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EFFECTS OF FIRM ORIENTATIONS ON INNOVATIVE CAPABILITY IN TURKISH MANUFACTURING INDUSTRY

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Abstract

The purpose of this paper is to examine the affecting factors of innovative capability and firm performance in small and medium-sized firms in manufacturing industry in Turkey. The affecting factors of innovative capability are firm's customer orientation, competitor orientation, technological orientation. In this study, a model which includes affecting factors of innovative capability and firm performance is developed. Then a questionnaire is developed and applied to managers of 162 manufacturing firms in Turkey. The model is tested by structural equation modeling (SEM) methodology, which is a statistical technique for testing and estimating causal relationships using a combination of statistical data and qualitative causal assumptions, via data provided from the survey. Then, results are discussed. Results of this study could lead to effective management of innovation for the manufacturing firms and benefits for the firms' managers.

Key words: Innovative capability, Firm orientations, Firm performance, Structural equation modeling

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1.INTRODUCTION

In today's constantly fluctuating and rapidly changing environments, firms need technological innovation and managerial response to changing environments in order to gain and to maintain competitive edge (Wang et al., 2008). Innovation is widely accepted as a key driver of economic growth and it plays a crucial role in competitive environment at both a national and firm level (OECD, 2010), and innovation is recognized as the engine for firm's performance, growth and survival in such environments (Bueno and Ordonez, 2004). In last decade, there has been an increasing interest in innovation capabilities.

Yang et al. (2009) had studied on relations between firms' resources, logistic, service capability, innovation capability and firms' performance . Calantone et al. (2002) had also defined the positive effects of innovation capability on firm performance. Lisboa et al. (2011) investigates the role of a firm's orientation, both customer and competitor, in driving innovative capabilities and the impact of those capabilities on a firm's current and future performance. According to their findings, although customer orientation relates to both exploitative and explorative innovative capabilities, competitor orientation relates only to exploitative innovative capabilities. Exploitative innovative capabilities affect current performance, whereas explorative innovative capabilities affect future performance. Furthermore, there are other studies which are searching the factors effects firms' performances. These more recent studies have mentioned the importance of innovation capability and found out the positive effect of innovation capability on firms' performance (Sher and Yang, 2005; Lisboa et al., 2011; Yam et al., 2011). Innovation can be defined as adoption ability of a firm to adopt any change related to a product, process, system, policy, or service which is new to the firm (Calantone et al., 2002). Innovative capability means ability of a firm to continuously transform knowledge and new ideas into new products, processes and systems by evaluating opportunities in the market (Lawson and Samson, 2001). Therefore it is important to define innovation capability and the right effective factors of innovation capability such countries like as Turkey which has mostly SMEs.

This study aims to examine the effects of customer orientation, competitor orientation, technological orientation (milestones of strategic orientations) and innovation capability on firm performance. Research questions of the paper are How strategic orientations influence innovative capability? Does innovative capability affect firm performance?

This paper is structured as following: In the second section, constructs of the research model are explained and discussed under favour of the literature, and then research hypothesis are developed. In the third section, the methodology is explained. Afterwards, in the fourth section the model is tested via structural equation model by the help of data provided from detailed survey. Finally findings of the study is presented and discussed.

2. CONCEPTIONAL FRAMEWORK AND RESEARCH HYPOTHESES

A sustainable competitive advantage in dynamic markets depends on firms' ability to provide, integrate, and rearrange resources and abilities. companies can maintain competitive advantage and performance by means of knowledge and innovative capabilities Lisboa et al. (2011). Both customer and competitor orientations

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prompt companies to deploy innovative capabilities. While customer orientation involves an understanding of customers, competitor orientation entails attention to what competitors are doing. Extended customer understanding can result in the development of current and new products and it can strengthen a company's survival in the market (Zhou and Li, 2010). Responsiveness to competitors' actions may involve improving existing products and strengthening relationships with business partners.

2.1.1. Customer Orientation

Customer orientation is defined as ‘‘the set of beliefs that puts the customer’s interest first’’ (Desphande et al., 1993), or ‘‘firm’s ability and will to identify, analyze, understand, and answer user needs’’ (Gatignon and Xuereb, 1997).

