correlation exists between the net profit margin and ICE and is 0.65518, which is the highest value of the correlation in this research. The weakest intensity correlation is between the indicators of business efficiency and ICE, which is -0.0541. A correlation between the business efficiency and ICE was conducted, however there were no connections on significant level.

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Authors' addresses

MEng in Wood Technology, Ivana Perić, e-mail: iperic@sumfak.hr
Professor, Tomislav Grladinović PhD
Associate Professor, Krešimir Greger PhD
University of Zagreb
Faculty of Forestry
Department for Production Organization
Svetosimunska 25
10000 Zagreb
Croatia

COMPARISON OF SELECTED PERFORMANCE INDICATORS OF WOODWORKING INDUSTRY IN THE CZECH REPUBLIC AND SLOVAKIA

Marek Potkány, Gabriel Giertl

ABSTRACT

The necessity of implementation of macroeconomic and sectorial analyses in connection with the assessment of the external business environment is essential for businesses achieved results. Article deals with a comparison of selected performance indicators wood processing industry in the Czech Republic and Slovakia and their statistical forecasting through a correlation analysis.

Key words: business performance, woodworking industry, value added.

1 APPROACHES TO MEASUREMENT OF BUSINESS PERFORMANCE

Business performance is defined as an ability to appreciate and transform the most of the investments in business activities that a company performs. There is a wide range of ways through which we can look and evaluate the performance. Company´s stakeholders under the term "performance" have understood mainly growth of their own capital put into the business. For customers means powerful business that company which is able to flexibly respond to changes in their preferences. From a management perspective is considered company as powerful if it has a stable market share, loyal customers, low cost, balanced cash flow and at a certain liquidity can achieves required profitability (Potkány, Giertl, Turkota, 2013).

For traditional approaches of business performance measurement is the most important objective maximization of profit. For his representation is used a wide range of indicators, which are often non-complex and mutually incompatible. For traditional approaches of business performance measurement is the most important objective maximization of profit. For his representation is used a wide range of indicators, which are often non-complex and mutually incompatible. These approaches are based on data collected from financial accounting. The basic sources of information for calculating are the balance sheet, income statement and cash flow statement (Pavelková, Knápková, 2005). The modern way of performance evaluation is based on the assumption that the company is a powerful in case that it is able to achieve pre-defined strategic objectives. In practice have been applied two basic approaches. The first approach is based on the definition and evaluation of strategic objectives for four basic areas (financial, customer, internal processes of learning and growth), for which is naturalized English name - Balanced Scorecard (BSC). The second approach is based on the measurement of organizational performance through measurement of processes performance, called Performance Management. The common indicator of both approaches is their diversion from the assessment of business performance based only on financial indicators and the widespread use of other types of qualitative and time indicators (Boros, 2003).

Basic indicators of performance measurement are follows: (Franko, J., Losonczy P., Németh, L., Strelcová, S., 2005):

- Sales: Revenues of the company, the company receives them from the sale of its output to the customer, respectively external customer.
- Economic result: by using this indicator is usually measured profit of enterprise. Basically, the difference between revenues and costs of the company.

- Value Added (VA): is currently one of the most advanced forms of expression profitable business. In this indicator is the profit increased by the amount of depreciation and wages, which would ensure the future long-term development of the company and its prosperity. The value-added means:

$$VA = \text{production value - intermediate consumption} \qquad (1)$$

- VA = wages + benefits + social operating surplus (ie. depreciation + / - profit before paying interest and taxes, or loss),
- Production value - for the production of revenues (sales), intermediate consumption (the cost of raw materials and services).

2 STATISTICAL TOOLS OF PERFORMANCE MEASUREMENT

To monitor a large number of economic-social acts, it is desirable to determine whether a change of one phenomenon (variable) or more events can affect different phenomenon (variable) and how. For examining of these relations, it is possible to use in modern statistics methods of regression and correlation analysis. *(Sodomová, 2000).* Regression analysis is the summary of statistical methods and procedures used to study the interaction between two (or more) variables, when we observe the dependence between them. The task of regression analysis is to find a form of dependence, express it through mathematical function and to determine the parameters, with the basic aim - estimate values of mean values of the dependent variable. *(Pacáková, 2009).*

Correlation analysis allows assess the tightness of dependences, it means, the extent to which independent variables explain the variability of the values of the dependent variable and the appropriateness of choice of the regression function. *(Klein, Bahýl, Vacek, 2002).* Simple linear correlation (often called as a simple pairwise correlation) examines the interdependence of two random variables (economic indicators) that from the aspect of the position in the linear regression model distinguishing between dependent (explained) variable -Y and the independent (explanatory) variable - X. In the simple linear correlation are solved two tasks - regression and correlation. The regression task is to determine the regression line y = a + bx, it means determine the line that the best describes a given linear relationship. Within correlation task we find the strength (the tightness) of dependence, which is determined by the correlation coefficient r.

$$r = \text{cov (xy) / s(x) s(y)} \qquad (2)$$

$cov(xy)$ *– covariance of random variables X and Y*

$s(x), s(y)$ *– standard deviation*

Correlation coefficient takes the values from interval < -1, 1 >, while assume *(Sodomová, 2000)* : r = 0 – variables X and Y are not linearly dependent, r > 0 – between X and Y is a direct linear relationship, r < 0 – between X and Y is an indirect linear relationship. If is the absolute value of the correlation coefficient closer to 1, the dependence is stronger. If r = 1 and r = - 1, it is a functional dependency, not statistical. Through squared exponential of correlation coefficient (r) is obtained the coefficient of determination d.

$$d = r^2 \qquad (3)$$

The coefficient of determination takes the values from interval < 0, 1 > and its hundredfold determinates what percentage of the total variability in the dependent variable Y is explained by linear regression function of the explanatory variable X. *(Pacáková, 2009).*

3 BASIC INDICATOR OF THE SLOVAK REPUBLIC AND CZECH REPUBLIC

Slovakia's economy is among the successful economies in the world, which in 2004 joined the European Union. Slovakia in recent years is regularly one of the fastest growing economies in the EU. After Slovenia and the Czech Republic is the third strongest economy in post-communist countries. The basic macroeconomic indicator (www.statistics.sk):

Currency:	Euro
GDP:	127,1 bilion USD
GDP per capita:	23 300 USD
HDP by sector:	agriculture - 2,7%,
	industry - 35,6%,
	service - 61,8%
Unemployment rate:	13,4%
Public debt:	41,5% HDP
Inflation rate:	4,1%
Average gross monthly wage:	892 €
Value of exports:	39,7 mld. EUR
Value of imports:	38,7 mld. EUR

The Czech Republic is a developed country, classified among the most developed economies in the world. Country reports the second most stable economy in all post-communist countries. Conversion rate, according to the Czech National Bank on 31.12.2013 is 1 EUR = 27,425 CZK (www.cnb.cz):

Currency:	Czech koruna
GDP:	3 845,93 mld. CZK
GDP per capita:	365 955 CZK
GDP by sector:	agriculture – 1,8 %
	industry– 39,6 %
	service – 58,6%
Unemployment rate:	7,5%
Public debt:	1 759,0 bilion CZK
Inflation rate:	1,8 %
Average gross monthly wage:	24 953 CZK
Value of exports:	3 076,2 bilion CZK
Value of imports:	2 766,9 bilion CZK

According to the NACE classification, woodworking industry in Slovakia and the Czech Republic is divided into three main sectors namely: manufacture of wood – NACE 16, manufacture of furniture – NACE 31 a manufacture of paper and paper products – NACE 17.

4 RESULTS OF STATISTICAL ANALYSIS

Data for the statistical analysis are presented from database of yearbook of industry in the Slovak Republic 2005 – 2013 issued by the Statistical Office of Slovak Republic. Data from Czech Republic are presented from database of yearbook of industry in the Czech Republic 2005 – 2013 issued by the Statistical Office of Czech Republic.

Summary overview of the input data for the purposes of statistical analysis and forecasts presents table 1, Figure 1 and Figure 2. For the using of statistical analysis was used statistical software STATISTICA 7th.

Table 1. Basic indicators of performance in woodworking industry in Slovakia

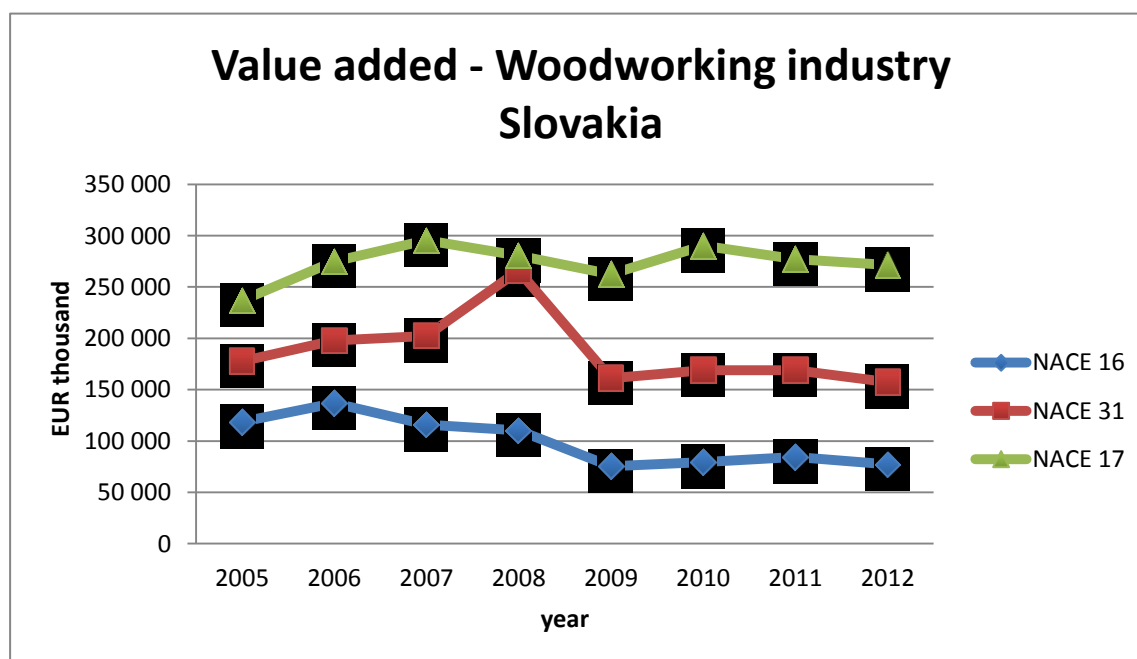| Indicator		Unit	2005	2006	2007	2008	2009	2010	2011	2012
Value added	16	th. €	118 856	136 883	115 816	110 402	75 303	79 402	84 377	77 139
	31		177 769	197 764	202 159	265 988	161 229	168 859	169 053	157 282
	17		236 819	275 022	295 394	280 601	262 339	290 347	277 271	271 584
	∑		533 445	609 671	613 369	656 992	498 871	538 608	530 701	506 005
Average monthly wage	16	€	436	487	544	589	583	635	647	663
	31		571	573	628	645	636	660	680	1 023
	17		728	792	851	899	948	974	965	714
	∑		565	598	652	690	722	771	764	800
Profit after taxation	16	th. €	20 798	29 785	24 876	3 919	-37 107	-19 633	-36 563	- 10 792
	31		41 960	32 274	12 313	20 427	19 461	6 949	-383	81 538
	17		45 933	77 856	65 740	91 604	24 835	94 332	69 155	4 650
	∑		108 691	139 916	102 930	115 951	7 189	81 648	32 209	75 396
Average number of employees	16	person	9 924	9 681	9 451	8 617	6 478	5 724	5 770	5 062
	31		11 830	14 240	15 970	14 812	10 578	10 136	10 356	9 887
	17		7 458	7 285	7 110	7 409	6 869	6 527	6 356	5 062
	∑		29 212	31 206	32 531	30 838	23 925	22 387	22 482	21 106
Sales	16	th. €	514 769	585 724	678 981	585 762	378 192	411 365	493 014	469 010
	31		957 044	972 681	1 284 308	948 269	538 539	541 078	606 626	618 006
	17		1 083 091	1 203 166	1 414 868	1 402 606	1 087 761	1 135 564	1 252 983	1 346 064
	∑		2 554 905	2 761 572	3 378 159	2 936 639	2 004 493	2 088 008	2 352 623	2 433 080

Figure 1. Value added in woodworking industry in Slovakia

Table 2. Basic indicators of performance in woodworking industry in Czech Republic

