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Training on Sustainable Use of Water in the Processing Industry

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Abstract

The aim of this article is to present research results on the influence of factors of sustainable water use training (management support of training, co-worker support of training, incentives for using skills acquired during training) and the influence of this training on technical efficiency and employee efficiency. The article is based on an empirical study of 328 medium and large companies in the Slovene processing industry. The findings show that the training factors have a statistically significant and positive effect on sustainable water use training and that training has a positive effect on technical efficiency. They also offer new theoretical knowledge as well as practical guidelines for anyone working in the sustainable development management of natural resources.

Keywords: Management, water, processing industry, research, sustainable development, training.

1 Introduction

The current approach to managing natural resources, including drinking water, does not meet even the most fundamental needs of the world's population (Elliott, 2013). One of the biggest consumers of drinking water is the industrial sector (European Commission, 2012a; European Commission, 2012b). The industries that consume the most water are the paper, food, textile, and chemical processing industries (European Commission, 2012a; European Commission, 2012b). Industrial water is used for cooling, technological, sanitary, and other purposes (e.g., washing and cleaning). To increase competitiveness, industrial organizations are modernizing and increasing their production capacities (Krivograd-Klemenčič, Drev, Kompare, Jami, & Weissbacher, 2011). Consequently, global water demand is expected to rise by 50% by 2025 (European Commission, 2012a). The increased consumption of drinking water will also result in increased wastewater production. Reforms in water resource management are, therefore, necessary according to the OECD and will require governments to take decisive measures (OECD Environmental Outlook to 2050, 2013). The OECD suggests implementing two economic incentives that would improve water efficiency: increasing water prices and increasing penalties for water pollution (OECD Environmental Outlook to 2050, 2013). Although different strategies for stimulating development and economic competitiveness have been adopted on the EU and national levels, governments and institutions cannot take action in the place of business organizations and their management teams.

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The recession caused by the 2008 financial crisis brought to life weaknesses and unsustainable economic conditions in individual EU countries and led to the implementation of measures designed to stimulate the economy (Svet EU, 2011). In 2010, EU member states adopted the Europe 2020 strategy with the goal of building a smart, sustainable, and inclusive 21st-century European social market economy (European Commission, 2010, p. 10). EU member states further adopted "A Blueprint to Safeguard Europe's Water Resources" in 2012 (European Commission, 2012c, p. 3), which states:

The EU needs to focus on green growth and become more resource efficient (including water) to achieve a sustainable recovery from the current economic and environmental crisis, adapt to climate change and build resilience to disasters. Tackling these challenges holds significant potential to boost the competitiveness and growth of the European water sector. There is also potential for green growth in other water-related sectors (water-using industries, water technology development, etc.) where innovation can increase operational efficiency.

More recently, in 2013, the EU signed into law the 7th Environment Action Programme "Living well, within the limits of our planet." One of the priority objectives of the program, which will guide EU environmental policy until 2020, is improving resource efficiency in the water sector, with a view to maintaining, achieving, and enhancing good water status in accordance with the Water Framework Directive (Uradni list EU 2013).

Slovenia took similar steps in 2005 with Slovenia's Development Strategy (UMAR, 2005), where sustainable development and competitive and faster economic growth were set as development priorities for the 2005–2013 period. In 2006, the strategy was followed by the Programme of Measures for Promoting Entrepreneurship and Competitiveness 2007–2013, which recommended measures for "strengthening human resources for needs of the economy by stimulating the share of highly educated people in the economy" (Ministrstvo za gospodarstvo, 2006, p. 5). The processing industry was listed as a sector employing very few highly educated people (p. 21). The same year also saw the adoption of the Operative Programme for Drinking Water Supply (Ministrstvo za okolje in prostor, 2006), which specified the funding of the drinking water supply. The Decree on Drinking Water Supply followed in 2012 (Vlada Republike Slovenije, 2012), establishing priorities and conditions for the country's drinking water supply.

Therefore, the functioning of an organization should be based on constant innovation, the maintenance of customer relations, the internationalization of business processes and training (Evans, 2013; Schermerhorn & Wright, 2014; Singh,

Garg, & Deshmukh, 2008), as it is only in this way that organizations will develop, create, and maintain their current competitive advantage (Armstrong, 2009; Evans, 2013; Forslund, 2009; Jeston & Nelis, 2008; Jones, 2004; Robbins & Coulter, 2012; Robbins & Judge, 2013; Schermerhorn, 2012; Schermerhorn & Wright, 2014). The importance given to training on the sustainable use of water in industry, as well as support given to it by management and co-workers, has led us to examine the current state of this field.

This article consists of six parts. Following the introduction, we briefly describe the theoretical background and put forward our hypotheses. Then, the empirical data and research methodology are presented and the survey findings introduced. The final part consists of a discussion of the findings, the conclusion, and final remarks.

2 Theoretical Background and Hypotheses

2.1 Theory

Sustainable development is becoming an increasingly important factor in achieving and maintaining organizational success. Business costs can be reduced by encouraging the development and use of new technologies that reduce the need for raw materials, natural resources, and energy and by reducing the strain on the environment and increasing the recycling of raw materials (Elliott, 2013; Pearce & Barbier, 2009; Soyka, 2012). Sustainable development policies can also lead to greater corporate social responsibility and increased market share as consumers demand eco-friendly products and services (Elliott, 2013; Pearce & Barbier, 2009). Senior management plays a central role in introducing sustainable development policies and training into organizations (Blewitt, 2014; Dodds, Laguna-Celis, & Thompson, 2014; Elliott, 2013; Kralj, 2005).

The general consensus is that applying skills learned in training requires the cooperation and support of management (Rampersad, 2004; Schermerhorn & Wright, 2014; Spitzer, 2005). Research (Devos, Dumay, Bonami, Bates, & Holton, 2007; Wieland Handy, 2008) has also demonstrated that the success of training programs depends on support given by management. Our study focused on the following forms of management support: encouraging employees to undergo training, showing interest in what employees learn there, meeting employees to discuss their new skills, and giving employees goals that motivate them to apply their new knowledge.

Another important factor that contributes to successful training, according to research (Evans, 2013; Holton,

Hsin-Chih, & Naquin, 2003; Schermerhorn & Wright, 2014; Wieland Handy, 2008), is co-worker support. Devos et al. (2007, p. 183) defined it as support given to other employees that encourages them to use new knowledge in the workplace. In our study, we defined it as the degree to which employees value sustainable water use training and encourage their co-workers to take advantage of the training opportunities offered in the workplace as well as the degree to which they support co-workers in using their newly acquired skills.

Feedback (helpful information given by co-workers, managers, and other employees) is required to transfer acquired knowledge into the workplace (Evans, 2013; Holton et al., 2003; Schermerhorn & Wright, 2014; Wieland Handy, 2008). If management combines training with incentives such as opportunities for pay rises or awards, the means they require for the use of new skills, as well as other forms of reward and promotion opportunities, the probability for a successful transfer of knowledge in the workplace can become very high.

Researchers have not arrived at any completely convincing conclusions about the effectiveness of any type of training, including sustainable water use training, on company efficiency (employee efficiency, technical efficiency, etc.). However, some empirical studies have tried to determine the effects of training on employees and companies (Barron, Black, & Loewenstein, 1989; Bartel, 1994; Blandy, Dockery, Hawke, & Webster, 2000; Campbell, 2006; Duncan & Hoffman, 1979). For example, training has been shown to affect employees' personal incomes: A 10% increase in training over 3 years can lead to a 1.5% rise in wages (Duncan & Hoffman, 1979; Mincer, 1994). Barron et al. (1989) and Blandy et al. (2000) tried to determine the relationship between training and productivity, concluding that a 10% increase in training leads to a 1% to 3% increase in productivity. In addition, Bartel (1994) and Campbell (2006) demonstrated that a 5% increase in training attendance in manufacturing companies led to a 4% increase in productivity. Huselid's (1995) work showed that conducting training courses on quality within the company led to increased product quality. A direct link between sustainable water use training and technical efficiency and employee efficiency was not detected. However, because training in general enables individuals to acquire the knowledge needed to do their work, the same is true for sustainable water use training (such as the implementation of new cost-effective technologies, tools, and methods for sustainable supply, use, and disposal of water in industry).

Following Škerlavaj, Indihar, Škrinjar, and Dimovski (2007), we defined technical efficiency as the improvement of work and process quality and of the technology of work processes as well as the implementation of improvements in work processes that lead to reductions in drinking water consumption. Similarly, employee efficiency was defined as

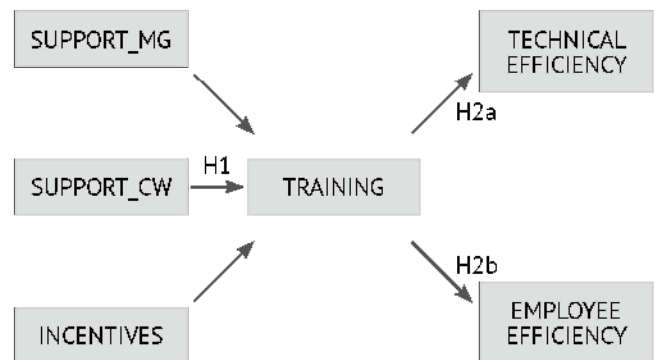
the level of understanding of key organizational problems, work motivation, work quality, and average productivity.

2.2 Hypotheses

The aim of our study is to explore the factors of sustainable water use training (management support of training, co-worker support of training, incentives for using skills acquired during training) and the influence of this training on technical efficiency and employee efficiency of people working in the Slovene processing industry. A study of this kind has never been carried out in Slovenia.

After reviewing the existing literature, we proposed certain relationships between the three factors of sustainable water use training and training as well as between training and factors of technical efficiency and employee efficiency. We then formulated hypotheses based on the relationships between the variables. The research framework generated in this study is illustrated in Figure 1.

Figure 1: Research framework and hypotheses



Notes: Management support of training (SUPPORT_MG), Co-worker support of training (SUPPORT_CW), Incentives for using skills acquired during training (INCENTIVES).

We put forward the following hypotheses:

- Hypothesis 1: Management support of training, co-worker support of training, and incentives for using skills acquired during training affect sustainable water use training.
- Hypothesis 2: Sustainable water use training affects technical and employee efficiency.

H2a: Training on the sustainable use of water affects technical efficiency.

H2b: Training on the sustainable use of water affects employee efficiency.

3 Data in Methodology

3.1 Sample description

The biggest consumers of water in Slovenia in 2010–2012 were processing industry companies (holding type C: standard classification – SKD 2008) (SURS, 2013a). When this fact was compared to the 2013 statistical data (SURS, 2013b) on processing companies in Slovenia, which shows that the number of medium and large food processing companies decreased by 5.75% between 2010 and 2012, we arrived at the conclusion that water consumption from the public water supply (the consumption of drinking water) has not decreased significantly. Thus, we included 20% of the 608 medium and large (SURS, 2013b) processing companies (SKD 2008 Category C) in a random sample. The electronic questionnaire was sent by e-mail to a contact person in 122 companies in the processing industry, together with a note informing them of the goal and intention of our research. The contact person then sent the questionnaire on to all employees. All employees with company e-mail addresses were included in the survey. We received 386 questionnaires, 328 of which were complete and used for analysis. The incomplete questionnaires were excluded.

Table 1 shows the demographic profile of the respondents. In terms of gender, 68% of respondents in the sample were men, while female respondents accounted for 32%. The youngest respondent was 26 years old, the oldest was 63, and the average age of respondents was 43. Furthermore, 15.9% of respondents were employed in high management, 26.5% in middle management, and 27.7% in operations management, while 29.9% worked in other positions. In terms of length of employment, 19.8% of respondents had worked at their companies for up to 5 years, 47.6% between 5 and 15 years, and 32.6% for more than 15 years. In addition, 5.5% of respondents had up to 5 years of work experience, 30.5% had between 5 and 15 years, and 64.0% had more than 15 years of work experience. Finally, 1.5% of respondents had completed only secondary education, 10.1% had completed higher vocational education, 61.3% had completed higher education/undergraduate degree/specialization, 25.3% had earned master's degrees, and 1.8% had earned doctoral degrees.

3.2 Methodology

The instrument of the research was a closed-ended online questionnaire. The questionnaire statements about training

Table 1: Demographic Profile of Respondents

Characteristics	Descriptor	Distribution (percent)
Gender	Male	68.0
	Female	32.0
Age	Min	26 years
	Max	63 years
	Average age	43 years
Position	High management	15.9
	Middle management	26.5
	Operations management	27.7
	Other	29.9
Duration of employment in the organizations	Up to 5 years	19.8
	5–15 years	47.6
	More than 15 years	32.6
Work experience	Up to 5 years	5.5
	5–15 years	30.5
	More than 15 years	64.0
Education level	Secondary education	1.5
	Higher vocational education	10.1
	Higher education, undergraduate degree, specialization	61.3
	Master's degree	25.3
	Doctoral degree	1.8

Sample size = 328

(non-formal education) on sustainable water use in the organization were based on the work of Dimovski, Škerlavaj, Kimman, and Hernaus (2006), Garvin, Edmondson, and Gino (2008), Holton et al. (2003), Škerlavaj et al. (2007), and Wieland Handy (2008). Statements regarding technical efficiency and employee efficiency were adapted from Škerlavaj et al. (2007). The questionnaire was tested on seven randomly selected employees from one of the analyzed companies. No comprehension problems were reported, so the questionnaire was not changed.

The questionnaire was divided into two parts. The first part consisted of six demographic questions (gender, age, position, duration of employment in the organization, work experience, education level). The second part consisted of 23 questions on sustainable water use training (informal education) and non-financial success (technical efficiency and work efficiency of employees). A 7-point Likert scale was used in the second part of questions, with 1 being “strongly disagree” and 7 being “strongly agree” for questions on sustainable water use training and 1 being “much worse” and 7 being “much better” for questions on technical and work efficiency of employees. Cronbach’s alpha (Cronbach’s $\alpha^1 = 0.909$) was calculated as an estimate of the scales’ internal consistency (Garson, 2013).

The data were collected in June 2013 through the Centre of Social Informatics at the Faculty of Social Sciences of the University of Ljubljana. The responses for every questionnaire

¹ $\alpha > 0.9$: Excellent consistency.

were checked and analyzed using SPSS 19.0’s descriptive data analysis functions: univariate analysis (frequency, arithmetic mean, and standard deviation) and multivariate statistical analyses (principal component analysis [PCA], correlation, and regression analysis).

4 Descriptive Statistics

4.1 Training on sustainable use of water

Participants were asked to rate to what degree statements on sustainable water use were true for them. Table 2 shows that participants gave the statements “Our organization offers sufficient opportunities for training on sustainable water use” and “All employees receive occasional training on sustainable water use” the highest mean score ($M = 4.40$). The statement “The organization offers sustainable water use training” received the lowest mean score ($M = 4.01$). By looking at the mean scores, we see that no significantly high or low scores occurred.