Customer orientation refers to the business philosophy of putting customers at the forefront of strategic and tactical planning and decision-making in the hope of providing superior value and satisfaction (Noble et al. 2002).

Shapiro defines the customer orientation as to share information about customers in an organization, find the strategy to satisfy the market and practise all over the firm (Auh and Mengüc, 2005). According to Slater and Narver (1994), customer orientation is to understand the customer for creating values. Customer orientation is a duty of an organization to collect information about customers’ needs-wishes, define the strategy to meet customer needs and to put into practise (Mavondo, 2000). Customer orientation is to listen the customer wishes and claims, give high priority for after sales activities, search opportunities to give support for valuable products/service and to regular follow up of customer satisfaction level.

Customer oriented firm is a firm which can understand, define, analyse the customer needs and meet the customer requests (Gatignon and Xuereb, 1997). This means to put customer in high priority. It covers to create values for them by meeting their requests for existing needs and trying to determine future needs (Mavondo, 2000). In this case the aim is to protect current situation and act by considering next customers. Customer orientation is being proactive to meet urgent customer requests, focus on customer satisfaction and to supply continuous improvement (Han et al., 1999).

2. 1.2.Competitor Orientation

All firms need to follow the potential competitor’s actions which are in the market or can be in market to compete. In this scope it is needed to understand and follow competitor products, process (Mavondo, 2000). Competitor orientation is to define, analyse competitor actions and the react capacity (Gatignon and Xuereb, 1997). In other word it means to define competitors’ strong and weak sides in short term, understand the abilities and strategies of existing and potential competitors. All technologies that can meet customer request must be evaluated during the analysing of existing and potential customers (Narver et al., 2004). Competitor orientation focuses on an in-depth evaluation of competitors. Companies concentrate on competitor's goals, strategies, activities, products/services, resources and abilities through the information gathered from this evaluation (Olson et al.,2005a).

Competitor orientation involves, collect market outputs about customer and use sales power to regular follow up for competitor actions. Thus, firms can be obtain technological improvements to meet customer

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needs to have a fast action for opportunities and competitors threats (Siguaw and Diamantopoulos, 1995).

2.1.3. Technological Orientation

Technology orientation suggests that consumers prefer products and services of technological superiority. According to this philosophy, firms devote their resources to R&D, actively acquire new technologies, and use sophisticated production technologies (Gatignon and Xuereb, 1997). Accordingly, a technology oriented firm is one "with the ability and will to acquire a substantial technological background and use it in the development of new products". When the market environment is marked by rapid technological advances, the value and impact of prior technology deteriorates very quickly, firms must allocate more resources to technology development, experiment with new technologies, and manage uncertainty through innovations; otherwise, they will be driven out of the market due to increasingly obsolete technology (Gao et al., 2007). Technological orientation refers to the inclination of firms to learn and adopt the latest technologies in new product development and the commitment to R&D. It reflects a certain ''technology push'' philosophy inside of the firm, which often results in a dense emphasis on R&D, and on prioritizing state-of-the- art technologies in new innovations (Zhou et al., 2005).

Technological orientation can be defined as to give priority for research and development activates, to have strong R&D, close follow up of technological improvements, usage of complex technological methods to develop new products, quick integration of new technologies and to act proactive to develop new technologies and solutions (Hurley and Hult, 1998). Technological orientation reflects a firm's ability to adopt new and integrated systems and technology, and an ability to innovate with new products and manufacturing technology in order to keep ahead of the market (Hogan et al. 2011).

2.1.4. Innovation Capability

Terms such as innovation, innovation capacity, innovative capability and innovation capability appear in the innovation literature and have been used interchangeably (Hogan et al., 2011). Innovation is viewed as an evolutionary process within an organization to adopt any change pertaining to a device, system, process, policy, or service that is new to the organization (Yang et al., 2009). Hurley and Hult (1998) define firm innovativeness as openness to new ideas as an aspect of a firm's culture. Innovative capability is an internal ability that conditions the entire organization (Akman and Yılmaz, 2008). An innovation capability is defined as the ability to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders (Turker, 2012).