Indicator		Unit	2005	2006	2007	2008	2009	2010	2011	2012*
Value added	16	th. €	730 966	896 125	977 392	882 456	807 539	832 329	821 654	735 205
	31		378 828	396 325	433 303	429 730	373 475	382 866	363 439	356 640
	17		469 069	512 207	605 828	543 367	483 285	552 811	491 178	482 516
	∑		1 578 863	1 804 657	2 016 523	1 855 553	1 664 299	1 768 006	1 676 271	157 436
Average monthly wage	16	€	444	487	553	581	605	645	636	615
	31		469	514	583	632	638	683	673	651
	17		606	690	760	803	861	939	914	872
	∑		506	564	632	672	701	756	741	713
Profit after taxation	16	th. €	177 310	263 926	316 021	247 330	166 736	182 954	188 855	-
	31		55 138	49 372	64 744	63 553	31 164	44 412	47 931	-
	17		137 414	123 740	173 689	97 749	95 909	119 389	89 890	-
	∑		369 862	437 038	554 454	408 632	293 809	346 755	326 676	-
Average number of employees	16	person	45 281	45 682	45 976	44 248	40 032	38 790	36 020	35 000
	31		30 179	30 290	30 895	28 716	25 674	23 245	22 018	21 000
	17		21 469	21 036	22 212	21 412	19 076	18 100	18 579	18 000
	∑		96 929	97 008	99 083	94 376	84 782	80 135	76 617	74 000
Sales	16	th. €	2 828 207	3 381 626	3 781 583	3 502 884	3 186 039	3 321 376	3 387 017	-
	31		1 415 414	1 494 670	1 672 262	1 522 865	1 299 135	1 408 523	1 332 648	-
	17		2 112 483	2 138 476	2 480 246	2 233 786	2 022 627	2 388 532	2 443 247	-
	∑		6 356 103	7 014 772	7 934 092	7 259 535	6 507 800	7 118 431	7 162 912	-

* estimate
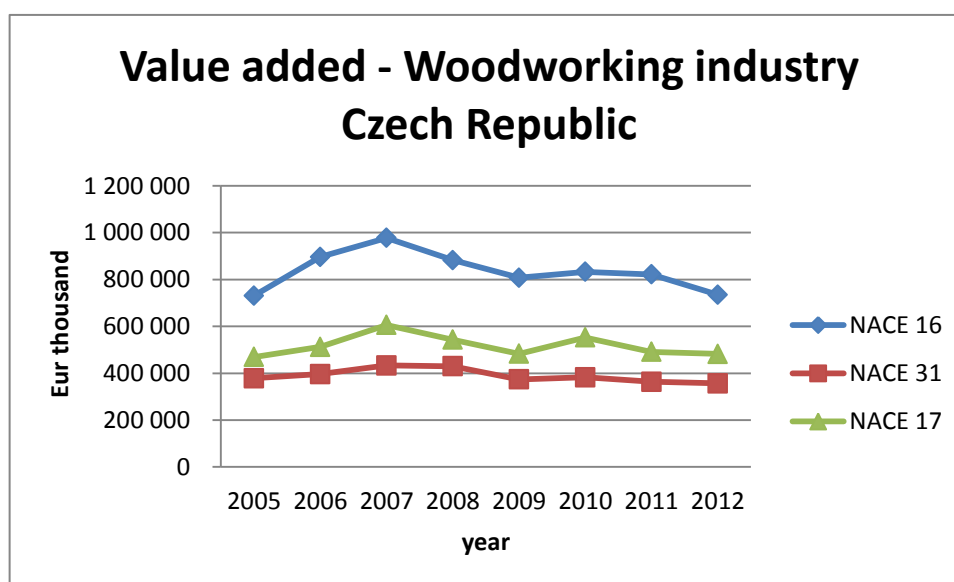
Figure 2. Value added in woodworking industry in Czech Republic

In the correlation analysis are quantified indicators - correlation coefficient (r) and the coefficient of determination (d), regression analysis quantified coefficients of the regression line (a, b) in cases of forecasting future standard errors were calculated regression lines (SYX) (standard deviations residues). The analysis also verify the statistical significance of the linear dependence between economic indicators by testing the correlation coefficient for the chosen significance level α = 5%.

Figures 3, 4, 5 presents selected statistical dependence in the sectors of manufacture of wood, manufacture of furniture and the entire woodworking industry in Slovakia and the Czech Republic.
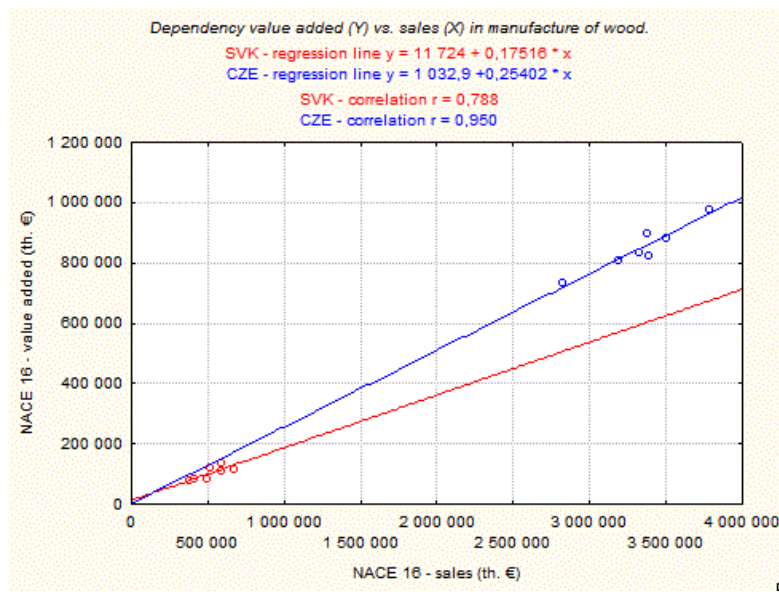
Figure 3. Correlation analyses for sector of manufacture of wood – sales/value added

Between the value added and sales in the woodworking industry (Fig. 3) was found the tight direct linear relationship. In the Czech Republic we can even discuss about a very close linear relationship with a correlation coefficient of r = 0.950. From the coefficient mentioned above, we can conclude that these two variables (value added and sales) are highly influenced by each other, much more than it is in the Slovak Republic, where the correlation coefficient reaches a value only at r = 0.788. Coefficient of determination d= r^2 indicates that in the Slovakia the variability of sales explains 62% variability of value added. The remaining 38% are associated with random influences, as well as other factors not included in the regression function. The equation of the regression line has the form y = 11,724 + 0.17516.x, in the Czech Republic is the coefficient of determination even at 90% while only the remaining 10% is attributed to random effects. The equation of the regression line for the Czech Republic has the form y = 1032,9 + 0,25402.x.

Figure 4. Correlation analyses for sector of manufacture of furniture - number of employees/sales

136

Figure 4 presents a correlation analysis for the furniture manufacturing sector, where is higher dependence of average registered number of employees and salees in manufacturing of furniture in Slovakia than in the Czech Republic. This fact also indicates a tight correlation at r = 0.919. From the regression line for the Slovak Republic y = - 515 000 + 107,52.x, we can conclude that the increase in the number of employees by 1 unit (1 employee) will increase the revenues by an average of 107,520 €. Based on this fact, we can predict that increasing of the average registered number of employees, for example of 18 000 employees, with 68 % reliability will bring revenues at the level of 1 420,36 million € ± 121,3 mil. € (± 1.s_{xy}) or with 95% reliability will bring revenues at the level 1 420,36 million € ± 242.6 mil. € (± 2.s_{xy}). €. Coefficient of determination is r^2 = 84%, and we can say that 84 % variability of sales is caused by variabilit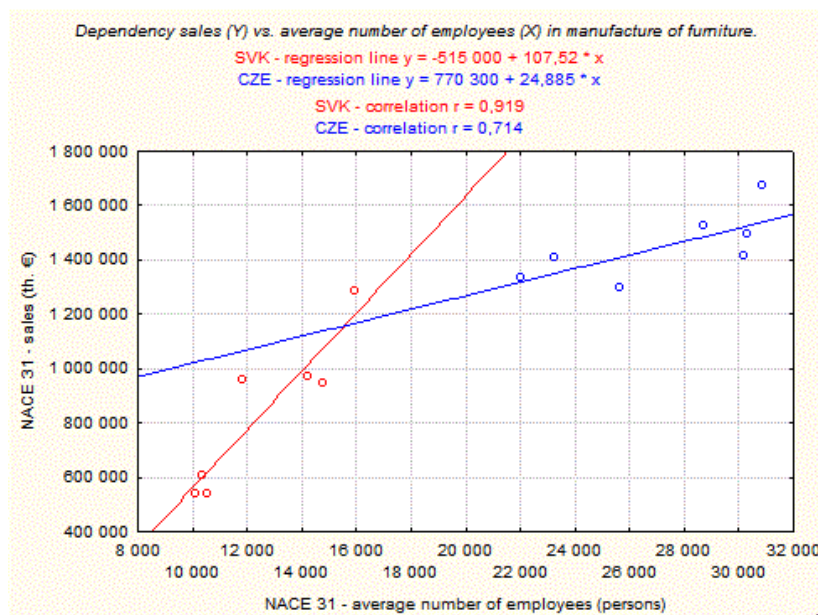y of average registered number of employees. In the Czech Republic is the correlation coefficient at r = 0.714 and the regression line has the form y = 770 300 + 24,885.x.
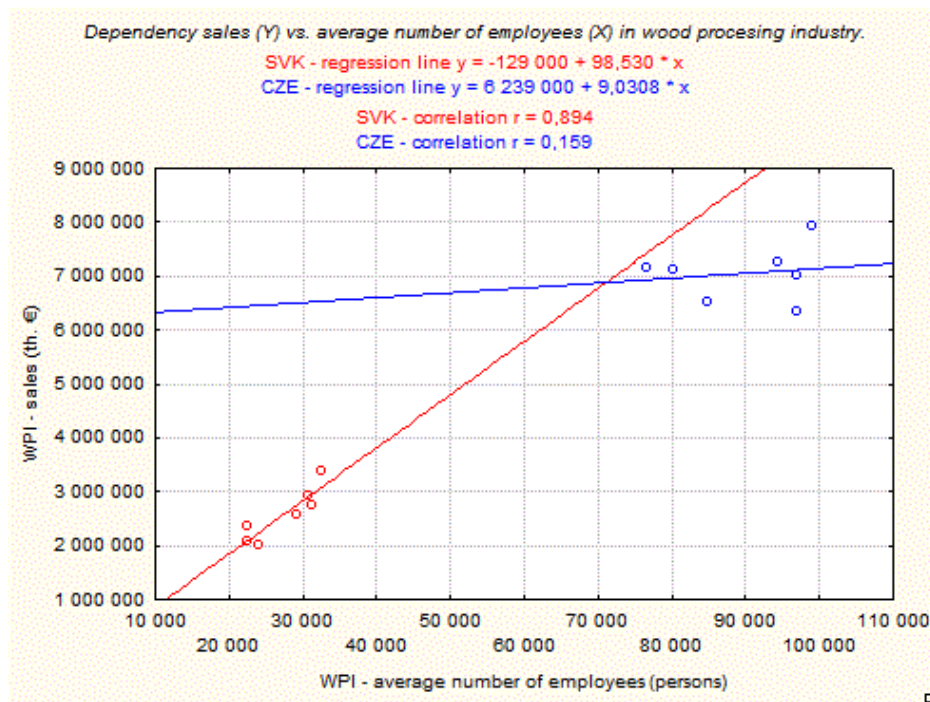
Figure 5. Correlation analyses for woodworkng industry - number of employees/sales

Between the indicators of average registered number of employees and sales in the whole sector of wood processing industry (WPI) we found a close correlation in Slovakia with the value of the correlation coefficient r = 0.894. Therefore we can argue that in case of increase in the number of employees in the woodworking has also increased the average sales in woodworking industry in Slovakia. Coefficient of determination in Slovakia is d = 80%, which means that the remaining 20% are random influences. Regression line has the form y = -129 000 + 98,530.x. In the Czech Republic a close relationship we do not can argue, because the correlation coefficient is only at r = 0.159. Regression line has the form y = 6 239 000 + 9,0308.x.

CONSLUCION

This paper is devoted to the issues of evaluation and forecasting of selected indicators development in the woodworking industry in the Czech Republic and in the Slovak Republic. Modern and advanced correlation and regression analysis have a long history, which built up a very strong base in various areas of the economy. These analyses are an essential base for modelling in econometrics.

It has been over 20 years since these two countries was separated and have formed two self-governing countries. Even after such a long time, we find similarities and on the other hand also the differences between these 2 countries. These differences are mainly in the stronger progress in the

Czech economy in compare with the Slovak economy, which is evident even after accession of both countries to the European Union in 2004.

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Authors' addresses

doc. Ing. Marek Potkány, PhD., e-mail: potkany@tuzvo.sk
Ing. Gabriel Giertl
Faculty of Wood Sciences and Technology
Technical University in Zvolen
Slovakia

ECONOMETRIC MODELLING OF PRODUCTION COSTS: CASE STUDY ON MANUFACTURER OF WOODEN CHAIRS IN SERBIA

Slađana Skakić, Branko Glavonjić

ABSTRACT

Wood industry of Serbia is an export-oriented industry that exports more than ½ of its GDP. Enterprises engaged in production and export of furniture and wood products provide significant contribution to achieving these results. One of important factors contributing to their export performances is the price competitiveness of their products. Price competitiveness is largely dependent on the structure and size of certain categories of costs, whose monitoring and analysis are imperative to the success of any enterprise. One of the instruments available to the management of the company for the production of furniture and wood products is the econometric modelling of production costs with the aim of identifying the impact of certain factors on these costs. This paper presents the results of econometric modelling of production costs on the example of company for production of wooden chairs in Serbia. The impact of production volume on the costs at different levels of capacity utilization is explored by using econometric modelling.

Key words: costs, competitiveness, models, chairs.