4.2 Management support of training

Participants were then asked to rate statements about management support of training. Table 3 shows that participants rated the statement “Management values sustainable water use training” highest ($M = 4.48$). The statement “Management meets with employees to discuss how to use skills

Table 2: Training on Sustainable Use of Water in Industry (TRAINING)

Variables	Mean score	Standard deviation
Our organization offers sufficient opportunities for training on sustainable water use.	4.40	1.88
The organization offers sustainable water use training.	4.01	1.94
Offered training programs on sustainable water use are of very high quality.	4.29	1.92
Training programs on sustainable water use are regularly reviewed and updated to keep up with changes in the environment.	4.27	1.90
All employees receive occasional training on sustainable water use.	4.40	1.87
All new employees receive suitable training on sustainable water use.	4.28	2.08

Table 3: Management Support of Training (SUPPORT_MG)

Variables	Mean score	Standard deviation
Management shows interest in what employees learn in sustainable water use training.	4.24	1.77
Management meets with employees to discuss how to use skills learned during training.	4.20	1.75
Management encourages employees to attend programs and workshops on sustainable water use.	4.34	1.84
Management values sustainable water use training.	4.48	1.82
Management gives employees goals that encourage the use of skills acquired during training in the workplace.	4.47	1.78

learned during training” received the lowest mean score ($M = 4.20$). No significantly high or low scores occurred.

4.3 Co-worker support of training

Next, participants were asked to rate statements about co-worker support of training. Table 4 shows that the statement “Employees value training on sustainable water use” received the highest mean score ($M = 4.54$). The statement “Employees encourage co-workers to attend programs and workshops on sustainable water use” received the lowest mean score ($M = 4.05$). No significantly high or low scores emerged.

4.4 Incentives for using skills acquired during training

Next, the participants were asked to rate statements about incentives for using skills acquired during training. Table

5 shows that the statement “After training, the means that employees need to use the acquired skills are available” received the highest mean score ($M = 3.42$). The statement “When employees make use of skills acquired during training, they receive some form of pay raise or award” received the lowest mean score ($M = 2.63$). All statements received somewhat low scores.

4.5 Technical efficiency and employee efficiency

Finally, the participants were asked to rate statements about technical efficiency and work efficiency. Table 6 shows that the statement “Product and service quality” received the highest mean score ($M = 5.77$) whereas the statement “Work quality” received the lowest mean score ($M = 5.30$). No significantly high or low scores were evident.

Table 4: Co-worker Support of Training (SUPPORT_CW)

Variables	Mean score	Standard deviation
Employees value training on sustainable water use.	4.54	1.67
Employees encourage co-workers to attend programs and workshops on sustainable water use.	4.05	1.72
Employees value co-workers who use skills acquired during training and encourage their use.	4.46	1.71

Table 5: Incentives² for Using Skills Acquired During Training (INCENTIVES)

Variables	Mean score	Standard deviation
When employees make use of skills acquired during training, they receive some form of pay raise or award.	2.63	1.46
After training, employees receive feedback on their use of acquired skills.	3.32	1.76
After training, the means that employees need to use the acquired skills are available.	3.42	1.91

Table 6: Technical Efficiency and Work Efficiency

Variables	Mean score	Standard deviation
Product and service quality.	5.77	0.96
Technology of work processes.	5.75	0.86
Implementation of improvements in work processes to reduce drinking water consumption.	5.76	0.88
Work quality.	5.30	0.99
Employees' understanding of key organizational problems and work motivation.	5.33	1.02
Average productivity of employees.	5.39	1.01

² The statements represent opportunities and possibilities for employees for improved efficiency and greater personal satisfaction in the future. This is why we also asked about what happens after training.

5 Multivariate Data Analysis

In order to extract the relationships presented in Figure 1, a multivariate data analysis was performed in two stages:

- Stage 1—factor structures: To extract the factor structure, we used PCA with varimax rotation.
- Stage 2: We analyzed the relationship between the factors using correlation analysis and regression analysis (ENTER regression method).

5.1 Stage 1—Factor structures

PCA³ was used to reduce each of the constructs (training on sustainable use of water, management and co-worker

³ PCA reduces the data down to the fundamental components, stripping away any unnecessary parts.

support of training, incentives for using skills acquired during training), as well as the constructs of technical efficiency and employee efficiency. The suitability of the data for PCA was assessed for each construct by using Bartlett's Test of Sphericity and the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy. The KMO index ranged between 0.708 and 0.910, with 0.500 considered suitable for analysis (Bartholomew, Knott, & Moustaki, 2011). Factors with eigenvalues (the amount of variance accounted for by a factor) larger than 1 were carried for further analysis (Bartholomew et al., 2011; Mulaik, 2010). PCA on the training on sustainable use of water produced one factor that explained 76.88% of the observed variance for training on the sustainable use of water, as shown in Table 7.

The PCA on management support of training produced one factor that explained 69.36% of the observed variance for management's support of training, as shown in Table 8.

Table 7: PCA of Training on Sustainable Use of Water

Factor	Factor loads	Eigen-value	Cum. % variance explained
Factor 1: Training on sustainable use of water (TRAINING)		4.613	76.877
Offered training programs on sustainable water use are of very high quality.	0.924		
The organization offers sustainable water use training.	0.903		
Training programs on sustainable water use are regularly reviewed and updated to keep up with changes in the environment.	0.869		
All new employees receive suitable training on sustainable water use.	0.869		
Our organization offers sufficient opportunities for training on sustainable water use.	0.849		
All employees receive occasional training on sustainable water use.	0.844		

KMO measure of sampling adequacy = 0.910; Bartlett test of sphericity = 1681.138; $p < 0.001$.

Table 8: PCA of Management Support of Training

Factor	Factor loads	Eigen-value	Cum. % variance explained
Factor 2: Management support of training (SUPPORT_MG)		3.468	69.358
Management values sustainable water use training.	0.924		
Management shows interest in what employees learn in sustainable water use training.	0.867		
Management encourages employees to attend programs and workshops on sustainable water use.	0.828		
Management meets with employees to discuss how to use skills learned during training.	0.790		
Management gives employees goals that encourage the use of skills acquired during training in the workplace.	0.743		

KMO measure of sampling adequacy = 0.854; Bartlett test of sphericity = 959.614; $p < 0.001$.

The PCA on co-worker support of training produced one factor that explained 72.91% of the observed variance for co-worker support of training (see Table 9).

The PCA on incentives for using skills acquired during training produced one factor that explained 77.23% of the observed variance for incentives for using skills acquired during training (see Table 10).

The PCA on technical efficiency and employee efficiency produced two factors that explained 72.82% of the observed variance for technical efficiency and employee efficiency.

The Cronbach α for the underlying factors ranged from 0.85 to 0.76, again indicating a reliability of factors (see Table 11).

5.2 Stage 2 – Relationship analysis

The correlation analysis showed significant relationships among almost all variables and factors. The correlations were positive. Three pairs had a weak association (Pearson correlation > 0.260 and < 0.510) while seven pairs had a good association (Pearson correlation > 0.510 and < 0.760).

Table 9: PCA of Co-worker Support of Training

Factor	Factor loads	Eigen-value	Cum. % variance explained
Factor 3: Co-worker support of training (SUPPORT_CW)		2.187	72.909
Employees encourage co-workers to attend programs and workshops on sustainable water use.	0.877		
Employees value co-workers who use skills acquired during training and encourage their use.	0.854		
Employees value training on sustainable water use.	0.830		

KMO measure of sampling adequacy = 0.708; Bartlett test of sphericity = 333.474; $p < 0.001$.

Table 10: PCA of Incentives for Using Skills Acquired During Training

Factor	Factor loads	Eigen-value	Cum. % variance explained
Factor 4: Incentives for using skills acquired during training (INCENTIVES)		2.317	77.230
After training, employees receive feedback on their use of acquired skills.	0.894		
After training, the means that employees need to use the acquired skills are available.	0.875		
When employees make use of skills acquired during training, they receive some form of pay raise or award.	0.867		

KMO measure of sampling adequacy = 0.729; Bartlett test of sphericity = 429.286; $p < 0.001$.

Table 11: PCA of Firm Technical Efficiency and Employee Efficiency

Factor	Factor loads	Eigen-value	Cum. % variance explained
Factor 5: Technical efficiency		2.376	39.608
Implementation of improvements in work processes to reduce drinking water consumption.	0.959		
Technology of work processes.	0.956		
Product and service quality	0.655		
Factor 6: Employee efficiency		1.993	72.820
Employees' understanding of key organizational problems and work motivation.	0.803		
Work quality	0.759		
Average productivity of employees.	0.678		

KMO measure of sampling adequacy = 0.718; Bartlett test of sphericity = 1336.089; $p < 0.001$.

Table 12: Descriptive Statistics and Correlation Analysis

	Mean	S.D.	TRAINING	SUPPORT_MG	SUPPORT_EM	INCENTIVES	TECHNICAL EF.	EMPLOYEE EF.
TRAINING	4.27	1.69	1	0.776**	0.639**	0.614**	0.186**	0.045
SUPPORT_MG	4.35	1.49		1	0.688**	0.688**	0.206**	0.030
SUPPORT_CW	4.35	1.45			1	0.612**	0.136*	0.026
INCENTIVES	3.12	1.51				1	0.341**	0.263**
TECHNICAL EF.	5.76	0.81					1	0.526**
EMPLOYEE EF.	5.34	0.79						1

** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed)

Table 13: Results of Regression Analyses

H	Regression analyses	Unstandardized Coefficients		Standardized Coefficients Beta	t	p (Sig)	R	R ²	F	Result
		B	Std. Error							
H1	(Constant)	0.139	0.193		0.720	0.000	0.795	0.628	18.915	Supported
	SUPPORT_MG	0.658	0.059	0.579	11.240	0.000				
	SUPPORT_CW	0.190	0.057	0.163	3.354	0.001				
	INCENTIVES	0.144	0.053	0.128	2.707	0.007				
	TRAINING = 0.139 + 0.658 * SUPPORT_MG + 0.190 * SUPPORT_CW + 0.144 * INCENTIVES									
H2										Supported
a	(Constant)	5.378	0.120		44.771	0.000	0.186	0.131	11.623	
	TRAINING	0.089	0.026	0.186	3.409	0.001				
	TECHNICAL EFFICIENCY = 5.378 + 0.089 * TRAINING									
b	(Constant)	5.430	0.118		46.026	0.000	0.045	0.002	0.653	Not supported
	TRAINING	-0.021	0.026	-0.045	-0.808	0.419				
≠										

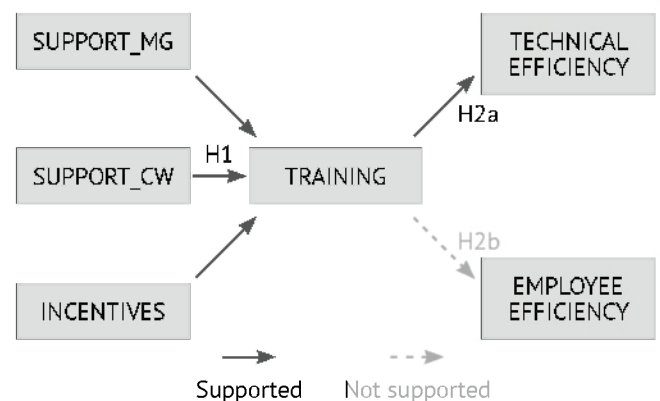
No pair had a very good association (Pearson correlation > 0.760), as shown in Table 12. We can deduce that higher levels of training, management and co-worker support, and incentives are associated with higher levels of technical efficiency whereas only higher incentives are associated with higher levels of employee efficiency.

The research framework generated in this study is illustrated in Figure 1 (a theoretical scheme), which was also our research model. Figure 2 depicts the main findings of the three regression analyses conducted using SPSS 19.0, which were analyzed according to regression diagnostics: all variance inflation factors⁴ < 2 (ranged between 1.495 and 1.654); Durbin–Watson tests⁵ were close to 2 (ranged between 1.986 and 1.998); and the normal distribution of residuals (Newbold, Carlson, & Thorne, 2013).

⁴ The variance inflation factor (VIF) is used as an indicator of multicollinearity.

⁵ The Durbin–Watson test is a test for first-order serial correlation in the residuals of a time series regression.

Figure 2: Results concerning the hypotheses



Notes: Management support of training (SUPPORT_MG), Co-worker support of training (SUPPORT_CW), Incentives for using skills acquired during training (INCENTIVES).

Table 13 shows the result of the regression analyses. The arrows in Figure 2 (with the exception of H2b ($p = 0.419$)), which symbolize the supported associations, were statistically

significant ($p < 0.05$). The findings show that management and co-worker support of training as well as incentives for using skills acquired during training positively influences sustainable water use training (Hypothesis 1). The multiple correlation coefficient (R), whose value was 0.795, showed a very strong relationship between sustainable water use training and the three independent variables: management support of training, co-worker support of training, and incentives for using skills acquired during training. The value of the coefficient of determination of $R^2 = 0.628$ indicates that 63% of the variance in sustainable water use training is explained by the independent variables. The F-test ($F = 18.915$) and the significance level ($p = 0.000$) also indicate the existence of a relationship. Furthermore, a weak relationship was found between technical efficiency and sustainable water use training ($p = 0.001$; $R = 0.186$; $R^2 = 0.131$; $F = 11.623$; Hypothesis 2a). However, no relationship was found between employee efficiency and sustainable water use training ($p = 0.419$; $R = 0.045$; $R^2 = 0.002$; $F = 0.653$; Hypothesis 2b).

6 Discussion and Conclusion

This article reported on a study of sustainable water use training in the Slovene processing industry, drawing on a sample of 328 firms. A theoretical framework was empirically tested to determine the relationship between training factors (sustainable water use training, manager and co-worker support, incentives for using skills acquired during training) and factors of technical efficiency and employee efficiency (product and service quality, improving technology of work processes, implementation of improvements in work processes to reduce drinking water consumption) in companies. In addition, various good associations emerged among four factors on the sustainable use of water. Thus, hypothesis H1 was supported. The results of the analysis also demonstrated that hypothesis H2a—namely, training on the sustainable use of water affects technical efficiency—was accepted. However, the relationship between sustainable water use training and employee efficiency (H2b), was not found to be significant.

These findings substantiate our conceptual model and offer several managerial implications. Managers of firms should put additional emphasis on training related to the sustainable use of water as it is an important instrument for the improvement of the technology of work processes, the quality of products and services, and the implementation

of improvements in work processes in order to reduce industrial consumption of drinking water. We believe that these improvements would also lead to greater financial and non-financial success of companies.

Our study shows that management support of training plays a fundamental role in training for the sustainable use of water as it has the greatest regression coefficient. By giving support to sustainable water use training, management shows interest in what their subordinates have learned. By working with employees on learning objectives and solving any potential problems, management strengthens the impression that training is important and necessary.

Despite having the smallest regression factor, the use of skills acquired during training has a positive and significant association with sustainable water use training. With their attitudes toward training and the attention devoted to employees after training, management can encourage other important stakeholders in the company to make it possible for employees to apply skills learned during training to the workplace. New skills have the potential to lead to improvements in the technology of work processes, the quality of products and services, and work processes, which can in turn lead to a reduced consumption of drinking water.

Our findings give support to the idea that sustainable water use training ought to become an integral part of business strategy. Managers should recognize and manage training as well as incorporate it into their action plans. Two limitations of the study need to be acknowledged: This research was only carried out among medium and large companies in the processing industries, and only fully answered questionnaires were used for analysis. Nevertheless, we believe that our research offers a significant contribution to the subject of sustainable water use training. For a fuller understanding, we recommend that similar research be conducted in all companies in the processing industry.

