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THE ROLE OF ORGANIZATIONAL RESOURCES AND MARKET COMPETITIVENESS IN INNOVATIVENESS

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ABSTRACT

The purpose of this study is to empirically test a framework based upon the relationships among organizational resources, market competitiveness, and innovativeness of organizations with special emphasis on enterprises in Turkey. Data used in the study were gathered from Business Environment and Enterprise Performance Survey conducted by World Bank. The research framework was tested using descriptive statistics and regression analysis. The results of logistic regression analysis indicate that both organizational resources and market competitiveness have a direct, positive and significant impact on product innovations. In contrast, neither operational resources nor market competitiveness variables have a significant and direct impact on process innovations but only human resources has. The limitation of this study is its narrow focus on Turkish enterprises. Thus including the other emerging countries might be useful in generalization of findings. By validating a multi-dimensional construct of innovativeness, the study provides managers with a useful tool for evaluating their current resources and competitiveness in the market. Second, the analysis of the relationship among organizational resources, market competitiveness and innovativeness indicates that human resources directly influence both product and process innovations. This paper adds to the body of knowledge by providing empirical insights into the relationships among organizational resources of companies, market competitiveness and innovativeness of companies operating in Turkey.

1. INTRODUCTION

Globalization is getting higher, markets and technology are changing rapidly, and complexities and uncertainties are increasing in the market, which results in the creation of a new competitive environment (Tracey et al. 1999).

In the industrial era, firms aimed to produce a narrow range of products, sustain economies of scale and achieve high productivity and low costs. In post-industrial era, organizations take the customer needs into the consideration and aim to develop production systems which design, produce and deliver high-value products to the customer (Anatan and Radhi, 2007). In today's highly competitive environment changing demands of customers for customized and high quality products force the firms for responding them quickly as much as possible (Tracey, et al., 1999). In other words firms have to meet the changing needs of their customers and cope with the pressures of their competitors as well. Every company aims to gain and sustain a competitive advantage and this aim could only be achieved by the capability of firms to introduce innovations (Rungtusanatham and Forza, 2005; Barrett and Sexton, 2006).

Innovativeness of the firms means adopting the innovations as quick as possible and it depends on their management practices, capabilities and resources. Other influential elements for adopting innovations are customers and competitors which are called as market competitiveness in this study. These influential elements, in other words innovation drivers are categorized in two main schools of thought (Barrett and Sexton, 2006). These theories are trying to explain the differences in the performance of firms in different ways. The first theory is referred as the market-based view of innovation and it focuses on the market. According to this perspective competitive advantage is gained due to the competition barriers of the market in which the company performs. Second theory is called as the resource-based view of innovation and it stresses the role of the firm's resources and capabilities in profitability and value of the firm. Resource-based view point to valuable, rare, inimitable and non-substitutable resources of the firm that could not be imitated easily by competitors and this theory explains competitive advantage by means of these resources. In other words resource-based view focuses inward of the firm, whereas market-based focuses outward (Barrett and Sexton, 2006; Makhija, 2003).

The purpose of this study is to determine the underlying dimensions of innovativeness and to empirically test a framework identifying the relationships among organizational resources of companies, market competitiveness and innovativeness of organizations operating in Turkey. This paper seeks to add to the body of knowledge by providing empirical insights into those relationships. The remainder of this paper is organized as follows. The next section presents the literature review that helps to underpin the research framework and sets out the study's hypotheses. The research methodology is presented in the third section. Results and discussion are in section four followed by conclusion and implications.

2. LITERATURE REVIEW

The framework developed in this study is shown in Figure 1. The framework proposes that both organizational resources used in organizations, and market competitiveness will influence the innovativeness of organizations directly. A detailed description of organizational resources, and market competitiveness along with innovativeness of organizations is provided in the following sections. Based on a literature survey, the proposed relationships among those are discussed and hypotheses related to these variables are developed.

2.1. Resource-Based View of Innovation

Resource-based view of innovation theory focuses on organizational capabilities which are defined as 'the comprehensive set of capabilities which are used by the organization in order to facilitate and support the innovation strategies'. Based upon the literature about innovation, it can be said especially in small manufacturing-based firms, accumulation and development of resources and capabilities are the relatively most important influential factors for innovativeness (Barrett and Sexton, 2006). In this study resources are classified as human resources and operational resources and the effect of each are investigated.

