

The effects of environmental factors and Market orientation's indexes on manufacturing performance of Iranian SMEs

Fakhraddin Maroofi¹

Corresponding Author, Department of Management, University of Kurdistan

Email: maroofif2900@gmail.com

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Abstract

The present paper attempts to investigate the impact of market orientation indices and environmental variables on production performance. The market orientation indices in this study include: customer orientation, competitor orientation and inter-functional coordination, which concerned with environmental variables some factors such as competitive intensity, market turbulence, technological turbulence and market growth are considered. The current study is applied in terms of objective and it is descriptive-measurable and of a correlative type in terms of data collection. The statistical sample is 265 **SMEs**. The research hypotheses were tested by Spearman correlative coefficient and the robustness and the model was evaluated by using structural equations modeling. The results indicated that all market orientation indices exert a positive and significant impact on production performance, but among environmental variables the only factor influencing market is market growth. Therefore, it should be noted that a high level of environmental exuberance and complexity requires firms act in a more responsive manner to these variations. Market-oriented firms have a better understanding of external environment and consequently they are more capable of responding to external environment demands.

Keywords: Market orientation's indexes, environmental variables, manufacturing performance, Small and Medium Enterprises, Structural Equation Modeling

1. Introduction

Since companies often experience their infancy, youth, adulthood and ageing naturally, it is necessary to create an appropriate bed for them. All the active companies are really alive. A considerable number of firms only deal with their routine activities. The market factor ruthlessly guides the survival struggle phenomenon. Critical factor for all companies, especially Small and Medium Enterprises is that how they are able to follow fundamental

objectives (survival, growth and profitability) in their life cycle (Naydoo, 2010). In order to survive and to achieve success, a firm must endeavor to achieve competitive advantage. Therefore, stepping towards this goal requires a new attitude and culture all over our organization to consider market and customers from one hand and to focus on competitors' mobility on the other hand. So this task must not be regarded as the mere duty of market orientation and all the members of organization and all inter-organizational units must be responsible and unanimous in this regard (Beygi, 2002). In fact, the recognition of these factors and presenting effective strategies to deal with them play significant roles in the success of these firms in target market and so an increasingly demand to market orientation is felt. By the better identification of customers' demands, competitors' activities and effective factors on market and more effective distribution of this data in all parts of firm, has more capacity to survive in competitive market.

It could be said that market orientation is a critical instrument and activity in organizations and it assumes that companies do achieve their goals only when customer needs and wants are met. The market orientation is the heart of modern marketing; Narver and Slater consider market orientation as a behavioral phenomenon that is composed of three components: customer orientation, competition orientation and inter-functional coordination tasks (Narver and Slater, 1990). With respect to the manufacturing process, research shows that environmental factors related to market dynamics, competition and technological changes significantly affect a firm's ability to manage its production process efficiently. For example, when competitors' products change rapidly or when customers' needs fluctuate, it becomes important to understand these changes in order to suitably respond to them. Market orientation provides firms with the ability to deal with these exigencies.

The present study underlines the significant role of environmental variables and factors (competitive intensity, market turbulence, technological turbulence and market growth) which are described as follows.

In general, authors attribute market orientation indices and environmental indices to the increase of performance in these firms, so there is a justified relationship between the firms and their production performance. Therefore we follow the evaluating of relationship or non-relationship of each market orientation index and environmental variables with production performance, which this question raises, how much market orientation indices can affect production performance; and also how much above-mentioned environmental variables can enhance or deteriorate market orientation and production performance. Finally, the aim of this study is to obtain a model of the relationship between market orientation and environmental variables on production performance through effective indices. Therefore, all significant factors are maintained in the model and ultimately the optimized model is selected through model selection methods using software.