1 INTRODUCTION

Costs represent a complex category which consists of consumptions and corresponding prices and for their observation must be taken into account that both of these factors affect on their size. Such approach to this problem is very important for the management of the company, as it provides the possibility of wide manipulation of the costs in order to reduce them. Management of the company may strive to reduce cost (eg. using cheaper materials) with unchanged amounts of consumptions. Conversely, the amount of consumption (waste, production errors, etc.) could be minimized with unchanged rates, which will also lead to lower overall costs.

In the last few years in a row, Serbian wood industry records external trade suffict. According to the Serbian Chamber of Commerce, total exports of wood products for the first quarter of 2013. is twice the size of imports compared to the same period last year. Domestic manufacturers are faced with constant change and increasing competition in the international market. In order to fight for their own survival and increased competitiveness, they need to monitor their own costs constantly.The global economic crisis and the problems that it causes in the international market, has encouraged entrepreneurs to think intensively to reduce production costs, increase efficiency and productivity in order to increase their competitiveness in the market.

2 SUBJECT, GOALS AND METHODOLOGY OF WORK

The main subject of this paper are the costs of production of wooden chairs at producer from Serbia. The main objective of present study is determination of the impact of changes in production output on selected categories of costs. Categories of costs that are analized are costs of materials, wage costs and costs of amortization. An additional objective of this paper is to analyze international

trade of wooden chairs with the aim of reviewing the competitive position of Serbian producers in the international market.

For determination of type and degree of dependency of costs on production volume is used software package "Statistics" v.8.0., in which the regression and correlation analysis are merged into a single methodological tool. Calculated parameters of the equations for some functional forms are subjected to evaluation of statistical significance by comparing their standard errors and the corresponding *t*-statistics. Forming of regression models is made for selected factor in linear, degree and exponential form. The coefficient of determination (R^2) is used as a criterion for the selection of one of these three forms for further analysis. Forecasts of the costs for different levels of production volume on a particular example are given based on the parameters and forms of functional dependency.Source for research of international trade of wooden chairs was EUROSTAT database.

3 INTERNATIONAL TRADE OF WOODEN CHAIRS

3.1. Major world exporters (2007 – 2013)

China is the world's largest exporter of wooden chairs and seats with constant growth of it's export. In 2004. China exported 838 million € of these products. Until 2007. China's export increased up to 2.3 billion €. In 2013. China exported 4.8 billion € of wooden chairs and seats. Half of this amount was exported to USA. China's share in total world export of this group of products was 27.1% in 2007. and 42.5% in 2013. During analized period, Poland maintained steady second position with export values around 1.1 billion €. However, in 2013. Poland increased it's export up to 1.3 billion €. Italian export of wooden chairs and seats has decreasing trend in last 10 years. In 2004. Italy exported over 2 billion € of these products. Until 2007. value of export declined to the level of 1.6 billion € and in 2013. Italy exported only 1.1 billion € of wooden chairs.
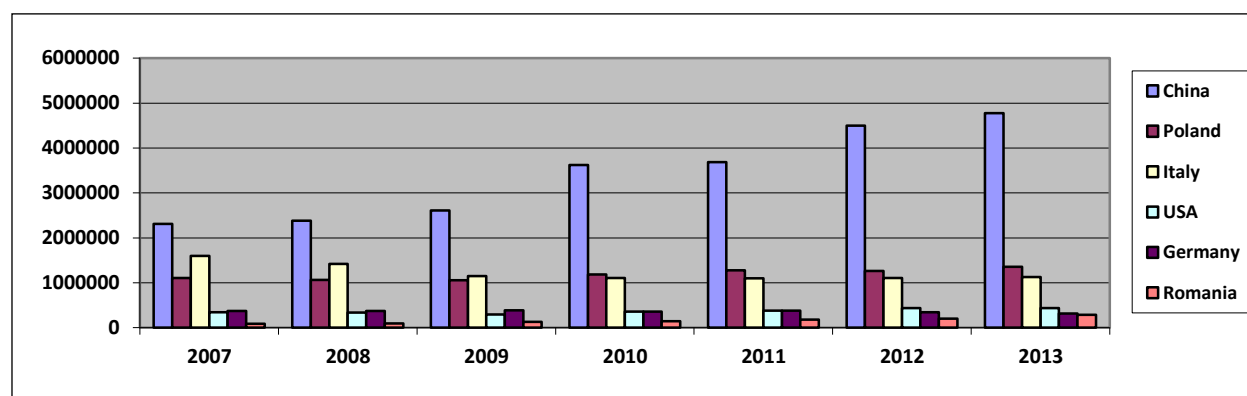
Graph 1. Major exporter countries for wooden chairs and seats (EUR thousand)
(source:epp.eurostat.ec.europa.eu)

Major importing market for wooden chairs and seats from China are United States of America which imports 40,1% of total amount of China's export for this group of products. Value of China's export to USA grew continuously - from 455 million € in 2004., up to 1.9 billion € in 2013. Although they have drastically lower values of imports, other four countries (United Kingdom, Japan, Australia and Canada) are also important to China's export of wooden chairs and seats. All four countries recorded a significant increase in imports during the period 2004 – 2013.
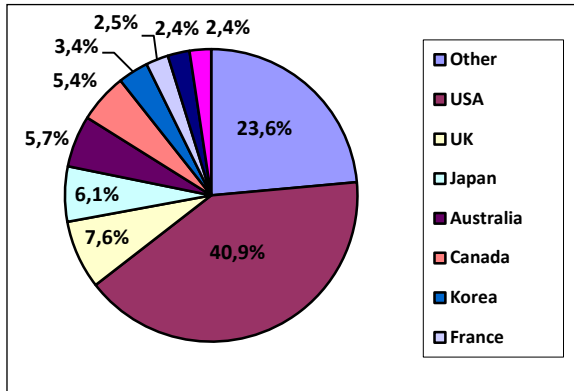
Graph 2. The most significant countries for export of wooden chairs from China in 2013
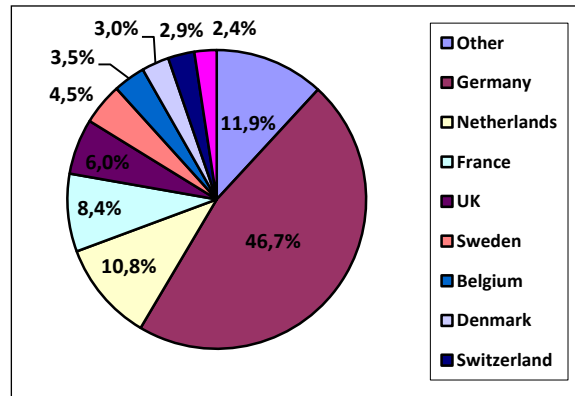
Graph 3. The most significant countries for export of wooden chairs from Poland in 2013.

Main export market for wooden chairs and seats from Poland is Germany. Value of Poland's export to Germany ranges from 538 million € in 2004. to 631 million € in 2013. Netherlands, France and UK recorded a significant increase of import from Poland between 2007 - 2013. (cca. 70%), while Sweden keeps balanced level of import from Poland around 60 million €/year.

2.2 Major world importers (2007. - 2013.)

The largest world importer of wooden chairs, seats with wooden frames, upholstered are United States of America. In 2013. USA imported more than 3.2 billion € worth of this products. Germany is in the second place with import over 1.1 billion € in the same year. Germany is the biggest import market for wooden chairs and seats in EU and one of the most important markets for Serbian wood industry.
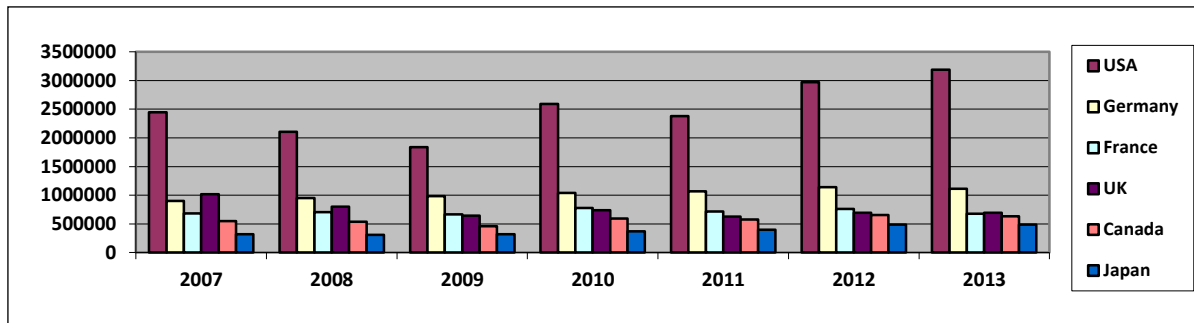
Graph 4. Major importer countries for wooden chairs and seats (EUR thousand)
(source:epp.eurostat.ec.europa.eu)

United States of America imports the largest share of the total amount of wooden chairs and seats from China. In 2007. this amount was nearly 1.6 billion € and in 2013. import from China raised up to 2.4 billion €, which represents 76% of all USA import in 2013 for this product group. Italian export of wooden chais to USA has constantly decreasing trend - value of export from Italy to USA in 2007. was 150 million € and in 2013. only 77 million €.

Graph 5. The most significant countries for import of wooden chairs in USA in 2013.

Graph 6. The most significant countries for import of wooden chairs in Germany in 2013.

In 2013. Germany imported 582 million € of wooden chairs and seats from Poland. This amount represents nearly half of German's total import of wooden chairs from all over the world. Second place takes China, with 96 million € worth of import. In 2004. Italy exported over 93 million € of wooden chairs and seats to Germany and the next 9 years Italian export decreased to a level of 37 million € in 2013.

2.3 Serbian export and import of wooden chairs and seats

Export of wooden chairs and seats from Serbia was 47 million € in 2013. Major importing market for that group of products is France. From 2007. to 2009. value of export from Serbia to France fluctuated around values of 3.6 million €. In 2010. export value increased to 6.6 million € and continued to grow until 15 million € in 2013. The largest decline in export of wooden chairs from Serbia was towards Italy. In 2005. Serbia exported over 14 million € of these products to Italy, while in 2013. value of this export fall down to only 3.9 million €.

Graph 7. The most significant countries for export of wooden chairs from Serbia in 2013

Graph 8. The most significant countries for import of wooden chairs in Serbia in 2013.

In 2013. Serbia imported 9.1 million € of wooden chairs and seats (export in 2013. was 47 million €). Three major supplying partners in 2013. were Bosnia and Herzegovina (2.3 million €), Italy (1.7 million €) and China (1.5 million €). Import from Italy declined from 2.6 million € in 2007., while import from China increased from 452 thousand € in 2007. up to 1.5 million € in 2013. Import from Poland also increased from 352 thousand € in 2007. up to 671 thousand € in 2013.

4 ECONOMETRIC MODELLING OF THE COSTS OF PRODUCTION OF WOODEN CHAIRS: CASE STUDY OF PRODUCERS IN SERBIA

Econometric modelling in this paper is based on actual data of the costs of production, which are collected at one of the leading manufacturers of wooden chairs in Serbia for period 2007. - 2013. Production costs are affected by different factors. With this model, the impact of changes in production volume on costs of materials, wage costs and costs of amortization can be assessed.

4.1 Impact of production volume on costs of materials

Impact of production volume on costs of raw materials is best represented by degree regression model (highest R^2) with the following equation:

$\ln y = \ln a + b \ln x_2$

$\ln y = 3{,}025480 + 1{,}029241 \ln x_2$ ie, as transformed equation:

$y = 20{,}6 * x^{1{,}029241}$

Basic parameters of this model are:

$a = 3{,}025480$	$b = 1{,}029241$
$S_{(a)} = 3{,}100299$	$S_{(b)} = 0{,}225420$
$t_{(a)} = 0{,}975867$	$t_{(b)} = 4{,}565888$
$\mid t_a \mid < t_{005}$	$\mid t_b \mid > t_{005}$

$R = 0{,}88$	$R^2 = 0{,}78$	$R^2 cor = 0{,}74$
$F_{(1,6)} = 20{,}85$	$F\text{-test}_{(0,05)} : +$ $D = 1{,}330078$	$DW\text{-test}_{(0,05)} : ?$
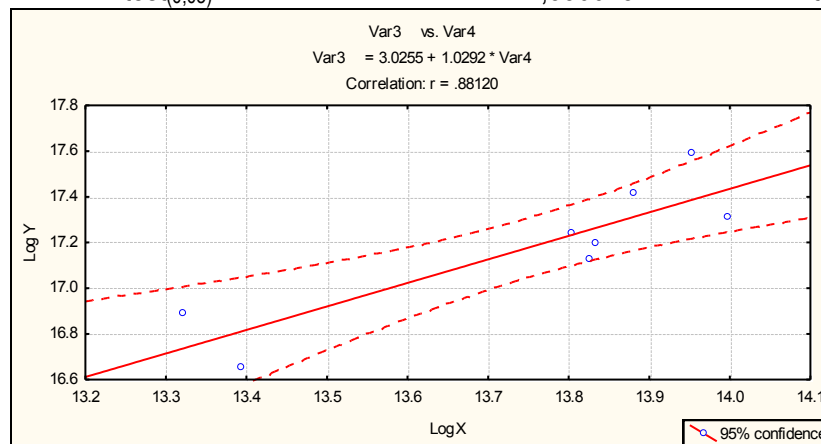
Graph 9. Impact of production volume on costs of materials

High coefficient of correlation (R = 0,88), its significance and the significance of the parameter *b* with high coefficient of determination shows that changes in production volume greatly affect the value of the costs of manufacturing materials. Considering that DW test indicates that the effect of autocorrelation is in the field without a decision (?), in the model was added time (x_t) as additional variable. Degree form of multiple regression which shows the impact of production volume on costs of materials, has the following parameters:

$\ln y = \ln a + b \ln x_2 + c x_t$

$\ln y = 8{,}294366 + 0{,}667033 \ln x_2 + 0{,}053105 x_t$

$y = 4001{,}27 * x_2^{0{,}667033} * 1{,}05^{X_t}$

$a = 8{,}294366$	$b = 0{,}667033$	$c = 0{,}053105$
$S_{(a)} = 1{,}895828$	$S_{(b)} = 0{,}141565$	$S_{(c)} = 0{,}014578$

$t_{(a)} = 4,375062$ $t_{(b)} = 4,711843$ $t_{(c)} = 3,642902$

$|t_a| > t_{005}$ $|t_b| > t_{005}$ $|t_c| > t_{005}$

$R = 0,98$ $R^2 = 0,97$ $R^2cor = 0,96$

$F_{(2,5)} = 81,027$ $F\text{-test}_{(0,05)} : +$ $S_q = 0,05862$

Coefficient of multiple determination (R^2) indicates that the model explains 97% of variation of material costs. Extremely high coefficient of multiple correlation and its significance (F-test) confirm the existence of causal-effect relation between production volume and costs of materials. In this case, the increase of production volume for 1% can be expected to increase the costs of materials for 0,67%.

