

SUSTAINABILITY-ORIENTED INNOVATION AND ITS IMPACT ON MARKETING EFFICIENCY: EMPIRICAL EVIDENCE FROM CROATIAN AGRICULTURAL ENTERPRISES

Silvije Jercinovic¹, MSc/ Senior Lecturer; **Nada Dadacek**², BSc/ Senior Lecturer

^{1, 2} Krizevci College of Agriculture, Croatia

Abstract. This paper empirically analyzes the tendency of developing sustainability-oriented innovative competences of agricultural enterprises in relation to their marketing efficiency. Research was conducted on a sample of 107 agricultural enterprises from the three Northwestern Croatian counties; Koprivnica-Krizevci, Bjelovar-Bilogora and Zagreb County.

The main aim of the study in this paper was to determine how agricultural enterprises can affect their marketing efficiency by developing sustainability-oriented innovation.

Empirical research was conducted through a survey and for this purpose a questionnaire was used as a major research tool. SPSS 22 software package was used for statistical analysis of the collected data. A method of descriptive statistics was used for the purpose of data analysis and their processing. Regression analysis was also made in order to establish the statistically significant influence of some independent variables on the marketing efficiency of agricultural enterprises as the dependent variable.

Independent variables were Research and Development, Sustainable Product, Marketing Management, IT and Education. Statistically significant ratio of change F indicates that independent variables contribute to explaining the dependent variable. The more innovative competence is oriented towards sustainability, the better is marketing efficiency. Within the innovation competence it is clear that research and development and information and communication technologies variables contribute to the marketing efficiency. As these two competences are more pronounced, marketing efficiency is better.

Key words: innovation competence, sustainability, marketing efficiency, Croatian agricultural enterprises

JEL code: M31 O31, Q01, Q13

Introduction

Innovations are considered as a key factor in the growth and development of enterprises, and they represent the main driving force of the economy of many countries. In terms of high competition, enterprises are forced to invest in the development and to introduce innovations if they want to be competitive on the market.

On the one hand, agriculture these days is not considered an overly attractive type of business. On the other hand, requests for food are growing day by the day. Accordingly, the agricultural sector should strive for new opportunities through technology development and commercialization of innovations. Croatian farmers have good natural conditions for agricultural development, experience and tradition. By production of quality agricultural products they could achieve a much more efficient and competitive market position than the current one. Acquirement of such a goal is possible only through the development of innovations and process of learning. On the one

hand, rural society is torn between tradition and innovation. On the other hand, for fear of investment and a lack of motivation, innovations in agribusiness are not applied to the extent that they might be.

Problems in this paper are defined as the problem of finding a connection between different independent variables that make up the concept of sustainability-oriented innovation, and marketing efficiency as the dependent variable.

The purpose of this paper is to determine the connection between the variables of sustainability-oriented innovation, which is defined as the number of different enterprise's commitments (research and development, sustainable product, marketing management, use of information technology and employee training) and the marketing efficiency.

The main hypothesis of this paper is that there is a distinct connection between individual parts (components) of the concept of sustainability-oriented innovation and marketing efficiency.

Based on the results it will be possible to conclude which sustainability-oriented innovation components are positively connected with the marketing efficiency, and ultimately, which ones are not.

Theoretical review

The shift in the marketing paradigm towards resolving individual consumer or social problems requires a whole range of innovations in the broad field of business activity. Innovation presents application of ideas, knowledge and practices that are new in a particular context in order to create a positive change. Also, innovation is the way of establishment of new products, development of new production processes and the accession to a new market segment where the company was not present before (Posavec et al., 2011).

A large number of research focus on innovation in the context of sustainability (Gallardo-Vasquez D. et al., 2010; Schaltegger S., 2011; Terziovski M. and Guerrero J.L., 2014), and explore the development of innovative strategies and their impact on the needs and expectations of a broad array of stakeholders (Ayuso S. et al., 2006; van Kleef J.A.G. and Roome N., 2007), at the same time exploring its economic impact on businesses (Skerlavaj M. et al., 2007; Hubbard G., 2009; Maletic M. et. al., 2014). Enterprises that have persisted and went through numerous stages in the implementation of sustainability have created more opportunities for innovation and competitiveness (Nidumolo R. et al., 2009; Sezen B. and Cankayab S.Y., 2013). Innovation is a crucial factor in achieving competitiveness. Their importance is even more prominent due to modern processes such as increased competition, shortening product life cycle, increasing technological capability and rapidly changing demands of consumers etc. (Bakovic T. and Ledic-Puric D., 2010).

