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## Marketing Innovation in Rural Small Food Industries in Iran

Shohreh Soltani<sup>a</sup>, Hossein Azadi<sup>b,c,d1</sup>, S. Jamal F. Hosseini<sup>a</sup>, Frank Witlox<sup>d</sup>, Steven Van Passel<sup>be</sup>

<sup>a</sup> Department of Agricultural Extension and Education, Science and Research Branch,  
Islamic Azad University, Tehran, Iran

<sup>b</sup> Centre for Environmental Sciences, Hasselt University, Hasselt, Belgium

<sup>c</sup> Economics and Rural Development, Gembloux Agro-Bio Tech, University of Liege, Belgium

<sup>d</sup> Department of Geography, Ghent University, Belgium

<sup>e</sup> Department of Engineering Management, University of Antwerp, Antwerp, Belgium

*Marketing innovation is essential for small industries to transform products into profit and therefore, understanding its nature and determinants is of utmost importance. This study aimed at understanding marketing innovation and its determinants in the 60 small food industries in the rural areas of Tehran province, Iran. Using a census sampling method, 111 managers of these firms were interviewed. Results showed that the firms' performance in marketing innovation is generally weak and a higher level of radical innovation in marketing is perceived compared to the incremental innovation. Also, a cause and effect relationship exists between both "product and organizational innovations" and "marketing innovation". Furthermore, while "incremental marketing innovation" was negatively influenced by formal R&D unit, product diversification, and the manager's years of experience, "radical marketing innovation" was affected by the capacity of production, product diversification, and managers' age and education. The study concluded that in order to boost marketing innovation, innovation should be made also in products and organization. Besides, in order to facilitate the process of marketing innovation, practical and up-dated trainings for managers, encouraging incremental innovation in marketing, product diversification, and improving R&D activities in the studied firms should be regarded.*

*KEYWORDS: incremental innovation, organizational innovations, radical innovation, SMEs, rural development.*

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<sup>1</sup> Corresponding author. Email: [hossein.azadi@ugent.be](mailto:hossein.azadi@ugent.be), Tel. +32 (0)9 264 46 95. Fax +32 (0)9 264 49 85.

## INTRODUCTION

Small and medium-scale enterprises (SMEs) are the backbone of the industrialization process in many countries and play a crucial role in increasing a country's economy (Yusuff *et al.*, 2005). The introduction of new goods, services and methods of production as well as management practices and marketing, allow such firms to improve their efficiency (Polder *et al.*, 2010). SMEs are often confronted with the barriers of developing and introducing innovation (Kühne *et al.*, 2007), therefore, devising innovative marketing measures is essential to help them transform good ideas and products into sales revenue and profit (Lin and Chen, 2007).

Marketing innovation (MI) is defined by OECD (2005:17) as “the implementation of new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing”. MI is an attempt to come up with applications, novelties and changes that enrich the value of a product through marketing activities (Utkun and Atilgan, 2010). The nature of such innovations would be a dichotomous category, encompassing radical and incremental changes (Lin and Chen, 2007). While an incremental or routine innovation is defined as a cumulative series of minor changes or introducing something similar to previous practices, an abrupt major change or doing something markedly different from what the organization had done before is called a radical innovation (Nord and Tucker, 1987). In other words, incremental MI is about slight changes in ways of reading and serving current markets (Johne and Davies, 2000) whereas radical MI is presenting a product or service to customers in a very different way (Utkun and Atilgan, 2010).

Apart from such dichotomous nature, innovation generally takes various forms such as new technologies, new business models, business organizational forms, and innovative marketing (Ciemleja and Lace, 2008). Obviously, there is a kind of interaction between MI and other types of

innovation. In the next section, a review of literature is made on the relationship between marketing, product and organizational innovations.