4.2 Impact of production volume on wage costs

Based on results of coefficient of determination (R^2) for all models (linear, degree and exponential), the highest R^2 has linear model of multiple regression. Therefore, degrees and exponential model are not taken into further consideration. Impact of production volume on wage costs is expressed in simple regression model with following linear equation:

$y = a + b\, x_3$

$y = -2707218 + 17,748 * x_3$

Basic parameters of this model are:

$a = -2707218$ $b = 17,748$

$S_{(a)} = 3556522$ $S_{(b)} = 4$

$t_{(a)} = -0,761198$ $t_{(b)} = 4,906980$

$|t_a| < t_{005}$ $|t_b| > t_{005}$

$R = 0,89$ $R^2 = 0,80$ $R^2cor = 0,77$

$F_{(1,6)} = 24,08$ $F\text{-test}_{(0,05)} : +$ $D = 1,813761$ $DW\text{-test}_{(0,05)} : +$
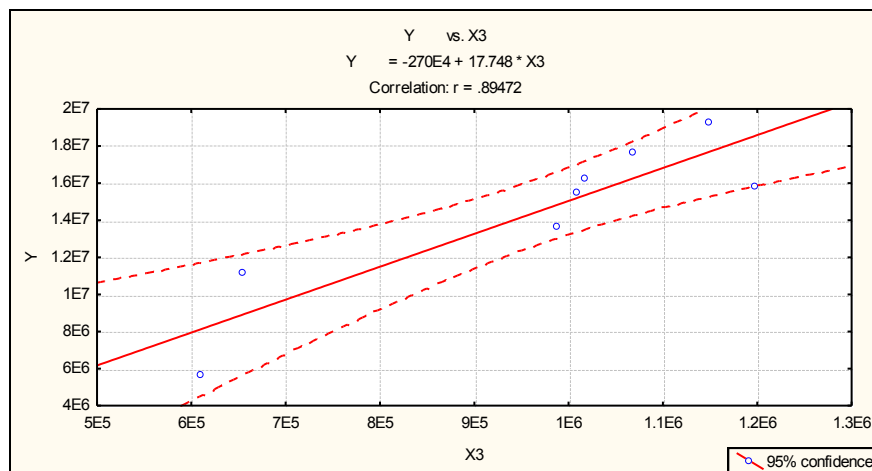
Graph 10. Impact of production volume on wage costs

Changes in production volume affect 80% variations of wage costs. t-statistic shows that parameter b is significant, while DW-test indicates that autocorrelation doesn't exist in this model. In this case, the increase of production volume for 1€ can be expected to increase the wage costs for 18 RSD.

4.3 Impact of production volume on costs of amortization

Impact of production volume on costs of amortization is best represented by degree regression model (highest R^2) with the following equation:

$\ln y = \ln a + b \ln x_4$

$\ln y = 3{,}237090 + 0{,}901019 \ln x_4$

ie, as transformed equation:

$y = 25{,}46 * x^{0{,}901019}$

Basic parameters of this model are:

$a = 3{,}237090$	$b = 0{,}901019$
$S_{(a)} = 2{,}979592$	$S_{(b)} = 0{,}216643$
$t_{(a)} = 1{,}086420$	$t_{(b)} = 4{,}158998$
$\lvert t_a \rvert < t_{005}$	$\lvert t_b \rvert > t_{005}$

$R = 0{,}86$	$R^2 = 0{,}74$	$R^2cor = 0{,}70$
$F_{(1,6)} = 17{,}29$	$F\text{-test}_{(0,05)} : -$	$D = 1{,}443280$	$DW\text{-test}_{(0,05)} : ?$
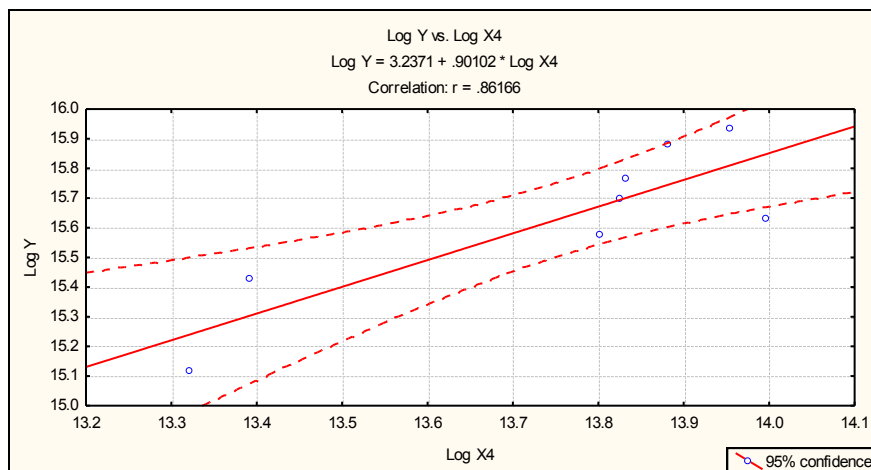
Graph 11. Impact of production volume on costs of amortization

Because of the insignificance of the parameter a (t - test) and the coefficient of correlation (F-test) and the result of DW-test (?), the impact of production volume on costs of amortization can not be examined clearly enough. Therefore, in the model was added time (x_t) as additional variable. Degree form of multiple regression which shows the impact of production volume on costs of amortization, has the following parameters:

$\ln y = \ln a + b \ln x_2 + c x_t$

$\ln y = 11{,}03846 + 0{,}30823 \ln x_2 + 0{,}07784 x_t$

$y = 62221{,}76 * x_2^{0{,}30823} * 1{,}08^{Xt}$

$a = 11{,}03846$	$b = 0{,}30823$	$c = 0{,}07784$
$S_{(a)} = 2{,}395754$	$S_{(b)} = 0{,}178896$	$S_{(c)} = 0{,}018422$
$t_{(a)} = 4{,}607510$	$t_{(b)} = 4{,}722978$	$t_{(c)} = 4{,}225395$
$\lvert t_a \rvert > t_{005}$	$\lvert t_b \rvert > t_{005}$	$\lvert t_c \rvert > t_{005}$

$R = 0{,}97$	$R^2 = 0{,}94$	$R^2cor = 0{,}92$
$F_{(2,5)} = 41{,}870$	$F\text{test}_{(0,05)} : +$	$S_q = 0{,}07408$

Considering the coefficient of multiple determination ($R^2 = 0{,}94$), conclusion is that model explains 94% of variation of amortization costs. The coefficient of correlation differs considerably from zero and it is

significant (*F*-test). All parameters *a, b* i *c* are significant (*t*-test). In this particular case, the increase of production volume for 1% can be expected to increase the costs of amortization for 0,31%.

5 CONCLUSIONS

High correlation coefficients for all models and its significance (F-test), as well as the significance of the parameter b (t-test) confirm the hypothesis that the volume of production has a strong effect on the amount of direct costs (costs of materials, wage costs and costs of amortization). In case of costs of materials, the increase of production volume for 1% can be expected to increase the costs of materials for 0,67%. Coefficient of multiple determination (R^2) indicates that the model explains 97% of variation of dependent variables, whereas the remaining 3% of activity is a result of factors which are not included in this model.

Using these econometric models, the value of production costs can be predicted for different levels of capacity utilization. Thereby, management of the company can make long-term plans for the production and sale of their products on the market with reliable information about the costs that will be incurred at a certain level of production.

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Authors' addresses

Slađana Skakić, BsC. PhD student in group, e-mail: sladjana.skakic@gmail.com
Timber trade and wood industry economics
University of Belgrade Faculty of Forestry
Kneza Viseslava 1
11030 Belgrade
Serbia

Branko Glavonjić, PhD.
Full Professor
University of Belgrade Faculty of Forestry

FOREST PROMOTIONAL COMPLEX AS A PROMOTION TOOL FOR THE SUSTAINABLE FOREST ECONOMY MANAGEMENT

Renata Stasiak-Betlejewska

ABSTRACT

Promotional forest complex is a specific promotion tool of sustainable, multifunctional forest economy management. In Poland they are considered as a legal form of pro-environmental forest policy for acceptable form of state forestry organization. Tasks of the promotional forest complexes are connected mainly with conducting forest management on environmental grounds, which aims to preserve the natural variability of natural forest or restoration and the integration of economic factors with the protection of nature and landscape. In the article the author identifies and analyzes forest complexes activities within promotion of sustainable forest management and protection of natural resources in the forests, as the functional areas of ecological, educational, social and economical program. Innovative and improvement activities of state forestry in the scope of the tasks and its financial aspects realized by promotional forest complexes were identified and analyzed.

Key words: promotional forest complex, sustainable forest economy management.

1 INTRODUCTION

The year 2011 was established by the United Nations "International Year of Forests" (resolution 61/193 of 2006). Its main slogan "Forests for people" was aware of societies, how important are forests in the life of each of us, how much they are needed for the survival and prosperity of people around the world. In Poland, State Forests have been actively engaged in the promotion of forests and sustainable forestry. There were prepared five slogans that were carrying the message about the important role of forests in the human lives. Slogans were consistent with the UN objectives. With the celebration of the International Year of the Forest there was able to convey a wide range of public information on the good condition of Polish forests. Since 1990, the forest area of the country has increased by 466 000 ha and there were also increased timber resources on 1,110 million m^3. There was noticed an improved health status of the Polish forests.

Polish forests are open to society in terms of access and to society, if the infrastructure prepared for tourists is taken into account. Many thousands of miles of hiking and horseback riding trails, an accommodation, an educational basement, forest parks and rich little tourist infrastructure (shelters, benches, paths and other health facilities) - all this makes that Polish forests are a place frequently visited by millions of Poles.

Forests are the natural habitat for many plant and animal populations. In Poland, for most species (65%) the forest is a primary habitat. In terms of biodiversity Polish forests are a model for other European countries. There is located here majority of Polish protected areas, including Natura 2000 network, which occupies 40% of the total forest area of the State Forests. Polish forests provide jobs for more than 370 thousand people, found employment in the forestry, the forest service, the woodworking and the furniture industry and in other sectors of the economy producing for forestry. The funds obtained from the sale of wood are used for the maintenance of forests in the best state of health, the production of organic raw timber, providing the public forest areas and for educational purposes. Despite the fact that Poland is one of the largest in Europe manufacturers and exporters of wood products, mainly

furniture and stationery, Polish state forests, where the raw material is extracted, is constantly improving.

2 THE IDEA OF THE FOREST PROMOTIONAL COMPLEX

The term "forest complex promo" was officially used for the first time in the decision support of the Polish minister of environmental protection, natural resources and forestry on 8 November 1994 on the protection and management of the Bialowieża Forest, which refers to the resolution of programming the first two Pan-European Ministerial Conference on the Protection of Forests in Europe (Ministerial Conference on the Protection of Forests in Europe - MCPFE) - Strasbourg, in 1990 and in Helsinki in 1993. According to these documents, Poland, becoming a signatory to these resolutions, is committed to the implementation of the arrangements adopted there.

The conference, organized in 1993 in Helsinki, has given the beginning of the so-called Helsinki process, where criteria and indicators for sustainable forest management were formulated, as well as clearly articulate a list of non-productive functions of forest. Two conventions and resolutions were assumed, conveying achievements of the Earth Summit in Rio de Janeiro into Europe, demonstrating a clear recognition of the Forest Principles, and other documents relating to forestry, taken there the year before . In Helsinki, there was formulated the fundamental definition of sustainable forest management, understood as : the management and use of forests and forest land in such a manner and such a pace that will keep them as renewable natural resources and does not deplete them in a long time, preserve their biodiversity, productivity ability to meet present and future relevant ecological and social functions of the local national and global levels , without causing damage to other ecosystems. In short accepted to speak about this definition as the basis of SFM (Sustainable Forest Management).

It is alluded to these ideas, the Minister for the Environment, Natural Resources and Forestry in support of the Decision No 23, as evidenced by the words: "Poland takes part in the international dialogue on the development of criteria and indicators that should be taken into account in the conduct of forest policy signatory countries to ensure sustainable development of forests and forestry."