Innovative capability is defined as an important factor that facilitates an innovative organisational culture, characteristics of internal promoting activities and capabilities of understanding and responding appropriately to the external environment (Wang and Ahmed, 2004). While Koc (2007, p. 375) defined innovative capacity as to be "the continuous improvement of the overall capabilities and resources that the firm possesses to explore and exploit opportunities for developing new products to meet market needs", Chen (2009, p. 94) described innovative capabilities as a "firm's capabilities, grounded in the processes, systems, and organizational structure, which can be applicable to the product or process innovation activities".

Ngo and O'Cass (2009, p. 48) defined innovation-based capability as "the integrative process of

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applying the collective knowledge, skills, and resources of the firm to perform innovation activities pertaining to technical innovations (products and or services, and production process technology), and non-technical innovations (managerial, market, and marketing)". Hogan et al. (2011) defined innovation capability as "a firm's ability, relative to its ompetitors, to apply the collective knowledge, skills, and resources to innovation activities relating to new products, processes, services, or management, marketing or work organization systems, in order to create added value for the firm or its stakeholders."

2.1.5. Firm Performance

Studies about firm performance are based on two approaches. In first approach, firm performance is compared with competitor's performance by using subjective criteria. Second approach is using objective criteria's of firm performance. All these studies showed the relation between objective and subjective criteria's. Jaworski and Kohli (1993) has used mentioned two approach but find out that replies can be reliable with using subjective criteria. Slater and Narver (1994) have used subjective methods to evaluate business firm performance . There are criteria's that most commonly used scale of firm performance, ROA (return on assets), increase in sales, increase in profit, success of new product, overall performance of firm, and competitive advantage.

2.2.Research Hypotheses

According to previous literature, this study proposes a conceptual model as shown in Figure 1. The network of relationships among the variables in the model and the rationale for the proposed linkages are elaborated on below.

Matsuo (2006) identified a link between customer orientation and innovativeness, pointing out that customer orientation enforces salespeople's capacity to solve problems andenhances creativity. Appiah-Adu and Singh (1998), Kahn (2001), Gatignon and Xuereb (1997) and Grinstein (2008) found a positive relationship between customer orientation and innovation. Customer-focused culture enables innovation capability. A customer-focused company deals with a long term point of view rather than short term profits. So it is natural that a customer-focused company is more innovative than other non customer-focused companies (Han et al., 1999). According to some researchers, that customer orientation favors innovation (e.g., Atuahene-Gima, 1996; Hurley and Hult, 1998; Paladino, 2007; Theoharakis and Hooley, 2008). Study of Lisboa et al. (2011) confirms the role of customer and competitor orientations as precursors to innovative capabilities. Both customer and competitor orientations encourage firms to deploy exploitative innovative capabilities. Also, Akman and Yılmaz (2008) found a positive relationship between customer orientation and innovative capability in software industry.

H1: Customer orientation has a positive effect on innovation capability

Being competitor-focused comprises the endeavour to be better than competitors (Liu, 1995) and the effort to do different things in reacting to competitors. This could only be done by innovation. A competitor-focused culture enables achieving innovations (Han et al., 1999); because it lets the companies develop their capabilities by making them compare themselves with others, resulting in affecting positively the innovation ability. According to Lisboa et al. 2011), competitor orientation entails attention to what competitors are doing.

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Responsiveness to competitors' actions may involve improving existing products and strengthening relationships with business partners. Studies by authors such as Gatington and Xuerberb (1997), Hurley and Hult (1998), Augusto and Coelho (2007), and Paladino (2007) found significant relationships between competitor orientation and innovativeness. Therefore competitor orientation affects innovative capability positevely.

H2: Competitor orientation has a positive effect on innovation capability

Companies that have a strong technological aspect have, have also strong innovation ability at the same time (Ritter and Gemünden, 2004). Being technology-focused increases the company's innovation capability, enabling it to gain new technological information for creating new technical solutions to meet the new and potential requirements of the users. This results in an increase in the capability of developing new products (Atuahene-Gima and Ko, 2001). There is only a few studies that technological orientation has significant impact on innovation (e.g., Gatignon and Xuereb, 1997; Salavou, 2005; Hortinha et al., 2011).