It is known that greater innovation and higher adoption of innovations is related to the

Jelgava, LLU ESAF, 21-22 April 2016, pp. 151-152 development of new or improvement of the existing products and technologies as well as the organizational structure and business processes, positive impact on the marketing efficiency, which, among other things, improves the image of the company (Yu-Shan C., 2008; Vitezic N., 2011), credibility, product image, differentiation, level of satisfaction, retention and consumer fidelization, satisfaction and retention of the best employees and market positioning (Gallardo-Vasquez D. et al., 2010). It is also positively correlated with the number of new consumers (Hitchhock D. and Willard M., 2009), rationalization of operations, higher value for consumers (Ismail S. T. and Alsadi B.Y., 2010) and ultimately with improved business efficiency which is reflected in the improved general competitiveness of enterprises (Epstein M. and Rejc Buhovac A., 2010; Crittenden V. et al., 2011; Fraja E. et al., 2011; Vitezic N., 2011; Langa E. and Zegrenau P., 2012).

Research results and discussion

Variables and measurement

The paper empirically examined the relationship between innovation and some of its components and marketing efficiency of agricultural enterprises in the area of three Northwestern Croatian counties. The study was conducted on a sample made up of 107 representatives of agricultural enterprises from Koprivnica-Krizevci, Bjelovar-Bilogora and Zagreb County.

All respondents filled in the questionnaire composed of 29 items. The level of agreement with the given statements is assessed on a Likert scale from 1 to 5.

The first part of the questionnaire included data on gender, age, education, business and enterprise size, number of employees and the type of enterprise: family farm (FF), agricultural craft (AC) and agricultural enterprise (AE) (Table 1).

Sample description (N=107)

Demographic characteristics	Frequency	%
Gender		
Male	74	69
Female	33	31
Age		
< 30	28	26
30-39	31	29
40-49	30	28
> 50	18	17
Education		
High school education	52	49
Bachelor degree	39	36
Master degree	16	15
Enterprise size		
<10	84	79
10-49	20	19
50-249	3	2
Type of enterprise		
FF	63	59
AC	20	19
AE	3	29

Source: authors' calculations based on empirical research

The second part of the questionnaire refers to the assessment of claims related to development of sustainability-oriented innovative competences. Claims are derived by the content compilation of recent literature titles, especially scientific journals, covering an area of innovation in the organization, innovation capabilities of enterprises through the development and application of environmentally friendly technologies, development of eco-innovative technologies and investments in the development of research and development projects (Maletic, M. et al., 2014; Gallardo-Vasquez, D. et al., 2010; Fraj-Andres, E. et al., 2009). In this way independent variables such as Research and Development, Sustainable Product, Marketing Management, IT and Education have been constructed. Research and Development variable concerns the application of new methods and

tools, which comprehensively use innovative, environmentally friendly technologies and processes, both in production and administration, including investment in the development of research and development projects.

Sustainable Product variable is based on a holistic concept of adopting environmentally friendly and socially responsible product or service. Given the specificity of an ecological agricultural product and its treatment as socially acceptable, it is very important how it is certified and marketed for the purpose of communication with consumers.

Marketing Management variable is explained by product distribution, design, packaging and relationship with consumers.

IT variable is defined by the application of information and communication technology, and the enterprise's presence on the Internet.

Education refers to the investment in promotion and education of employees.

All variables assume some form of sustainability-oriented innovation, whether it is a technological or business innovation.

The third part of the questionnaire deals with the dependent variable Marketing Efficiency. It consists of nine items: credibility, image of the company and products / services, the level of satisfaction and customer retention, creating a loyal consumer, differentiation towards competition, positioning and new product launches. This variable with its nine items refers to the marketing efficiency and is based on recent scientific literature sources (Epstein M. and Rejc Buhovac A., 2014; Maletic, M. et al., 2014; Terziovski M. and Guerrero J.L., 2014).

Research results

The SPSS 22 software package was used for statistical analysis of the data. A descriptive statistics was used for the purpose of analysis

Jelgava, LLU ESAF, 21-22 April 2016, pp. 151-154 and data processing. Arithmetic mean and standard deviation for each variable were calculated in order to determine the homogeneity / heterogeneity of the respondents (Table 2).

Regression analysis was used to determine the relative contribution of sustainability-oriented innovation competence on marketing efficiency.

Important criteria for the regression analysis is correlation between the independent variables. Correlation matrix indicates statistically significant correlations between independent variables. But, there is no high ($r < 0.60$) correlation between the independent variables which indicates possible usage of regression analysis.

The dependent variable of regression analysis is Marketing Effectiveness. The independent variables were Research and Development, Sustainable Product, Marketing Management, IT and Education. The results of the regression analysis are shown in Tables 4 and 5.