The principles of sustainable development forests are formulated in the 7 criteria [Fronczak, K., 2007]:
1. Conservation of biological diversity.
2. Maintain productive wealth of forests.
3. Maintaining the health and vitality of forest ecosystems.
4. Protection of soil resources and water.
5. Protection and enhancing the participation of forests in the global carbon balance.
6. Maintaining and strengthening long-term and multilateral socio-economic benefits flowing from the forests.
7. Existence of legal, political and institutional solutions that support the sustainable development of forestry.

The whole Polish forestry plans in this regard shall be included in the "Polish politics comprehensive protection and improvement of forests." The principles of this program are used throughout the natural Polish area, but with methodical and financial reasons in the first place in designated forest areas. On this purpose, to promote environmentally friendly technologies in the management and implementation of the comprehensive nature protection purposes, there were designated seven forests complexes, representing 5% of the total area of the National Forests, and representing different environmental conditions Polish. One of them is the Bialowieża Forest, which is provided as a promo forest complex .

Forest promotional complexes were considered as legal form of the pro-environmental forest policy for acceptable form of the state forestry organization in Poland (Act amending the Act on Forests and amendments to certain Set of 24 April 1997). It was a big success of the Polish forestry. Forest

promotion complexes were determined as a tool of the Director General of State Forests in the promotion of the sustainable forest management and the protection of natural resources in the forests, as the functional areas with the ecological, educational and social meaning with specific uniform economic - protective program.

The concept of forest promotional complex in the basic assumption provides a close relationship of sustainable, multifunctional forest management with active protection of nature in all its forms prescribed by law. The assumptions of Polish Policy of the Forest Resources Protection from 1994 the forest promotional complexes were gradually extended to all forest districts of State Forests in order to implement environment-friendly state forest policy based on the assumption that the purpose of forest management is not a forest stand alone, but the whole forest ecosystem seen as a landscape fulfilling a specific function in the nature of the region and the country.

Due to many unproven methods and the effects of "greening" were to be tested is in the Promotional Forest Complexes, and therefore the reference objects multifunctional and sustainable forest management and forest education site staff and the public.

Forest promotional complexes have become the interpretation and the example of Polish policy of Comprehensive Protection of Forest Resources including technological, educational and research tasks [Bogacz, J., Falkowski, J., Gałecki I., Śliwa, W. 2013].

The main objectives of Forestry promotional complexes are contained in the Order No. 30 of the Director General of State Forests established on 19.12.1994r. :

1. Comprehensive diagnosis of the state of the forest biota in their area and the conditions of its existence, and trends in these changes.
2. Permanent preservation or restoration of forest values of rational methods of forest management on environmental grounds;
3. Integrating the objectives of sustainable management of forests and active nature conservation.
4. Multifunctional and promoting the sustainable forest management using financial support from the national and international;
   – to conduct research and experimentation forest in order to draw conclusions about the possibilities and conditions for the dissemination of the principles of sustainable development throughout the operation of the National Forests;
   – trainings Forest Service and environmental education.

Educational component of the forest promotional complex was directed to the two main audiences:
   – forestry workers, mostly at Forest Service Offices and staff of Forest Management and Geodesy;
   – society, especially young people, teachers and social activists and local government.

An important aspect of the promotion of forest complexes is the social role of management, which is done by developing an economic and protective program, which is worked out by the scientific and social council.

Forest promotional complexes are large, dense forest areas, which are part of one or several forest districts. They are formed all over the country, show a variability in habitat conditions, a variety of species composition of the forest and the many functions performed by him. As part of the forest promotional complex policy foresters promote the unsustainable forest management, promote research and provide education forest society.

Due to this form it can be noted, that it is possible to reach a compromise between the major tasks of forestry: forest management aimed at, inter alia, timber production, nature conservation, research and education within. They are a proof that permanently sustainable, multifunctional forest management prevents the risk of forest, resulting from the development of civilization.

New forestry technologies are tested within the forest promotional complexes including Forest Service training. It conducts research and experience, the results of which are then implemented in the

entire State Forests. As a result, the principle of sustainability are upheld in all forests managed by State Forests.

Forest complexes provide a forum for the foresters with the public cooperation. The scientific and social councils of each forest complex includes representatives of the local government authorities, academic representatives and representatives of non-governmental organizations, the timber industry, local media, those who had a special trust of local communities. It is worth noting that forest promotional complexes are the original idea of promoting indigenous ecological forestry. The only equivalent in Europe is a Swedish model forest concept and outside Europe - like, a little earlier Canadian initiative. The idea of creating forest promotional complex was recognized among European foresters and scientists.

The forest promotional complex composition that was formed in 1996 named "Rychtalskie Forests" in addition to Forest divisions Syców and Antonin, there was found Experimental Forest Siemianice of Agricultural Academy of Cieszkowski in Poznan. Cooperation within the framework of the objectives of the forest promotional complex between Forest Inspectorates and the Department of Experimental Siemianice was a leading example of what the result was the creation of two more Promotional Forest Complexes, which came in the Experimental Forest in Rogów (PFC "Forests Spalsko-Rogowskie") and the Forest Department experimental in Krynica (PFC "Forests of Beskid Sadecki). There are 25 forest promotional complexes in Poland with total forest area 1 222 537 ha

Forest promotional complexes are appointed by decree of the Director General of State Forests and is composed of individual forest districts, but also private forest owners. Forest complexes this valuable natural larger and dense forest areas, which are part of one or often several forest districts. They were created for the promotion and education of forest. This place daily encounters with nature lovers foresters and forest, as well as the place of discussions on the management and protection of forest areas.

3 THE ACTIVITY OF POLISH FOREST PROMOTIONAL COMPLEX – CASE STUDY

The environmental education and the development of appropriate social attitudes towards wildlife, including forest environment is the important part of the activities of the State Forests and forest promotional complexes in Poland, because the word "promotional" highlights one of the main functions of the complex - an educational function. Shaping and promotion of sustainable, multi-functional (and therefore pro-environmental) forests management, reaching with its rules for public awareness, building a proper relationship to the forest and the activities of foresters are tasks for years carried out by State Forests and forest promotional complexes in Poland. One of the aspects of the educational activity is also reaching out to numerous organizations and environmental associations that following the noble objectives of conservation. It is the foundation upon which a very diverse project.

The forest promotional complexes there are prepared lists of objects that shall be protected by law and protected plants and animals, suggests new forms of conservation. Comprehensive protection of fauna and flora, including microorganisms, is maintaining their genetic richness. Performed analyzes allow foresters to submit proposals to supplement the list of protected areas and species and forms of protection. They also enable Techno-Economic Commissions the display of development directions of large-scale forms of nature conservation in forests, and thus incorporate them into local development plans.

Forest promotional complex becomes a leading example of harmonization of social and economic development of regions, bears witness that the rational use and renewal of forest resources does not have to downplay or production forest wealth, nor in any way threaten its other functions than production one. There is also characteristic another symptom of particular concern for foresters, forest condition, and thus the whole of the natural environment in the forest complex - in its area is firmly committed to the reconstruction of heating systems in residential areas and forest villages, so that there

were the use of modern, environmentally friendly combustion technologies (e.g., wood chips). There are built also biological wastewater treatment and waste disposal unit.

One of the significant forest promotional complex is located in the Poznan State Forest (LKP Rychtalskie Forests) with total area 47 643 ha, which was founded on 1 July 1996. It is situated in the Southern part of Greater Poland, between Ostrow Wielkopolski, Kluczbork, Oleśnica and Wieruszow. The composition of Rychtalskie Forests include two superintendences and the experimental forest department of University in Poznan.

There is also another forest promotional complex located in the mentioned area, which is the greatest complex in Poland including 7 superintendences. It was founded in 2004 in the Northern part of Greater Poland and it has total area 137 300 ha in Notecka Forest. Forestry superintendences in the complex work with multiple entities, especially on the educational field. The different types of events involved more than 140 schools and the media (press, radio, television). Every year the educational offer of the superintendence engage about 17 000 people. Classes include in an educational center, 4 colleges of education and 10 natural-forest paths.

Statutory objectives of analyzed forest complex are also realized through the implementation of research projects. Among them, noteworthy programs implemented by the Forest Arbotreum in Sycow (the clones archive, the tissue culture laboratory, the yew protection and restoration program, the riparian habitat enrichment project). Regional Directorate of forest complex in Poznan reaches positive effects of promoting sustainable forest management in society in different ways. It organizes or participates in a number of regular educational-promotional events. It is worth mentioning some of them:

− "Eco Forum" in the framework of the Education Fair, where the coordinator is Wielkopolska Land Parks Team and Poznan forest complex act organizes every year the trade fair stand highly rated by visitors.
− "Tree of waste paper" - the action in cooperation with the editorial board of Wielkopolska journal. Readers of the journal "Voice of Wielkopolska" pick up seedlings of trees and shrubs.
− "And you need to plant your tree" - the action involving the planting of trees in areas of Poznan schools and kindergartens. This is done in collaboration with the students of forestry faculty.
− Mushroom maps in the "Voice of the Wielkopolska" – action was held three times already in two editions.

Poznan forest complex cooperate also with organizations and associations such as: "My Forest", "Clean Forest", A competition "Young People in European Forests". It also has published in recent years, three educational books with an insert containing information about regional education directorates and forest education ("Forest" - twice", "About the behavior in the forest", "How the rangers take care about the forest"). Website of the Poznan superintendence, besides presenting the events and superintendence activity, is used to promotional and educational actions. In the summer months there was presented daily updated service in the fire situation in the forest.

Regional Directorate of the analyzed forest promotional complex cooperates with foreign partners pursuing interesting projects on the wider forestry. In 2005, an agreement was signed on cooperation between regional directorate of the forest complex and Landesbetrieb Hessen-Forst in Germany. Its fundamental purpose is the exchange of foresters in the form of traineeships and apprenticeships. In 2007 there was signed a cooperation agreement with Landwirtschaftkammer Niedesachsen (GB Forstwirtschaft) on the exchange of professional information exchange in the field of timber harvesting technology and the creation of a common platform for discussion on private forests. In 2006-2007 regional directorate of the analyzed forest complex participated in the project "Forests as a source of sustainable development and spatial planning in the Baltic Sea Region – BALTIC FOREST". The project includes 24 partners from 9 countries of the Baltic Sea and it was co-financed by the Interreg IIIB BSR. Its total budget amount is 2 million Euro [Regional Directorate of State Forests in Poznan, 2012]. There were already implemented activities divided into five work packages: forest management and aspects of the production, forest ecology and environmental aspects, social functions

of forests, forestry, private as well as small and medium-sized enterprises associated with forestry and forest model as a tool for sustainable forest management and regional development. Currently the analyzed forest complex interacts with 15 partners from 7 countries: Belarus, Estonia, Finland, Latvia, Poland, Russian and Sweden in the project "Baltic Landscape - an innovative approach to sustainable forest landscapes." Duration of the project: 01.01.2012 - 31.03.2014. This project provides four thematic packages: the Model Forest concept, a new approach to integrated planning in forest areas, tourist management of forest areas, water management in forested areas.

4 CONCLUSIONS

Forest promotional complexes are a manifesto of sustainable, multifunctional forest management, and it is symptom of leaving the concept of the so-called normal forest, which brought up the previous generations of foresters. This is an original, native broad idea of promoting multifunctional, sustainable forest management, the only equivalent in Europe is at most Swedish model forest concept. It should be emphasized an important educational aspect of this unprecedented project and the wide opening of the forest to the public. The analyzed idea of promoting sustainable forest management is realized by the forest promotional complex predominantly within the educational projects and international cooperation in the framework of European projects. The highly valuable activity is done within the research units of the forest complex that are founded by universities. Actually, each forest promotional complex involving superintendence should have developed separate, interdisciplinary, long-term and comprehensive research program taking into account its specificity. Such studies should cover the entire area of the forest complex and should include, in particular: new and innovative technologies, integrating forestry purposes with active nature conservation, sustainable behavior and play, and other forest values.

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Author's address

dr inż. Renata Stasiak-Betlejewska
Czestochowa University of Technology
Institute of Production Engineering
Al. Armii Krajowej 19 B
42-200 Częstochowa, POLAND
E-mail: renatastasiak@wp.pl

CAPABILITY TESTING OF GAUGE IN PRODUCTION CONDITIONS

Anna Šatanová

ABSTRACT

Quality assurance of the production process is closely linked with quality control. Application and successful realization of process approach depend on implementing of all activities related to the management and quality assurance. It is necessary to lay stress on quality realization of measurement process and all aspects related. It is not concerning just the person who performs the measurement, but also the environment, procedure and last but not least, the gauge. Gauges are namely used in practice day by day, when it's extremely important to provide reliable information to the user.

This paper deals the problematic about the capabilities testing of gauge which is one of the most important attributes for quality in production conditions.

Key words: accuracy, capability indexes, control chart, gauge, measurement.

1 INTRODUCTION

The current business environment is characterized by fierce competitive struggle. Businesses are constantly trying to better position on the market. They realize the importance and necessity to know and of course to meet the needs of their customers. According to Šatanová, Krajčírová (2010) they must increase the quality of their products and services. They must know how to manage their staff and all processes within the value chain. To do this it is important to have information in sufficient quantity and quality. One source of data the measurement process is. In general, it can be described as a certain transformation of the input data to the file of output parameters resulting from the measurement. The standard STN EN ISO 10012 (2003) characterizes it as actions aimed at determining the value of the quantity.