2. Literature review

2-1. Market orientation

The theoretical conceptualizations of the concept of market orientation can be grouped in two broad categories – behavioral approach and cultural approach. Proponents of the behavioral approach (Kohli and Jaworski, 1990) theorize market orientation as a set of ongoing activities to improve customer satisfaction. On the other hand, proponents of the cultural approach (Narver and Slater, 1990) emphasize on the shared values and beliefs in a firm that put the customer's interests over and above everything else. Even with the theoretical differences, the operationalization of the market orientation is not much different in the two approaches. While Kohli and Jaworski (1990), based on the behavioral approach,

operationalized market orientation as comprising intelligence generation, intelligence dissemination, and organization wide responsiveness to it. Narver and Slater (1990), based on the cultural approach, operationalized market orientation as comprising customer orientation, competitor orientation and inter functional coordination. Both these approaches are similar in the sense that customers remain the key element of market orientation philosophy. In this study, we rely on Narver and Slater's (1990) cultural approach as it encompasses the behavioral dimensions needed to achieve market orientation. Narver and Slater (1990) define market orientation as an organization wide culture that helps firms undertake the necessary behaviors needed for the creation of superior customer value and business performance. They have proposed that market orientation consists of three behavioral components: customer orientation, competitor orientation, and inter-functional coordination. Customer orientation refers to understanding target buyers now and over time in order to create superior value for them continuously. Competitor orientation pertains to understanding current principal and potential competitors, their strengths, weaknesses, and capabilities. Inter-functional coordination involves the coordinated use of resources in creating superior value for target customers. A market-oriented firm is able to retain existing customers by keeping them satisfied and loyal, attract new customers, accomplish the desired level of growth and market share, and consequently achieve desirable levels of business performance (Homburg and Pflesser, 2000).

2-2 .manufacturing performance

For small and medium-sized enterprises (SMEs), which are the focus of this study, manufacturing is one of the key functions, ultimately determining the growth, survival and profitability in the long run. This makes it important to assess manufacturing performance for SMEs (Vickery et al., 1993). There are four important components to manufacturing performance – cost, quality, delivery and flexibility (Hayes and Pisano, 1994). The cost component includes the cost of material, labour, overhead, and other resources used in the production process (Miltenburg, 1995). There is always pressure to reduce the manufacturing cost as every dollar saved in manufacturing provides an opportunity to not just increase the profitability, but also pass on the benefits to the customers and thereby increase the firm's competitiveness (Miller and Roth, 1994). Quality is the extent to which materials and operations conform to specifications and customer expectations (Miltenburg, 1995). Delivery refers to the reliability and value of delivery time, whereas flexibility refers to the ability of a firm to change its product mix and production volumes in response to the changing needs of the customers (Miltenburg, 1995). We conceptualize these four dimensions to make up the construct of manufacturing performance. In the following section, we elaborate how each dimension of market orientation helps firms achieve superior manufacturing performance.

2-2-1. Market orientation indexes and manufacturing performance

Market orientation can influence a firm's manufacturing performance in several ways. Firms with higher level of customer and competitor orientation are likely to have a better understanding of the key elements along the buyers' value chain, competitors' moves and how these change over time (Day and Wensley, 1988). Such understanding enables a firm to create and deliver superior customer value and improve the manufacturing performance. Likewise, a high level of coordination between different departments is likely to facilitate the sharing of important information between various departments for fast and efficient response to the external stimuli (Tyler and Gnyawali, 2002). The strength of a single

department may be limited, but an integration of various departments can achieve much more than the summation of single units working alone (Ruekert and Walker, 1987).

A greater level of market orientation also has a positive influence on the four dimensions of manufacturing performance – cost, quality, delivery and flexibility. Subramanian and Gopalakrishna (2001) argued that a market-oriented firm is likely to use its market information to achieve efficiency in its manufacturing operations. Market oriented firms are more likely to understand the importance of providing better products along with reducing customers' acquisition and usage costs. The efficiency and cost reduction that firms achieve through their understanding of the customers helps in enhancing the overall firm productivity. In addition, a better understanding of customers' expectations and the products, which competitors have on offer, helps firm produce superior quality products. With respect to the delivery aspect, firms need to ascertain the right delivery schedules, understand the importance of meeting the delivery schedule and coordinate with the channel partners to ensure timely delivery. Market orientation helps in each of these aspects. For example, customer orientation helps in ascertaining the delivery expectations of the customers, competitor orientation helps in benchmarking against the competitors to reach the customers in a more efficient manner, and inter-functional coordination ensures that the delivery objectives are well communicated to all the parties involved (Morash and Clinton, 1998). Finally, flexibility is particularly important for small firms as these firms often do not have resources needed to have a vast array of product lines all the time. Often small firms compensate their lack of resources by being nimble and flexible in the market place. However, firms cannot be flexible unless they understand their customers, have a good knowledge of competitors' current and future moves, and have a great deal of coordination within the firm. Thus, market orientation helps in achieving a greater level of flexibility in the manufacturing process.

