Impact of innovation applications in restaurants on competitive advantage

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Abstract: The aim of this study is to analyze the impacts of green innovation applications in restaurants on their competitive advantage. In line with this purpose, questionnaires have been implemented on 468 first class restaurant establishments in Turkey. The questionnaire was sent to all of these establishments and 275 questionnaires were taken into consideration. Factor and regression analyses were conducted on the obtained data. At the end of factor analysis, statements were grouped under four variables: environmental, product, process and production innovations. Regression analysis was conducted for the relation between competitive advantage and environmental, product, process and production innovations. Competitive advantage was observed to be impacted significantly by environmental, product and production innovation variables. Environmental innovation was observed to be the variable that explains competitive advantage best, followed by production innovation and product innovation. Restaurant establishments' managers are required to place importance on product, production and environmental innovations in order to gain competitive advantage.

Keywords: green, green innovation, competitive, competitive advantage, restaurant, restaurant establishments

INTRODUCTION

It is necessary to adopt a preventive approach in order to eliminate environmental issues which become increasingly urgent in the world. In order to eliminate environmental pollution, environmental management concepts such as green management, green production and green innovation, etc. are followed (Chen 2008, 531). Many organizations have become more willing to spend efforts to develop green innovations in increasingly important environmental management (Chang 2011, 362). This effort of the organizations towards green innovations is also significantly affected by the

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increasing awareness of people regarding environment (Işık and Barlak 2018, 14). There are many definitions for green innovation formulated by researchers in time (Gupta and Barua 2018, 123). The most distinctive concepts used in the literature to define this innovation type are "green", "eco", "environment" and "sustainable" (Schiederig, Tietze and Herstatt 2012, 180; Tariq et al. 2017, 11). Literature reviewed showed that these concepts are also used synonymously (Schiederig et al. 2012). Green innovation is an innovation type that includes technological improvements which save energy, prevent pollution, contribute in waste recycling and that contribute in the sustainability of the organization (Aguilera-Caracuel and Ortiz-de-Mandojana 2013, 365). It may also be thought as an innovation type in which innovator expects a good market share with a high profit while also contributing in the environment (Hörte and Halila 2008, 302). Green innovation is an important basis for a company in balancing profitability with environmental responsibility (Li et al. 2017, 41). Businesses adopt green innovation approach to remain competitive due to the short life cycles of the products (Tseng et al. 2013, 71). Especially manufacturing companies gravitate towards product designs which enable less energy consumption and towards materials which do not contain hazardous substances while enabling minimized waste after consumption (Tepe Küçükoğlu and Pınar 2015, 1233). Companies with successful green innovation performances are able to create and strengthen their key competencies while also obtaining more productivity (Albort-Morant et al. 2016, 4912).

LITERATURE REVIEW

Due to pressures coming from consumers and other stakeholders, companies are led to take innovative measures in order to increase their environmental performances (Li et al. 2017, 41). Increasing social and regulatory concerns regarding environment lead many companies to view green issues as a great strategic change source (Noci and Verganti 2002, 3). Since pressures to protect the environment were considered as obstacles for the business operations by the companies, many companies have fought against environmental protection pressures (Chen et al. 2006, 332; Albort-Morant et al. 2016, 4912). However, adequate environmental standards and strict environmental supervision are highly required to trigger green innovation (Li et al. 2018, 469).

For companies contributing to various environmental issues, there is increasing pressure coming from numerous stakeholders to include green management in their business applications (Li et al. 2018, 462). Suppliers are required to help in improving product design and production processes as well as general compliance with environmental regulations (Chiou et al. 2011, 824). As they adopt a greener approach, suppliers create a positive impact on environmental performance and competitive advantage (Tseng et al. 2013, 73). The importance of green innovation management increases day by day both in practice and in academy (Schiederig et al. 2012, 180; Cainelli et al. 2015, 211).