#### Relationship between Marketing, Product and Organizational Innovation

Some studies show that innovation in marketing is positively correlated with firm innovativeness in general (e.g. Dhamvithee *et al.*, 2005, Nguyen and Mothe, 2008). Others show that product innovation is associated with MI or leads to marketing innovation. For example, Braadland and Hauknes's (2000) study on innovation in the Norwegian food cluster and McNamara *et al.* (2003) study in the German food manufacturing firms showed that innovativeness in product and market are associated. In a study by Verhees (1997), path analyses used to show the market orientation of firms. The analyses showed that such an orientation, which is related to marketing innovation, has a positive impact on product innovation and market performance.

Some other studies show the relationship between organizational and marketing innovation. For example, Mitchell (2009) pointed to a report in telecommunication sector, which shows that managers who have moved among different business units (that refers to an organizational innovation) tend to be more innovative in marketing. Other studies confirm the relationship between all three types of organizational, product and marketing innovations. Tushman *et al.* (2010), and Sampaio and Perin (2004) in Brazil's electronic industry are two examples of studies which confirm the relationship between inovativenss in organization, product and marketing sectors in firm.

In short, there is a probable relationship between marketing, product and process innovations. In our study, this relationship will be examined. Additionally, several other factors that may influence MI are explained in the following section.

## Factors Influencing Marketing Innovation

*Customer's demands:* A fundamental pre-requisite of good marketing performance is that of awareness of the customers (Leat and Revoredo-Giha, 2008). Almost without exception, key industries are restructuring their supply chain networks in a bid to meet global trends and continue to meet customers' demands (Hunt *et al.*, 2005). Therefore, the measurement of consumers' needs and their purchase interest can support continuous innovations in marketing (Tse *et al.*, 2003). In other words, firms have to pay more attention to the needs of customers in the prevalent business environment which is understood highly competitive and offer them quality products and services to satisfy their ever-rising expectations. Hence, firms need a strategy that aligns the organization with the stakeholders (Azadi *et al.*, 2011) and a business approach with customer or market orientation (Erdill *et al.*, 2004).

*Organizational ties:* Organizational ties help SMEs to establish their network. There are at least two types of inter and intra-organizational ties for any organization. Assessing the quality of inter-firm relationships has been the focus of many recent studies (Cox and Hadjivassiliou, 2010; Puspitawati, 2011; Walley and Custance, 2011). The opportunities to produce products in a collaborative way refer to *inter-organizational ties* which have become a key issue for supply chain partners. The concept of extended product, packaging core products with additional services to make the overall package more attractive to the prospective customer is now becoming an issue for managers and researchers (Hunt *et al.*, 2005).

Intra-organizational ties are also very important for MI. Literature shows that collaboration between suppliers and customers is a meta-capability for the innovation. It is necessary for organizations to put together different capabilities and services with the goal, through cooperation between suppliers and customers, and service providers and scientific institutions to achieve innovations of high quality (Ebrahim *et al.*, 2008). Studies by Efi (2010) and Dhamvithee *et al.*

(2005) confirm the positive significant relationship between intra-organizational ties and the innovation.

*Competition intensity:* With globalization, the extent of competition is rapidly increasing in the world. In such a situation, companies need innovation to be more efficient and productive, and also to offer what is expected from them (Utkun and Atilgan, 2010). According to Thoben *et al.* (2003), Hunt *et al.* (2005) and Rudi *et al.* (2011), to compete in the competitive global marketplace, manufacturers and suppliers have to come up with novel ways of forming alliances to sell their products. Chen (2003), in an economic analysis on MI, showed that firm's incentives for MI depend on market structure and the nature of competition. The results of Dhamvithee *et al.*'s (2005) study support Schumpeter's hypothesis that lowered competition encourages innovation in market. Furthermore, the intensity of competition may reduce the success rate of products in market (McNamara *et al.*, 2003) as World Bank's (2009) study shows that heavy competition is negatively associated with MI.

*Firms' and managers' characteristics:* According to literature, firm's and managers' characteristics may influence MI as explained in the following.