In summary, the previous discussion suggests that firms with greater level of customer orientation, competitor orientation and inter-functional coordination are likely to do better in terms of achieving cost efficiency, providing superior quality products in a timely manner, and in achieving a greater level of flexibility. This leads us to the following hypotheses:

H1: Customer orientation has a positive and significant impact on production performance.

H2: Competition orientation has a positive and significant impact on production performance.

H3: Inter-functional coordination has a positive and significant impact on production performance.

2-3. Role of environmental factors

The role of environment as an important contingency factor has been long espoused by organizational scholars (Dess and Beard, 1984). External environment puts constraints on a firm's strategic actions and the benefits a firm can derive from those actions. A greater level of environmental dynamism and complexity requires that firms be more responsive to these changes. External environmental poses additional challenges for SMEs as SMEs do not always have resources to counter the external pressures (Bamford et al., 1999). Importance of being market oriented increases under such conditions due to the fact that a market oriented firm has a better understanding of the external environment, and consequently, such firms can better respond to the demands of the external environment (Subramanian and Gopalakrishna, 2001). In the following sections, we elaborate on the role played by the four dimensions of external environment in affecting the market orientation and performance relationship.

2-3-1. competitive intensity

Competitive intensity refers to extent of rivalry among different players in an industry. According to Porter (1980), competitive intensity is an important determinant of firm profitability in a given industry. The level of competitive intensity determines a firm's choice of strategic actions and responses (Chen and Miller, 1994). When the level of competitive intensity is low, firms can perform well even if they are not highly market oriented (Gatignon and Robertson, 1991; Kohli and Jaworski, 1990). This is because, in an environment of low competitive intensity, customers do not have much choice and they remain stuck with whatever is available in the market place. In contrast, under conditions of intense competition, customers have many options, and will reject the products and services that do not meet their expectations. Consequently, it becomes important to not only have a high level of competitor orientation, but also a high level of customer orientation to better understand customer expectations, and a high level of inter-functional coordination to effectively respond to the challenges of the market place (Jaworski and Kohli, 1993). Therefore, if competitive intensity is very high in the industry and there are a lot of competitors in the desired industry, the company will be more successful in quick reaction to environmental changes. In order to win in among competitors, manufacture products in accordance with customers' needs. Based on matters provided, following hypothesis is presented:

H4. Competitive intensity has a positive and significant impact on production performance.

2-3-2. market turbulence

Market turbulence refers to the level of instability in the external environment which forces firms to change their strategies in the face of changing customer needs (Golden et al., 1985). In an environment characterized with a high level of market turbulence, products and production processes become obsolete very fast, forcing firms to change their product lines and processes. The introduction of new products is partly driven by innovations from other competitors and partly because of the demand from customers. A good understanding of competitors' actions and customers' preferences becomes very important for firms when the level of market turbulence is high. Market orientation helps firms develop the ability to adapt and respond to the challenges from competitors and the evolving needs of customers in a turbulent environment (Davis et al., 1991). On the contrary, in a stable environment, where customers' needs and preferences do not change frequently, firms do not have to be market oriented (Appiah-Adu, 1998). If company customers always are tendency to look for new products and customer preference varies toward products over time, companies must monitor their production strategies constantly, go forward in coordination with customers So that will remain competition arena. Based on presented issues, therefore, following hypothesis is provided:

H5. Market turbulence has a positive and significant impact on production performance.

