



## **THE EFFECT OF INNOVATION CAPACITY ON INNOVATION PERFORMANCE ON COMPANIES**

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### **ABSTRACT**

The purpose of this research is to analyze whether the companies with research and development department and the companies without it and companies with an employee in innovation and companies without it differs from each other in terms of innovation performances as well as analyzing whether the capacity of innovation of the companies effects the innovation performances. To do so, the data that has been gathered from 160 different companies that are located in Gaziantep Organized Industrial Zone has been used by making exploratory and confirmatory factor analyses, correlations analysis, reliability analysis and regression and t-tests. According to the results, there is a difference between the companies with research and development department and without it in terms of innovation performance and there is a difference between the companies with an employee in innovation and without it in terms of innovation performance. In addition to these, the capacity of innovation of the companies effects innovation performance in a positive way.

## **1. INTRODUCTION**

Today survival of enterprises is closely associated with innovation which will enable customers to prefer them (Kılıç and Bilginoğlu, 2010). Enterprises have to be innovative to operate in a global competitive environment, to respond technological change and to survive. Therefore, they always endeavour to develop different products and services or to design new products and services (Özden and Reyhanoğlu, 2014 p.24).

Innovation is the main source of competitive advantage for enterprises over their competitors. For enterprises to survive in the competitive market conditions, rules of global economy require them either to closely follow innovations and adopt them or to be innovative themselves (Güleş, 2004 p.115).

Many of the companies that are operating in our country has adopted the traditional management approach; they remain passive with respect to the application of innovative management approach within their own structure through an institutional perspective. This situation raises the issue of not being able to protect their competitiveness for enterprises (Soba et al., 2011 p.196).

## **2. THEORICAL FRAMEWORK**

Nowadays as a result of rapid technological change and of the continuous improvement of environmental conditions, consumer needs also vary. Due to very similar products in the market, fast delivery and good service became vital. Thus, the importance of differentiation from the rivals increases as time passes (Bulut and Arbak, 2012 p.2).

There are many descriptions in the literature for innovation. One defines the innovation as “a complex process in which new ideas implemented to make profit or a purpose that will allow to make profit” (Kılıç and Bilginoğlu, 2010 p.218 quoting from Tang, 1998 p.297) while another is “a social concept, does not necessarily need to be technologic or scientific, which requires people to generate new ideas and work together to implement them” (Kılıç and Bilginoğlu, 2010 p.218 quoting from Man, 2001p.229)

Sources of innovation are classified as internal and external sources. First internal source for innovation that can be named is employees working for the company. Ideas of employees from the highest to the lowest position are very important for the company. Successful enterprises adopt an organizational culture that will encourage employees to explore possibilities to improve products and production processes (Güleş and Bülbül, 2004p.184). When it comes to external sources of innovation customers are the first to come to mind. Changes in demographics, changes in perceptions, new information, suppliers etc constitute external sources for innovation process (Yuanjia et al., 2007 p.296).

Some of the types of innovation can be listed as follows;

- ✓ Product Innovation: Is defined as developing a new or different product or changing/renewing an existing product (Elçi, 2009 p.3).
- ✓ Process Innovation: Contains all the innovative implementations of new methods in providing product, semi-product and raw material from suppliers, storage, production system, customer relations and services, new product development, inventory management etc. (Kılıç, 2013 p.66).
- ✓ Service Innovation: Implies new improvements in service, delivery of basic service to customers and make service more attractive for customers. (Oke, 2004 p.38).
- ✓ Technological Innovation: Contains development of new products and processes or substantial technological change in existing products and processes. (Erkek, 2011 p.7).
- ✓ Marketing Innovation: Marketing must be closely associated with innovation. Thanks to successful innovation, an enterprise, through new and different methods than competitors, can improve its products and services and offer to market to attract customer’s attention and enlarge demand in the market (Barutçugil, 2013 p.369).
- ✓ Customer Innovation: Incorporates customer interaction with enterprise, defining, analysing and communicating the customer, involving customers in innovation process, assisting customers in improving existing products and services (Kılıç, 2013 p.95).

When analysed concepts linked to innovation it can be seen that R&D, invention patent and entrepreneurship have a very important place. Innovation certainly is a concept very closely related R&D (Çeliktaş, 2008 p.27). Studies under R&D represent improvement and renewal of business life (Ayhan, 2002 p.168). While invention is being first to generate something new, innovation is being first to commercialize something new (Turanlı et al., 2010 p.18). If an invention or a technological finding is not new i.e. a similar product or technology already exist, then it is not possible to talk about a patent. A patent should have something new. Therefore, patent is a directly connected concept to innovation (Ayhan, 2002 p.264). Entrepreneurship is a process of exploiting opportunities that exist in the environment or that are created through innovation in an attempt to create value ((Gül, 2012 p.11 quoting from Uljin and Brown, 2004). Entrepreneurs are people who pursue and assess all opportunities. Innovation provides a substantial power to entrepreneurs to be successful (Zhao, 2005 p.28).