The quality of measurements is a prerequisite seeking to reach and to support quality of products of each business unit. Analysis of the measurement system is based on experiments, which are, according to Brassard et al. (2005), most often used to evaluate the need of improving the measurement system itself prior to data collecting. Brassard et al. (2005) and Plura (2001) inform via groups of statistical characteristics about the status of the measuring, which process is in - partiality, consistency, repeatability, reproducibility, stability and linearity.

A part of of the measurement process is a measuring device that is represented by the measuring instrument, software, measurement standards, reference material or auxiliary apparatus, if necessary: combination thereof. All operations which have ensure compliance with the requirements of the measuring device to its use is denoted by the term metrological confirmation (EN ISO 10012, 2003).

Businesses to have control of all their processes, they must ensure that all information which they obtain from the measurements, had the desired explanatory and they are accurate and reliable. It is important to ensure continuity of measurement itself and its continuous. It must be accurately determined the frequency of each of the measurements according to ISO 21747 (2010) depend on the type of process and product type. The actual measured values must be processed as quickly as it is possible. It is vital to keep their current reporting ability.

According to Bílý (2008) there can be identified different groups of processes in an enterprise, which can also include process of measurement, analysis and improvement. For those processes which

are needed for measurement and data collection for performance analysis, for improvement of their effectiveness and efficiency.

Within the measuring process, it is important to insist that measuring equipment is in such condition, which guarantees them that fact. By this can be achieved a high level of quality of their processes and products.

The aim is to establish capability of the measuring device using the capability indexes and also to confirm the fact, that this method can be applied directly in the production conditions of timber companies.

2 EXPERIMENTAL SECTION

We carried out testing of the instrument directly in the production conditions of a timber company. In the conditions of the production plant, we have tested capability of digital calliper from the company MORN.

Table 1. Digital calliper – basic data (Krajčírová, 2012)

measuring range	0 – 200 mm/0 – 8in
distinctiveness	± 0,02 mm/0,001 in (<100 mm)
	± 0,03 mm/0,001 in (>100 mm – 200 mm)
repeatability	0,01 mm/0,005 in
maximum measuring speed	1,5 m/s/60 in s-1
working temperature	from +5 ˚C to +40 ˚C
influence of atmospheric humidity	to 80% relative

Digital calliper is used to measure the depth, width and thickness, so we considered it necessary to establish its eligibility for each of these quality characteristics. The verification of eligibility for characters depth and width we have made on the product: a groove doors walls and for quality characteristic thickness we had chosen cladding the door - the dash. Both products were taken directly from the production process.

The measurement, we carried out directly in the manufacturing workshop at 20 ˚ C and a relative humidity of 30%. We have not been setting the calliper during the measurement, because this is unacceptable.

For each of the three quality characteristics we performed 50 measurements, which we gradually recorded in prepared form, so we created artificial subset of data with a range of 5. For each subgroup, we calculated the mean $\overline{X}$, standard deviation S_W and a selection criterion R in terms of relationships

$$\overline{X_a} = \frac{1}{n}\sum_{i=1}^{n} X_i \tag{1}$$

$$S_w = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}\left(X_i - \overline{X_a}\right)^2} \tag{2}$$

$$R = x_{max} - x_{min} \tag{3}$$

To the presentation of measurement data, we used diagram deviations. In the next step we calculated the capability of the instrument C_{gm} and C_{gmk}.

$$C_{gm} = \frac{0,2 \cdot T}{6 \cdot \sigma_g} \tag{4}$$

$$C_{gmkU} = \frac{(x_r + 0{,}1T) - \overline{x}_a}{3\sigma_g} \qquad (5)$$

$$C_{gmkL} = \frac{\overline{x}_a - (x_r - 0{,}1T)}{3\sigma_g} \qquad (6)$$

T – tolerance of feature

σ_g – standard deviation of the measured values

x_r – accepted reference value of a standard

$\overline{x}_a$ – arithmetic mean of the measured values

C_{gm} – capability index of the instrument

C_{gmkU} – upper critical capability index of the instrument

C_{gmkL} – lower critical capability index of the instrument

The value of each character quality for our chosen manufacturing process of doors is presented in Table 2. It also expresses the values of production tolerance limits, which we used in our calculations.

Table 2. Value of quality characteristics (Krajčírová, 2012)

	value of the quality characteristic	tolerance
groove depth	15 mm	± 1mm
groove width	19 mm	+ 0,5 mm a - 1 mm
thickness of the cladding	18 mm	± 0,5 mm

The practice is characterized by the fact that businesses to calculate indicators of competence set out various coefficients that reflect their own production conditions. In general, for the calculation capability indexes that relationship is expressed as a relationship between a shares of width tolerance field with bandwidth of variability in the acquired data. Parameter of tolerance field and selection standard deviation is multiplied by relevant coefficients k_1 (for tolerance field T) and k_2 (for sample standard deviation σ) in those relations. We used the method according to Bosch, which represent the values for $k_1 = 0.2$ and $k_2 = 6$. We built on the fact that a digital calliper is used also in this industrial production. Therefore, we can consider the fact that the coefficients shall be valid to its use in the production of timber. The measuring instrument can be considered as capable of performing the requirement that it be placed in the measurement process, case the rule applies that $C_{gm} \geq 1{,}33$ and C_{gmkU}, $C_{gmkL} \geq 1{,}33$.

3 RESULTS AND DISCUSSION

On the base of 50 made measurements we have fitted diagrams of deviation to all three of quality characteristics
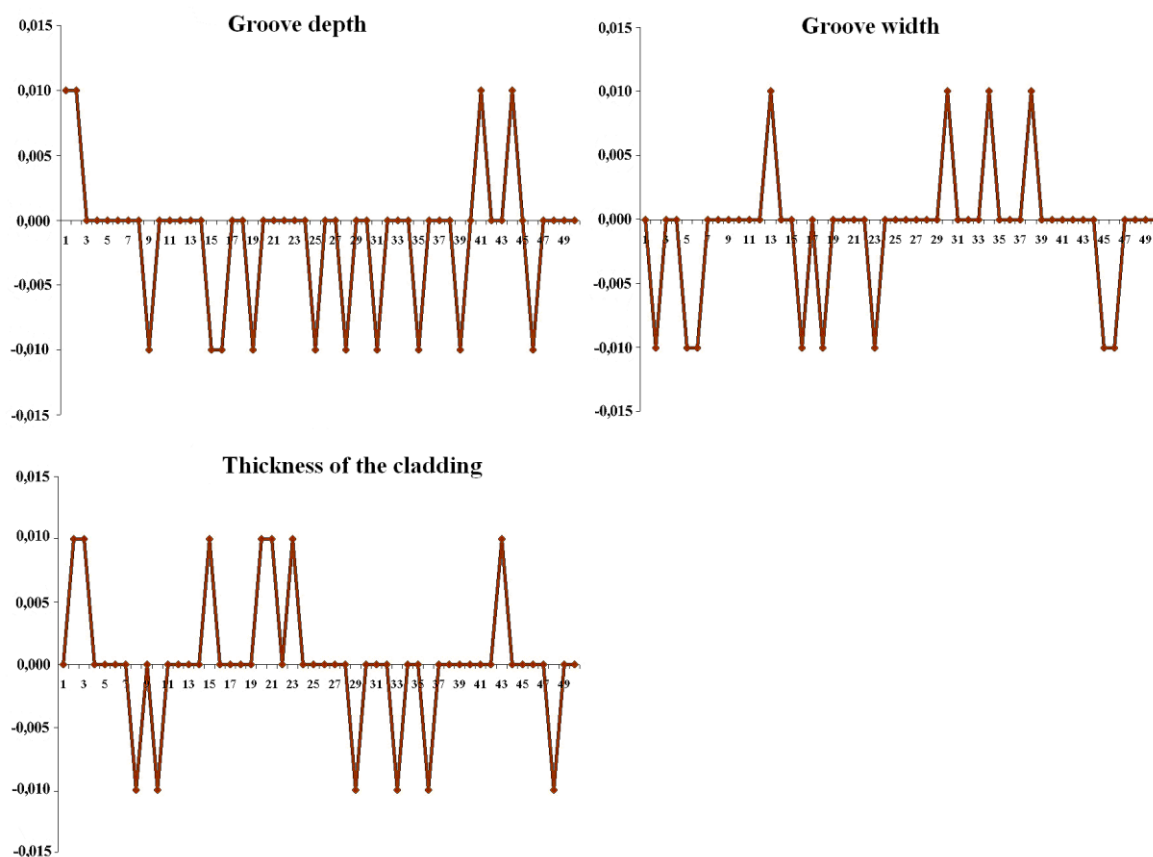

Figure 1. Deviation from the measured values (Krajčírová, 2012)

Presenting the identified data in this way we have obtained visual information about the deviations of individual measurements of each character quality. This control chart has provided us information about the current state of the measuring process.

According to the relations (1), (2) and (3), we have calculated relevant features for each subset (see Tab. 3).

Table 3. Calculated characteristics (Krajčírová, 2012)

	$\overline{X}$	S_W	R
depth	14,999	0,000519	0,010
width	18,999	0,000424	0,010
thickness	18,000	0,000486	0,010

The calculated values according to relations (4), (5) and (6) we have used to evaluate the capabilities of the instrument. The listed indexes referred us information on whether or not the instrument is capable of meeting the requirements to which it is put in the measurement process.

Table 4. Calculated capability gauge indicators (Krajčírová, 2012)

	C_{gm}	C_{gmkU}	C_{gmkL}
depth	128,45	129,22	127,68
width	117,98	118,61	117,36
thickness	68,66	68,52	68,79

We have found that the digital calliper achieved significantly high values (see Tab. 4). In our view, that situation is also caused by significantly large tolerance limits set for business process conditions. If we had used more stringent tolerance limits, values of indicators would have been significantly lower.

We have confirmed this fact by exploiting precision figures of monitored calliper from the documentation supplied by the manufacturer:

± 0,02 mm (< 100 mm)

± 0,03 mm (> 100 mm – 200 mm)

± 0,04 mm (> 200 mm – 300 mm).

Selection of characteristics measurement accuracy was for the reason that this characteristic of quality is very important and decisive in the measurement process.

Table 5. Calculated capability gauge indicators by using new tolerance limits (Krajčírová, 2012)

	C_{gm}	C_{gmkU}	C_{gmkL}
groove width	3,146	3,776	2,517
groove depth	2,569	3,340	1,798
thickness of the cladding	2,746	2,609	2,884

As can be seen in Table 5, in the case of using more stringent tolerance limits, we can conclude that the digital calliper is capable because the index values of eligibility satisfy the conditions set for a vote of this conclusion.

Based on our identified and evaluated information we can conclude that the digital calliper is capable of meeting the demands, which are placed on it in the process of manufacturing the door placed. It is able to provide to the owner of process information in required quality.

4 CONCLUSION

In the article we focus on the verification of the quality of the measuring device. We investigated the ability of digital calliper directly during production in the timber business. We take into account the impact of various factors on the quality of measurements (environment, personnel, equipment, and enterprise scale). We tested three quality attributes - breadth and depth of the groove walls doors and door cladding thickness. For each of them we made 50 measurements. To presentation of the measured data, we used diagrams deviations. To determine the capabilities of digital calliper we used the expression (1), (2), (3), (4), (5) and (6). We also used to this aim methodology according to Bosch. We found that our tested digital calliper is capable; therefore, it is able to meet the demands, which are placed on it in the process of manufacturing the door placed. The whole procedure of verification capabilities we made directly in production conditions, based on which we can conclude that it can be used directly in the production process. We also confirmed the fact that the mere verification of the measuring device is an important tool for maintaining and increasing the quality of the reporting process.

This method of testing the ability of the instrument is to serve to its use in the measurement process, which has been introduced in acquiring the necessary data for statistical evaluation of the production process. The data from it should further serve to established standards to ensure the stability of the manufacturing process.

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Author's address

prof. Ing. Anna Šatanová, CSc.
Katedra podnikového hospodárstva
Drevárska fakulta
Technická univerzita vo Zvolene
T. G. Masaryka 24
960 53 Zvolen
Slovakia
E-mail: anna.satanova@tuzvo.sk

THE IMPACT OF THE GLOBAL RECESSION ON WOOD PROCESSING INDUSTRY AND WOOD PRODUTS TRADE AND THE ROAD TO RECOVERY

Mikuláš Šupín

ABSTRACT

The current financial and economic crisis, also known as the Global Financial Crisis, is considered by many economists the worst financial crisis since the Great Depression of the 1930s. It resulted in the threat of total collapse of large financial institutions, the bailout of banks by national governments, and downturns in stock markets around the world.

The paper deals with analyzing the impact of the financial and economic crisis on the wood processing industry and wood products trade and seeking recovery of these sectors.

Key words: The Great Recession 2007-2009, globalisation, wood processing industry, wood products trade.