2.2. Market-Based View of Innovation

The second important factor for innovation is the ability of firms to understand and estimate the market. If a company wants to be innovative it has to consider the changing market conditions. The market-based view emphasizes the market conditions as those facilitate or hinder the innovativeness of firms (Barrett and Sexton, 2006). On one side we see that competition increases due to the number of competitors in the market and their pressure to reduce the costs, and to innovate while on the other side there is a pressure of customers' to reduce the costs and to innovate.

2.3. Innovativeness

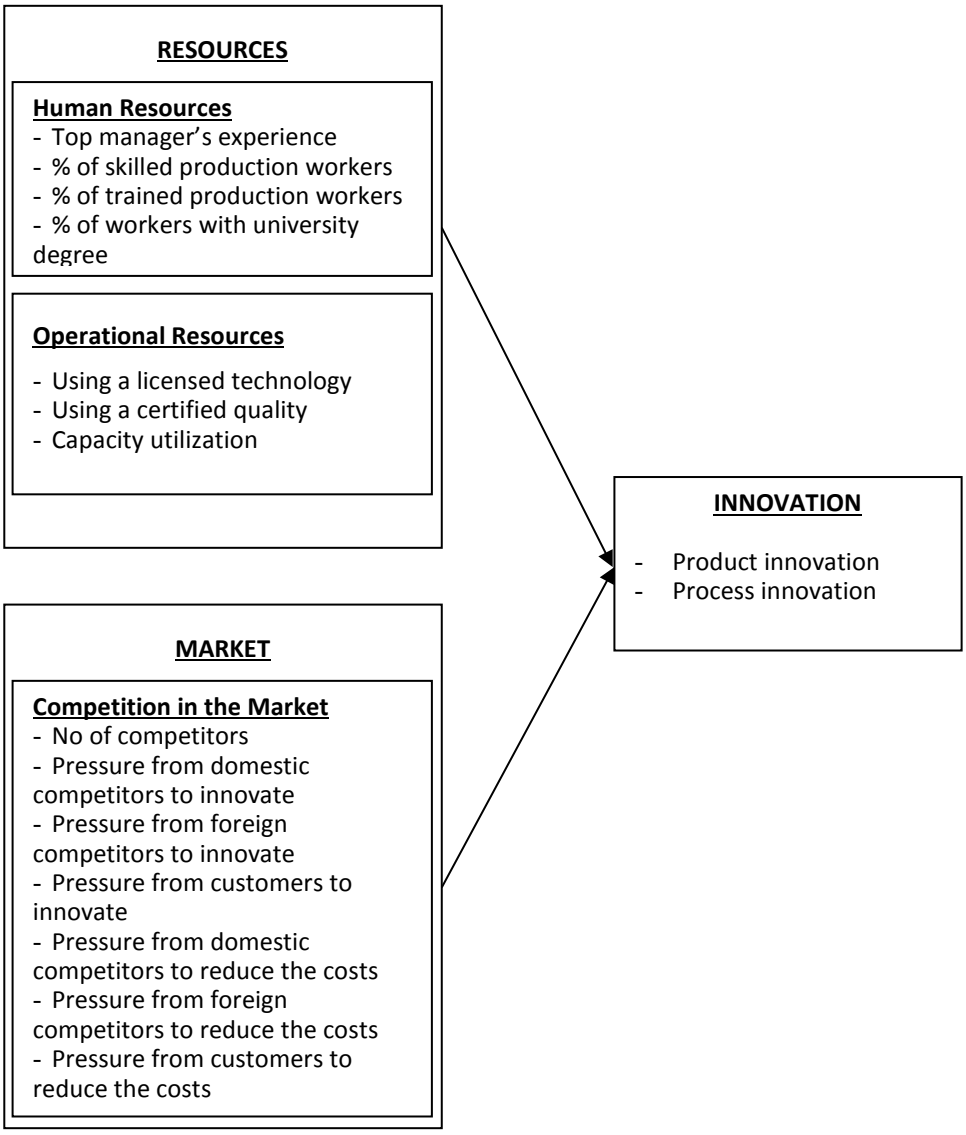
In today's highly competitive, dynamic and uncertain market environment with short product life cycles, product development becomes very important. It satisfies the quality and speed of production on one hand, and it must ensure that products are innovative on the other (Hsiao and Chou, 2004). Demands of customers are for customized and high quality products and manufacturing firms should response to these demands as quickly as possible (Tracey, et al., 1999). Each firm has to introduce new and perhaps radically innovative products for surviving in such a highly competitive, dynamic and uncertain environment (Rungtusanatham and Forza, 2005).