For Kongar (1995) there are three main reasons which necessitate enterprises to make innovation. These are; to survive, to be market leader and to increase profitability (Örücü et al., 2011 p.62).

In innovation process the need for innovation must be determined firstly. In other words, company should feel that they need to be innovative. After that the decision for innovation is taken and it starts. Especially at this stage ideas, to articulate thoughts and suggestions of all employees, have a great importance. Next stage is commercialization of the innovation. Commercialization is not end of the innovation process. A completed innovation process is a signal for a new innovation process meanwhile (Durna, 2002 pp.115-121).

In a study on innovation and workforce, it is stated that there are seven ways for organizations to encourage development of new products/services and improvement of processes through employees (Yılmaz, 2015 p.600 quoting from DeMarco et al.,2006);

- ✓ Developing a brilliant vision and make innovation a necessity,
- ✓ Eliminating the fear of risk-taking
- ✓ Focusing diversity
- ✓ Allowing employees to communicate within the organization
- ✓ Increasing the visibility level of ideas and developing mechanisms to ensure that ideas create results,
- ✓ Moving beyond the boundaries of enterprise,
- ✓ Motivating employees to be innovative.

### 3.METHODOLOGY

The purpose of this study is to investigate; whether is there a significant difference between innovation performances of enterprises which have a R&D department and those have not, enterprises which have an innovation officer and those have not, whether innovation performances of companies show significant differences according to their respective sectors, whether innovation capacities of enterprises influence their innovation performance. For this purpose, a survey is conducted with 160 companies operating in Gaziantep Organized Industrial Zone. Frequency, correlation, reliability, regression analysis, t-test and ANOVA tests are performed over the data. Innovation capacity scale is taken from the study by Svetlik vd. (2007) and innovation performance scale is taken from the studies by Calantone et.al. (2002) and Kmiecik et.al. (2012).

The hypothesis of this study is defined as follows;

H1: There are statistically significant difference between the innovation performance of companies which have R&D department or not.

H2: There are statistically significant difference between the innovation performance of companies which have an innovation officer or not.

H3: Innovation capacity of companies have a statistically significant effect on the innovation performance positively.

#### 3.1. Research Sample And Some Demographic Features

Information on the positions of the employees who answered the questionnaires are given in Table 1.

Tablo 1. Positions of The Employees

Position	Frequency	Percentage	Cumulative Percentage
Senior Executives	30	18.8	18.8
Middle Level Executives	85	53.1	71.9
Lower Level Executives	28	17.5	89.4
Engineer	7	4.4	93.8
Responsible for R & D	2	1.3	95.0
Foreman	6	3.8	98.8
Other	2	1.3	100
Total	160	100	

As seen in Table 1, 71,9% of the employees are senior and middle level executives.

The company types of the companies in the survey are in Table 2.

As seen in Table 2, of participant companies 41,9% is joint stock and 37,5% is limited liability companies.

Information on management structure is given in Table 3.

As seen in Table 3, 50,6% of the participant companies are managed by professionals.

Tablo 2. Types of The Companies

Types	Frequency	Percentage	Cumulative Percentage
Joint -Stock Company	67	41.9	41.9
Limited Liability Company	60	37.5	79.4
Unlimited Company	13	8.1	87.5
Limited Partnership	6	3.8	91.3
Other	14	8.8	100
Total	160	100	

Tablo 3. Management Structure

Management Structure	Frequency	Percentage	Cumulative Percentage
Family Members	35	21.9	21.9
Non-Family Partners	44	27.5	49.4
Professionals	81	50.6	100
Total	160	100	

Informations on companies employ is given in Table 4.

As seen in Table 4, 34,4% of the companies employ between 50-99 staff.

Information on R&D department of companies is given in Table 5

As seen in Table 5, 66,9% of the companies have a R&D department.

Tablo 4. Companies Employs

Companies Employs	Frequency	Percentage	Cumulative Percentage
Between 1-49	42	26.3	26.3
Between 50-99	55	34.4	60.6
Between 100-149	37	23.1	83.8
Between 150-249	26	16.3	100
Total	160	100	

Tablo 5. Information on R&amp;D Department

R&D Department	Frequency	Percentage	Cumulative Percentage
Yes	107	66.9	66.9
No	53	33.1	100
Total	160	100	

Information on whether companies have an innovation officer or not is given in Table 6.

Tablo 6. Innovation Officer

Innovation Officer	Frequency	Percentage	Cumulative Percentage
Yes	94	58.8	58,8
No	66	41.3	100
Total	160	100	

As seen in Table 6, 58,8% of the companies have an innovation officer.

Information on the sectors that the companies having operation in is given in Table 7.