H3: Technological orientation has a positive effect on innovation capability

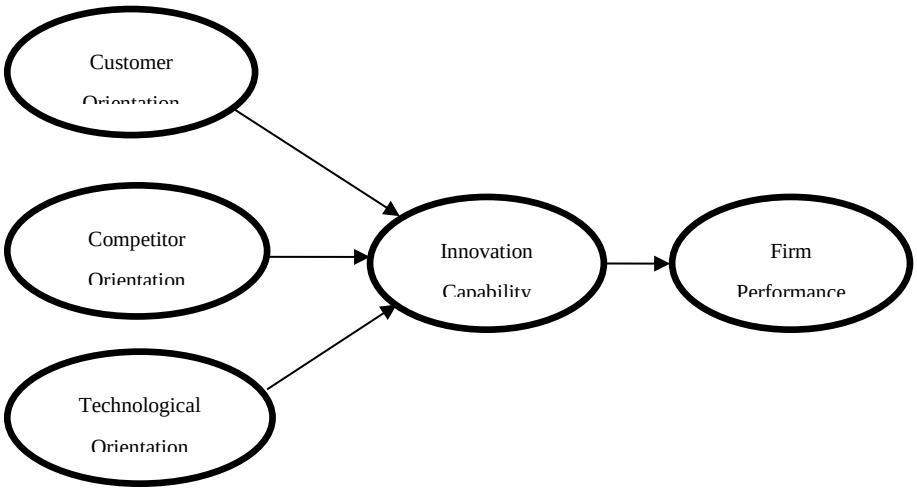


Figure 1. Research Framework

As Drucker put forward, innovation capability is the main determinant of the company performance. This approach has been verified in the innovation literature, and the companies have to be innovative to acquire and keep competition strength. Innovative companies show better performances (Calantone et al., 2002). Success of many companies has become more dependent on their ability to introduce more innovative products to the market (Mone et al., 1998). Innovation capability is the most important determinant of firm performance (Cooper, 2000). Well grounded theoretical and empirical research such as Han et al., (1998); Terziovksi and Samson, 2007; Calantone et al., 2002; Wang and Ahmed, 2004; Jimenez-Jimenez and Sanz-Valle (2010) has supported a positive relationship between innovation and organizational performance. In order to gain a

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competitive advantage and to survive, firms must be innovative.

H4: Innovation capability has a positive effect on firm performance

3.METHODOLOGY

3.1.Sample and Data Collection

This study aims to examine the impacts of customer orientation, competitor orientation, technological orientation on innovative capability and effect of innovation capability on firm performance. For this aim, a survey is planned. Quantitative research methodology was used in this study to collect primary data. The questions used this study wer formulated from existing measurements and information from the literature review. This study considered carefully considered questionnaire design such as wording, sequence and appearance. This study was conducted in Turkey. A questionnaire is prepared. The results presented in this study come from a questionnaire survey performed among managers of manufacturing firms in Kocaeli, Turkey and 162 usable questionnaires were obtained in order to use for statistical analysis.

The profiles of respondents' firms and their characteristics are displayed in Table 1.

Table 1. Respondents' Profile

	Percent of respondents
Age of firm	
1-10	19.7
10-20	16.3
20-30	32.8
30-40	21.4
Above 40	9.8
Total	100.0
Number of employees	
Less than 50	52.5
51-100	23.0
101-150	3.3
151-200	8.2
Above 200	13.0
Total	100.0
Type of business	
Machine	32.5
Electricity	6.4
Automotive	11.2
Treatment	8.1
Other	41.8
Total	100.0

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3.2. Research Methods

Aim of this study is to examine the impacts of customer orientation, competitor orientation, technological orientation and innovation capability on firm performance. Therefore, the research is based on three steps. In first step; data were tested by exploratory factor analysis and reliability test and It was seen that the results are in proper values. In second step data were tested by confirmatory factor analyses to see and evaluate if observed variables show latent variables. Structural equation modeling was used to estimate relations between latent variables in last step. All analyses were carried out using the SPSS 17.0 for Windows and LISREL 8.51 statistical packages.