New product development process' aim to provide outstanding service to customers by manufacturing products with more variety and more suitable for customers' unique needs through responding without delay (Hsuan, 1999), since adjusting production methods globally and quickly in response to changes in the environment has become possible (Ethier, 2005).

Improving a new product is one of the most important management challenges today. Successful new products not only contribute to financial and market performance measures, but also offer new opportunities to become visible (**Tseng, 2006).** Schumpeter (1947) was the first economists who emphasized the importance of new products in economics. Since then, the studies related with the innovation area have defined different types of innovation which cover process innovations beside product innovations (Cooper, 1998; Walker, 2006; Friedrich et al., 2010). Thus, innovation can be defined as

the management of all the activities involved in the process of idea generation, technology development, manufacturing, and marketing of a new (or improved) product or manufacturing process or equipment (Trott, 2008).

Figure 1: Research Model



2.4. Hypotheses

The developed framework proposes that organizational resources have a direct impact on the innovativeness of companies. Innovativeness of a company is expected to increase when companies have a higher level of human and operational resources. This leads to the following hypotheses:

H_1. Companies having a higher level of human resources are likely to make product innovations.

H_2. Companies having a higher level of human resources are likely to make process innovations.

H_3. Companies having a higher level of operational resources are likely to make product innovations.

H_4. Companies having a higher level of operational resources are likely to make process innovations.

Other influential element is the market competitiveness. Pressures come from the customers and competitors to innovate and reduce the costs, and the number of competitors in the market is expected to enhance a company's innovativeness. Thus, following hypotheses are developed:

H_5. Companies performing in a competitive market are likely to make product innovations.

H_6. Companies performing in a competitive market are likely to make process innovations.

3. RESEARCH METHODOLOGY

The hypotheses are tested by utilizing the data in Business Environment and Enterprise Performance Survey conducted by World Bank. The survey provides a wide range of data regarding to financing, laboring, infrastructure, training, innovation, quality, technology etc. related issues in 29 economies located in the region of Europe and Central Asia. It is a periodic survey, which is last updated in 2009 (The World Bank, 2009). The data used in this study is collected from 1152 Turkish companies in 2008. 860 of these 1152 are operating in manufacturing industry, 165 in service industry and others in core industry. The main aim of our study is to investigate the effects in manufacturing companies, the data regarding to these 860 companies are used here. Since the survey is conducted in all regions of Turkey, the results can be generalized to Turkey.

All factors investigated in the conceptual model, variables used in measuring these factors and scales used for the items are provided in Appendix 1.

In some questionnaires there are some missing values due to lack of knowledge, declining to give any response or because of some other reasons. The most common approach to missing data is list-wise deletion which means omitting the cases with missing data and running the analyses on what remains. A total of 26 questionnaires were eliminated due to high percentage of missing values. List-wise deletion often results in a decrease in the sample size but since the sample size is big enough, the sample size is considered satisfactory for subsequent analysis.

4. RESULTS AND DISCUSSION

The frequency distribution of the sample firms is shown in Table 1. The sample consists of firms from a wide variety of industries. Most of the firms (15.7 %) are operating in textile industry. Firm age distribution shows that 83.88 % of the firms have been operating from zero to twenty nine years. The small-sized, medium-sized and large-sized firms are distributed equally in the sample.

After evaluating the firm specific characteristics included in the sample with frequency tests, the proposed relationships shown in Figure 1 was tested with logistic regression. Since our dependent variable is a yes/no question which means it is a dichotomous variable, logistic regression is an optimal method (Allison, 2012).