*Firm's characteristics:* Literature shows that some features of a firm influence innovation generally, and MI specifically. For example, World Bank's (2009) study shows that product diversification was associated with more innovations. Also in the study by Dhamvithee *et al.* (2005) in the Thai agro-industry, the effect of firms' size on innovation was confirmed. The same result was found in McNamara *et al.*'s (2003) study. The link between research and development (R&D) and innovativeness was emphasized by Esterhuizen *et al.* (2001), Azadi and Filson (2009), and Schoot Uiterkamp *et al.* (2011). The style of managing a firm is also an important characteristic which can influence the market. The scientific literature (Leat and Revoredo-Giha, 2008; Azadi *et al.*, 2010) shows that a cooperative management style can motivate the creativity and innovation.

*Managers' characteristics:* SMEs usually lack marketing specialists while their owners/managers are the sole decision makers (Marcati *et al.*, 2010). Some studies (Soltani *et al.*, 2010; Mohamad *et al.* 2009; Gray and Allan, 2002) have shown that some characteristics of managers such as education, training, experience, and age have an effect on innovation. In this study, such characteristics that may influence MI are also taken into consideration.

## CONCEPTUAL FRAMEWORK

The conceptual framework of this study is formed due to the aforementioned literature. According to the literature, many studies show a link between MI and organizational and product innovations. Therefore, the relationship between the three types of organizational, product and marketing innovations is considered in the framework of the studied firms.

Moreover, factors that influence MI (both radical and incremental) are investigated. As already discussed, such factors can be classified in four main categories; i.e. 'organizational ties' (including inter and intra-organizational ties), 'competition intensity', 'firms', and managers' characteristics'. The classification of the factors is shaped in conceptual framework (Figure 1).

[insert Figure 1]

This study aims at exploring the determinants of marketing innovation practices of small industries (SIs) in the rural areas of Tehran province, Iran. More precisely, the study tries to investigate: i) the level and nature (radical or incremental) of marketing innovation in the firms, ii) the relationship between marketing innovation and other types of product and organizational innovations, and ii) factors influencing marketing innovation.

## METHODOLOGY

This survey study was conducted in the rural areas of Tehran province, Iran. The main reason to focus on this province was that, according to the most recent statistics by the Statistic Center of Iran (SCI, 2006), more than 27% of all the Iranian SMEs are located in this area.

### Population and Sample

“Rural small food industries” (RSFIs), as a major part of the food manufacturing sector in Iran, include those rural firms with less than 50 staff. To date, 104 RSFIs are formally registered in Tehran province by the Ministry of Agriculture from which 60 firms are active<sup>2</sup>.

A total number of 111 managers in these 60 active firms were interviewed on a census basis. Depends on the size and structure of the firms, the managers could be identified as owners, directors, production managers, marketing managers, human resource managers and vice presidents.

### Indicators

To investigate MI, interviewees were asked to indicate whether their firms have adopted major changes in market—including expansion to alternative geographical markets and new customers or market segments—during last 12 months. This was regarded as radical innovations. Besides, they were asked to indicate whether their firms have adopted minor changes in marketing approach—including the advertisements procedure, services for customers, product licence, packaging, etc. during the last 12 months. This was regarded as incremental innovations.

In case they had innovation in any of the two forms of (radical and incremental) innovations, they were asked to explain two more important innovations in each of the two categories, and finally they were supposed to evaluate the importance of the innovations for firms' success in

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<sup>2</sup> At the time when the research was conducted (2009-2010).

market and bringing benefit to their firm (5-point Likert continuum: from 1= not important to 5=very important).