4. RESULTS OF EMPIRICAL ANALYSIS

4.1. Exploratory Factor Analysis

In order to validate the measurement scale and its structure, a series of exploratory and confirmatory factor analyses were performed (Bearden et al., 2001). First we used statistical software of SPSS version 17.0 to performthe initial exploratory factor analysis (EFA) and than we used LISREL 8.51 was used to estimate the various confirmatory factor analysis (CFA) procedures.

A series of exploratory factor analyses were initially undertaken on the analysis sample using principal component analysis and varimax rotation as there was no a priori reason to assume the dimensions were not related. The Kaiser–Meyer–Olkin Measure of Sampling Adequacy was 0.83, suggesting that factor analysis was appropriate.

An iterative process was used to eliminate items with low loadings or high cross loadings (Hair et al., 2006), which led to the retention of 7 items shown. The final factor analysis found five factors with eigenvalues greater than one, that together explained 67.3 % of the total variance. The final factor analysis results are presented in Table 2.

4.2. Confirmatory Factor Analysis

To evaluate the scale's factor structure, a confirmatory factor analysis was performed on the sample. As a result, some items were eliminated, resulting in the 18-item five-dimensional scale that is shown in Figure 2. As presented Figure 2, The hypothesized model, presented in Figure 2, implies a measurement model where there are five latent variables (constructs) composed of their multiple corresponding indicators (measures or items). The five constructs in the measurement model, namely, customer orientation, competitor orientation, technological orientation, innovation capability, and firm performance, are inter-related, as indicated by the two-headed arrows.

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Table 2. Exploratory factor analysis for items of the study

Question Number	Item	Explanation	Factor Loadings
		Customer Orientation (α=0.7353)	
Q1	CO1	Importance of customer complaints and seggestions	0,760
Q2	CO2	After Sales service	0,745
Q5	CO3	Keep promises given to customer	0,818
Q6	CO4	Correct understanding of customer needs and expectations	0,747
		Competitor Orientation (α=0,8173	
Q7	CTO1	Following competitors' efforts in the market	0,819
Q8	CTO2	Acquiring competitor knowledge	0,839
Q10	CTO3	Searching continuatlly competitive opportunities in the market	0,761
		Technological orientation (α=0,7607	
Q12	TO1	Being pioneer in the market by developing new products	0,697
Q13	TO2	Integrating new technologies rapidly	0,689
Q16	TO3	Using advanced methods and techniques to develop new products	0,702
		Innovative capability (α=0,8423)	
Q17	IC1	An organizational culture supporting and encouraging innovation	0,716
Q18	IC2	Capability to use knowledge related product development activitiesfrom diferent resources	0,776
Q20	IC3	Participations of employees to product/ process development facilitites	0,762
Q21	IC4	Evaluating new ideas of customers, suppliers for product/process innovations	0,745
		Firm peformance (α=0,8462)	
Q22	FP1	General situation of the company	0,768
Q23	FP2	Increase in market share when compared sector averages	0,834
Q24	FP3	Increase in profits when compared sector averages	0,723
Q25	FP4	Increase in sales when compared sector averages	0,734

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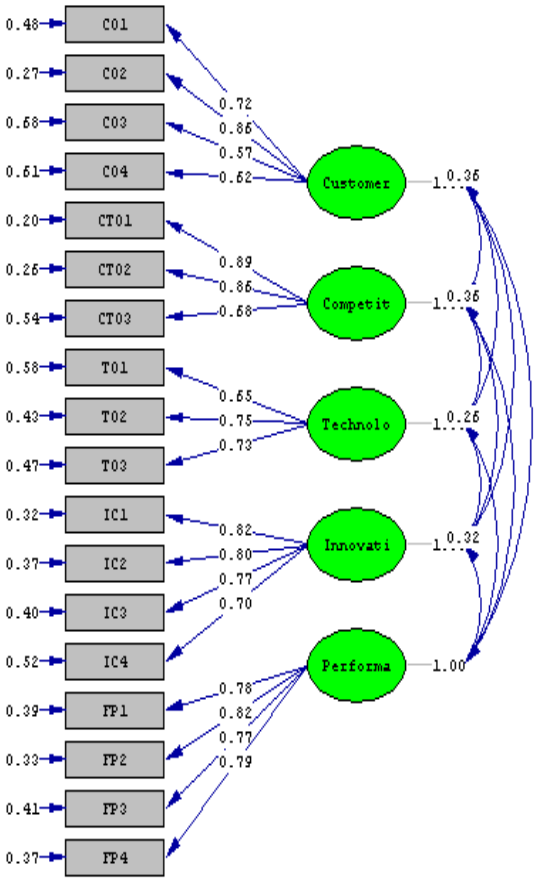