Tablo 7. Sectors

Sectors	Frequency	Percentage	Cumulative Percentage
Textile	23	14.4	14.4
Food	38	23.8	38.1
Steel	28	17.5	55.6
Other	71	44.4	100
Total	160	100	

### 3.2. Analysis And Findings

In the study, firstly exploratory factor analysess of the innovation capacity and innovation performance are applied. Result of explanatory factor analysis shows that the innovation capacity variable is grouped under a single factor. Item number 5 is removed from the scale as a result of factor analysis. KMO value is calculated as 0,881, chi-square value as 500.335, degrees of freedom as 10 and significance value was found to be 0.000. It is founded that it can be explain the 72% of total variance and factor weights have been founded between 0,772 and 0,897. Results of explanatory factor analysis shows that the innovation performance variable is grouped under a single factor. Item number 3 is removed from the scale as a result of factor analysis. KMO value is calculated as 0,876, chi-square value as 556,923, degrees of freedom as 105 and significance value was found to be 0.000. It is founded that it can be explain the 66% of total variance and factor weights have been founded between 0,752 and 0,859. Following the explanatory factor analysis, for both variables confirmatory factor analysis is performed and goodness of fit values are presented in Table 8.

Tablo 8. Goodness of Fit Values

Variables	X2		CMIN/DF≤5	GFI ≥.85	AGFI ≥.80	CFI ≥.90	TLI ≥.90	RMSEA ≤.08
Innovation Capacity	4.081	5	0.816	0.99	0.97	1.00	1.00	0,000
Innovation Performance	12.32	8	1.54	0.977	0.939	0.992	0.985	0.058

Note: Goodness of fit value range is organized according to “acceptable” standards

As it can be seen from Table 8, it fits well.

At the second stage normality test for data is done and as kurtosis and skewness values are found to be between -2 and +2, it is assumed that it is normally distributed.

Reliability of variables is analysed at the third stage and for the innovation capacity variable, Cronbsh’s Alpha value is calculated as 0,903; and for the innovation performance as 0,900. Variables are found as reliable after analysis results.

At the fourth stage the correlation between dependent and independent variable is tested and as correlation value is found as 0,786. Between innovation capacity and innovation performance a significant positive relation is determined at the 0,01 significance level.

At the fifth stage, t test is done to assess whether is there a significant difference between innovation performance of companies with R&D department and those without R&D department. Test results are given in Table 9.

Tablo 9. Results of Independent Two Sampling T Test Performed According to R&amp;D Department

	F	Sig.	t	df	p
Innovation Performance	4.775	.030	3.171	158	.002

According to t test results there is a significant difference between innovation performance of companies in favor of those that have R&D department. Test results show that H1 hypothesis is supported.

At the sixth stage, t test is done to assess whether is there a significant difference between innovation performance of companies that employ innovation officer and those does not. Test results are given in Table 10.

Tablo 10. . Results of Independent Two Sampling T Test Performed According to Innovatin Officer

	F	Sig.	t	df	p
Innovation Performance	6.561	.011	3.237	158	.001

According to t test results there is a significant difference between the innovation performance of companies in favor of those that employing any innovation officer. Test results show that H2 hypothesis is supported.

Finally, to test the effect of the innovation capacity over the innovation performance, regression analysis is performed and analysis results are presented in Table 11.

Tablo 11. Results of Regression Analysis

Independent Variable	Beta	Sig.	Adjusted R <sup>2</sup>	F	Sig	DW
Innovation Capacity	.786	.000	.615	254.701	.000	1.706

As seen in Table 11, findings show that the innovation capacity significantly effects the innovation performance in a positive way. Adjusted R2 value indicates that 61,5% of change in the innovation performance is explained by the innovation capacity. Standard beta value shows that 1 unit change in innovation capacity increases the innovation performance by 0,786 unit; Durbin Watson value shows that there is no autocorrelation. As sigma value of F is 0,000, it is concluded that the model is significant. Analyses results show that H3 hypothesis is also supported.

#### 4. CONCLUSION

In this study using data collected from 160 companies operating in Gaziantep, tests are performed to investigate; whether is there a significant difference between innovation performances of enterprises which have a R&D department and those have not, enterprises which have an innovation officer and those have not, whether innovation performances of companies show significant differences according to their respective sectors, whether innovation capacities of enterprises influence their innovation performance in a positive way. Of companies that form the sample 41,9% are joint stock and 37,5% are limited liability companies. 50,6% of the companies are managed by professionals.

T test results indicate a significant difference between innovation performance of companies in favor of those that have R&D department. The results also show that there is a significant difference between innovation performance of companies in favor of those that employ innovation officer. The result of regression analysis shows that innovation capacity of companies significantly effects their innovation performance in a positive way.

This study was done with companies operating in Gaziantep Organized Industrial Zone regardless of their sector. Therefore, a similar study is advised in different regions and sectors.

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