The firm's characteristics included "the firm's size (no. of employees), the firm's age (years), having formal R&D unit (Yes/No), having informal R&D unit (Yes/No), fixed capital (USD \$), firm's capacity of production (Tons), product diversification (Number of other products which is produced beside the main product), production sort ('Grain and cereal', 'Dairy and meat', 'Fruit'), and profitability (if their firm has been profitable) during last 12 months (Yes/No), and their management style (private/cooperative)". The managers' characteristics included "education level (less than high school, diploma, bachelor, master, and PhD), age (years), experience in the current job (years), and training (no. of attended courses). Intra-organizational ties were classified into two groups: linkage with customers and linkage with producers. The strength of the linkages was estimated by the respondents using the Likert continuum (from 1= very weak to 5=very strong). The strength of inter-organizational ties within firms was determined by the managers through the Likert continuum (from 1=very weak ties to 5=very strong ties). The competitors' intensity was measured from the managers' viewpoint using the Likert continuum (from 1=very low level of competition to 5=very high level of competition). The indicators and their constructs are summarized in Table 1.

[insert Table 1]

The content and face validity of the questionnaire were confirmed by a panel of experts. Some structuring and wording revisions in the instrument were made based on the comments of the experts. A pilot study was conducted on 30 managers of the RSFIs, to determine the reliability of the questionnaire. After revising the questionnaire, Cronbach's Alpha coefficients were estimated and confirmed at 0.75 for intra-organizational ties, 0.73 for MI, and 0.75 for inter-organizational ties. The data were analyzed by SPSS (version 15) software.

## RESULTS

### Firms' and Managers' Characteristics

Table 2 summarizes the characteristics of the firm's and managers. As the table shows, the average number of employees was 24.3 and the average age of the firms was 7.6 years. Twenty-four firms were profitable in the last year, while other 36 firms did not report any profit in the past 12 months. Twelve firms had the R&D unit, 36 firms employed some staff to be in charge of the R&D's activities (informal R&D) while the rest did not have any formal or informal R&D in their firms. Forty-one firms produced other products apart from their main products. This shows that most of the firms preferred to have different products which potentially can reduce the risk of the products' failure at marketplace. These firms in food sector were categorized into three categories; i.e. "Grains and cereals" (22), "Dairy and meat" (30), and "Fruits" (8).

The average age of the managers was 42.4 years. Fifty-six percent of the managers hold, at least, a bachelor degree while 23% did not have any academic education. From those managers who were educated, 46% indicated that their job is related to their academic background while 11 percent had different academic backgrounds. For the rest, their job was "somewhat" related to their education. The average work experience of the managers was 19.2 years. The total number of their attended training in the last 12 months was 36 courses. In other words, there have been 0.32 training courses per manager.

[insert Table 2]

### Managers' Perception toward Organizational Ties and Competition Intensity

Most of managers' believe that both intra- and inter- organizational ties are at average level (Mode 3). From the managers' point of view, the RSFIs have been more successful in linkage with customers than producers of their inputs. Most responses to the question regarding competition intensity are "moderate" too (Mode 3).

### Marketing Innovation Rate

Each firm was supposed to mention maximum two radical and two incremental MIs. Thirty-eight firms had radical MIs in the past 12 months. These firms reported 51 cases of making radical changes in their marketing approach. These innovations included expanding market area to new geographical zones (40 cases) and targeting a new group of customers like sport clubs, school kids, governmental organizations (11 cases). Also, 19 firms changed their marketing approach in 24 cases. These changes mainly included changes in advertising methods and media (15 cases), recruiting new marketing staff whose wage is a percentage of their sale (5 cases), and finally prizes and rewards for customers. All firms which had incremental marketing innovation were in the group of firms with radical innovation too. Overall, 20 firms did not report any marketing innovation. Table 3 shows the number of innovative firms and the number of innovations in each of the two categories of the radical and incremental MI for the three sub-sectors of Grain and cereals, Meat and dairy, and Fruits.

[insert Table 3]

The innovation scores (range 0-10) show the perception of the managers on how important has been the innovation in bringing success to the firms at market level. This variable (MI), which is associated with the number of innovation, was regarded as dependent variable. The highest mean of score was for radical MI in the 'Grain and cereal' subsector (4.41). The lowest mean of the scores was for incremental innovation in 'Fruit' subsector (1.19). However, Chi-square test shows that the differences between subsectors are not significant.