Figure 2 Path Diagram for the Measurement Model

Table 3 shows the results of confirmatory factor analysis. As seen from Table 3 all ways (hypothesis) are significant on 0.05 priority level and proved for each uni-dimensionality assumption of latent variable. Furthermore, the standardize analysis results shows us that each observed variable is a good representative. The standardized analysis results are high and addition to this each R^2 of observed variable is above 0.3 which shows us the model is certain.

Measurement model provided an adequate model fit (χ^2 (125) = 138.97, p = 0.186>0.05), indicating that the measurement model was purified and acceptable. The goodness-of-fit statistics of measurement model are given as ; Root Mean Square Error of Approximation (RMSEA): 0.027, Comparative Fit Index (CFI): 0.99, Goodness of Fit Index (GFI): 0.91. Consequently, the normed chi-square statistic (χ2/df) was examined. In this case, the normed chi-square (χ^2/df = 1.11) was acceptable (Bollen, 1989).

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Table 3. Parameter estimate, standard errors, critical ratios, and R^2 for the measurement model

Latent variable and Item	Std. factor loading	Std. error	C.R.	R^2
CUSTOR-Customer Orientation				
CO1	*0.72*	*0.040*	*9.50*	*0.52*
CO2	*0.86*	*0.037*	*11.92*	*0.73*
CO3	*0.57*	*0.056*	*7.13*	*0.32*
CO4	*0.62*	*0.044*	*7.98*	*0.39*
COMPOR-Competitor Orientation				
CTO1	*0.89*	*0.073*	*12.96*	*0.80*
CTO2	*0.86*	*0.072*	*12.31*	*0.74*
CTO3	*0.68*	*0.091*	*9.16*	*0.46*
TECHOR-Technological Orientation				
TO1	*0.65*	*0.070*	*7.82*	*0.42*
TO2	*0.75*	*0.069*	*9.22*	*0.57*
TO3	*0.73*	*0.088*	*8.92*	*0.53*
INCAP-Innovation Capability				
IC1	*0.82*	*0.053*	*11.80*	*0.68*
IC2	*0.80*	*0.056*	*11.27*	*0.63*
IC3	*0.77*	*0.056*	*10.83*	*0.60*
IC4	*0.70*	*0.057*	*9.38*	*0.48*
PERFOR-Firm Performance				
FP1	*0.78*	*0.060*	*10.96*	*0.61*
FP2	*0.82*	*0.059*	*11.75*	*0.67*
FP3	*0.77*	*0.064*	*10.75*	*0.59*
FP4	*0.79*	*0.063*	*11.21*	*0.63*

C.R. Critical Ratio

4.2. Structural Equation Modeling

After confirming and establishing a good model fit for the measurement model, we proceeded to assess the proposed structural model and examine the hypothesized relationships. The relationships to be tested with structural equation modeling are shown in Figure 3.

Innovation capability is an intermediate variable of customer orientation, competitor orientation, and technological orientation on firm performance. In other

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words, three external variables (customer, competitor and technological orientation) are carrying over their effects on firm performance by innovation capability. Table 4 displays a summary of the data related to testing the hypothesized relationship shown in Figure 3.

Table 4. Summary of relationships between latent variables

Relationship	t-value	Significant	Path coefficient
Customer-Innovati	*5.29*	*Yes*	*0.48*
Competit-Innovati	*1.46*	*No*	*0.12*
Technolo-Innovati	*2.81*	*Yes*	*0.26*
Innovati-Perform	*3.99*	*Yes*	*0.35*

The relations between Competitor Orientation and Innovation Capability are statically incoherent; therefore it is taken from the analysis.