2-3-3. technological turbulence

Technological turbulence refers to the rate of technological change. The importance of technological turbulence emanates from the fact that technology has emerged as a major source of competitive advantage in the past decade (Lengnick-Hall, 1992). Weerawardena and O'Class (2004) suggested that firms that actively engage in learning changing customer preferences and competitor behavior, and integrate such knowledge in the production process can outperform their counter parts, which do not care about technological

developments. However, effectively integrating technological considerations into corporate processes is a challenging task, as this requires coordination of multiple functions, including technical, marketing, financial and human resource management. The challenges associated with managing technology are compounded by several factors, such as the complexity and pace of technology development, costs associated with such development, high failure rate when it comes to commercialization of technology and acceptance of end products by the customers (Steele, 1989). A greater level of market orientation helps firms in effectively dealing with the challenges arising due to technological turbulence. For example, the failure in commercialization of new technologies, and the costs associated with these activities can be minimized if firms can integrate the technological knowledge with the knowledge of customers' expectations. Such integration, however, requires a great level of understanding of not only what customers expect and what the competition has to offer, but also a great level of coordination between different departments. On the other hand, when the technological turbulence is low, firms can keep their product offerings stable, and can do well even without a very high level of market orientation. If the company does not care about the technological development and does not update their products to keep pace with technological progress, the company may lose its customers. This leads us to the following hypothesis:

H6. Technological turbulence has a positive and significant impact on production performance.

2-3-4. Market Growth

In general when market attractiveness of local markets, that is, market size is large and market growth rate is fast, business performance of overseas subsidiary will be improved. If market demand exceeds supply, consumers are inclined to accept products and service with ease (Yonggyu, 2003). The firm could give little attention about market orientation if market demand is large. Because demand exceeds supply by large market demand, consumers are inclined to accept products and service with ease. To the contrary, small market demand makes the firm concentrate on market orientation more (Kohli and Jaworski, 1990; Slater and Narver, 1994). The market growth is measured as market size, the extent of market growth, and the degree of consumers' interest. If a company has consumers that interest its products, and the company markets are grows well, the company will have a competitive advantage compared with competitors. As a result the company has vast market and for the considerable growing, it should constantly monitor their production performance. Thus, on the basis of presented issues, following hypothesis is provided:

H7. Market growth has a positive and significant impact on production performance.

3. Concept model

Theoretical framework is a conceptual model based on theoretical relationship among a number of factors which are considered important in relation to problems under study. This theoretical framework is circulated by reviewing research records in the subject reasonably. The present study conceptual model is a combination of the model presented by Gaur and his colleagues (2011) and Yung Yu in (2003) which is applicable to measure the effect of market orientation indices and environmental variables on production performance (Fig. 1):

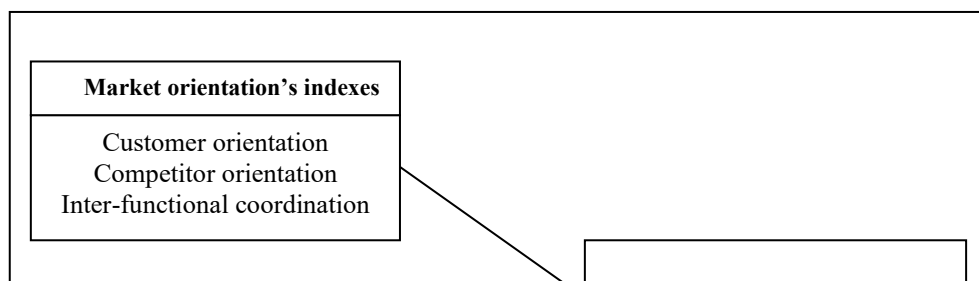


Figure 1: research conceptual model

4. Materials and methods

This research is an applied one in terms of its aim and descriptive- survey in terms of the type of data, in which relationship by using correlation test and especially based on structural equations model. Using SPSS software, Spearman's correlation coefficient was used to examine relationships between independent and dependent variables and to test research hypothesis. Multiple regression models were used to test the set of cause-and-effect relationships between variables and components studied. And, finally, in order to identify optimal model, the relationships between variables were modeled by structural equations AMOS software. In order to know how well a model performs, especially in comparison with other possible models, in terms of explaining a set of observed data, the ratio of the R^2 to the degrees of freedom (R^2/df), the root-mean square error of approximation (RMSEA), the root mean square residual (RMR), the goodness-of-fit index (GFI), the adjusted goodness of fit index (AGFI), the normed fit index (NFI), the comparative fit index (CFI), increasing fit index (IFI), were used.