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Usposabljanje o trajnostni rabi vode v predelovalni industriji

Izvleček

Namen prispevka je predstaviti izide iz raziskave o vplivih dejavnikov usposabljanja o trajnostni rabi vode (o podpori usposabljanju, ki jo kažejo nadrejeni in sodelavci, spodbudah za uporabo znanj in veščin, pridobljenih med usposabljanjem) in vplivu usposabljanja na tehnično in delovno učinkovitost zaposlenih. Empirično raziskavo smo opravili na vzorcu 328 srednje velikih in velikih podjetij v slovenski predelovalni dejavnosti. Ugotovili smo, da podpora usposabljanju, ki jo kažejo nadrejeni in sodelavci, ter spodbude za uporabo znanj in veščin, pridobljenih med usposabljanjem, statistično značilno in pozitivno vplivajo na uposabljanje o trajnostni rabi vode, uposabljanje o trajnostni rabi vode pa statistično značilno in pozitivno vpliva na tehnično učinkovitost. Izidi iz raziskave prinašajo nova teoretična spoznanja in praktične usmeritve za vse, ki se ukvarjajo z menedžmentom trajnostnega razvoja z vidika ohranjanja naravnih virov.

Ključne besede: menedžment, voda, predelovalna dejavnost, raziskava, trajnostni razvoj, usposabljanje

E-business in Micro Companies: Lessons learned

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Abstract

E-business is entering its mature stage. E-business in large companies has been researched in several surveys, whereas SMEs and micro companies have been researched less often. Micro companies are, together with SMEs, a critical part of national economies worldwide; both are central to the EU's development strategies. It is well known that, in an information society, business models are driven by e-business concepts, and e-business models are emerging. An in-depth understanding of e-business use in micro companies is crucial for the success of such companies. The main purpose of this paper is to research the intensity of e-business use, advantages and disadvantages of e-business, the biggest problems of e-business implementation/maintenance, and attitude toward trends of e-business in micro companies. The paper presents findings from a survey carried out on a sample of micro companies. Data were collected via an e-questionnaire, and results were calculated using SPSS. The data confirmed that e-business in micro companies is most often used in connection with e-banking; e-business with the government also appears to be very important.

Keywords: E-business, micro companies, e-business adoption, e-business CSFs

1 Introduction

The rapid development of information technology has enabled e-business to become a global phenomenon. As the Internet became more commercialized and users began to participate in the World Wide Web in the early 1990s, the term *e-business* was coined and e-business applications expanded rapidly (Turban, Chung, & Lee, 2000). Organizations adopt e-business for several reasons and perceived benefits (Wang & Zheng, 2011). Authors mention the better management of information, better integration of suppliers and vendors,

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better channel partnership, lower transaction costs, improved market understanding, expanded geographical coverage (Abid, Rahim, & Scheepers, 2011; Damanpour, 2001), and trading time expanded to 24 hours a day, 7 days a week, 365 days a year (Tsao, Lin, & Lin, 2004).

E-business in large companies has been researched in several surveys, but SMEs have been researched more rarely and the smallest companies—often referred as micro companies—have only seldom been researched (Abid et al., 2011). Micro companies are, together with SMEs, an important part of national economies worldwide, and both are central to the EU's development strategies. In an information society, business models are driven by e-business concepts, and e-business models are emerging. An in-depth understanding of e-business use in micro companies is crucial for the success of such companies.

This paper presents findings from a survey carried out on a sample of micro companies. The research model included where and how e-business is used in communication with business partners, how micro companies use e-business to communicate with governmental institutions, which benefits are they seeking through e-business, which problems are arising, and what influences e-business use in micro companies.

2 E-business in the Global Marketplace

Various researchers in different contexts have demonstrated that e-business is rapidly growing and expanding. A study conducted in Europe by e-Business Watch (2008) showed that e-business activities are mainly determined by value chain characteristics and company size. Regional factors are less important in this regard. The study concluded that, on average, EU companies are on the same level as their competitors in other advanced economies in terms of electronic business activity (e-Business Watch, 2008).

Another study conducted in Europe by European Communities (2008) highlighted big differences between different areas of e-business use in companies and also defined differences between small and big companies. One of the first pieces of evidence for e-commerce activities amongst enterprises belonging to the industrial sectors selected in a 2006 report is that, regardless of size, buying online is more developed than selling online. At the European level, the Internet channel is used by 54% of small companies for placing orders and by 26% for receiving orders; amongst large companies, the percentages are 68% and 26%, respectively. The expected differences

amongst the firms' groups emerged from an analysis of the percentages of companies using e-business applications to support marketing and sales. In particular, the percentages of small companies using CRM systems and specific ICT solutions for marketing and sales are half of those for large companies.

Raymond and Bergeron (2008) examining the performance outcomes of the alignment between SMEs' e-business capabilities and their business strategy by studying SMEs in Canada. Their findings indicated that the ideal e-business profiles vary in relation to the company's strategic orientation; in addition, e-business alignment has positive performance outcomes for the SMEs studied in terms of growth, productivity, and financial performance.

In their study Ghobakhloo, Arias-Aranda, and Benitez-Amado (2011) researched the factors within the technology–organization–environment (TOE) framework that affect the decision to adopt e-business as well as to adopt or not different e-business applications within SMEs. They found that e-business adoption within SMEs is affected by a perceived relative advantage, perceived compatibility, CEOs' innovativeness, information intensity, buyer/supplier pressure, support from technology vendors, and competition.

Ng (2005) studied business to business (B2B) e-business models for Australian agribusiness companies and defined factors (both internal and external) influencing the choice of e-business models as well as insights into the current practices of Australian agribusiness in relation to the selection process of B2B e-business models.

Globalization and technology effects appear to have forced smaller firms around the world to implement e-business practices, however, there is considerable variability in adoption and usage from country to country (Fillis, Johansson, & Wagner, 2004). Fillis et al. (2004) identified several reasons behind adoption and non-adoption in SMEs—namely, macro-level, industry-level, and company-level factors. They also researched owner/manager motivations and attitudes toward e-business adoption.

Taylor and Murphy (2004) explored a range of issues surrounding the adoption e-business technologies by SMEs. They examined models of e-business adoption by SMEs and analyzed barriers to the adoption of e-business technologies. They concluded that the take-up of e-business by SMEs needs to be seen as a means to an end rather than an end in itself.

Mendo and Fitzgerald (2005) set out to critique the applicability of e-commerce staged models in explaining

the progression of SMEs in their use of e-business technologies. The premise of this study was that examining the evolution of websites over time provides insights into actual evolving strategies and motivations behind e-business investments. They proposed that a multidimensional framework combines three dimensions of organizational change: process, content, and drivers.

Comprehensive research on e-business in SMEs in Scotland conducted by Fillis and Wagner (2005) indicated that industry factors, customer influences, the degree of entrepreneurial orientation of the key decision maker, and the level of competency development within the organization play important roles in the level of e-business development achieved. They also found that some small firms only embrace e-business to a certain level and even revert to more conventional business practices.

Simmons, Armstrong, and Durkin (2008) examined what determines small business website adoption, focusing in the role that the small business marketing context plays within e-business technology adoption.

Wynn, Turner and Lau (2013) recently performed in-depth research, using two case studies to explore the impacts of e-business technology adoption at the process level in SMEs. They illustrated how contrasting information system strategies can successfully embrace e-business process change. They also suggested the importance of organizational issues in determining the degree of benefits delivery.

Behind the rapid developments summarized above are business models implemented and applied by companies around the world. These companies are driving force behind the innovative use of new technologies in all business areas. The e-business model, like any business model, describes how a company functions, how it provides a product or service, how it generates revenue, and how it will create and adapt to new markets and technologies. The four traditional components of the e-business concept are value proposition, sources of revenue and the required activities, resources, and capabilities (Prudens, 2008).

The review of the literature leads us to the following hypotheses: E-business is most often used in connection with e-banking; e-business has the largest impact in B2B micro companies; micro companies' attitude toward e-business is high; micro companies see the biggest problems of e-business in the high costs and lack of educations and experiences; and micro companies do not lead trends of e-business. We tested these hypotheses using descriptive statistics.

3 Research Study

The aim of this research study conducted among micro companies was to clarify participants' attitude toward e-business and gain insights into how they are adopting e-business. The data were collected by survey using an e-questionnaire. We sent the questionnaire hyperlink to the e-mail addresses of more than 500 micro-entrepreneurs. Questionnaires were sent to randomly assembled micro-enterprises, regardless of the field with which they were doing business. The questionnaire was available on the website for 20 days. Ultimately, 110 entrepreneurs answered questionnaire. In addition, another 100 respondents looked at the questionnaire but decided not to complete it.

The number of employees in the companies ranged from one to nine according to the categorization of micro companies. Most respondents (23%) employed only one person; another 46% employed from two to four employees, and the rest employed five to nine employees. In addition, 58% of participants were limited liability companies, compared to 42% that were sole proprietorships.

Respondents' level of education ranged from vocational education (18%) to professional education (22%), bachelor's degree (50%), and master's or doctoral degree (9%). Regarding knowledge of computer, software solutions, and e-business, by level of education, the arithmetic mean (average self-assessment) was 3.34 while the standard deviation was 0.803 and median and mode were 3. Thus, most participants indicated that their computer knowledge was good.

4 Research Findings

We categorized participants' e-business activities into four groups. We also determined the intensity of e-business use using a five-stage grading scale (never, rarely, occasionally, often, and constantly) (see Figure 1):

- E-business with customers: 43% of companies use it all the time, 35% often, and 14% occasionally.
- E-business with other companies in areas beyond selling activity: 42% perform it all the time, 37% often, and 8% never.
- Interaction with government administration based on e-business in area where already sometimes required as a necessity: 43% conduct it all the time, 16% often, and 10% never.
- Internal communication between employees in the company based on e-business technologies: 42% use e-business-based internal communication all the time and 17% use it often.

Figure 2 details how participants most often use business solutions such as electronic funds transfer (ETF; and electronic payment system), customer relationship management (CRM), supply chain management (SCM), and electronic data interchange (EDI).

Banking transactions are very useful e-business services because they enable banking services from the office or at home, they are adapted so every user can quickly and easily find everything, and they can be used to safely carry out the necessary activities. The results of the survey also indicated that bank transactions are very popular among participants:

90% answered that they always use bank transactions, 8% answered that they often use them, and only 2% of them have never used them. Receiving customer orders via e-business CRM solutions is always used by 27% of companies, 37% use them often, 23% use them occasionally, and only 13% use them rarely or never. Ordering goods/services using SCM solutions via e-business occurs always in 34% of companies, often in 38% of companies, occasionally in 22% of companies, and rarely or never in only 6% of companies. Finally, 46% and 30% of companies always and often, respectively, use EDI solutions, indicating an advanced level of e-business.

Figure 1: Areas of activities conducted as e-business

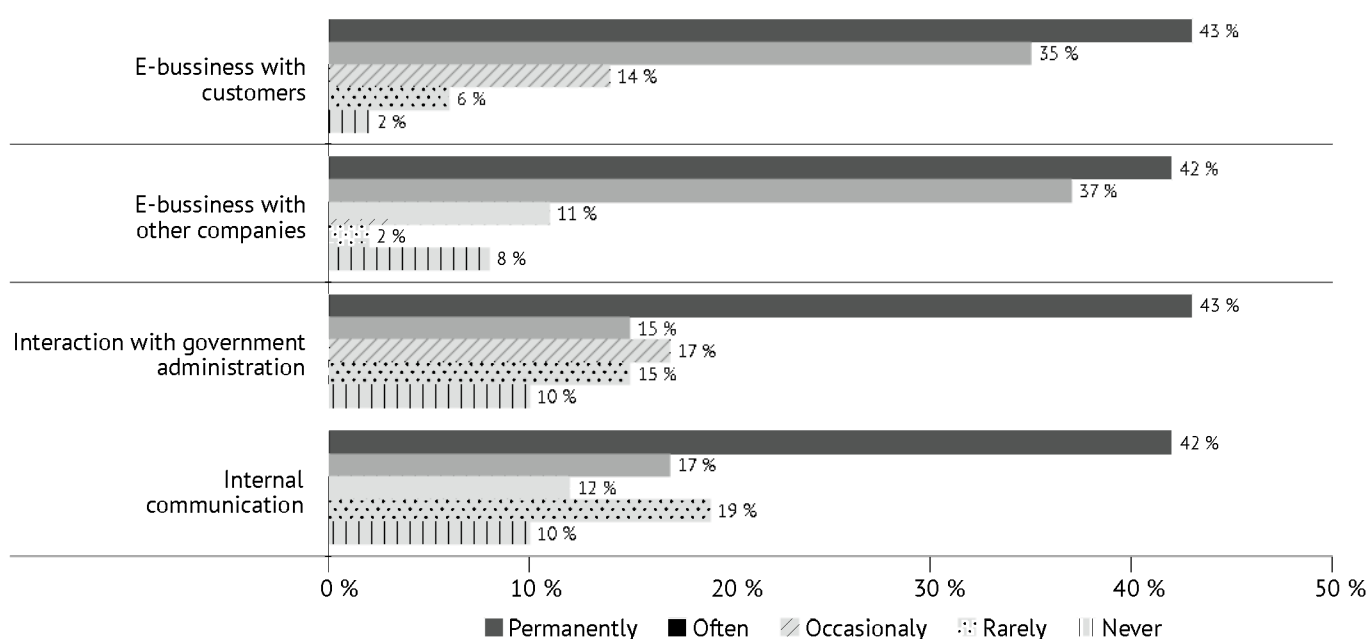
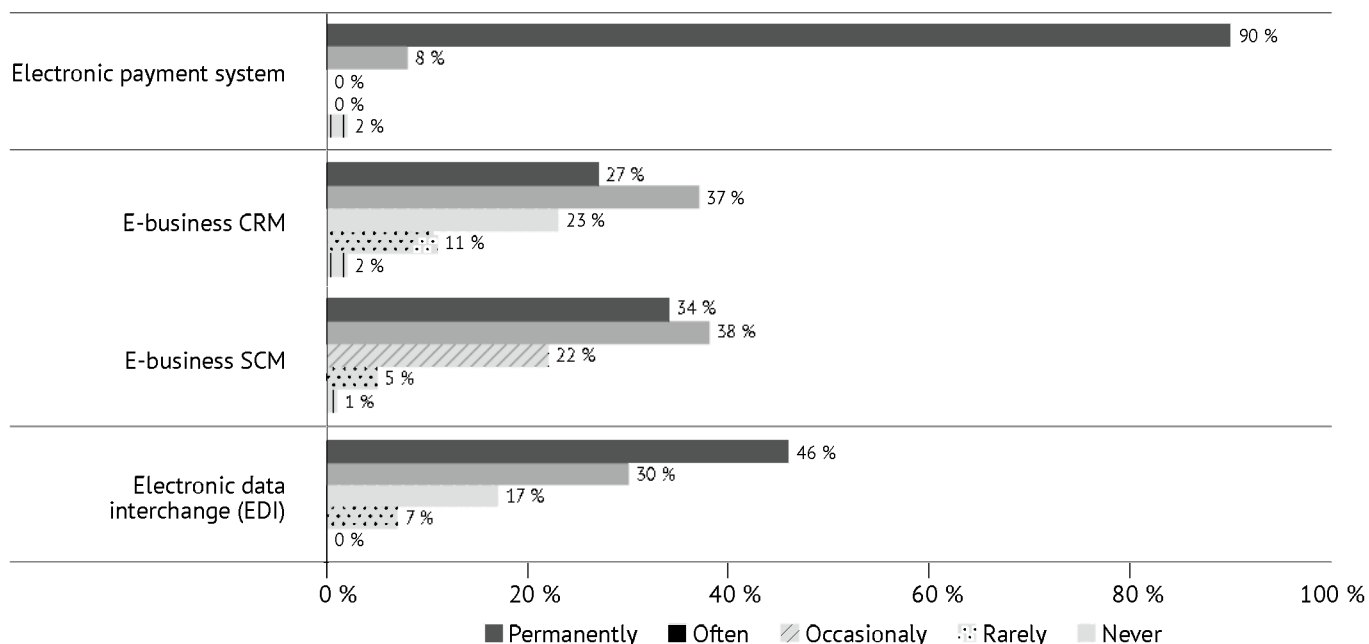


Figure 2: Use of e-business solutions



Business to government (B2G) is gaining importance. Because of the rapid development of e-services provided by the government as well as governmental requirements, companies are increasingly using e-business-based interactions with the government and its agencies. In this study, we researched the use of e-business-based communication with the government in micro companies, focusing on participants' attitudes toward e-taxes. The results are presented in Figure 3. The majority of participants (90%) were familiar with e-taxes; 91% trust such interaction with the tax agency, 88% feel that the necessary information is obtained from the e-taxes solution, and 88% have detailed knowledge of the

services provided while nearly the same percentage (87%) believe that the services provided by the e-taxes solution facilitate their business.