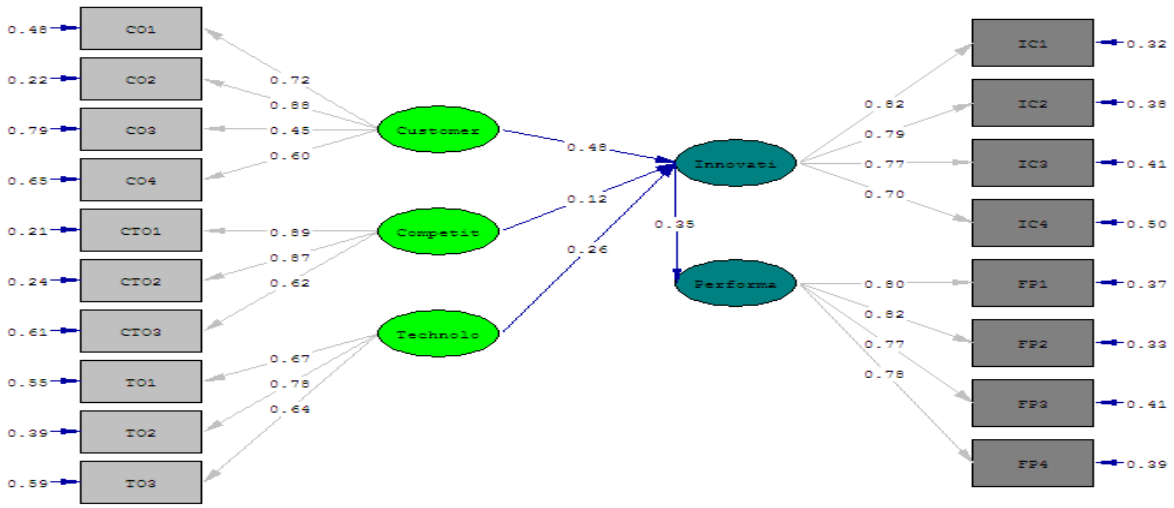


Figure 3. Initial Research Model of SEM

Mediation tests were done with innovation capability between customer orientation, competitor orientation, technological orientation and firm performance as innovation capability is an intermediate variable. Mediation tests were based on three steps. In first step, customer orientation is directly connected to the firm performance in one path and in second path customer orientation to innovation capability. Than both paths (customer orientation-innovation capability and customer orientation-firm performance) were statistically analysed if they are significant or not. As a result of this test; using the path from customer orientation to firm performance was not significant. Therefore it is seen that innovation capability is carrying the effect of customer orientation on firm performance. Technological orientation is directly connected to firm performance in second step. Results are shown that, again innovation capability is carrying the effect of technological orientation on firm performance.

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In the last step, competitor orientation is connected to firm performance directly. Statistical analyses shown that path between competitor orientation and firm performance is significant. There is no effect of competitor orientation on firm performance via innovation capability. Final results of mediation tests are shown in Figure 4.

The goodness-of-fit statistics of final model which tested by structural equation modeling is in below. The overall model fit can be assessed using five goodness-of-fit indices. These statistics with their recommended values are provided as following (Jöreskog and Sörborn, 1993; Byrne, 1998): (1) The smaller value of $\chi 2$, the better goodness-of-fit; (2) $\chi 2$/degree of freedom<3; (3) Root mean square error of approximation (RMSEA) <0.08 (4) Comparative fit index (CFI) >0.9; (5) Goodness of fit index (GFI)>0.9.

χ^2 = 151.70, df = 141, χ^2 /df = 1.07, RMSEA = 0.022, CFI = 0.99, GFI = 0.90 and p (probability level) = 0.254. These statistics point out that goodness-of-fit statistics of the measurement model are in proper level.