A questionnaire is the information source used to test said hypotheses, therefore, research method is based on field research. Data required to test questionnaire research hypotheses by using five-degree Likert spectrum (from very low to very high). We used Narver and Slater's scales (1990) to measure customer orientation, competitor orientation and inter functional coordination and Jaworski and Kohli's (1993) scales to measure the level of competitive intensity, market turbulence and technological turbulence and Yonggyu (2003) scales to measure market Growth .Finally we measured manufacturing performance by using four items relating to cost, quality, delivery, and flexibility. Cua et al. (2001) used these items to measure the manufacturing performance of a firm.

Questionnaire validity was confirmed by sampling opinions from several experts. Also, in order to test reliability, one primary sample including 30 questionnaires was pre-tested and then the degree of confidence coefficient by method of Cronbach's alpha, which was 0/873 totally for this questionnaire. For separated variables of customer orientation, competitor orientation ,inter-functional coordination, competitive intensity, market turbulence, technological turbulence and the market grows, Cronbach's alpha was obtained at 0/696, 0/677, 0/824, 0/604, 0/701, 0/562, 0/476 and 0/802 respectively.

The present study statistical community includes 855 small and medium active enterprises in Kermanshah province. In order to select sample size of each class, we used appropriate

allocation method. In this study, there are five categories of food and medication; non-metallic mineral; chemical and cellulose; textile, leather and clothing; metal, power electronics and automobiles, which the volume of the sample in each category is 59, 74, 70, 7 and 55, respectively, and a total of 265 questionnaires were distributed between the top and middle managers of small and medium enterprises in Kermanshah.

5-1. Research finding

In present research, respondents indicated their sex, education, the number of personnel, job background, type of company (food and medication; non-metallic mineral; chemical and cellulose; textile, leather and clothing; metal, power electronics and automobiles), which was provided in the form of closed responses. In relation to 265 questionnaires distributed, results indicated that majority of respondents were males (73.8%), having B.A degrees (63%), the number of personnel between 10 to 19 (32%), the job background between 1 to 3 years (54.3%), from non-metallic mineral companies (27.9%).