Concerning the advantages and disadvantages of e-business, we asked micro companies to list what advantages they have using e-business models and solutions. Participants were asked to indicate if they agree or disagree with selected benefits of e-business (see Figure 4):

- Reduction of the operating costs: 34% completely agree with this statement, 50% agree, and 13% did not express an opinion.

Figure 3: Attitude to the e-taxes services and their use

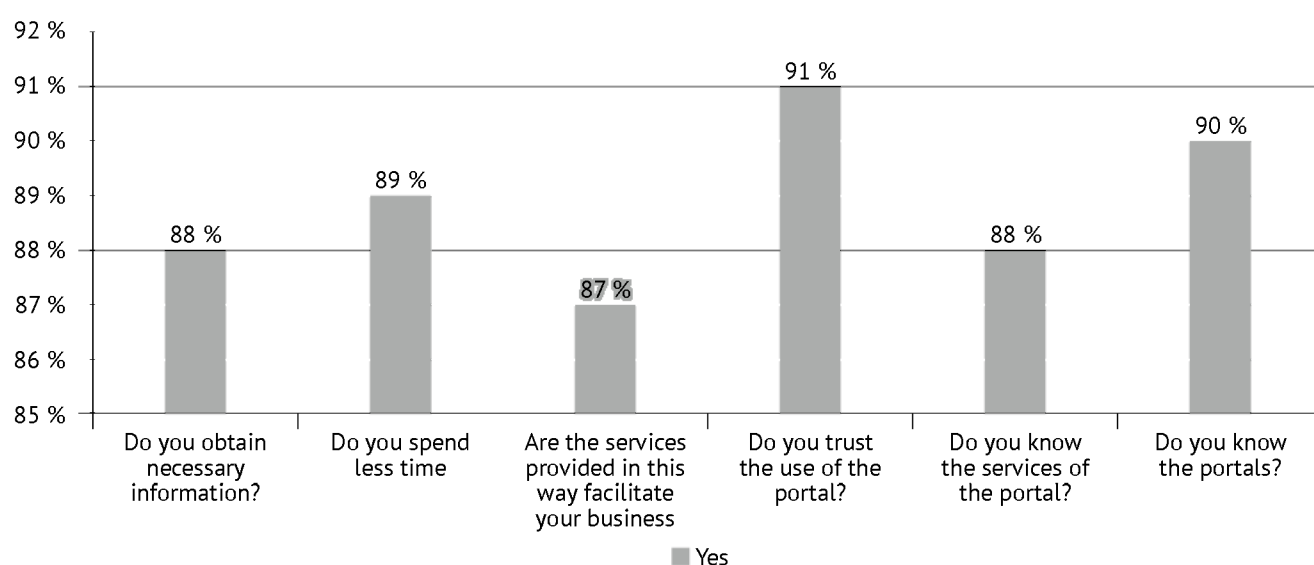
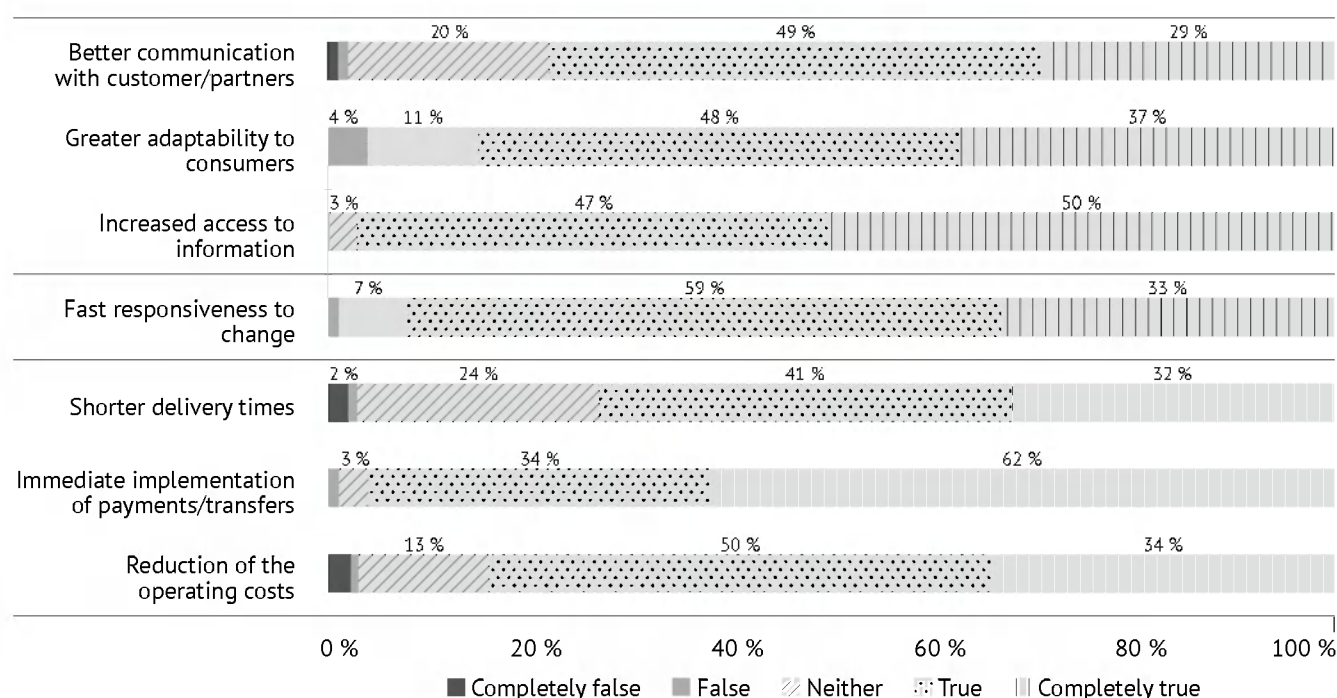


Figure 4: Advantages of e-business in the surveyed enterprises



- Immediate implementation of payments and transfers: 62% completely agree, and a little more than 30% specified that the statement is true.
- Shorter delivery time: 24% did not indicate if delivery time is actually reduced through e-business while 73% stated that this statement is true or completely true.
- Speed of response to changes: 59% answered that the speed of responding to changes is faster with the use of e-business.
- Increased access to information: Half of all respondents completely agree with this statement, and a few percentage points less only agree with the statement.
- Increased adaptability to customers: 48% believe that this is true, and 33% say this is completely true.
- Better communication with customers: 1% said this is completely false and another 1% said it was false; 20% did not comment; and the highest percentage—49%—considered this statement to be true while 29% said it is completely true.

On average, the companies did not assess any of the proposed advantages as being less than 4 or the descriptive assessment “true”; therefore, we can conclude that their attitude toward e-business is high and that companies have adopted e-business to such a level that they have used all of the advantages in their favor.

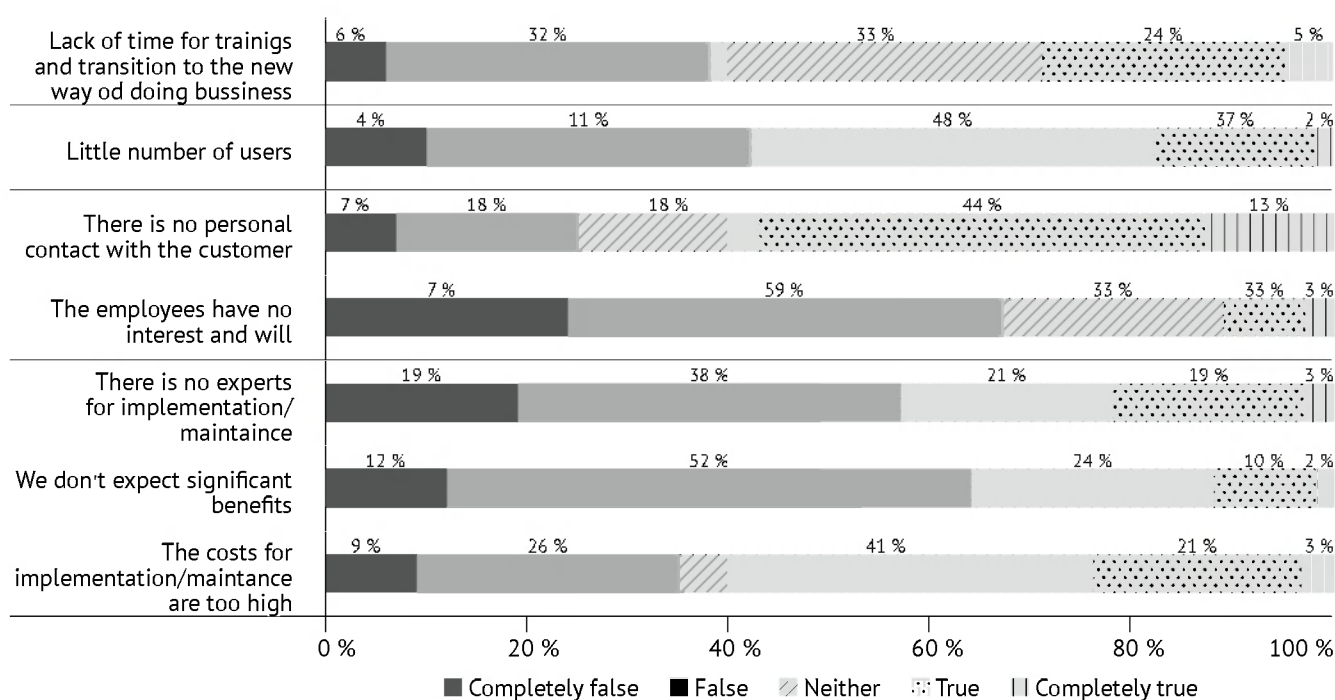
Yet e-business also brings disadvantages and raises problems for entrepreneurs. When assessing these disadvantages, we noted a greater dispersion of responses on

the 5-stage grading scale than with the assessed advantages (see Figure 5):

- 41% of respondents (the largest percentage) could not identify whether the costs of implementation and maintenance are too high.
- More than half of respondents did not agree that e-business means they do not experience significant benefits.
- 38% of companies did not agree that they do not have experts for implementation, support, and maintenance of e-business solutions.
- 43% percent of participants did not agree that employees do not show an interest in and willingness to implement or develop e-business.
- 44% of respondents saw a problem in the statement that e-business does not bring personal contact with customers, which is crucial for some specific activities.
- 40% of respondents could not identify whether the e-business problems are a result of the small number of users.
- The question about the lack of time for trainings and transition to the new, improved way of doing business was answered as “neither” by 33% of respondents, meaning they could not decide about this statement. Only one percentage point less answered that the statement was false.

Due to their size, micro-entrepreneurs are very sensitive to financial issues and to human resource management issues, so one of our hypotheses suggested that

Figure 5: Disadvantages of e-business in the surveyed enterprises

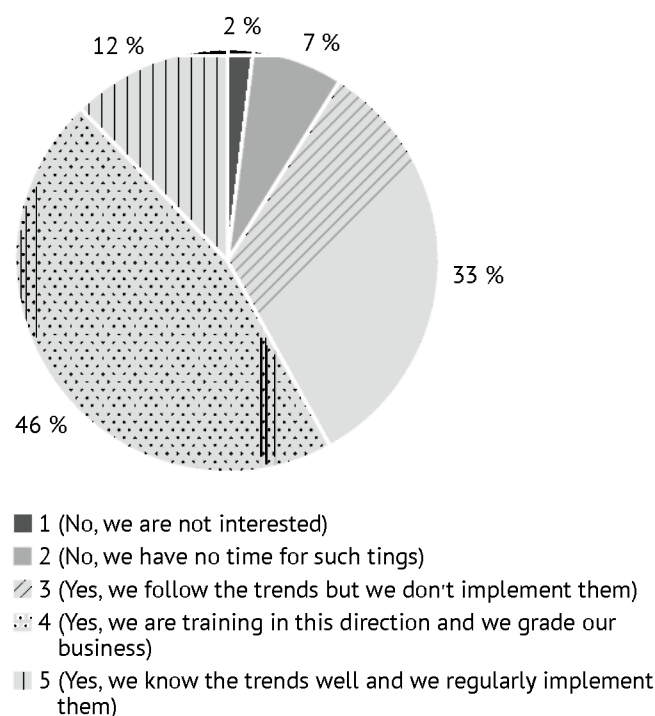


micro-entrepreneurs see the biggest problems of e-business in the high costs and lack of education and experience. Based on the collected data, we can neither disprove nor confirm the hypothesis. In both cases, the largest percentage of respondents answered that they neither agreed nor disagreed with the statement (Figure 6). However, the second largest percentage answered in the positive, suggesting a rejection of the hypothesis. In addition, 26% of the respondents did not agree that the cost of implementation and maintenance is too high, and 32% did not agree that they lack time for education and transition to a new way of doing business. Certainly, the information in the opposite direction is not insignificant; indeed, an insignificant proportion of respondents defined this as (21%) compared to true (26%).

E-business, as with all modern concepts and approaches, is developing very rapidly. We wanted to research participants' attitudes toward future trends in e-business and how they are familiar to micro-entrepreneurs. Figure 7 shows the answers in the negative direction (left side) and positive direction (right side).

As indicated, 9% of all respondents were not familiar with the trends and have no time to follow them, whereas the remaining 91% were informed about e-business trends. In addition, 33% of respondents follow the trends, but do not implement them, while the largest percentage (46%) move in this direction and update operations. The remaining 12% are familiar with the trends and always implement them.