Noci and Verganti determined that "green" product innovation may have strategic impacts for SMEs in their studies (2002). Chen found a positive relation between green key skills of companies and their green innovation performances as well as their green images (2008). Hörte and Halila conducted a study on 285 innovations that qualified for the final in 3 innovation contests organized in Sweden and found that eco-innovations are different from other kinds of innovations (2008). Qi et al. revealed that managerial concerns were the most important driver in the adoption of green applications in their study on contractors (2010). Chiou et al. conducted a study on 124 companies from 8 different sectors in Taiwan and determined that green innovation on the part of the suppliers significantly benefits the environmental performance and the competitive advantage of the companies (2011). Schiederig et al. stated that three different concepts (green, eco/ecologic and environmental innovation) are largely used synonymously while the concept of sustainable innovation extends this concept and brings in a social dimension in it (2012). Horbach and Rennings (2013) confirmed that companies who implement environmental process innovations have a much higher employment dynamic. Similarly, Kunapatarawong and Martínez-Ros reviewed the results obtained from more than five thousand companies and determined a positive relation between green innovation and employment (2016). Cainelli et al. conducted a study in which they used data sets of 4829 Spanish manufacturing companies and determined that internel resources had a much higher significance for environmental innnovations, emphasizing the suitability of complementing resources with internal resources accessible for the company in order to fully understand and support development of environmental innovations (2015). Albort-Morant et al. determined, in their study conducted on 112 companies from manufacturing sector,

that skills had direct and indirect positive and significant impacts on green innovation performance and that these improve the estimates of green innovation performance of the companies (2016). Saez-Martínez et al. analyzed innovation strategies and conducts of 212 young companies in Spain in their first 10 years and found that market-oriented innovators had more share in eco-innovation field (2016). They also emphasized that small enterprises needed to develop their innovation skills that enable them to adopt advanced technologies, before trying to become even greener. Xavier et al. conducted a study to analyze variability of eco-innovation models and found that analyzed models were dominating the scene in terms of their general and definitive characteristics (2017). In addition, they pointed to a gap in eco-innovation models related to the organizational and structural factors and social aspects of sustainability. Tariq et al. conducted a systematic literature review on the articles dealing with innovation on green products and processes and found that innovations of green products and processes had positive impacts on the financial performance of the company (2017). Li et al. conducted a study on the top 100 companies in China listed from 2008 to 2014 and detemined that environmental regulations had significantly reduced negative impacts in quality management in terms of both green management innovation and green technology innovation (2018). Saunila et al. determined that the possibility of the companies for investing in green innovation had increased as the value given by the companies to economic, corporate and social sustainability increased (2018).

Argued that green product innovation had a significant and positive impact on both company performance and competitive advantage (2012). When green innovation performance's impacts on competitive advantage are analyzed, green product innovation and green process innovation performances are found to be linked to corporate competitive advantage (Chen et al. 2006). In a study conducted on 224 companies which have entered in ISO500 list in the last 3 years, green innovation activities are found to have a significant impact on a company's environmental performance and competitive advantage (Tepe Küçükoğlu and Pınar 2015). Similarly, environmental strategies are found to have a positive impact on a company's competitive power in a study conducted on Spanish manufacturing companies (Fraj-Andrés et al. 2009). In the light of this information, this study analyzed the impacts of green innovation applications on competitive

advantages of restaurant enterprises. The study puts forward the following hypotheses:

H1: Environmental innovation has a positive impact on competitive advantage.

H2: Production innovation has a positive impact on competitive advantage.

H3: Product innovation has a positive impact on competitive advantage.

H4: Process innovation has a positive impact on competitive advantage.

METHODOLOGY

The aim of this study was to analyze the impacts of green innovation applications in restaurants on their competitive advantage. In line with this purpose, questionnaire form was used for the field study. First, a pilot study was conducted on ten first class restaurants in Denizli province. Pilot study was conducted through face-to-face interviews in order to understand whether there were any problems about the questions. After face-to-face interviews, the questionnaire was implemented on all of the 1st class restaurant establishments operating in Turkey. In questionnaire, first some information about the study were given and then questions about green innovation and competitive advantage were asked. These questions were adapted in previous studies.

There are 468 1st class restaurant establishments in Turkey. Questionnaire form was sent to all of these establishments via mails. Mails were sent three times as a reminder and establishments were called over the phone. After electronic mails and telephone calls, 275 questionnaires were returned, however 246 of these were taken under evaluation. Only one questionnaire was implemented on each establishment. Absent data and extreme values were evaluated first and analysis was conducted to see whether data distribution was normal. Later, obtained data was used in factor analysis to understand which variables contained the statements related to green innovation applications. Regression analysis was conducted later to reveal the impacts of these variables on competitive advantage.