5-2 Data analysis

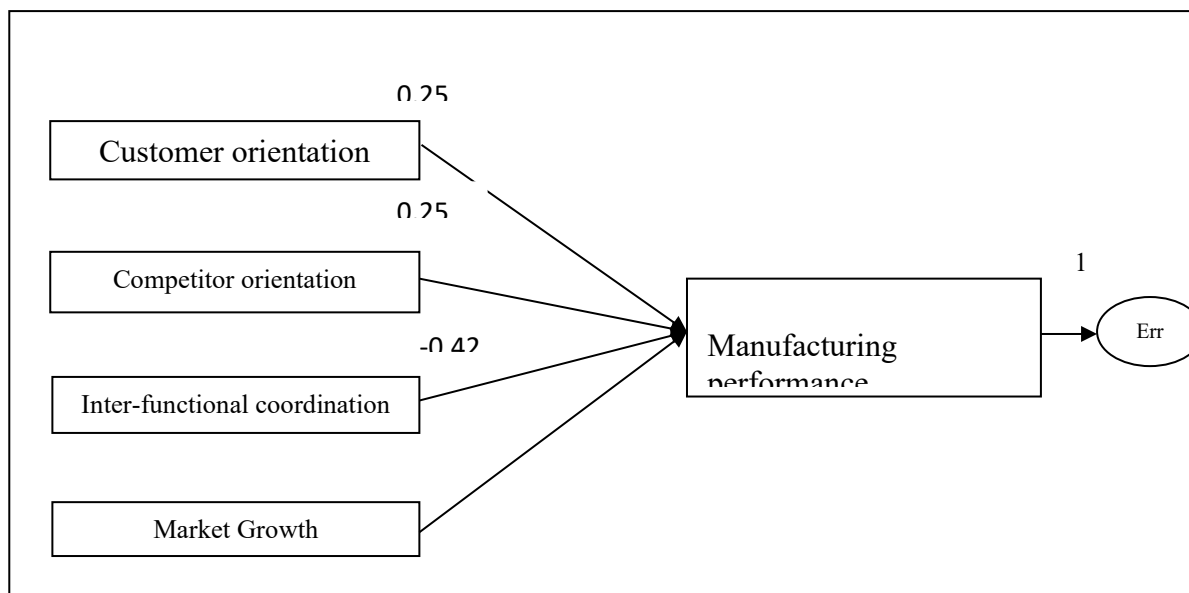
Spearman's correlation coefficient was used to test hypotheses. The first hypothesis indicates that, at significance level (0.000), correlation coefficient between customer orientation and manufacturing performance is 0.291 for which calculated significance level is less than 0.05, therefore, there is a significantly positive correlation between customer orientation and manufacturing performance, that is, in small and medium-sized enterprises, manufacturing performance increases as customer orientation increases. Results obtained from the second hypothesis show that, at significance level (0.000), Coefficient of correlation among variables is 0.330. Therefore there is a significantly positive correlation between competitor orientation and manufacturing performance, that is, increased actions of competitor orientation lead to an increase in manufacturing performance. The results from third hypothesis indicate that the significance level is (0.169) and correlation coefficient between variables is 0.850 and as the calculated significance level is higher than .05, it could be said there isn't a relationship between inter-functional coordination and production performance. Results obtained from the fourth hypothesis show that, at significance level (0/007), Coefficient of correlation among variables is 0/165. Therefore there is a significantly positive correlation between competitive intensity and manufacturing performance, that is, increased actions of competitive intensity lead to an increase in manufacturing performance. The fifth hypothesis indicates that, at significance level (0/415), coefficients of correlation between variables is -0.050, so there isn't a significantly positive correlation between market turbulence and manufacturing performance. Results obtained from the sixth hypothesis shows that, at significance level (0/657), coefficient of correlation among variables is -0/027, and since the significance level is more than 0.05, it is concluded that, there is not a significant and positive correlation between technological turbulence and manufacturing performance. The results from seventh hypothesis indicate that the significance level is (0.000) and correlation coefficient between variables is 0/449 and as the calculated significance level is less than .05, it could be said there a relationship between Market Growth and production performance , that is, increased actions of Market Growth lead to an increase in manufacturing performance. In general, results and finding obtained from the research hypotheses testing are summarized in table1.

Table1. Results of testing research hypotheses

<i>Results</i>	<i>The correlation coefficient</i>	<i>Sig</i>	<i>Research hypotheses text</i>	<i>Hypotheses</i>
<i>Confirmed</i>	0/291	0/000	There is a significantly positive relationship between customer orientation and manufacturing performance.	<i>Hypothesis1</i>
<i>Confirmed</i>	0/330	0/000	There is a significantly positive relationship between competitor orientation and manufacturing performance.	<i>Hypothesis2</i>
<i>Refused</i>	0/085	0/169	There is a significantly positive correlation between inter-functional coordination and manufacturing performance.	<i>Hypothesis3</i>
<i>Confirmed</i>	0/165	0/007	There is a significantly positive correlation between competitive intensity and manufacturing performance.	<i>Hypothesis4</i>
<i>Refused</i>	-0/050	0/415	There is a significantly positive correlation between market turbulence and manufacturing performance.	<i>Hypothesis5</i>
<i>Refused</i>	-0/027	0/657	There is a significantly positive correlation between technological turbulence and manufacturing performance in distribution companies.	<i>Hypothesis6</i>
<i>Confirmed</i>	0/449	0/000	There is a significantly positive correlation between market Growth and manufacturing performance.	<i>Hypothesis7</i>

6. Analysis of original model course and general fitness of research model

In present model, we are going to study relationship among independent variables of customer orientation, competitor orientation, inter functional coordination, competitive intensity, market turbulence, technological turbulence and market Growth and dependent variable of manufacturing performance. To this end, we use multiple regression model, therefore, our targeted model is as follows (figure 2):



n 40

Figure2. Final model of research

Figure2. Final model of research

The diagram presented in Figure 2 is that the regression coefficients, For example, it could be stated customer orientation as much as 0/25, competitor orientation by 0/25, the inter-functional coordination - 0/42 market growth rate of 0/40 are associated with the production performance. However, results indicate that competitive intensity, market turbulence, technological turbulence have no significant relationship with production performance. Following criteria are used to examine appropriateness of the model (Table2):