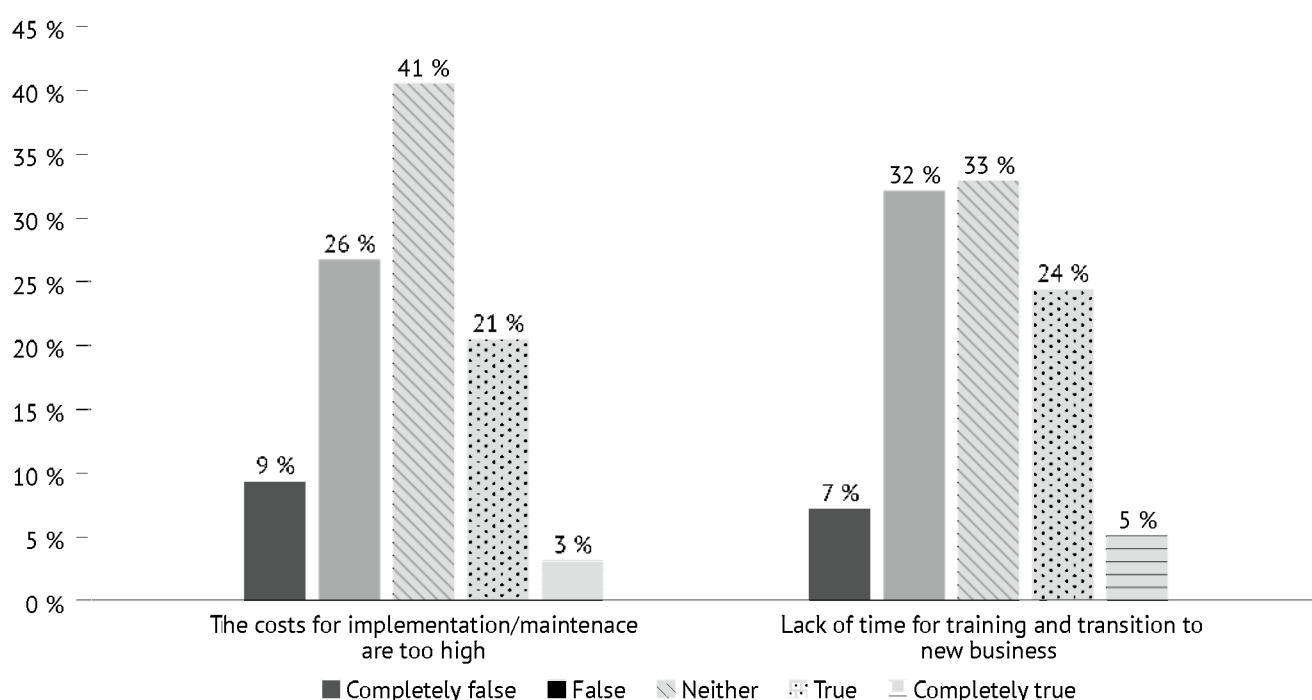
Figure 7: Attitude toward trends of e-business



5 Conclusion

We can conclude that entrepreneurs in micro-companies have very positive ideas about e-business. The research also confirmed the majority of our hypotheses. E-business is most often used in connection with e-banking. The data

Figure 6: Attitude toward costs for implementation/maintenance and toward training



indicate that micro-entrepreneurs most frequently use e-business services for banking. E-business is comprehensive concept that enables cooperation inside the company and with other companies, doing business with customers, suppliers, and the government. We expected e-business to have the largest impact when doing business with other companies. However, the data did not prove or disprove this hypothesis, although e-business-based interactions with the government appeared very important.

We also researched the advantages and disadvantages of and problems with e-business. All of the listed advantages were demonstrated to be applicable. Micro-entrepreneurs familiar with e-business are also familiar with the advantages that this business approach brings, confirming our hypothesis. Yet the hypothesis regarding the disadvantages was not confirmed as the percentage of responses between the descriptive assessments (i.e., false, neither, or true) were extremely similar.

In the last part of the survey, we questioned the adoption of new trends in e-business. Interestingly, 91% of all respondents follow the e-business trends, and 12% of these recognize that trends are very good and implement them regularly. The survey itself did not explain in detail what the given statements mean, but a good explanation of trends and their regular implementation were understood to be news and updates that occur in this area. The percentage given here, based on these statements, is very high. We cannot define if the consequence of this result is a misunderstanding of the statement or if participants truly do follow and implement innovation in e-business. We can only say that the participating micro companies were interested in trends emerging on the market and implemented them according to their abilities.

Irrespective of the size of the companies, we have to gain the necessary skills and experience to succeed in e-business. The latest ICT will not bring the desired benefits and impacts if we cannot cope with and manage them in our favor.

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E-poslovanje v mikro podjetjih – nova spoznanja

Izvleček

E-poslovanje vstopa v svojo zrelo fazo. Področje e-poslovanja v velikih podjetjih je bilo raziskano v številnih raziskavah, po drugi strani pa je zelo malo raziskav, ki obravnavajo njegovo delovanje v malih, srednje velikih in mikro podjetjih. Mikro podjetja so skupaj z malimi in srednje velikimi podjetji zelo pomemben del nacionalnih gospodarstev v svetu in imajo tudi osrednji pomen za razvoj strategij Evropske unije. Znano je, da so koncepti e-poslovanja v informacijski družbi vodilo za razvoj poslovnih modelov, vse bolj pa se pojavljajo tudi modeli e-poslovanja. V bistvu je razumevanje uporabe e-poslovanja v mikro podjetjih ključnega pomena za njihov uspeh. Glavni namen prispevka je raziskati intenzivnost uporabe e-poslovanja, njegove prednosti in slabosti, največje težave pri implementaciji/vzdrževanju ter odnos do trendov v e-poslovanju v mikro podjetjih. V glavnem delu prispevka bodo predstavljene ugotovitve na podlagi raziskave, ki je bila izvedena v mikro podjetjih. Podatki so bili zbrani z elektronskim vprašalnikom, rezultati pa izračunani s programom SPSS. Raziskava je potrdila, da se e-poslovanje v mikro podjetjih najpogosteje uporablja v povezavi z e-bančništvom, zelo pomembno pa postaja tudi e-poslovanje z vlado (Business to Government – B2G).

Ključne besede: e-poslovanje, mikro podjetja, sprejetje e-poslovanja, kritični dejavniki uspeha e-poslovanja

Advantages and Disadvantages of the Single European Patent

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Abstract

In February 2013, the European Union successfully completed more than 30 years of negotiations and formally signed an agreement establishing a single European patent. The agreement brought about a more competitive patent law compared with that in the United States and Japan. The agreement resulted in a number of advantages, especially for small and medium-sized enterprises, such as the reduction of costs by as much as 80%, simplification of procedures, and the adoption of the Unified Patent Court. With the new unitary patent, intellectual property will grow in importance. Yet experts warn that the new patent results in new forms of unwanted behavior, such as forum shopping and the emergence of patent trolls. This study presents both sides—the pros and cons—to predict the effects on business and cover the widest possible range of experts, providing their views on the topic.

Keywords: Single European patent, single patent court, reduce costs, patent trolls, simplified procedures, forum shopping, European Union

1 Introduction

Since signing the European Patent Convention, member states of the European Union (EU) tried to establish a patent system that would have a unitary effect on the entire area of the union and to foster a more competitive patent regime compared to the previous situation. Negotiations were extended (European Patent Office, 2014a). The main issues were language and legal arrangements. After more than 30 years, on February 19, 2013, the EU adopted a third and final part of the EU Patent Package,¹ opening the door to a single European patent. The single patent was accepted by 24 EU member states (exceptions were Spain, Italy, and Portugal), who have been unified in opinion that the creation of unitary patent system is important for the EU's economic development.

Intellectual property, which represents an important part of the patents, has gained importance in recent years and is becoming an indispensable element of successful companies (Baecker, 2007). Intellectual property rights are closely linked to innovations that significantly contribute to competitiveness (Langinier & Giancarlo, 2002). It seems that promoting links (EPO & OHIM, 2013), leading from the research and development (R&D) to new jobs—through innovation, competitive advantage,

¹ Unified Patent Court Agreement (UPC, 2013). In December 2012, member states also adopted the European Parliament and the Council implementing enhanced cooperation in the area of the creation of Unitary Patent protection Regulation (EU No.1257/2012) and Regulation implementing enhanced cooperation in the area of the creation of Unitary Patent protection with regard to the applicable translation arrangements (EU No. 1260/2012).

and economic success—has never been more important than in today's world of increasingly globalized markets and the knowledge-based economy.

One of the main features of the current patent system has been the fragmentation that occurred as a result of bringing the 27 national patents together as one (EESC, 2012); such fragmentation is not known in other major economies, such as Japan, China, and the United States. This disunity has had a significantly negative impact on business and has contributed to:

- a high level of uncertainty and increased complexity of management;
- a high cost of lawsuits in the case of multiple or parallel litigation; and
- economic and legal inconsistencies.

Through centralization, the new unitary patent will not only reduce financial expenditures, but also increase the efficiency and attractiveness of the system (Danguy & Potteelsberghe, 2009).

A single patent provides numerous benefits for individuals—including the ability to achieve unitary patent protection is easier and faster, primarily due to simplified procedures and the reduced costs of obtaining it—as well as member states and the EU, while it represents an important part of the single market. One without the other cannot perform in its optimal form. Of course, we cannot overlook the fact that the new system brings new challenges that those market players will have to face (Hilty & Drexel, 2012), such as increased legal imbalances, the complexity of intellectual property protection, and an increased number of newly established patents in the signatory countries, thereby allowing—according to experts (Pentland & Mukherjee, 2012)—many unwelcome business behaviors, such as forum shopping and the emergence of patent trolls.

The purpose of this research is to describe all the benefits brought about by a single European patent (i.e., reduced costs, simplified procedures, and the adoption of the Unified Patent Court) and the weaknesses and possible forms of unethical business behavior (i.e., forum shopping and patent trolls). The objectives of the research are to define more precisely how patent law will change in the EU, define the advantages and disadvantages brought about by a single patent, and demonstrate how the latter will affect the business operations of companies. The theme is new. A single patent was adopted in February 2013 and did not enter into force. Due to the actuality of the theme, not much material connected with unitary patent is available, despite the emergence of many new possibilities for European companies.

This paper consists of an introduction followed by the second chapter, in which we present the benefits of the single patent

and define them in detail in the subsections. In the third part, we focus on the weaknesses of the new patent system, what it means for business, and what types of unethical behavior might occur. The fourth section provides key findings.

2 Benefits of the Single Patent

The European patent system, as in force to date and only representing a set of national patents (Evropska komisija, 2014a), was significantly more expensive than the system in, for example, the United States (11 times more expensive) or Japan (13 times more expensive), considering only the translation costs and costs of gaining a patent. If we include the costs of 20 years of protection in the equation, the European patent is still almost 9 times more expensive than those in the United States and Japan. However, if we limit the analysis to only patent claims, the differences in financial expenses increase even further (Evropska komisija, 2007). As a result, the EU is behind the other two countries in patent activity. In total, 7.3 million inventions were patented in 2010, including 2 million in the United States and 1.4 million in Japan. Their total value represented almost a half (48%) of all worldwide patents (Komisija evropskih skupnosti 2007).

The EU wanted to create a system that would be more attractive than the existing one (Evropska komisija, 2007). In today's increasingly competitive global economy, it is particularly important that the EU does not lag behind others in the field, which is so crucial for innovations as patent policy (Evropska komisija, 2006). Patents are a driving force for promoting growth, competitiveness, and innovation (Langinier & Giancarlo, 2002). From 2008 to 2010, the industrial sectors in the EU, particularly those dealing with intellectual property, created almost 26% of all jobs, and patents represented 10% of the total value. Many jobs were produced in industries indirectly connected with areas of intellectual property and the supply of goods and services. If we also take into account indirect jobs, the total number increases to more than 35%.

During the same period, IPR-intensive branches (together with patents, this group also includes brands and designer industries) represented 39% of total economic activity—of which patents accounted for 14%—in the EU and took a leading position in the EU's trading activity with the rest of the world outside of its borders. The added value per employee is higher than in other sectors; in the patent sector, the number is even higher at 64% (EPO & OHIM, 2013). Key features of patents, from an economic point of view, are that patents:

- Deal with new knowledge, as already foreseen in the item of product or process innovation, and
- Grant a limited monopoly right to the inventor.

New knowledge enables the production of new products or processes and has great economic value. A patent ensures property rights, positively impacts the promotion of innovation, and can increase the flow of these rights (Langinier & Giancarlo, 2002). The increase in the number of patents is particularly desirable; otherwise, a market system might provide little new knowledge.

Although differences exist between industrial sectors and member states, the overall "patent premium" for member states included in the survey² from 1994 to 1996 was 1% of the national GDP. From 2000 to 2002, this number increased to 1.16% of the GDP (WIPO, 2013). The overall economic crisis in 2008 caused a decline in the number of patents (3.6%) in 2009, but the number started to grow again in 2010. The economic recovery in the field of intellectual property was faster and stronger than in other industries. Patents increased by 7.2%, which is much higher than the global GDP growth (5.1%).

A strong connection exists between innovation effectiveness and the use of intellectual property. Countries that are highly efficient in terms of innovation tend to have a higher level of patenting and the use of other rights (e.g., design, model, and trademark rights). Highly patented sectors are also more innovative.

The patent system affects the overall economy. Once a survey or an invention is publicly known, the benefits and advantages are available to the entire economy in a particular industry. Such information leaves little doubt that it was necessary to take action in the EU to provide a simple, high-quality, and cost-effective patent system to provide everything in one place: the start of the process for obtaining patent rights, the granting of patents as post-grant procedures, and inclusion of the legal litigations (Komisija evropskih skupnosti, 2007). A new patent system is attractive for businesses and provides cost reductions, the simplification of procedures for obtaining patents, and a single patent court.

2.1 Reducing costs

The success of a new single patent system is largely based on reducing the costs of obtaining a patent, which will ease business processes, especially for small and medium-sized enterprises. Large companies have the advantage in covering the costs of enforcing patents (especially those incurred as a result of the translation), and they accept it as a price they have to pay if they want to do business in the EU (Riley, 2002). Member states predicted that the total administrative

costs of filling and maintaining a single European patent, including patent office translation and court fees, decreased by 80%. The number was slightly lower initially (around 70%).

Patent costs consist of the following (Evropska komisija, 2013):

	European patent	Single European Patent
Translation	23.375 €	5.610 €
Publication	2.987 €	308 €
Representation	5.750 €	500 €
Total	32.112 €	6.418 €

The largest costs reduction will be a result of the single procedure for granting a patent (EU no. 1260/2012, article 6–7).

Determining and designing annual renewal fees for the patent were especially difficult. Before the single patent was adopted, the Patent Office examined and granted the patent, but the owners had to pay an initial registration fee in each country in which they wanted patent protection (EPK, 2002, Article 141). Of course, fees were not only an initial, one time-cost. Patent holders were required to pay the renewal fees each year in every country in which their patent was valid. These fees represented around 15% of total patent costs (Edmondson, 2013). Many countries also requested several translations and the participation of their lawyers in the proceedings. Such practices meant that obtaining a patent in Europe represented a large financial burden,³ especially for small and medium-sized enterprises. Indeed, one of the main arguments in favor of the creation of a unitary patent was cost reduction and, consequently, the partial elimination of the financial burden for business (EU no. 1260/2012, Article 5). Patenting in Europe was considerably more expensive than obtaining a patent, for example, in the United States (2000€) or China (600€) (Parreira, 2013), two major competitive markets for the EU.

In the single European patent, fees will be divided, with 50% going to the European Patent Office (EPO), which is responsible for keeping a register of all patents, and the remaining half to national patent offices, which will ratify the treaty (EU no. 1257/2012, Chapter 5, Article 13). EPO is responsible for the management and approval of the unitary patent and will act as a kind of virtual national office in the territory of all the participating EU member states. Renewal fees for the unitary patent will be lower

² World Intellectual Property Organization - *Highlights on Patents*.

³ At a time when the intense negotiation for the creation of a unitary patent began, in 2012, the European Patent Office recorded a record number of patent applications. Patent applications have been made primarily by the most successful European companies in eight of the top 10 technology areas (Edmondson, 2013).

before the product is on the market and in the first years. Such a decision makes sense, as in the first years the product does not bring in a lot of money. Later, after 10 to 12 years, when the product becomes successful and generates higher revenues, fees for the renewal of patent rights will increase (EU no. 1257/2012, Chapter 5, Article 12). The highest level of fees will be from 15 to 20 years after the initial validity of the patent.