Appendix 2 and Appendix 3 show the results of logistic regression analysis. While the models in Appendix 2 are investigating the relationship between the independent variables and product innovation, the models in Appendix 3 are investigating the relationship between the independent variables and process innovation. Model 1 in Appendix 2 and Appendix 3 are the baseline models which include only the control variables. The results show that firm size and age are significant in the expected direction for product innovation. Interestingly, we could not find significant evidence that industry influences product innovation. Thus, in Model 2 industry is removed from the model and human resources variables (experience, % of skilled and trained production workers, and % of workers with university degree) are included. According to the results, skilled and trained production workers have a likelihood of making product innovations. In Model 3 we use skilled and trained production workers only and add operational resources (using a licensed technology, using a certified quality and capacity utilization). The results show that using a licensed technology is significant in the expected direction. In Model 4 we focus on market-based view and investigate the relationship between market competitiveness and product innovations. According to the results, the main important point considered by the companies is the number of competitors in the market. And Model 5 is a comprehensive model that takes all of the significant variables into the consideration. Based upon the results of Model 5, companies that have trained production workers, use a licensed technology and take the number of competitors into account have a higher likelihood of making product innovations. The results demonstrate that all hypotheses related with product innovations (H_1, H_3 and H_5) are accepted.

Model 1 in Appendix 3 shows that all of the control variables are significant in the expected direction for process innovation. Thus, all these variables and human resources variables (experience, % of skilled and trained production workers, and % of workers with university degree) are included in Model 2. According to the results, firm age and trained production workers affect the likelihood of making product innovations. In Model 3 operational resources (using a licensed technology, using a certified quality and capacity utilization) are added to the model and the results show that using a licensed technology is significant in the expected direction. In Model 4, we focus on the market-based view and investigate the relationship between market competitiveness and product innovations. According to the results, the main important point considered by the companies is the number of competitors in the market. And Model 5 is a comprehensive model that takes all of the significant variables into consideration. Based upon the results of Model 5, firm age and having trained production workers affect the likelihood of making process innovations. Accordingly, firm age and the human resources are more important in making process innovations than the market competitiveness and their operational resources. Therefore we can say only H_2 is accepted for process innovations.

Table 1: Demographic Characteristics of the Sample

	Frequency	Percent
Industry		
Textiles	176	15.67
Food	157	13.98
Garments	126	11.22
Non-metallic mineral products	109	9.71
Chemicals	106	9.44
Retail	99	8.82
Wholesale	82	7.30
Plastics & rubber	43	3.83
Fabricated metal products	38	3.38
Machinery and equipment	34	3.03
Other services	34	3.03
Basic metals	19	1.69
Electronics	12	1.07
Construction	11	0.98
Transport	7	0.62
IT	2	0.18
Hotel & restaurants	1	0.09
Firm Age		
0-9 years	253	22.53
10-19 years	458	40.78
20-29 years	231	20.57
30-39 years	111	9.88
40-49 years	35	3.12
50 and more years	26	2.32
Don't know	8	0.71
Firm size		
Small Sized Enterprises	351	31.3
Medium Sized Enterprises	442	39.4
Large Sized Enterprises	330	29.4

5. DISCUSSION AND CONCLUSION

This paper has provided empirical justification for a framework that identifies two school of thoughts and describes the relationship among them and innovativeness of companies within the context of Turkish companies.

Data used in the study were gathered from Business Environment and Enterprise Performance Survey conducted by World Bank. The research framework was tested using descriptive statistics and regression analysis. The results of logistic regression analysis indicate that organizational resources and market competitiveness have a direct, positive and significant impact on product innovations made by the firms.

In contrast, neither operational resources nor market competitiveness have a significant and direct impact on process innovations but only human resources has.

This study offers a number of managerial implications. First, by validating a multi-dimensional construct of innovativeness and by exhibiting its value in today's highly competitive market, it provides managers with a useful tool for evaluating their current resources, their current position in the market and their innovativeness. Second, the analysis of the relationship between human resources, operational resources and innovativeness indicates that human resources might directly influence both the product innovations and process innovations. Third, the findings of this study tend to support the resource based view and market based view for innovation in an emerging country context.

Researchers can further extend the findings of this study for future studies, but it should also be acknowledged that our study is subject to some limitations. The limitation of this study is its narrow focus on Turkish companies. Future research should endeavour to collect data from other emerging countries in order to generalize the findings.