Table2. Measure of final model fitness

index title	magnitude (value)	acceptable range	result
$\frac{x^2}{df}$	1/749	$\frac{x^2}{df} < 3$	Model confirmation
RMSEA	0/053	MSEA < 0.08	Model confirmation
RMR	0/016	RMR \geq 0	Model confirmation
GFI	0/989	GFI > 0.09	Model confirmation
AGFI	0/942	AGFI > 0.85	Model confirmation
NFI	0/986	NFI > 0.90	Model confirmation
CFI	0/994	CFI > 0.90	Model confirmation
IFI	0/994	IFI > 0.90	Model confirmation

The estimation results (model fitting) indicate the suitability of the indices. Based on the results for this model, statistics degree χ^2 is 21.242 and the freedom degree is 7 which show high fitting of the model. The results related to the confirmation or refuse of the hypotheses is shown in Table 3.

Table 3. The results related to the confirmation or refuse of the hypotheses

Results	Sig	Amount effect	Research hypotheses
Confirmed	0/000	0/25	Customer orientation has a positive and significant impact on production performance

Confirmed	0/000	0/25	Competition orientation has a positive and significant impact on production performance.
Confirmed	0/000	-0/42	<i>Inter-functional coordination has a positive and significant impact on production performance.</i>
Refused	0/284	-0/07	<i>Competitive intensity has a positive and significant impact on production performance.</i>
Refused	0/314	-0/07	<i>Market turbulence has a positive and significant impact on production performance.</i>
rejection	0/349	0/06	<i>Technological turbulence has a positive and significant impact on production performance.</i>
Confirmed	0/000	0/40	<i>Market growth has a positive and significant impact on production performance.</i>

7. Research results and recommendations

Although the main body of market orientation is developing, most previous studies has focus in European and American countries. In Iran most market orientation studies is in the field of

services. The present study aim to investigate the impact of market orientation and environmental variables on the production performance of Kermanshah small and medium enterprises with a combination of two models of Gaur and his colleagues (2011) and Yung Yu (2003). The current study has been conducted among the senior and middle managers of such firms. Based on the study findings, market orientation indices (customer orientation, competition orientation and inter-functional coordination) significantly affect production performance, i.e. more improvement in customer orientation, competition orientation and inter-functional coordination in small and medium enterprises, more enhanced production performance will be achieved. Also, among environmental variables, only market growth factor influences the production performance of small and medium enterprises in Kermanshah, and according to managers and supervisors, more growth in such enterprises results in more positive production performance. Therefore, while considering market orientation culture in Kermanshah small and medium enterprises, the impact of this index on production performance must be increased as well, which this results in the improved overall performance of firms. In addition, firms must not only to understand competitors' activities in industry, but also has the ability to adapt to environmental changes, so that they become effectively responsive to such variations. Because ignoring competitors, market and technology results in falling behind other firms. More attention to the recommendations given in summary in the following can be helpful to the enhanced effectiveness of market orientation indices on production performance: 1- it is recommended that firms' managers act in line with market orientation, to make market orientation as a part of organizational culture and values and all directors and employees adhere to that. The firms must also seriously focus on collecting and disseminating information about customer needs and competitors situation (which this leads to higher performance) and inter-functional coordination, and given the critical role of market orientation in the firms' performance, make it more powerful than the past.

2- It is obvious that creating a market orientation culture is time consuming and challenging, therefore managers must create a more competitive environment for firms before further development of technological advances and cross-border business markets, and globalization of business, and also achieve a higher competitive position through activities such as constant investment on market orientation, encouragement of entrepreneurship and innovation, rewarding systems dependent upon customers satisfaction and consequently the development of market orientation culture in firm.

3- Since disregarding competitors' activities leads to falling behind market variations, it is recommended that firms consider effectively and accurately competitors and their activities.

4- Small and medium enterprises can reduce their production costs through adopting innovative strategies such as reducing waste and utilizing learning curve and lower the price of their goods to some extent that their competitors fail and increase their production volume as well.

1- Firms must be flexible enough to change production volume in accordance with competitors' policies.

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