The costs of a single patent application and fees for its extension have not been determined (Evropska komisija, 2014a). This area represents one of the most sensitive issues. It is necessary to create a system that will be attractive to applicants for EU patents (EU no. 1257/2012, Chapter 5, Article 12, paragraph 2), which essentially means that costs for a single European patent should not be higher than the costs of three of four national patents⁴; if these costs are higher, especially given the fact that the effect of the unitary patent does not include Spain, Italy, and Portugal, it will be much harder to create a sufficient financial structure that is attractive for future patent holders.

2.2 Simplified procedures

Another important advantage of the single European patent is simplifying the procedures for obtaining a patent (EU no. 1257/2012, Article 4). The previous system involved a more complex and time-consuming process for obtaining a patent. Previously, acquiring a patent required submitting a national application for the grant of a patent at the National Patent Office for the protection of intellectual property rights first (Malešević, 2007). Once the office concluded that the application met all the requirements, it published the patent application and granted the patent. The applicant then had two options (EPK, 2002): file a national application with the competent authority of the foreign country, carried out through an agent enrolled in the country's Register of the Office (some countries have similar procedures, as Slovenia, while others—before granting the patent—check if it is innovative, industrially useful, and new), or submit an international application under the Patent Cooperation Treaty (PCT). In the latter case, we could apply (in German, French, English, or Slovenian) to the Slovenian office for a patent for more than 140 PCT member states. If we decide to use Slovenian,

we must guarantee translation into the three remaining languages within two months (EU no. 1260/2012, Article 10). The process then continued at WIPO in Geneva. Once the process was complete, the applicant must request the grant of a patent at the appropriate authorities of the countries in which he wished to gain protection (European Patent Office, 2014c). For all of these previous procedures, the applicant needed a representative for the various foreign authorities.

With the adoption of the single European patent, these procedures were simplified and shortened. Now, the applicant can submit an application for a single patent at any national office or directly at the EPO. All further processes take place before the EPO, and the applicant can fulfill the requirements himself or through a European patent attorney (European Patent Office, 2014b). The applicant must also pay all maintenance fees.

An important part of the procedures for obtaining a single patent is also the language regime. There are 23 official languages in the EU, and to date the majority of member states have required a translation of patent claims into their own language. Thus, translation costs have traditionally been very expensive and represented a large financial burden for businesses and individuals. Through the process of negotiation, this area was one of the most complicated and lengthiest problems among member states (Roberts & Venner, 2014). Despite all the effort, the language arrangement is still not acceptable for all EU member states; particularly strong opponents are Spain and Italy, which claim the insufficient linguistic regime is one of the main reasons why they did not join unitary patent system.

However, after many negotiations, the signatory countries came to a compromised solution for how patent translations will be arranged. They have decided that applications for patents must be in one of the three official languages: French, German, or English. The application can be filed with the EPO in any other language (EU no. 1260/2012, Article 10), but within two months should be translated into one of the three official languages (EU no. 1260/2012, 7th and Article 12). The official language of the proceedings before the Patent Office is the one in which the application was filed or to which it was translated. Specifications of the single European patent are also published in the official language of the proceedings (EU no. 1260/2012, Article 7) and contain a translation of the patent application into the remaining two official languages.

The long-term or ultimate goal of the unitary patent will begin to be realized only after a 12-year transitional period, when the translation into other languages will no longer be required (EU no. 1260/2012, Articles 12 and 13).

⁴ According to statistics from the European Commission (EPO Statistic, 2013), until 2013, among all EU member states, only about 2% of European patents—8% in 13 countries or more and 40% in 5 countries—were approved. The remaining half of the patent was valid in only three EU countries. The geographical coverage of European patents, covering on average 5 EU member states, and the costs of patent protection and renewal fees for patents are relatively lower than anticipated fees for a single patent with wider geographical protection.

The program, which EPO aims to develop, will be called “Patent Translate” and will be designed to provide users with free online access to information and automated translations of all European patent applications and patents (Kuhnen, 2013). Exclusively, in the event of litigation or at the request of the court (EU no. 1260/2012, Article 8), the patent holder will have to provide “human” translation into an appropriate language.

2.3 Unified Patent Court

Prior to February 2013, the competent authorities that decided on the validity and infringement of European patents were National Courts and authorities of the Contracting States of the European Patent Convention (EPC 2002 Rule 5 (2)). In practice, this represented numerous problems, especially when the patentee wanted to enforce a patent in different European countries or when a third party wanted to cancel the validity of the patent. The decentralized legal area resulted in particularly high costs, the high possibility of contradictory decisions, and the lack of legal certainty (Esche, 2013). Patent holders and third parties involved in legal disputes could interpret court decisions in their own way. Processes were long, and no one knew exactly who was responsible for decision making in patent litigation. With the adoption of the Unified Patent Court, participating countries wanted to limit irregularities in the field of patent law and—due to the different national legal systems—prevent participants in litigations from finding loopholes and avoiding legal responsibility.

The Unified Patent Court comprises (UPC, 2013, Chapter 2, Article 6):

- The Court of First Instance,
- The Court of Appeals, and
- Various committees (e.g., Budget Committee, Governing Board).

The Court of First Instance is divided into:

- A central division,
- Local divisions (for each state party), and
- Regional divisions (two or more state parties, only if they prefer to establish a common division) (UPC, 2013, Chapter 2, Article 7).

The central division consists of:

- Two legally qualified judges who are citizens of different state parties, and
- One qualified judge with qualifications and experience in the field of concerned technology.

The central division will be chaired by a legally qualified judge (UPC, 2013, Chapter 2, Article 8). The new structure

ensures the neutrality of judges and presence of trained professionals in the patent field (UPC, 2013, Chapter 3, Article 15). With the participation of professional judges qualified for a specific field of technology, linked to patent examples, court proceedings will gain significant weight and knowledge, which to date has often been lacking in legal processes in the field of patents (Pagenberg, 2013). Many times judges have not been adequately trained or did not have enough knowledge to make decisions about the infringement and validity of patents.

Local departments, highlighting the decentralized nature, can be established in any contracting state at its wish or request. The Administrative Committee will make decisions to establish local departments, with each country deciding where the seat of a department will be located (UPC, 2013, Chapter 2, Article 7). A maximum of three additional local divisions can be established in one country for every 100 patents per year (Esche, 2013). For example, in Germany alone, the national courts deal with more than 1,400 cases a year, which means that it might require up to four local departments.

Regional divisions can be set up at the request of two or more signatory countries (UPC, 2013, Chapter 2, Article 7 (5)), who will determine where the seat unit will be. The regional division is designed to be wider, not limited to addressing cases in only one location, but can discuss matters at several locations (Kuhnen, 2013). It would be wrong to say that local and regional divisions have national character, although they will act within national borders. Despite the small scale of operations, they are still internationally formed bodies.

The composition of the Patent Court is expected to deliver more efficient work while dividing responsibilities; the central division will be in charge of the enforcement of patents, and local and regional divisions will address infringements (UPC, 2013, Chapter 6). Patents will be granted faster and legal disputes resolved more quickly. More courts, at the expense of local and regional divisions, also mean a reduction of queues, less burden on judges and, as a result, of course, once again, faster handling of cases (IPO, 2014). For business it is important that, when patent rights have been violated, the disagreement be resolved as quickly as possible so the business processes can continue. It is expected (Komisija evropskih skupnosti, 2007) that the costs of an average case in the Court of First Instance will be reduced by 10% to 45% and from 11% to 43% in the second stage. In big patent cases, savings should be even higher, as these have thus far taken place mostly before the courts in the UK, where the litigation costs are the highest in Europe.

3 Weaknesses of the Unitary Patent

Most European Union countries and their European representatives strongly believe in the positive effects and benefits brought about by the European patent with unitary effect (Evropska komisija, 2014c)—namely, a user-friendly, simpler, and cheaper system. On the other hand, professional experts, legal experts, and large enterprises seem to strongly oppose the single patent. Opponents of the EU Patent Package (Hilty & Drexel, 2012) have accused the new regime of insufficiently regulating several aspects of patent law and, to some extent, providing even worse solutions than before.

Like the existing European patent, the single patent is not innovated in any way, especially regarding the conditions for patenting and the definition of exclusivity and its exceptions (Ullrich, 2012). The Chartered Institute of Patent Attorneys (CIPA) strongly criticized the new system, believing that responsible agencies adopted the new European patent reform with excessive haste and put too much hope on the unitary patent system to help the Eurozone recover from economic problems (CIPA, 2013). However, if the EU wants to transform the patent system in such a way to contribute to economic recovery, it is important that changes be properly formatted. Otherwise, the opposite effect can result.

Before the new system is implemented in practice, 13 member states—which must include France, Germany, and England—have to ratify it (Evropska komisija, 2014b). Thus far the requested quota has not been achieved. As a result, its performance and impact on the economy remain unclear.

Official registration and maintenance fees are still not well-defined (Weal, 2014).⁵ Experts warn that some patent proposals could create an even less sufficient patent system than the existing one (Hilty & Drexel, 2012)—namely, one that is more uncertain, less flexible, and more expensive in terms of both obtaining protection and its execution. Arguments that the new system will be much cheaper for companies are based on rather doubtful assumptions, without reliable evaluations on how high fees for the renewal of patents or judicial proceedings will be (Weal, 2014). These statements are only a comparison between the costs of gaining patent protection in the form of 24 different national patents through the EPO and the acquisition of a patent with unitary effect. The single patent was, without a doubt,

the winner, but the question of whether the companies need protection in such a large number of countries has not been raised. Costs will, of course, be much lower in the framework of a unitary patent system than when obtaining 24 separate national patents (Reddie&Grose, 2013). However, when compared with patent fees that the patent holder should pay to acquire patent protection in a smaller number of EU countries, the reduction is called into question. This may result in the reduced flexibility of the unitary patent. In the previous system, the patent holder could decide if he wanted to save money, which rights he wants to abandon, and which to invest more money in (CIPA, 2013). With the unitary patent, the choice is reduced to one: pay in full or lose all rights.

Concerns about the actual performance of the new patent system have not only been raised by experts in this field. Even before the European Parliament adopted the single patent regime via a plenary vote, big names in the business world sent an open letter⁶ with a call to reject the text before them. Nokia, Ericsson, and BAE⁷ represent some of the most important and largest patent owners (European Patent Office, 2012). All three companies have been united in the opinion that the adopted text will cause more harm than good to European companies. The accepted regulation is supposed to be sufficient, but instead of a better unitary patent system that would help business—much more than the previous one—the currently proposed fails to do so (Macpherson, 2012). The three business giants have expressed concern that the new system will harm competition, innovations, and entrepreneurship in Europe. The damage will be measured not in years, but in decades.

The accepted patent package can bring serious damage to Europe and place it in an unenviable position compared with other nations and commercial markets worldwide. It can create unfavorable conditions for companies doing business in Europe (Lichtenberger, 2012). The regulation will make unethical business behavior much easier. Holders of invalid or weak patents will be able to use the threat of pan-European orders to gain money from legitimate European companies that create and sell products in Europe. Such actions will have negative consequences for both small and large companies with business offices in the

⁵ The only indication of the estimated amount of fees is the fairly general statement of the president of the European Patent Office: “Renewal fees will be higher, as many had hoped, but lower than some had fear” (Battistelli, 2013).

⁶ In September 2013, 16 companies from Europe and the United States (including Adidas, Apple, BlackBerry, Google, and Intel) addressed a public letter to the bodies of the European Union to draw attention to different issues of unitary patent—namely, bifurcation and patent trolls (Adidas AG et al., 2013).

⁷ According to data from the European Patent Office, in 2011 Ericsson ranked among the top 25 patent holders and Nokia among the top 50. BAE System represents a subsidiary of the General Electric Company and British Aerospace, which were the third largest government parties in the world (European Patent Office, 2012).

EU. Business activities will become much more vulnerable. The patent package in its current form mainly forces European companies to find space for their infrastructure, such as factories and warehouses, somewhere beyond the borders of the EU and discourages them from active investments in companies headquartered outside the EU (European Patent Office, 2012). Such an environment will worsen employment opportunities and economic growth in the contracting states. Those companies that operate or will operate in this environment will face a significantly worse economic position than others.

According to Nokia, Ericsson, and BAE, the EU was not successful in reaching an agreement. The adopted Article⁸ of Regulation, which should solve the problem in a complex area of law, did not adequately improve the status quo. The EU created even greater legal uncertainty, instead of reducing it. The groundwork for unfair and unethical business behavior has been laid. The abuse of patents by patent owners will increase (McDonagh, 2014). Many experts—not only the three business giants already mentioned—have warned of the growing potential for manipulation through the judicial system; such behavior is called “forum shopping” (Radcliffe, 2012, p. 6). Forum shopping, a specific concept of private international law, refers to the situation where both the complainant and the defendant have two optional courts in which the specific legal concerns can be addressed. The involved parties, based on their own benefits, decide on a court based on which one they believe is more likely to rule in their favor. This undesirable behavior is eliminated by the rules of civil procedure, but not completely. To draw attention to the danger of forum shopping, it seems, according to the Single Court, which has a common set of legal rules and procedures and a common court of appeal, at best, a bit strange (Johnson, 2013). However, a closer look reveals parallels with the operation of the district courts in the United States and its appeal system, where unwanted conduct is already occurring. There, actors involved in legal proceedings often choose the district court, which they consider to favorably resolve their cases; this often leads to power-sharing battles (Whytock, 2011). It is concerning that the adopted patent system, allows similar consequences: Patent holders will be able to hold their legal disputes before various local or regional central divisions. The possibility of unwanted behavior grows, and its actual manifestation is not so far-fetched anymore.

EPO representatives answered that forum shopping is, in terms of costs and efficiency, a welcome result and, to a certain extent, inevitable (Richardson, 2012). They believe that there is a very low possibility that this kind of behavior will occur, but even if it does, the system is designed in such a way that it will repair itself. This will be ensured by the Court of Appeals, which will resolve this matter in the best possible means.

Forum shopping is a serious problem for all users of the Unified Patent Court, especially because of the separation of powers in relation to the infringement or validity of patents—namely, bifurcation (Pinsent Mason, 2013). Google, Samsung, and Apple have expressed concern over the system, where actions against the violation and revocation will be discussed before different courts. Particularly troubling is the possibility that the court may issue an injunction against the importation or exportation of a certain product alleged to infringe on the patent rights of an already established patent, when ultimately the original invention may turn out to have been invalid from the beginning (Roberts & Venner, 2014). Such sharing also allows the potential complications associated with the language in which the trial will take place.

In addition to new arrangements in the legal arena, new challenges are projected to increase in the number of patented inventions in countries. For decades, there has been an explosion of patent applications and adopted patents in the EU, similar to the trend observed in other major patent markets, such as the United States, where this growth is a little more obvious. Despite the 2009 crisis, when the number of new patents was at its lowest point in recent years, the EPO recorded a new record in 2012 (Edmondson, 2013). The exact causes of the increase in patents remain unknown. An indisputable fact is that, due to the increasing number of patents, the European patent system has become a victim of its own success. It has already been overloaded due to mass production, and the single patent system encourages an even greater number of patents because of its low cost and simpler procedures. Thus, the expected consequences are an increased burden on patent offices and, as a result, the adoption of “low quality” patents (Bisthoven, 2013). These types of patents cause the most damage and represent a significant art of patent litigation.