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Appendix 1: Variables used in the study

Variable	Definition
Control Variables	
Type of Industry	Activity field of the establishment
Firm Size	Size of the establishment consists of three dummies corresponding to small, medium and large firms. Small firms have 1-19 employees, medium firms have 20-99 firms, while large firms have over 100 employees.
Firm Age	Age of the establishment is calculated by subtraction the year of the survey (2008)-the year in which the firm is established
Ownership	Ownership consists of three dummies corresponding to state, domestic and foreign.
Resource Based View	
Resource-Based View	
Human Resources	
Top manager's experience	Years of experience of the top manager in this sector. It consists of three dummies corresponding to low-level, mid-level and highly experienced. It takes the value 1 if the top manager has had below 3 years of experience, it takes the value 2 if the top manager has had between 3-10 years of experience, it takes the value 3 if the top manager has had more than 10 years of experience.
Skilled production workers	Percentage of permanent skilled production workers
Trained production workers	Percentage of permanent trained production workers
Workers with university degree	Percentage of workers that has university degree
Operational Resources	
Using a licensed technology	Use of technology licensed from a foreign-owned company, excluding office software
Using certified quality	Having an internationally-recognized quality certification
Capacity utilization	Capacity utilization consists of three dummies corresponding to the establishment's capacity utilization levels below 50%, between 50% and 80%, and above 80%.
Market Based View	
Market Competitiveness	
Number of competitors	Total number of competitors in the market
Pressure from domestic competitors to innovate	The importance of domestic competitors in affecting decisions to innovate
Pressure from foreign competitors to innovate	The importance of foreign competitors in affecting decisions to innovate
Pressure from customers to innovate	The importance of customers in affecting decisions to innovate
Pressure from domestic competitors to reduce the cost	The importance of domestic competitors in affecting decisions to reduce the costs
Pressure from foreign competitors to reduce the cost	The importance of foreign competitors in affecting decisions to reduce the costs
Pressure from customers to reduce the cost	The importance of customers in affecting decisions to reduce the costs
Innovation	
Product innovations	It is a yes (1) no (2) question "Has your company developed a new product line in the last three years?"
Process innovations	It is a yes (1) no (2) question "Has your company upgraded an existing product line in the last three years?"

Appendix 2: Logistic Regression Analysis Results for Product Innovation

	Model 1				**Model 2**			
Variable	**B**	**S.E.**	**Wald**	**Exp (β)**	**B**	**S.E.**	**Wald**	**Exp (β)**
Industry	0.001	0.004	0.019	1.001				
Firm size	0.139	0.078	3.123	1.149*	0.009	0.082	0.012	1.009
Firm age	-0.002	0.001	2.716	0.998*	-0.002	0.001	2.580	0.998
Experience					0.001	0.000	1.663	1.001
Skilled production workers					0.000	0.000	5.023**	1.000
Trained production workers					-0.001	0.000	43.538***	0.999
Workers with university degree					0.000	0.000	1.433	1.000
Using a licensed technology								
Using a certified quality								
Capacity utilization								
No. of competitors								
Pressure from domestic competitors to innovate								
Pressure from foreign competitors to innovate								
Pressure from customers to innovate								
Pressure from domestic competitors to reduce the costs								
Pressure from foreign competitors to reduce the costs								
Pressure from customers to reduce the costs								
Product innovations								
Process innovations								
R^2 (Nagelkerke)	0.008				0.063			
R^2 (Cox&Snell)	0.006				0.047			
-2 LL	1538.852				1491. 844			
χ^2	χ^2= 21.683, p=0.05, d.f.=8				χ^2= 7.802, p=Not sig., d.f.=8			

Appendix 2: Logistic Regression Analysis Results for Product Innovation (Cont'd)