### Marketing Innovation Determinants

The determinants of MI are investigated in two stages. First, the relationship between MI and the two other types of innovation (organizational and product) was investigated. Then, the effect of the

firm's and managers' characteristics on MI was investigated using stepwise regression (Fig. 1). In order to investigate the relationship between the three types of innovations; i.e. marketing, product, and organizational innovations, Pearson correlation was used. As Table 4 shows, there are some significant positive associations between innovation in product, organization, and marketing. In other words, when one of them improves in the firm, the others will also improve.

[insert Table 4]

Further to the correlation coefficients, a stepwise regression model was applied to understand the relationship between the MI and product and organizational innovations. Such regression estimations let us understand the causality and interactions among them.

As the table 4 shows, in the model 1 (which MI is assumed as dependent variable), both the product and organizational innovations have significant positive beta coefficients ( $\beta = 0.608$  and  $0.498$ , respectively). This finding shows that when the product innovation increases one standard deviation, MI will increase by 0.6 whereas with one unit of increase in the standard deviation of organizational innovation, MI will increase by 0.5. On the other hand, MI affects both types of organizational ( $\beta = 0.348$ ) and product innovation ( $\beta = 0.511$ ), significantly (models 2 and 3). These findings indicate that with one increase in the standard deviation of MI, the organizational innovation will increase by 0.348 and product innovation by 0.511. Our findings also show that there is no direct cause and effect relationship between organizational and production innovation, but both of them are influenced by MI (Figure 2).

[insert Figure 2]

According to the figure 1, there are some internal factors which can potentially facilitate or hinder the process of marketing innovation. These factors are categorized in five groups namely “firm’s characteristics”, “competition intensity”, “managers’ characteristics”, “intra-organizational ties”, and “inter-organizational ties”. Two models of stepwise regression were used to understand the

relationship between the independent variables and MI. Model 1 shows those factors which influence the level of ‘radical innovation’ in the firm as dependent variable whereas Model 2 shows those which affect the level of ‘incremental innovation’ in the firm as dependent variable.

[insert Table 5]

#### Factors Influencing Radical and Incremental MI

A stepwise regression model was used to understand factors influencing radical marketing innovation (Model 1). The results show that the adjusted  $R^2$  in Model 1 shows that these factors can explain about 30.3 percent of the changes in the dependent variable (radical MI). As Table 5 shows, factors that influence incremental MI are the ‘firms’ capacity of production’ and ‘product diversification’ have significant positive effects on radical MI ( $\beta = 0.261$  and  $0.317$ , respectively). Also, ‘managers’ age’ ( $\beta = 0.221$ ) and ‘education’ ( $\beta = 0.229$ ) have significant positive influence on radical MI. Other factors did not have significant effect on radical MI. Accordingly, when the firms’ capacity of production, product diversification, managers’ age, and education increase by one standard deviation, the firm success in making radical changes in marketing will respectively increase  $0.261$ ,  $0.317$ ,  $0.221$ , and  $0.229$ ). Other factors did not have significant relationships with the radical MI.

Furthermore, the adjusted  $R^2$  in Model 2 shows that these factors can explain about 14.2 percent of the changes in the dependent variable (incremental MI). As Table 5 shows, factors that influence incremental MI are ‘existence of formal R&D unit’, ‘capacity of production’, ‘product diversification’, and ‘manager’s years of experience’. According to the results, formal R&D unit in the SIs significantly affects incremental MI but negatively ( $\beta = -0.348$ ). Firms which did not have an R&D unit were more successful in bringing incremental changes in their marketing (by about 35 percent). Nevertheless, there is a significant positive effect from product diversification on incremental MI ( $\beta = 0.245$ ). Diversification in product means producing other products in addition

to their main products. Those firms which diversified their production were more probable to bring incremental changes in their marketing procedure. Manager's years of experience in the field of small food industry has a significant positive effect on incremental MI ( $\beta = 0.319$ ). Accordingly, when the years of experience increase by one year, the firm success in bringing incremental changes in marketing will increase 0.32. Other factors did not have significant relationships with the incremental MI.