FINDINGS

39,5% of the participants were females and the remaining 60,6% were males. 46,3% of the participants were working in the sector for 1-5

years, 15% for 6-10 years, 8,5% for 11-15 years, 17,9% for 16-20 years and remaining 12,2% for 21 years or more. Of energy saving devices, 32,5% were heating and cooling equipment, 33% were lighting systems, 19% were kitchen equipment and remaining 15% were office equipment.

Table 1. Demographic Findings

	Percent (%)		Percent (%)
Gender		Energy Saving	
Female	39,4	Devices	32,5
Male	60,6	Heating and Cooling	
		Equipment	33
		Lighting Systems	19
		Kitchen Equipment	15
		Office Equipment	
Working Periods			
1-5 years	46,3		
6-10 years	15		
11-15 years	8,5		
16-20 years	17,9		
More than 20 years	12,2		

As a result of the factor analysis conducted to see which variables contained statements related to green innovation applications, the statements were group under 4 factors and their total variance was calculated as 0,64615. Below table presents factor analysis results.

Table 2. Results of Factor Analysis

Factors	Factor Load	Explained Variance	Alpha	Mean
Environmental		20,764	,946	3,869
We use sustainable building materials in our establishment.	,614			
We cooperate with stakeholders in order to develop environmental applications.	,656			
We prefer environmentally responsible suppliers to work with.	,681			
We contribute in the protection of the environment in our marketing campaigns.	,748			

We inform our customers in our promotion works by emphasizing our environmental efforts.	,758			
We share our environmental initiatives with all our employees.	,641			
We inform our guests about our works related to environmental awareness.	,588			
We provide trainings to our employees in environmental issues.	,653			
We award personnel who takes the best environmental initiative.	,483			
We encourage our employees to participate in the activities related to environmental awareness.	,630			
Product		20,394	,938	3,780
We pay attention to the products to be environmental-friendly when choosing the products we will use in food supply.	,582			
We buy the materials wholesale as much as possible to reduce packaging.	,710			
We take the necessary measures to reduce waste.	,692			
We don't use disposable materials as much as possible.	,421			
We use recycled products.	,536			
We sort our wastes.	,638			
We cooperate with our guests in protecting the environment.	,488			
We place importance on environmental awareness in our products.	,519			
Process		12,969	,904	3,704
We have applications for water saving.	,519			
Kitchen equipment are laid out away from factors such as sun light and heat sources.	,567			
Kitchen equipment are maintained and repaired by experts.	,660			
We pay attention to energy consumption.	,661			
There are applications for energy saving.	,736			
We use energy-saving (less energy consuming) devices.	,743			
We use renewable energy.	,513			
Data are collected about waste amounts.	,573			
Electricity, water, gas consumption amounts in areas such as kitchen, WC, etc. are recorded.	,544			

Production		10,487	,752	3,627
We use environment-friendly materials in production.	,484			
We prioritize offering ecological products.	,573			
We record used amounts of chemical substances.	,565			
We use chemical products as less as possible.	,497			
We use environment-friendly detergents and disinfection materials.	,500			
Cleaning is done without the use of chemicals in our establishment.	,759			
Our kitchen is open for our guests to see.	,671			

The results of the factor analysis showed an average of 3,869 for the first factor. The statements found under this factor were: We use sustainable building materials in our establishment; We cooperate with stakeholders in order to develop environmental applications; We prefer environmentally responsible suppliers to work with; We contribute in the protection of the environment in our marketing campaigns; We inform our customers in our promotion works by emphasizing our environmental efforts; We share our environmental initiatives with all our employees; We inform our guests about our works related to environmental awareness; We provide trainings to our employees in environmental issues; We award personnel who takes the best environmental initiative; and We encourage our employees to participate in the activities related to environmental awareness. When the statements are analyzed, this factor is observed to be about environmental innovation. Second factor's average was 3,780. The statements found under this factor were: We pay attention to the products to be environmental-friendly when choosing the products we will use in food supply; We buy the materials wholesale as much as possible to reduce packaging; We take the necessary measures to reduce waste; We don't use disposable materials as much as possible; We use recycled products; We sort our wastes; We cooperate with our guests in protecting the environment; and We place importance on environmental awareness in our products. When the statements are analyzed, this factor is observed to be about product innovation. Third factor's average was 3,704. The statements found under this factor were: We have applications for water saving;