	Model 3				Model 4				Model 5			
Variable	**β**	**S.E.**	**Wald**	**Exp (β)**	**B**	**S.E.**	**Wald**	**Exp (β)**	**B**	**S.E.**	**Wald**	**Exp (β)**
Industry												
Firm size												
Firm age												
Experience												
Skilled production workers	0.000	0.000	0.011	1.000								
Trained production workers	-0.001	0.000	45.493***	0.999					-0.001	0.000	49.424***	0.999
Workers with university degree												
Using a licensed technology	0.001	0.000	3.953**	1.001					0.001	0.000	15.328***	1.001
Using a certified quality	0.001	0.001	0.465	1.001								
Capacity utilization	0.000	0.000	2.307	1.000								
No. of competitors					0.000	0.000	4.057**	1.000	0.000	0.000	9.337**	1.000
Pressure from domestic competitors to innovate					0.003	0.011	0.092	1.003				
Pressure from foreign competitors to innovate					0.001	0.001	0.354	1.001				
Pressure from customers to innovate					-0.004	0.010	0.175	0.996				
Pressure from domestic competitors to reduce the costs					-0.011	0.021	0.264	0.989				
Pressure from foreign competitors to reduce the costs					0.000	0.001	0.123	1.000				
Pressure from customers to reduce the costs					0.011	0.021	0.262	1.011				
Product innovations												
Process innovations												
R^2 (Nagelkerke)	0.061				0.013				0.068			
R^2 (Cox&Snell)	0.045				0.009				0.051			
-2 LL	1493.782				1535.147				1487.166			
χ^2	χ^2= 4.713, Not sig., d.f.=8				χ^2= 6.566, p=Not sig., d.f.=8				χ^2= 6.844, p=Not sig., d.f.=7			

Appendix 3: Logistic Regression Analysis Results for Process Innovation

	Model 1				Model 2			
Variable	**B**	**S.E.**	**Wald**	**Exp (β)**	**B**	**S.E.**	**Wald**	**Exp (β)**
Industry	-0.009	0.004	4.273**	0.991	-0.003	0.006	0.211	0.997
Firm size	0.161	0.080	4.060**	1.175	0.038	0.084	0.209	1.039
Firm age	-0.002	0.001	4.991**	0.998	-0.002	0.001	4.898**	0.998
Experience					0.000	0.000	0.701	1.000
Skilled production workers					0.000	0.000	0.015	1.000
Trained production workers					-0.001	0.000	38.983***	0.999
Workers with university degree					0.000	0.000	1.272	1.000
Using a licensed technology								
Using a certified quality								
Capacity utilization								
No. of competitors								
Pressure from domestic competitors to innovate								
Pressure from foreign competitors to innovate								
Pressure from customers to innovate								
Pressure from domestic competitors to reduce the costs								
Pressure from foreign competitors to reduce the costs								
Pressure from customers to reduce the costs								
Product innovations								
Process innovations								
R^2 (Nagelkerke)	0.021				0.073			
R^2 (Cox&Snell)	0.016				0.054			
-2 LL	1494.635				1449. 610			
χ^2	χ^2= 21.531, p=0.01, d.f.=8				χ^2= 17.333, p=0.05, d.f.=8			

Appendix 3: Logistic Regression Analysis Results for Process Innovation (Cont'd)

	Model 3				Model 4				Model 5			
Variable	**β**	**S.E.**	**Wald**	**Exp (β)**	**B**	**S.E.**	**Wald**	**Exp (β)**	**B**	**S.E.**	**Wald**	**Exp (β)**
Industry												
Firm size												
Firm age	-0.002	0.001	5.154**	0.998					-0.002	0.001	4.758**	0.998
Experience												
Skilled production workers												
Trained production workers	-0.001	0.000	40.4860***	0.999					-0.001	0.000	44.255***	0.999
Workers with university degree												
Using a licensed technology	0.001	0.000	6.884*	1.001					0.000	0.000	0.618	1.000
Using a certified quality	-0.001	0.001	2.197	0.999								
Capacity utilization	0.000	0.000	8.615	0.999								
No. of competitors					0.000	0.000	4.710**	1.000	0.000	0.000	1.220	1.000
Pressure from domestic competitors to innovate					0.001	0.066	0.000	1.001				
Pressure from foreign competitors to innovate					0.007	0.012	0.370	1.007				
Pressure from customers to innovate					-0.010	0.065	0.024	0.990				
Pressure from domestic competitors to reduce the costs					-0.065	0.074	0.773	0.937				
Pressure from foreign competitors to reduce the costs					-0.005	0.012	0.211	0.995				
Pressure from customers to reduce the costs					0.071	0.074	0.913	1.073				
Product innovations												
Process innovations												
R^2 (Nagelkerke)	0.083				0.027				0.072			
R^2 (Cox&Snell)	0.062				0.020				0.053			
-2 LL	1440.854				1489.211				1450.879			
χ^2	χ^2= 8.137, Not sig., d.f.=8				χ^2= 9.670, p=Not sig., d.f.=8				χ^2= 12.291, p=Not sig., d.f.=8			