Although weak patents might be highly profitable (Vary, 2012), one should not overlook the fact that we are talking about technologically and economically inappropriate inventions that have little scientific value (Bristhoven, 2013). In the long term, it could have a significantly negative impact on the economic environment. The lack of quality and inability to achieve economic standards will have a

⁸ The infamous Article 5a, which was adopted in order to move the negotiations deadlock and was the result of a compromise among the countries involved in the framework of enhanced cooperation, introduces and specifies uniform protection in this area (European Patent Office, 2014a).

negative impact on two areas essential for the successful operation of enterprises: competitiveness and innovation. They can also have a harmful effect on consumers, especially when we talk about patents in the field of technology for people.

With the adoption of low-quality patents, the possibilities for increasing so-called patent trolls increase (Davis, 2012). Patent trolls do not have their own assets, apart from patents, and are not manufacturing any products; attorneys represent the most important part of the working staff and are the patent holders, even if they do not invest in innovative technologies. These entities do not invest in research and development and do not perform any work on the product subjected to patenting. In other words, they want a shiny pot of gold in exchange for no effort whatsoever.⁹ Their business model is quite different from that of other market players (Bristhoven, 2013). The business practice of patent trolls is to wait until someone else develops new industries that lead to the new invention they want to patent, and then reveal that a specific product or service is already patented (and in their possession). They then put unreasonable demands on the disproportionate share they want, based on non-reimbursable aids. Their main activity is to strengthen patents on behalf of various suppliers identified as offenders and force them to pay high licensing fees under the threat of costly legal battles (Pohlman & Optiz, 2013). We are talking about individuals who constantly speculate about the potential value of patents, try to obtain these patents from inventors for a lower price, and remain alert to the bankruptcy of companies or small businesses that do not have their own legal capacity and experience for the protection and effective enforcement of patent rights.

4 Conclusion

The European Commission's reports and expert opinions are unanimous in the fact that intellectual property is growing in importance and becoming an increasingly significant part of the economy. An effective system of intellectual property protection brings a positive contribution for business: Companies can protect their inventions and take advantage of all the benefits that protection affords them, transforming patented inventions into money. These so-called cash patents are a lure for potential investors, and they are indicators of the innovative potential of enterprises.

A single patent system undoubtedly carries many benefits for businesses. It reduces the costs of acquiring a patent, simplifies procedures, and regulates the linguistic area in a user-friendlier manner than before. In the past, companies faced a much more difficult decision about the implementation of a European patent, as it represented a major financial challenge. Small and medium-sized enterprises in particular lacked the necessary capital funds. They often remain limited within national borders, and development and innovation brought by operating in international floor were taken from them. It was harder to prevent the exploitation of patents from competitors in countries where they did not hold patent rights. It is particularly important to ease the process of patenting from small and medium-sized enterprises, especially based on experts' findings that lower costs and simplified patent procedures help promote innovation between them and consequently promote economic growth in general.

Another important achievement is certainly a simplification of the procedures. A simpler system would facilitate the work of the company. All application procedures would be resolved in one place, thereby reducing the unnecessary waste of time. The new language regime is expected to reduce financial burdens. The new system is more understandable for users and easier to maneuver. Unnecessary obstacles are removed—obstacles that discourage companies with complex bureaucratic procedures and require valuable time that would otherwise be used more beneficially (e.g., for new research and development in the company).

In addition to the potential benefits, the new legal regulations mean the court's composition will allow neutrality of judicial decisions and greater objectivity, especially with the participation of knowledgeable judges trained in a specific field of technology bound to the patent case. Thus far, judges making decisions in patent litigations have often not been trained adequately or did not have enough knowledge to decide on the objections and the validity of patents. Courts will work faster. The new legal system will bring greater unity in the patent field. Through the establishment of local or regional divisions, the court will be easily accessible to all businesses and individuals who find themselves in a patent dispute.

The new system will certainly create a more business-friendly Europe. The territory of Europe will become economically attractive for all who wish to obtain patent protection.

⁹ The impact of patent trolls on the economy is huge. In the USA companies that become victims of patent trolls, had to pay in the total amount over € 23,000.000 in 2011 (Lacavera 2013).

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Prednosti in slabosti enotnega evropskega patenta

Izvleček

Evropska unija je februarja 2013 uspešno zaključila več kot tridesetletna pogajanja in uradno podpisala sporazum o uvedbi enotnega evropskega patenta. Sporazum prinaša bolj konkurenčno patentno pravo v primerjavi z ameriškim in japonskim. V dogovoru je predvidena vrsta prednosti, predvsem za mala in srednje velika podjetja. Ključne so: zmanjšanje stroškov za kar 80 %, poenostavitev postopkov in uvedba enotnega patentnega sodišča. Intelektualna lastnina bo z enotnim patentom pridobila pomen. Toda strokovnjaki opozarjajo, da lahko novi patent povzroči nove oblike neželenega vedenja, kot sta izbira najugodnejšega sodišča (ang. *forum shopping*) in pojav patentnih škratov. V raziskavi želim predstaviti predvsem obe plati, prednosti in slabosti, predvideti, kakšne učinke bodo imele na poslovanje podjetij, zajeti čim širši krog strokovnjakov ter prikazati njihove poglede na tematiko.

Ključne besede: enotni evropski patent, enotno patentno sodišče, zmanjševanje stroškov, patentni škrti, poenostavljeni postopki, izbira najugodnejšega sodišča, *forum shopping*, Evropska unija

Effect of Rurality and Human Capital Resources in the Entrepreneurial Opportunity Identification Process

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Abstract

In this paper, that is a country study of Slovenia, we tried to determine why individuals in rural residential areas are less likely to recognize entrepreneurial opportunities. Our results show that the increase in resources in human capital, consisting of education, skills, knowledge, and experiences in entrepreneurship, has a significant and positive effect on opportunity identification. For policy creators, our results suggest that policies focused on entrepreneurial education—especially education that would enable the acquisition of real-life entrepreneurial experiences and skills—are useful, especially in rural areas.

Keywords: entrepreneurship, human capital, opportunity identification, rural areas

1 Introduction

“Rurality defines a territorially specific entrepreneurial milieu with distinct physical, social and economic characteristics” (Stathopoulou, Psaltopoulos, & Skuras, 2004, p. 404). Rurality viewed as a dynamic entrepreneurial resource is what makes rural entrepreneurship an interesting field of research. This paper focuses on the process of entrepreneurial opportunities recognition. Although entrepreneurship is seen as a means of revitalizing rural areas, we believe that this topic is especially interesting for research because of the constraints and sources that individuals in rural areas are facing in terms of entrepreneurial activity.

According to the entrepreneurship literature, small new start-up entrepreneurial ventures encounter initial resource disadvantages compared to large established firms and, as a result, they need to depend on outside resource suppliers to compensate for their inherent resource disadvantages (Cooper & Folta, 2000; Venkataraman, 1997). In other words, external network partners can help prospective entrepreneurs overcome their inherent resource constraints (Floyd & Wooldridge, 1999; Johannisson, Alexanderson, Nowicki, & Senneseth, 1994; Low & MacMillan, 1988), and this is one of the reasons why the entrepreneurial process can start

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and develop based on repeated interactions with external resource providers (Aldrich & Zimmer, 1986). The social networks needed for new firm creation can be developed and fostered through geographic proximity—namely, new venture locations in urbanized clusters (Cooper & Folta, 2000). However, a rural environment does not provide prospective entrepreneurs with such location-specific advantages, resulting in an uneven distribution of resources for individuals across rural and urban regions. A better understanding of resources and the usage of those resources in the process of opportunity identification for their further exploitation within the entrepreneurial activities could support the creation and improvement of existing public policies for fostering rural entrepreneurship. Opportunities are viewed as a key concept within the entrepreneurial process, and the concept of alertness to profit opportunities is receiving a lot of attention, especially within the contemporary entrepreneurial literature (Kirzner, 2009; Shane, 2003; Shane & Venkataraman, 2000; Short, Ketchen, Shook, & Ireland, 2010). Venkataraman and Sarasvathy (2001) described entrepreneurial opportunity using four components: (i) new ideas or innovation; (ii) either subjectively perceived or objective goals; (iii) beliefs in the possibility of achievements of these goals; and (iv) the implementation of goals through the creation of output within the entrepreneurial-economic activity. This description combines two different elements or steps of the entrepreneurial process, where the opportunity recognition or discovery process precedes the opportunity exploitation process (Bhave, 1994; Shane & Venkataraman, 2000). In this paper, we focus on the first factor—that is, the opportunity recognition process.

2 Theoretical Background

2.1 Rural and urban areas

In 2011, 41% of the population of the European Union (27 member states) lived in urban regions, 35% in intermediate regions, and 23% in rural regions (Eurostat, 2012), with the regions being classified as urban, intermediate, or rural based on an analysis of the population density and total population. The largest shares of the population living in urban regions were recorded in Malta (entire population), the Netherlands and the United Kingdom (both 71%), and Belgium (68%). Luxembourg and Cyprus (each a NUTS 3 region¹) were classified as intermediate. With the exception

of these two member states, the largest proportions of the population living in intermediate regions were observed in Sweden (56%), Estonia (52%), and Bulgaria (45%). The largest shares of the population living in rural areas were registered in Ireland (73%), Slovakia (50%), Estonia (48%), and Hungary (47%). In Slovenia, almost half of the population (43%) lives in rural areas, less than one third (31%) in intermediate, and 26% in urban areas. The average population density in Slovenia is 101.1 inhabitants per square kilometer.

In the EU, the urban–rural typology, as previously described, is based on a classification of grid cells within a square kilometer as either urban or rural (Eurostat, 2012). To be considered as urban, grid cells should fulfill two conditions: a population density of at least 300 inhabitants per square kilometer and a minimum population of 5,000 inhabitants in contiguous cells above the density threshold. The other cells are considered as rural. NUTS 3 regions have been classified into three groups based on the classification of these grid cells:

- predominantly urban region: the population in the grid cells classified as urban makes up more than 80% of the total population
- intermediate region: the population in the grid cells classified as urban makes up between 50% and 80% of the total population (population in rural cells between 20% and 50%)
- predominantly rural region: the population in the grid cells classified as rural makes up 50% or more of the total population.

The EU typology is also used by the Statistical Office of Republic of Slovenia (with some slight modifications); this typology is also adopted in this paper. Urban settlements and settlements within urban areas are determined based on four criteria (Statistical Office of the Republic of Slovenia, 2012): (i) settlements with 3,000 inhabitants or more (formal criterion); (ii) settlements with 2,000–2,999 inhabitants and more workplaces than persons in employment living in these settlements (formal, functional criterion); (iii) settlements that are seats of municipalities and have at least 1,400 inhabitants and a surplus of workplaces or settlements that are seats of municipalities and have at least 2,000 inhabitants (formal, functional criterion); and (iv) suburban settlements that have fewer inhabitants but are gradually being spatially and functionally integrated with an urban settlement with 5,000 inhabitants or more, thereby becoming urban areas; functional criterion linking labor migration is used, while the share of agricultural holdings in the suburban settlement is used as a separation criterion (physiognomic-morphological, functional criterion). Non-urban settlements are all other settlements that do not meet the statistical definition of urban settlements and settlements within urban areas.

¹ The Nomenclature of Territorial Units for Statistics or Nomenclature of Units for Territorial Statistics (NUTS) is a geocode standard for referencing the subdivisions of countries for statistical purposes. The standard is developed and regulated by the European Union and, thus, only covers the member states of the EU in detail.

2.2 Differences in the opportunity recognition process in rural and urban areas

The realization of entrepreneurial activity begins with the identification of an entrepreneurial opportunity (Bhave, 1994). As already pointed out, Kirzner (1979) defined entrepreneurs as individuals who are more likely than others to be alert to the identification and exploitation of profit opportunities. This is why we consider it important to investigate opportunity identification in light of the effect of rural or urban characteristics of living areas.

Opportunities are viewed as a key concept within the entrepreneurial process and have attracted a lot of attention (Eckhardt & Shane, 2003; Short et al., 2010; Venkataraman & Sarasvathy, 2001). Bhave (1994) defined the process of the entrepreneurial venture creation as a linear model, where entrepreneurs proceed from opportunity recognition to selection and the commitment to physical creation; meanwhile, phases ranging from alertness to opportunities, the discovery of opportunities, and action upon discovered opportunities can be stretched over long time periods.

As entrepreneurship is a key tool for stimulating diversified and endogenous growth in rural development policy (OECD, 2004), rural entrepreneurship contributes not only to economic growth but also to social and cultural preservation and development of the rural areas. Business creation retains the local population in rural areas (Bryden, 2007), and the precondition of rural economic development retains the younger generation. In European countries with rural enterprise policies, the emphasis is on strengthening the viability and competitiveness of existing SMEs rather than focusing on the entrepreneurial capacity of peripheral rural areas by, for example, fostering a positive attitude toward entrepreneurship amongst young people and women (North, Smallbone & Vickers, 2001).

Potential entrepreneurs in different stages of entrepreneurial venture creation in rural areas face a unique set of challenges not generally encountered in urban contexts. These challenges derive mainly from the varying degrees of accessibility of rural areas, the small size and low population densities of rural communities, their social and economic composition, and the nature of internal and external linkages (European Commission, Agriculture and Rural Development, European Network for Rural Development, 2011). Specific social composition includes the lack of an entrepreneurial tradition combined with the lack of models for successful business ventures and the rural labor force, which tends to suffer from low skill levels and diversity, as well as a structural mismatch in the local labor market, caused by the emigration of the young and well-educated

(Kulawczuk, 1998). Large distances and low population density cause problems with infrastructure (lack of suitable business premises, less developed transport and communications infrastructure), shortages in essential services (limited access to public services, finance, information, and advice), and limited opportunities for networking and collaboration (less diversification of the rural economies compared to the urban ones, absence of private investors) (Kulawczuk, 1998).

The results of existing literature also suggest that the residential area—whether rural or urban—might affect the cohesiveness of networks in which individuals are embedded; individuals embedded in less cohesive networks (urban areas) are more likely to recognize opportunities than those embedded in more cohesive networks (rural areas) (Arenius & De Clercq, 2005).

Entrepreneurial venture creation is undoubtedly embedded in the institutional and cultural context of a country or region; therefore, the reasons behind the degree of involvement in entrepreneurial activities might vary across regions according to the context (Driga, Lafuente, & Vaillant, 2009). The Slovene countryside, as is also the case in many EU countries, is not homogeneous, but encompasses diversified demographic, economic, and social structures. In typical Slovenian rural areas, the aging structure of the rural population indicates that there is still satisfactory reproduction (Istenič & Kveder, 2008). However, 40% of the Slovene territory consists of rural areas characterized by depopulation (Perpar, 2007). Slovenian rural areas face problems such as maintaining schools, kindergartens, ambulances, and other necessary services (Perpar, 2007). This leads to the following research hypothesis:

H1: Rural areas have a negative effect on entrepreneurial opportunities' detection process.

2.3 Individuals' human capital that supports entrepreneurial opportunity identification

Alvarez and Busenitz (2001) applied resource-based theory to their entrepreneurship research, arguing that entrepreneurs have individual-specific resources that facilitate the identification of new opportunities and the assembling of resources for the venture. Thus, an individual's ability to detect and act upon discovered opportunities is supported by easier access to resources (Davidsson & Honig, 2003). Therefore the difference in entrepreneurial activity between rural and urban areas has many causes, one of them being the difference in the amount of resources that people have at their disposal, including social, financial, and human capital resources that might be utilized.