Table 2

Descriptive statistics (N=107)

	N	Minimum	Maximum	M	SD
Marketing Efficiency	107	2.44	4.78	3.7643	0.48665
Research and Development	107	2.33	5.00	3.3894	0.50467
Sustainable Product	107	2.00	5.00	3.8178	0.60809
Marketing Management	107	2.00	4.67	3.1651	0.46777
IT	107	2.00	5.00	3.9065	0.79542
Education	107	1.00	5.00	3.0561	0.95987
N	107				

Source: authors' calculations based on empirical research

Correlation analysis verified the degree of linear dependence between variables (Table 3).

Correlation between dependent and independent variables (N=107)

		Marketing Efficiency	Research and Development	Sustainable Product	Marketing Management	IT	Education
Marketing Efficiency	r	1	0.443**	0.280**	0.193*	0.397**	0.195*
	p		0.000	0.003	0.047	0.000	0.045
Research and Development	r		1	0.285**	0.298**	0.209*	0.175
	p			0.003	0.002	0.031	0.071
Sustainable Product	r			1	0.245*	0.081	0.179
	p				0.011	0.404	0.065
Marketing Management	r				1	0.076	0.224*
	p					0.439	0.020
IT	r					1	0.130
	p						0.180
Education	r						1
	p						

* Correlation is significant at the level of less than 5%

** Correlation is significant at the level of less than 1%

Source: authors' calculations based on empirical research

Table 4

Regression analysis (N=107)

R	R ²	Adjusted R ²	Estimate standard error	Modification				
				R ² modification	F modification	df1	df2	p
0.567	0.322	0.288	0.41050	0.322	9.596	5	101	0.000

df – degrees of freedom; p - statistical significance

Source: authors' calculations based on empirical research

Table 5

Contribution coefficient of explanation of the dependent variable

	Nonstandardized coefficients		Standardized coefficients	p
	B	standard error	Beta	
Constant	1.358	0.393		0.001
Research and Development	0.306	0.087	0.318	0.001
Sustainable Product	0.118	0.070	0.147	0.096
Marketing Management	0.024	0.092	0.024	0.791
IT	0.189	0.052	0.309	0.000
Education	0.034	0.043	0.067	0.435

p - statistical significance

Source: authors' calculations based on empirical research

Statistically significant F ratio of changes suggests that a set of independent variables contributes to the explanation of the dependent variable; the more sustainability-oriented

Innovation Competences, the better is Marketing Efficiency (F=9.596; df=106; p=0.00). The Innovation Competences explain 32.2% of the variability of Marketing Efficiency. Within the

sustainability-oriented innovation competences it is evident that Research and Development ($\beta = 0.318$; $p = 0.001$) and IT ($\beta = 0.309$; $p = 0.00$) contribute to the marketing efficiency. The more pronounced these two competences are, the better is marketing efficiency.

Conclusions, proposals, recommendations

This study empirically examined the relationship between sustainability-oriented innovations and marketing efficiency of agricultural enterprises in the three northernwestern counties in the Republic of Croatia.

The results of research show that the tendency to sustainability-oriented innovation in the surveyed Croatian agricultural enterprises is not equally emphasized in all aspects of innovation policies, probably because the innovation in all studied agricultural enterprises, which mostly belong to the category of small and medium-sized enterprises, represents additional costs which are not negligible since the Croatian economy, especially agricultural sector, is going through a difficult period of crisis. It should also be noted that management in the studied agricultural enterprises is often insufficiently trained. Likewise, the implementation of innovations very often represents an additional cost for the owners and / or managers, which is often considered a luxury or simply unnecessary or even impossible investment.

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Jelgava, LLU ESAF, 21-22 April 2016, pp. 151-156

The two variables, Research and Development ($\beta = 0.318$; $p = 0.001$) and IT ($\beta = 0.309$; $p = 0.00$) contribute to the marketing efficiency. The more pronounced these competences are, the better is marketing efficiency. Therefore, in order to improve the marketing efficiency of agricultural enterprises emphasis should be on:

a) research and development:

b) application of information and communication technologies;

Research and Development and Information Technologies are in a positive and statistically significant correlation with Marketing Efficiency, which represents a potential to create enterprise's positive image and credibility. Positive image implies loyalty and trust which results in continuity and solidity of partnership between businesses and consumers as well as suppliers, owners, investors and the social environment in which the enterprise operates. In this way a premise for "win-win" situation is created as well as an appropriate market status of the enterprise that results in acceptable profitability.

It can be concluded that in order to improve the marketing efficiency, independent variables Research and Development and Information and Communication Technologies that are in significant correlations should be promoted and maintained at a high level.

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