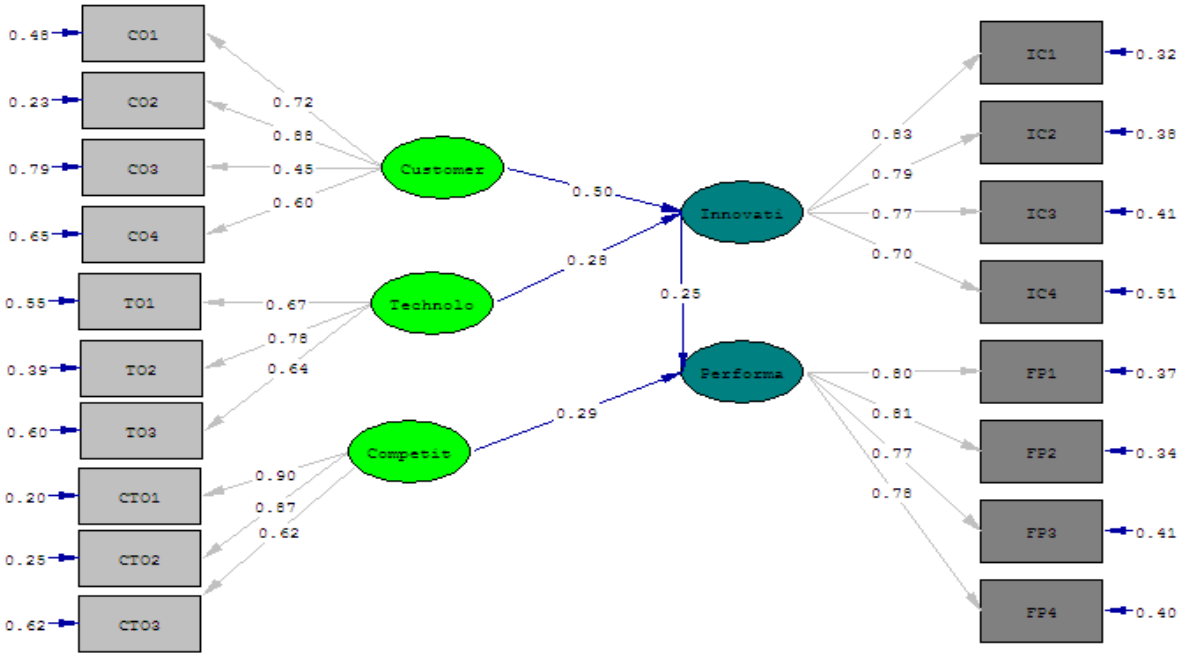


Figure 4. Final research model of SEM

5.CONCLUSIONS

Innovation capability improvement is strategic way of the firms to be competitive; therefore firms must give high priority to define right factors which has an impact on innovation capability. They should define budget of timing, cost, and human resources for development of innovation capability.

This study evaluates the effect of customer, competitor and technological orientation on firm performance by considering the role of innovation

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capability. Following the literature, this study models the effect of customer, technological and competitor orientation on firm performance directly and indirect via innovation capability.

Customer orientation is positively related to innovation capability (coefficient =.50, t = 5.63, P < .01). Studies such Hurley and Hult (1998), Paladino (2007), Theoharakis and Hooley (2008), Akman and Yılmaz (2008), Lisboa et al. (2011) as Technological orientation is positively related to innovation capability (coefficient =.28, t = 3.07, P < .01) . Gatignon and Xuereb (1997), Salavou, (2005), Hortinha et al. (2011) support this finding that technological orientation has significant impact on innovation are consistent with our results and support our findings.

The findings of this study is the effect of customer, competitor and technological orientation on firm performance is positive. Furthermore, the effect of customer and technological orientation on firm performance is indirect-carried by innovation capability but competitor orientation has a direct effect on firm performance.

The competitor orientation affects firm performance positively and significantly in contrast hypothesis 2 (coefficient =.29, t = 3.35, P < .01). It is not surprising because firms are always following their competitor's products, sales strategies and status in market as competitive behaviour. Noble et al. (2002) clarify that the competitor orientation has a significant effect on firm performance. According to the Kahn the protection effort of a firm has a positive effect on firm performance (Kahn, 2001).But they are mostly blaming to being customer orientated and technological oriented to be competitive.

Innovation capability is positively related to firm performance (coefficient =.25, t = 2.85, P < .01). This finding is consistent with literature (i.e. Han et al., (1998); Terziovksi and Samson, 2007; Calantone et al., 2002; Wang and Ahmed, 2004; Jimenez-Jimenez and Sanz-Valle (2010).

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