1 INTRODUCTION

At the present time, forestry and wood processing industry including their various sectors relating to the wood processing are influenced by many factors. For instance, changing climatic conditions, competition in harvesting wood, developing the technical complexity of the production process and innovations, at last but not least also legislative measures national governments and international policy have strong influence and control on the potential use of wood. The use of wood is connected with many different parts of society, agriculture, energy sector, transport and many other industries. (Parobek, 2013)

The market economy is cyclical in character. The basis of its development is the economic cycle (business cycle). The economic cycle, in other words, is the period between subsequent changes in a company's development trends (maxima and minima on the trend lines). It consists of the following periods (Lis 2012):

- recession (decline) – production and prices decline, unemployment grows
- intermediate – stabilization of production and prices at a low level accompanied by high unemployment
- expansion (recovery) – growth of production and prices and decrease in unemployment level
- peak (boom) – stabilization of production and prices at a high level, accompanied by low unemployment rate

An economic cycle may last from a few months to a few years, yet the scale of production, prices and unemployment rate vary. The economic cycle serves to compensate for developmental imbalance in various sectors of the economy. According to Austrian economist Schumpeter (Schumpeter 1964) – „recession is a period of recovery following the excesses of prosperity". Crises eliminate from the market the biggest risk-takers and optimists that are its weakest elements.

The crisis played a significant role in the failure of key businesses, declines in consumer wealth, and a downturn in economic activity leading to the 2008–2012 global recession and contributing to the

European sovereign-debt crisis. The active phase of the crisis, which manifested as a liquidity crisis, can be dated from August 9, 2007, when BNP Paribas terminated withdrawals from three hedge funds.

During the last two decades, there is a visible increase in the impact of globalisation on wood processing industry. Globalisation in this sector is characterized by a degree of openness of the economy, an increased share of imports and exports on GDP, as well as by the rapid growth of imports and exports of the Slovak wood and paper products in comparison with the growth of total exports and imports.

Wood product markets are influenced by a large number and wide variety of policies. Some policies directly affect how wood is viewed as part of an emerging green economy. These include trade policies such as illegal logging regulations and trade-related agreements. Renewable-energy policies, greenhouse gas reduction targets, oxide carbon, and green policies also affect wood markets.

With increasing levels of globalization and international competition, managers are facing ever more complex strategic decisions. Often foremost among these decisions it is relating to the choice forms of entry and strategy on export markets. Selection of an appropriate form of entry and strategy is a critical and is indispensable component of the strategic decision of firm to make investing overseas.

2 GLOBALIZATION IMPACT

After the year 1970, the globalization process has determined the growth of the gaps in competitiveness between countries. Globalization is a dynamic but also a highly controversial and asymmetric process. Globalization can create new demands and new possibilities for regenerating local identities.

Globalization is a powerful real aspect of the new world system, and it represents one of the most influential forces in determining the future course of the planet. It has many dimensions: economic, political, social, cultural, environmental, security, and others. The focus here will be on the concept of globalization as applied to the world economy. This concept is one that has different interpretations to different people. Partly as a result of these different interpretations, there are very different reactions to globalization, with some seeing it as a serious danger to the world economic system while others see it as advancing the world economy. Globalization has been source of trade liberalization and other forms of economic liberalization that have led to reduced trade protection and to a more liberal world trading system.

Globalization has had significant impacts on all economies of the world, with manifold effects. It affects their production of goods and services. It also affects the employment of labor and other inputs into the production process. In addition, it affects investment, both in physical capital and in human capital. It affects technology and results in the diffusion of technology from initiating nations to other nations. It also has major effects on efficiency, productivity, and competitiveness.

The wood and wood processing industry in many countries can be split between the primary and secondary processing sectors. Primary processing moves from forestry, through saw milling, and on to the production of semi-finished items, often for export and with low levels of value addition. Secondary processing focuses on the production of value-added finished items like furniture, household items, doors and windows, and materials for the construction sector. Within many countries, the secondary processors are often small and medium enterprises (SMEs), which produce solely for the domestic market, although analyzing the wood value chain proves that the highest value addition should be achieved by the secondary processing of sawn wood. SMEs in many countries often face similar handicaps and problems that hinder them in further development as industrial players and participants in the global value chain. Regulations on forestry, exports, taxation, and customs may, in fact, impair the opportunities for the secondary processing of wood by SMEs. Pulp - paper industry belongs to the category of large enterprises.

The rapid globalization of markets in the 1980s combined with increasing disposable incomes in Japan and Western Europe has mandated global thinking by both forest products companies and producing regions. The two end points for the continuum of strategic options for the export of wood products are international and global marketing. International marketing targets specific customer segments with distinctive product lines developed for each segment. Global marketing exports a single standardized product line to all customer segments regardless of geographical location. To successfully compete in the increasingly competitive world marketplace, companies and (or) industries in producing countries must understand the requirements, benefits, and disadvantages of these two dissimilar export approaches.

There has been remarkable growth in such trade and exchanges, not only in traditional international trade in goods and services, but also in exchanges of currencies, in capital movements, in technology transfer, in people moving through international travel and migration, and in international flows of information and ideas. One measure of the extent of globalization is the volume of international financial transactions, with some $1.2 trillion flowing through New York currency markets each day, and with the volume of daily international stock market transactions exceeding this enormous amount.

Globalization has both positive and negative effects. Globalization involves not only benefits, but also has costs or potential problems. These costs could lead to conflicts of various types, whether at the regional, national, or international level. One such problem is that of who gains from its potential benefits. There is the possibility that local economic fluctuations or crises in one nation could have regional or even global impacts. This is not just a theoretical possibility as seen in the exchange rate and financial crisis in Asia, starting in Thailand in 1998 and then spreading to other Southeast Asian economies and even to South Korea. In 2007 the worldwide recession or depression has started in USA and has led to break the interdependencies that have been realized through the globalization process. These linkages and potential instabilities imply great potential mutual vulnerability of interconnected economies.

Under these circumstances, the successful introduction of new products into the market becomes a critical factor for the survival and growth of companies. Effective new product development and commercialization is therefore a challenging task. Entry strategy is one of the most fundamental and main factors in increasing export performance.

3 MACROECONOMIC IMPACTS OF THE GLOBAL FINANCIAL AND ECONOMIC CRISIS

Following a decade of strong and sustained growth in the world economy, in mid-2007 the global financial crisis started in the United States and spread rapidly to other parts of the world. The crisis transformed into a global economic crisis with its effects being most severe in 2009, resulting in declining economic growth in many countries, rising unemployment and large declines in international trade and capital flows. The impacts on growth of gross domestic product (GDP) were most severe in the developed economies including USA. The USA initially most affected by the impacts of the crisis that had originated in its own subprime mortgage market and which had marked impacts on USA disposable incomes, consumer demand levels and housing starts. With interdependent globalised markets, the effects quickly spread to European Union (EU) countries and to developing countries with strong trading links with the USA and Europe.

3.1 Effects on economic growth

In the decade to 2008 the global economy had experienced its strongest sustained period of growth since the early 1970s. In the fourth quarter 2007, world real GDP growth started to slow following

uncertainty in global financial markets originating from the US mortgage crisis. Emerging risks and the ongoing turmoil in financial markets have reduced domestic demand in the advanced economies and have created significant spillovers into emerging markets and developing economies. In 2008 world GDP growth slowed substantially and further plunged in 2009 following a dramatic worsening of the global financial crisis, reaching the lowest rate since World War II.

3.2 Effects on global trade

World trade volume dropped significantly in 2008 and 2009, contracting by -11.3 percent in 2009, the largest one-year decline in trade since the Second World War. Trade rebounded sharply in 2010, as firms restocked their inventories. However, the revival of trade was uneven among countries, with significant growth occurring in the Asian region, particularly China and India, while growth in developed countries was significantly slower/non-existent.

3.3 Global trade imbalances

A major global economic risk pre-crisis was the persistent large global trade imbalances, particularly between China and the USA which, in addition to food price rises, threatened a rise in protectionist trade measures. One of the impacts of the crisis has been a narrowing of trade imbalances with much of the decline attributed to a fall in the US trade deficit and in China's trade surplus following the financial crisis. In the US, the bursting of the housing bubble saw spending levels fall and the US personal savings rate rise, resulting in a slowing of import growth. At the same time, China's surplus narrowed reflecting reduced high-income import demand, but also a post-crisis growth strategy in China that has emphasized domestic sources of growth, notably investment, which has raised imports faster than exports.

The global economic crisis brought suppliers not only declining demand and even loss of certain markets, but also lower prices. Some industry participants searched for new processing options to provide other revenue streams.

4 RECOMMENDATIONS FOR WOOD PROCESSING INDUSTRIES AND TRADE ASSOCIATIONS

The global economic downturn has created challenges for forest and wood processing industries worldwide but it has also created opportunities for those sectors that have taken action to improve their competitiveness.

4.1 Strengthen associations and cooperation:

• Strengthen capabilities and cooperation between trade and industry organizations in the sectors of forestry and wood processing industries to facilitate strategic planning and the implementation of action plans to minimize market risk for sector during global economic crises.
• Cooperate in the development of systems for market intelligence gathering and analysis and sharing of information and statistics of relevance to the sector.

4.2 Develop marketing strategies to overcome reduced market demand:

• Industry organizations can assist SMEs:
- in reexamining marketing strategies
- monitoring market share to maintain a strong position in existing markets,
- maintain long-term growth
- stabilize customer relationships
- keep a watching of customer performance.
- encourage SMEs to refrain from cutting marketing budgets during demand downturns.
• SMEs are encouraged to explore new markets and growing market share ahead of competitors, using market information and appraising the level of risk involved.
• SMEs are encouraged to make effective use of external resources, looking for collaborative research opportunities and to form strategic alliances with domestic or overseas companies to collaborate on technology transfer and training.
• consider participation in exhibitions and trade fairs to promote their products in regional markets.
• consider improvements in productivity, product diversification and the development of specialized products for a product range of specialist market niches and market destinations.

4.3 Develop internationally competitive wood processing enterprises:

• Effectively engage in ICT to improve processing efficiency, marketing and trade in wood products.
• Invest in continuing productivity improvements to improve cost competitiveness.
• Develop in company information statistical system and capacity for data collection, collation and analysis.
• Invest in increasing the overall quality of the workforce up skilling and training of personnel, particularly for value-added processing.
• Pursue the production and trade in legal and sustainable conditions with wood and wood products as a means of differentiating their products for both domestic and export markets.
• Commit to work in the wood processing industry and with trade associations including membership to internationally recognized trade associations as a means of gaining market information, in particular evolving regulations and changes in policy in their export markets.
• Invest in cooperative, joint initiatives to promote trade with wood products.

5 CONCLUSION

The analysis of global financial and economic crisis reveals why the years 2008 - 2011 market of wood products accumulated problems in the chain of export and import of wood and wood products. Progress towards bank solvency has had started. It began more less easy "Fed" money in the USA. But it has proven as tenuous. Chinese growth of GDP continued but with slowly declining. The Eurozone crisis uncovers today's worst unaddressed risk and the markets loss of confidence in governments. This offers insights into underlying flaws in the banking systems and the Eurozone's structure that remain unaddressed. The problematic member states have bought time with loans money and bailouts. Time is rapidly running out with the increasingly frightening signs of "perverse synchronization": for export and import, equity, credit, and commodity markets massively moving in tandem. It also offers specific recommendations for what policymakers can and must do now to restore the long-term health of the global markets.

Aknowledgement

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Author's address

Dr. h. c. prof. Mikuláš Šupín, PhD.
Department of Marketing, Trade and World Forestry
Technical University in Zvolen
Masaryka 24
960 53 Zvolen
Slovakia
E-mail: supin@tuzvo.sk

CUSTOMER RELATIONSHIP MANAGEMENT AND CURRRENT CHALLENGES AND CRM TRENDS

Miroslava Triznová

ABSTRACT

This paper provides an overview on Customer Relationship Management. It provides an overview on current and future challenges a company should overcome when building a long lasting relationship with a customer. Different theoretical approaches to CRM are included in the first part of the paper. Second part of the paper presents the results of research based on Delphi method, which was aimed on finding main CRM challenges of next years. Last part of the paper characterizes three major challenges and trends of the CRM,

Key words: Customer Relationship Management, trends, customer, challenges, CRM features.

Current information technologies and globalisation is changing both sides of the market. It is an empowering and challenging companies on one side, and customers on the other. Since the customers are more informed, they can compare companies' products, items prices and share references. Their voice is more powerful. Companies have to struggle with higher requirements and stronger competition. Some of the companies already create long term relationships with customers. Relationship management transforms and shifts from managing transaction on both sides to managing partnership between both sides.

1 THEORETICAL APPROACHES TO CRM

1.1 Approaches to Customer Relationship Management

An interaction between a company and a customer has always been present. What has changed, is the view on customer and transaction. In the beginning of the 50s of 20th century, it was a short-term transaction that helped companies to survive. The CRM processes were aimed only on selling. Customer was identified as a mass, there was no communication with the customer and no relationship with customer was built (Gordon 1998; Starzyczna 2007; Kotler 2007; Lehtinen 2007; Peelen 2005; Payne 2007). Later, as competition was growing, in order to survive transaction should repeat, so the companies started to gather information and create segments of customers. The aim of CRM shifted from satisfying minimal customer requirements in the 70s to bringing quality and excellence to the customer in the 80s and 90s. CRM processes have changed from only selling to selling and analyzing. The first signs of the CRM development can be marked in this time. There is automatisation of customer service. Earlier, the customer was understood as a group, later on as a specific segment. Short-term non personal relationship with customer is present. Communication with the customer shifted from one way to two-way, but there is a domination of the company in this communication (Greenberg 2010; Gordon 1998; Starzyczna 2007; Kotler 2007; Lehtinen 2007; Peelen 2005; Payne 2007)

Later on, with new technologies, customers became more powerful and good simple offer wasn't attractive anymore. Something attractive had to be be invented to keep customers for a long time. It was unique a customer´s experience with the company and its product that led into a long term

relationship. CRM processes became wider, they support selling, analyses and collaboration. With the internet and current social media, CRM is developing widely and deeply in its structure of customer-oriented processes. Customer is understood as a consultant or community. Relationship with the customer is personal, intensive and long-lasting. There is a two-way communication, with an aim on the customer. Greenberg 2010; Gordon 1998; Starzyczna 2007; Kotler 2007; Lehtinen 2007; Peelen 2005; Payne 2007).