Kitchen equipment are laid out away from factors such as sun light and heat sources; Kitchen equipment are maintained and repaired by experts; We pay attention to energy consumption; There are applications for energy saving; We use energy-saving (less energy consuming) devices; We use renewable energy; Data are collected about waste amounts; and Electricity, water, gas consumption amounts in areas such as kitchen, WC, etc. are recorded. When the statements are analyzed, this factor is observed to be about process innovation. Fourth factor's average was 3,627. The statements found under this factor were: We use environment-friendly materials in production; We prioritize offering ecological products; We record used amounts of chemical substances; We use chemical products as less as possible; We use environment-friendly detergents and disinfection materials; Cleaning is done without the use of chemicals in our establishment; and Our kitchen is open for our guests to see. When the statements are analyzed, this factor is observed to be about production innovation.

Regression analysis was conducted for the relation between competitive advantage and environmental, product, process and production innovations. Below table presents the results of regression analysis for the factors that influence competitive advantage.

Table 3. Results of Regression Analysis

Variables	Beta	t	Sig t
(Stables)	,610	3,432	,001
Environmental	,595	7,715	,000
Production	,252	3,149	,002
Product	,204	2,250	,025
Process	,069	1,304	,193
Multiple Regression =,808	R Square = ,654	p = 0.001	
Adjusted R Square = ,648	Durbin-Watson=1,709	F =113,685	

Since F value was 113,685 and significant at the level of p=,001, variables in the model and model itself are observed to be significant. Durbin-Watson test value was 1,709 (between 1,5- 2,5), there was no autocorrelation, the results were not random and reflected the real situations. As a result of the regression analysis conducted for the impacts of environmental, production, product and process innovations on competitive advantage, environmental, production, product and process innovations were observed to explain competitive advantage with the percentage of ,654. Competitive

advantage was observed to be impacted significantly by environmental, product and production innovation variables according to Sig. and ß (Beta) figures. The variables that explained competitive advantage with the highest rate were, respectively, environmental innovation (b= ,595; t=7,715; p=,001), product innovation (b= ,252; t=3,149; p=,002) and product innovation (b= ,204; t=2,250; p=,025). According to these results, H1, H2, H3 were supported while process innovation H4 (b= ,069; t=1,304; p=,193) was not supported.

CONCLUSION AND SUGGESTIONS

In this study in which impacts of green innovation applications on competitive advantage in restaurants were analyzed, green innovation applications were grouped under four factors: environmental innovation, product innovation, process innovation, and production innovation. Variables in the model and model itself were observed to be significant, there was no autocorrelation and the results were found to be non-random and they reflected the real situation.

Competitive advantage was observed to be impacted significantly by environmental, product and production innovation variables. Environmental innovation was understood to be the independent variable that best explained competitive advantage. First hypothesis, "Environmental innovation has a positive impact on competitive advantage," was supported. And the second hypothesis, "Production innovation has a positive impact on competitive advantage," is observed to be supported after the environmental innovation. Product innovation was observed to impact competitive advantage significantly as well. Third hypothesis, "Product innovation has a positive impact on competitive advantage," was supported. These results are found to be similar with those studies in which green product innovation was found to be significantly impacting competitive power (Ar 2012), and a positive relation was observed between green product innovation and corporate competitive advantage (Chen et al. 2006). Process innovation was determined to not have an impact on competitive advantage. Fourth hypothesis, "Process innovation has a positive impact on competitive advantage," was not supported. This result was not similar with the study in which a positive relation was determined between green process innovation and corporate competitive advantage (Chen et al. 2006). Restaurant establishments' managers are required to place importance on product, production and environmental

innovations in order to gain competitive advantage. Future studies may analyze impacts of green innovation applications on the companies' financial performances.

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