The focus of this paper is the role of human capital resources in the process of perceiving entrepreneurial opportunities. Human capital theory claims that knowledge increases cognitive abilities, leading to more productive and efficient potential activity (Davidsson & Honig, 2003). Knowledge can be acquired as a result of formal education (for example, secondary and university education), non-formal education (for example, adult education), and/or informal education (for example, work experience). In this paper, we measure the amount of human capital by the level of education and prior work experience. Experience and education (Cooper, 1981) are seen as “antecedents” to the decision to start a company.

Individuals with high general as well as specific human capital are more likely to exploit entrepreneurial opportunities (Clausen, 2006). Davidsson and Honig (2003) found that years of education positively influence the chance that a person could identify new opportunities. Dolinsky, Caputo, Pasumetry, and Quanzi (1993) argued that less educated women might face financial or human capital constraints that limit their business pursuits. The relatively low skill and education levels of the rural workforce have an adverse effect on the supply of entrepreneurs, the form and scale of enterprise development, and the quality and chances of success of new enterprises (North & Smallbone, 2006). Thus, to analyze an individual’s human resources importance in opportunity identification process, the following hypothesis was formed:

H2: An individual’s entrepreneurial opportunity identification is influenced by his/her formal education and self-estimated skills, knowledge, and experience needed for entrepreneurship.

3 Methodology

The main data sources for our study were Global Entrepreneurship Monitor surveys of the adult population in Slovenia in 2010, 2011, and 2012.² As entrepreneurial activity does not shift significantly from one year to another (Acs, Arenius, Hay, & Minniti, 2005), a consolidated sample of respondents was formed. The use of a consolidated sample is based on the assumption of the stability of phenomena researched in several consecutive years (Kelley, Brusy, Greene, & Litovsky, 2011). This procedure makes estimates more robust. The consolidated sample consists of $N = 7,031$ respondents. Some characteristics of the sample structure are presented in Table 1.

² The Global Entrepreneurship Monitor research methodology and data are presented in detail in Reynolds et al. (2005).

Table 1: Sample structure

Characteristics	Fi	f%
Residential area:		
Rural	3,343	47.5 %
Urban	3,688	52.5 %
Gender:		
male	3,618	51.5 %
female	3,413	48.5 %
Age:		
18 – 24 years	945	13.4 %
25 – 34 years	1,566	22.3 %
35 – 44 years	1,552	22.1 %
45 – 54 years	1,600	22.7 %
55 – 64 years	1,369	19.5 %

Source: Authors

Computer-assisted telephoning interviews were performed in this survey. A random number generator was used to select the telephone numbers for the interviews and determine whether the selected telephone number refers to a household in a rural or urban residential area (as defined in chapter 2.1). Therefore, the assigned value of the “residential area” variable equaled 1 for rural and 2 for urban residential area of the selected household.

The dependent variable used in testing was “opportunity identification”; respondents were asked if they believed that, in the 6 months following the survey, good business opportunities would exist in the area in which they lived. The variable is a dichotomous nominal, with yes (1) and no (0) answers.

Predictor variables refer to variables describing respondents’ human capital. These variables included:

- Education: Respondents were assigned to three categories in terms of their educational level: less than secondary, secondary, or post-secondary degree.
- Self-confidence in terms of skills, knowledge, and experience in entrepreneurship: Respondents were asked whether they believed they had the knowledge, skills, and experience required to start a business. The variable is a dichotomous nominal with yes/no answers.

Two control variables were also included to check if hypothesized predictor variables affect the level of opportunity recognition beyond the impact of these variables. These control variables were age (continuous variable, from 18 to 64 years old) and gender (dichotomous variable; males were assigned 0 and females 1).

We formally tested hypotheses H1 and H2 using binomial logistic regression (Hosmer & Lemeshow, 2000) that estimates the probability of an event happening, which in our case was the recognition of opportunities or not. We ran two

binomial logistic regressions. Model I included only control variables; Model II included the predictor variables and control variables. Maximum likelihood estimations were used to estimate the coefficients of the logistic regression function; these denote changes in the log odds of the independent variable. The goodness of fit of the model was assessed using the Model χ^2 -test, the rate of correct classifications, and the Nagelkerke R^2 . In order to test whether the inclusion of predictor variables led to statistically significant improvements of the model, we used the Blok χ^2 -test. In order to test the significance of the regression coefficient, we used the Wald test. The 0.05 (two-tailed) significance level was used.

4 Results

The results from Models I and II are presented in Table 2. Each variable included the maximum likelihood estimates (β), the significance of the estimates, and the estimates of standard errors of estimated coefficients, and both the Wald statistics and the odds ratio ($\text{Exp}(\beta)$) are reported. Table 2 indicates that Model II, which includes both control and

predictor variables, is significant at the 0.001 level (Model $\chi^2 = 263.009$, $p < 0.001$). As Block χ^2 is also significant (Block $\chi^2 = 156.190$, $p < 0.001$), the inclusion of predictor variables in the model leads to the significant improvement of the model compared to Model I.

In Model II, the relationship between the area of living and the identification of entrepreneurial opportunities is significant ($\beta = -0.450$, $p < 0.001$), indicating that those individuals living in rural areas are less likely to perceive entrepreneurial opportunities than those living in urban areas. Thus, we found support for hypothesis H1—namely, that rural areas have a negative effect on the entrepreneurial opportunities detection process.

Model II also provided support for hypothesis H2, showing that an individual's entrepreneurial opportunity identification is influenced by his/her formal education and self-estimated skills, knowledge, and experience needed for entrepreneurship. Individuals who believed that they have the skills, knowledge, and experience for entrepreneurship were more likely to perceive profitable entrepreneurial opportunities than those who did not ($\beta = 0.649$, $p < 0.001$). Those individuals with a secondary degree were less likely

Table 2: Results of Logistic Regressions: Models I and II

Variable	Variable categories	Model I			Model II		
		Coeff. β S.E.	Wald	$\text{Exp}(\beta)$	Coeff. β S.E.	Wald	$\text{Exp}(\beta)$
Age		0.019** (0.003)	59.919	0.981	-0.021** (0.003)	67.969	0.979
Gender	0-male 1-female	-0.455** (0.067)	46.553	0.634	-0.355** (0.069)	26.679	0.701
Area	0-urban 1-rural				-0.450** (0.067)	44.824	0.637
Skills, knowledge, and experience	0-no 1-yes				0.649** (0.071)	83.274	1.914
Education	Less than secondary				-0.210* (0.086)	6.039	0.810
	Secondary degree				-0.196* (0.079)	6.118	0.822
	More than secondary (base category)					8.250	
Constant		0.181 (0.142)	1.624	1.199	0.090 (0.173)	0.272	1.094
Model χ^2 (df)		106.818** (2)			263.009** (6)		
Block χ^2 (df)					156.190** (4)		
Nagelkerke R^2		0.030			0.072		
% of correct predictions		77.9			78.0		

Note: ** significant at $p < 0.001$; * significant at $p < 0.05$

Source: Authors

to perceive opportunities than those with more than a secondary degree ($\beta = -0.196, p < 0.05$) or less than a secondary degree ($\beta = -0.210, p < 0.05$).

In terms of control variables, we found both a gender and age effect. Men are more likely than women to perceive entrepreneurial opportunities ($\beta = -0.355, p < 0.001$). Age is also significant, having a negative effect on opportunity identification ($\beta = -0.021, p < 0.001$).

5 Discussion and Conclusion

Opportunity identification activity that represents the most distinctive and fundamental entrepreneurial behavior is not evenly distributed: Individuals in rural areas in Slovenia are much less likely to recognize entrepreneurial opportunities than those in urban areas. On average, 18.6% of the population in rural areas and 26.5% of the population in urban areas expect business opportunities in the near future. Our research results suggest that individuals living in rural areas are on average only 0.6 times as likely to recognize an opportunity as those living in urban environments ($\text{Exp}(\beta) = 0.637$).

In the next step of the analysis, we tried to determine why rural individuals are less likely to recognize entrepreneurial opportunities. The data showed that rural areas are marginalized in the process of generating the human capital resources needed for entrepreneurship. The "supply side" of potential entrepreneurs shows many disadvantages of rural areas compared to urban ones in Slovenia. Significant differences were found in terms of the characteristics important for the entrepreneurship creation process between populations in rural and urban areas.

The analysis of human capital resources among the population in rural areas revealed that the level of formal education is significantly different than among the population in urban areas. In rural areas, more than 40% of individuals received less than a secondary education and less than one third pursued post-secondary education; meanwhile, the urban population pursued post-secondary education to a greater extent while only 34.8% reported completing less than a secondary education. A larger proportion of individuals in urban areas (55.6%) possessed skills, knowledge, and experience in entrepreneurship than in rural areas (51.2%).

Our research suggests that individuals who completed a secondary education or less were on average only 0.8 times as likely to recognize a promising entrepreneurial opportunity as those who completed more than a secondary education ($\text{Exp}(\beta) = 0.822$ and $\text{Exp}(\beta) = 0.810$, respectively).

Meanwhile, those individuals who believe that they have the skills, knowledge, and education needed for entrepreneurial activity were on average almost twice as likely to perceive business opportunities as those who do not ($\text{Exp}(\beta) = 1.914$).

If we further focus on individuals already identified as entrepreneurs (to further illustrate the research results) in early stages of entrepreneurship who are living in urban or rural areas in Slovenia, no significant differences were found, indicating that entrepreneurship is an individual's personal decision, regardless of the urban or rural characteristics of the environment in which he/she lives. The highest proportion of entrepreneurs had post-secondary formal education and lived in both urban and rural areas; a similar pattern was observed in both groups in terms of the proportion of entrepreneurs who believe in self-skills, knowledge, and experience needed for entrepreneurship. Such results support the conclusions of previous surveys suggesting that entrepreneurs in Slovenia would have to endeavor to re-orientate their cultural and social norms and become more proactive in the identification of various opportunities (Korez-Vide, Bobek, Čančer, Perko, & Hauptman, 2010).

In terms of control variables, the significant effect of age and gender reflects the fact that entrepreneurial ventures' creation process is generally more intense among younger individuals than older individuals as well as among males than females. These results were expected as the literature provides evidence of significantly and systematically lower participation of women than men as well as elderly individuals than younger individuals in all phases of entrepreneurial activity (Arenius & Minniti, 2005; van der Zwan, Verheul, & Thurik, 2011). As entrepreneurial activity fuels economic growth, women have been recognized as an untapped source that should use their potential (OECD, 2004).

Driga et al. (2009) mentioned that an important social function of entrepreneurship in rural areas could be to provide women with local career alternatives; however, empirical evidence shows that this does not seem to be the case. Women in rural areas do not have many opportunities for quality employment, so they are often forced to work in low-paying and low-status jobs (European Commission, 2012). Much of today's rural demography in Europe is characterized by an often critical absence of women, which has serious social and demographic repercussions, such as the aging problem faced by many rural populations (Driga et al., 2009). In Spain, young men and women are drawn away from rural life, and from agriculture in particular, because of the difficulties of attracting partners to the rural lifestyle (Regidor, 2000). Chiappe and Flora (1998) wrote about a stereotypical image (held by both men and women)

that rural women are especially well suited for domestic and reproductive activities.

Yet rural women in some European countries are showing the potential to play an important role in the development and sustainability of rural areas. Regarding the new and non-agricultural farm activities, research has shown that the wife is often the one who creates new on-farm business (Clemenzen, Helfenberger, Joris, Rossier, & Wacker, 1995; Högbäck & Siiskonen, 1996; Ilbery, Healy, & Higginbottom, 1997; Pezzini, Ortensi, Mancini, & Baracani, 1997; Toutain, 1995).

The gap between women's shares in the total and in the economically active rural population is noticeable throughout the European Union, although it varies across countries. It is deepest in the rural areas of Italy (9.9% in 2009) whereas the difference is the lowest in the rural areas of Finland (0.7%) (European Commission, 2012). It is interesting that Slovenia has the highest percentage of women in the agricultural population in the new EU-25. However, the potential for women to contribute to agricultural development is, in many respects, less favorable than in other European countries because the great majority of women in Slovenia who own and manage their farms are old, probably already widowed, with poor general and agricultural education and own small farm estates with mixed, less productive output (Istanič, 2006).

Our results demonstrate that the increase in human capital resources consisting of education, skills, knowledge, and experiences for entrepreneurship has had a significant and positive effect on opportunity identification. For the policy creators, our results suggest that the policies focused on entrepreneurial education, especially education that would lead to the acquisition of real-life entrepreneurial experiences and skills (Čančer, 2014; Širec & Rebernik, 2011), are useful—especially in rural areas, where the acquired levels of individuals' human capital are in general lower than those in urban areas of Slovenia. The research results suggest that entrepreneurial training could be important for increasing the self-efficacy and self-confidence in

necessary abilities to start with entrepreneurial activity. Some research results show that the most important sources of entrepreneurial education and training in entrepreneurs' opinions not only include formal education, but also stem from especially informal working trainings and self-studies by observing other people in business or in someone else's business. Such experiences offer the strongest impact for entrepreneurial activity as the training support is reported to have positive effects primarily on individuals' skills related to the identification and capturing of business opportunities, the organization of resources, interpersonal communications and economic negotiations, increased self-confidence, and more achievement-motivated behavior (Petridou & Glaveli, 2008). Trainings that are not of a formal nature and that are aimed at different capacity-building initiatives, especially in terms of entrepreneurial and management skills, could have a positive effect on promoting individuals' entrepreneurial use of resources in the rural environment.

Several extensions of our work are also possible. Applying the assumption of the moderating effect of rurality, future research could analyze whether differences in the opportunity identification and entrepreneurial activity between rural and urban individuals could be explained only by the difference in the amount of human resources that they have or also by the difference in the intensity of the use of those resources for opportunity identification and entrepreneurial activity—in other words, to investigate whether resources have the same supporting effect on opportunity identification and entrepreneurial activity in urban and rural areas. Thus, the question is whether rurality has a moderating effect on the impact of resources on the opportunity identification and entrepreneurial activity. Another possible extension of this work could relate to the gender perspective. The lack of data concerning the prevailing gender system and the levels of gender equality in Slovenian urban and rural locations could be addressed in future qualitative research. Research could also benefit from the investigation of the moderating effect of rurality on opportunity identification and entrepreneurial activity of female and male populations separately. Further studies could also adopt a longitudinal approach as well as include comparisons with other rural areas.

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Vpliv ruralnega okolja in človeškega kapitala v procesu zaznavanja podjetniških priložnosti

Izvleček

V prispevku, v katerem je predstavljena študija na primeru Slovenije, smo želeli odgovoriti na vprašanje, zakaj posamezniki iz ruralnih okolij v svojem okolju manj pogosto razpoznavajo poslovne priložnosti. Naši podatki kažejo, da ima povečanje virov človeškega kapitala, sestavljenega iz izobrazbe, znanja, izkušenj in sposobnosti za podjetništvo, pomemben in pozitiven vpliv na identificiranje poslovnih priložnosti. Za oblikovalce ukrepov ekonomske politike so naši rezultati pomembni, saj nakazujejo, da so politike, usmerjene v podjetniško izobraževanje (predvsem tisto, ki vključuje pridobivanje izkušenj in veščin v realnem podjetniškem okolju), koristne, in to predvsem na ruralnih območjih.

Ključne besede: človeški kapital, podjetniško izobraževanje, razpoznavanje poslovnih priložnosti, ruralno okolje

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