1.2 Theoretical approaches to trends and challenges of CRM

However, CRM is still developing. There is no exact CRM because CRM is perceived differently among companies and experts. Some authors define CRM as technology Firth (2006) and, Lager (2008), (Tan 2002), others connect CRM with data management processes (Berson 2000). While Berson (2000), Chlebovský (2005), Johnston (2008), Kotler (2007) characterise CRM as a which is aimed on economic–profit on both sides, Buttle (2010), Greenberg (2010), Payne (2007), Bokorova (2003), Croteau (2003), Lee (2003), Seybold (2002) define CRM as a strategic approach to the customer which integrates all processes in the company in order to bring value to the customer. So the CRM is perceived as the technology connected with data, which enables higher profits, or as a strategic approach that brings value. The CRM in the company should be supported by different well running parts of the company. Berson (2002), Dohnal (2002), Peelen (2005), Torggler (2008), Buttle (2010) believe that company's CRM should be supported by 3 main parts: operational, analytical and collaborative. With the emerging social media and customer empowerment, the customer is one, who owns conversation, and this conversation is public (Evans, 2010). So the social CRM is taking part in building long-term relationship with the customers. Greenberg (2010) defines social CRM as "philosophy and business strategy, supported by technology platform, business rules, workflow, processes and social characteristics, designed to engage the customer in a collaborative conversation in order to provide mutually beneficial value in a trusted and transparent business environment . It´s the company's response to customers´ ownership of the conversation." Social CRM is strongly connected with Enterprise 2.0 since technologies are present and provided not only for customer but as well for companies. Shelton, Evans (2010) define enterprise 2.0 as company that conveys the idea of socially connected organization in which employees collaborate, facilitated through the formal adoption of the Web 2.0 technologies inside the organization, in an analogous way to what is happening through Web 2.0 outside the organization (Shelton, Evans 2010).

To sum up, companies should quickly react to changes on the market as social media, technologies, applications. We surveyed what the main CRM trends and challenges are in the next part.

2 METHODOLOGY

Research held from 2011 – 2012 was aimed on previous questions and the expert Delphi method has been used. This method is based on collective intelligence, with the aim to find a common consensus. The anonymity of the respondents needs to be ensured. It has to be held at least in 2 separate rounds, consensus was based on agreement, that has to reach 70% and more within the group Reichel (2009), Závadský (2006), Hsua, Stanford (2007). In the beginning, forty experts were asked to participate in first round via email. 15 of them were willing to participate first round. They were asked to answer questions concerning future trends and challenges of CRM. The survey was held via mail in Slovak an English language. The experts were from Europe 60%, USA 33%, Australia 7%. Some experts - 40% had previous experience in CRM management in company. 60% of experts were experienced as CRM consultants and CRM researchers. The participants from Slovakia and Czech Republic have in average 8,7 years of experience in the field of commerce, retail, marketing, CRM. The

experts from other countries were experienced in following areas: CRM, CRM strategies, CRM, analysis, customer experience, customer lifecycle, social CRM, business architecture, CRM safety, social strategies, and in average they have 20,57 years of experience in Customer Relationship Management. Research was aimed on changes CRM, that will company probably face and how to build deeper and long term relationships between two sides. In the first round experts were asked to name main challenges they think companies will face. Each of 15 experts provided different answers. Some of the answers were longer, since question wasn't limited by options and provided space for individual opinions. The answers were translated into one language, selected a clustered. The most frequent answers were used as representative source for second round. In the second round questioner was made of provided answers- statements. One third of the answers was used for the second round. The most characteristic experts statements were put into table. Experts were asked to mark their level of agreement with statement on scale from "-2" to "+2". Where "-2" was totally disagree "0" neutral, and "+2" totally agree. According to the level of agreement we could evaluate % of consensus. We didn't count with negative answers ("-2", "-1") The consensus was based as a percentage of positive ("0" ,"+1", "+2") results. Final results were put into the table and ordered from the higher level of consensus to lower one. In a case the consensus level was the same, order of the statements was determined by multiplicity of answers in the scale. There were 3 main areas there were questioned: 1. What are main challenges in the following 5 years. 2. How is CRM going to look like in 5 years. 3. What are main challenges to implement CRM successfully.

3 RESULTS

3.1 CRM challenges and trends

In this part of the paper we sum up main results of the research, based on Delphi method.

CRM challenges

As we mentioned in the previous part, we asked expert group to answer 3 main questions. Since the customer empowerment is stronger, and technologies making business faster, it has to have impact on building relationship with the customer. So we were trying to find out what are the main CRM opportunities and threats in following years. So the first question was "What do you think, what are the main challenges CRM will face in next 5 years?" In the first round there was shift 16 statements from 39 relevant ones from the first round. In the second round consensus was reached in 14 statements.

As main challenges have been defined ability move from managing relationship to having relationship. We could name this first area as **transformation**. Experts agreed that, move from the traditional to the social CRM will one of the challenges. It should be supported by new technologies integration. Top three challenges that have been accepted were: continuous integration of all parts of the company, continuous transformation of the traditional CRM to the social CRM and keeping up with technologies.

These challenges were followed by next three areas that could be named as **relationship.** All of these statements were market as very important ("+2" or "+1"). It will be crucial to build relationship inside and outside of the company. However customers are empowered by technologies to make rational decisions, they demand emotional engagement as well. It means, that companies should continue in mindset change and set out all activities outside, towards customer and other stakeholders. It will be important build and keep strong relationships with customers and stakeholders which will lead into close connection and active cooperation.

Table 1. CRM trends

Main challenges CRM could face in next five years	Agreement (%)			consensus
	0	1	2	
Needing to integrate with the rest of the enterprise i.e. ERP, Collaboration, Websites, Appstores, Data	17	83		100
CRM transitions from its traditional to the social form, there will be (already is) some confusion as to what CRM really is.	17	83		100
The challenge will be keeping up with technological advances	17	83		100
Continuation of inside-out mindset	17	83		100
Ability to move from managing relationships to actually having relationships	17	83		100
Being aligned across all stakeholders (customer, partner, employees within the enterprise)	17	83		100
Responding to customer-generated content in social media	33	67		100
Engaging customers with company on platforms, where also other stakeholders can act and are brought together	50	50		100
Challenge will be attempt to control the customer experience.	50	50		100
Engaging customers with company on platforms, where also other stakeholders can act and are brought together	67	33		100
Higher risk of data crimes therefore higher data security needed	17	67		83
Adapting to the customer needs in a timely manner	33	50		83
Breaking down traditional roles between active supplier and (a passive) buyer	33	50		83
Challenge stop relying on idea that technology will fix all problems	17	67		83
Customer's adoption of social and mobile technology - companies will find it challenging to keep up with what customers want and need.	17	50		67
Too much data, leading to analysis paralysis	0	17		17

Source: Own research

Another challenge will be **content.** According to expert group one the challenging activities will be keeping up with customer generated content, that can be positive or negative. The most important, is to have overall control over this content, throughout all media, including social media and active participation in customers engagement. Challenge that companies are facing, is customer experience control that leads into positive or negative reference. Content can be created in different platforms, which are available for competitors as well. That's why is important be informed about content customers are generating and platforms they are using to share their opinions.

CRM in 5 years

In the next question we were searching for the main core areas that must be reach within five years in the company. Experts predict main features of the CRM in the companies, they suppose to be everyday and common part of the company's CRM. (table 2) The survey question was: "How will the CRM in five years look like? "

First area is connected with **details** – there has been the strongest consensus within group 100%. When building long lasting relationship with customer, it is not possible without knowing customers. Customers are generating more content, there is more information available. So if the company wants to build long term relationships with customer, it should be able to adopt new technologies, that are connected with cloud solutions, online CRM solutions and CRM applications,

which can help to manage detail relationship. Company should be able not only adopt these technologies but also use them actively- all within 5 years. Technology will be strong part of the CRM, and company should actively involve social media in its internal CRM structure. Contextual information – such as location, previous purchases, personal dynamics should be part of the customer view, within in next five years.

Another strong area that should be managed within companies is **deep integration of the system.** Experts agreed that there will be strong connection between different areas that are connected with customer. Digitalization will enable encapsulate more social media strategies and social CRM. Relationship management will be deeper integrated throughout whole company.

Third area company should mange within five years, when talking about relationship with customer is **new customer model**. Experts think that customers will become active part of the company, it will have an important role inside of the company. The relationship management shouldn't be based on transaction management, but on value creation on both sides. Important is as well change of doing business from inside-out towards outside-in perspective.

Table 2. CRM in 5 years

CRM in 5 years	Agreement (%)		consensus
	0	1 2	
On premise solutions will be replaced by online solutions and clouds.	0	100	100
There will be massive integration of CRM with social networks.	0	100	100
Contextual information – such as location, previous purchases, personal dynamics will be added to the customer view.	0	100	100
More mobile apps used in CRM.	0	100	100
Digitalization will become even more integrated to CRM.	17	83	100
CRM will be more adjusted to concrete and unique company – in term of systems.	17	83	100
Different information databases will be interconnected enabling sharing common data.	17	83	100
Social business strategies as well as social CRM will be encapsulated.	17	83	100
CRM will become broader and deeper and more integrated within the enterprise.	17	83	100
There will be more of an emphasis on security of personal data across all sectors.	33	67	100
CRM will be more about value-based collaboration between the companies and customers/stakeholders (co creation).	33	67	100
Customers will become part of a successful operating model.	33	67	100
Changing the way of doing business (from inside-out towards outside-in perspective).	17	67	83
It will increase competitive advantage and differentiation for those companies who are successful at implementing it.	33	50	83
Professionalizing of traditional CRM building blocks (from customer knowledge, propositions, channels/customer experience, towards metrics/key performance indicators).	33	50	83
Portable devices rather than desktops will become more important.	50	33	83

Source: Own research

To conclude, if the companies want to increase competitive advantage by managing relationships with customers it should focus on managing more details about customer, by using actual technologies and inventions. The company structure will be change into integrated and deep system of the people and technologies. And finally customers have to be active part of internal structure of the company.

3 CONCLUSION

Customers characteristic is changing. Relationships, that customers was experiencing few years ago are not the same any more. Customers are becoming more self confident and active. That's why customer relationship management is changing as well. The latest approaches to the CRM were characterised in the first part of the paper. The CRM was considered as technology or data mining. Some authors approach CRM as philosophy or strategy. Others see it as partial process in companies. Currently, the CRM is profiled as philosophy and business strategy. It should be approached in a wide perspective on the strategical level, and shouldn't be viewed as separate technology or separate process on tactical level. The main aim of the CRM is not the profit, but it is the value creation. It should be created on both sides on company's side and customer's side as well.

The CRM is changing continuously. There are couple of changes and challenges we could expect in following years. Main CRM trends are:

1. transformation,
2. relationship,
3. content.

This activities are main challenge for the CRM of the companies. They should help companies to build up new approach to customers. According to results of the research, within next five years company should reach particular level of the CRM. That should be already implemented in companies. The main three areas which should be already vivid in the company within five years are:

1. new customer model,
2. deep integration,
3. detail information.

Customer's position is changing from unknown segment and partner to one who controls engagement, communication and collaboration with the company. Customers are becoming more active as bargainers and publishers. They are strongly empowered by technologies, which enable them to make rational decisions. On the other side they are demanding more emotional engagement. They group together, discuss and share ideas. The offer on the market is wider, and competitors have same tools. The market is changing. That's why companies cannot ignore new challenges and trends. Keeping building long lasting relationships with customers is becoming crucial.

4 LIMITATIONS

Some study limitations should be acknowledged. Findings are based on the expert method, where group of experts was smaller than 100 participants. However it is recommended to put smaller group of experts, when dealing with new ideas or the topic is homogenous- the findings are based on qualitative research. However, results can serve as the theoretical basis for further researches. We invite other researches to conduct quantitative large scale follow- on explorations.

5 IMPLICATION

This exploratory theoretical research contributes to better understanding of current approaches to CRM trends. Main trends and predicted features can serve as basis in further theoretical research. Results can help researches and organisations better understand and practically implement CRM in the

companies. It includes practical suggestion on areas that should be improved in the company within next years. It names probable trends CRM trends, that can help companies to plan better strategic steps. It suggest concrete improvements, when building competitive advantage by building unique and strong relationship with customers.

Specially thanks to:

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Author´s address

Ing. Miroslava Triznová, PhD.
Technical University in Zvolen
Department of Marketing, Trade and World Forestry
Ul. T.G. Masaryka 24
360 53 Zvolen
Slovak Republic
E-mail: miroslava.triznova@tuzvo.sk