## DISCUSSION AND CONCLUSION

According to the results, the performance of the firms in MI is generally weak. According to the results, about one-third of the firms have not come up with MI during the previous 12 months. About two-third of the studied firms were innovative in marketing and brought radical changes in their marketing procedure. Compared to incremental innovation, radical innovation was more developed. In other words, managers were more concerned about radical changes in marketing rather than incremental changes. Nevertheless, some authors (Holck *et al.*, 2008; Lam, 2004; Banbury and Mitchell, 1995) emphasize on incremental innovation rather than radical innovation, because incremental changes are considered to be more cost-effective and less time-consuming. Rice *et al.* (2002) believe that the process of innovation starts with incremental innovation and then radical innovation will develop followed by the incremental innovation. Consequently, managers need to focus on boosting incremental MIs, which are slight and trivial changes in marketing and can be followed by radical and vital change(s) in the future.

Innovation, no matter if radical or incremental, should be managed in a way that can bring success for the firms in market. Otherwise, it is a simple change which might have no benefit. In this study, we asked the managers to estimate how important have been the mentioned innovations in bringing success for their firms in the market. Results show that the importance of radical changes in MI in bringing success is less than medium, on average. It means that there are a lot of

vital and radical changes which are not successful in bringing benefit at market level. This may partly be the result of the fact that innovations need more time to make an impact in market. In this research, we investigated innovations which were developed during the previous 12 months. Obviously, the 12 months period might not be sufficient for radical innovations to achieve success in market and bring benefit to the firms. The success of incremental innovations in market is less than radical innovations. Nevertheless, the success of incremental innovations in market is not as time-consuming as radical innovations. This fact shows the necessity of training managers of the studied firms on innovation management. Accordingly, the managers should be trained to gain necessary skills for managing incremental and radical MI so that they can benefit from the marketing innovation process.

There is no significant difference between the subsectors of Fruits, Grain and cereals, Meat and dairy in terms of both radical and incremental innovations. This is against the findings of Dhamvithee *et al.*'s (2005) study that showed a significant difference between the subsectors of Thai agro-industry in terms of innovation (in market). The implication of this finding for policy makers is that there should be similar plans for for improving MI in all the subsectors of the studied food industries at initial stages. After some introductory projects, future studies may lead to basic information on planning specific projects for raising innovation in each subsector.

There is a significant positive cause and effect relationship between innovation in product and organization with marketing innovation in the studied firms. The implication for policy-makers is that those practices which result in improving MI will, at the same time, result in improvement of product and organizational innovation. Thereby, if the policy-makers are looking for improvement in marketing innovation, they should pay attention to the other types of product and organizational innovations as well. Similar relationships were also found in Erdill *et al.* (2004), Tushman *et al.* (2010), Nguyen and Mothe (2008), McNamara *et al.* (2003) and Sampaio and Perin (2004).

Therefore, any plans which consider all the three types of innovations would benefit from the synergy among them.

Radical MI is affected by several factors. The results of regression model show that those firms which produce other products further than their main products are more successful in introducing radical changes in their marketing (radical innovation). This is in line with the findings of World Bank's (2009) study. By increasing age, the managers are more likely to bring about radical changes in their marketing procedure. Also those managers who are more educated are more likely to bring radical changes in their marketing. These two factors (age and education) make them ready to take risk and bring up radical changes in their marketing procedure.

Incremental MI is affected by some other factors. Having formal R&D unit in the SIs affects incremental MI, negatively. Those firms which have no formal R&D unit are more successful in incremental marketing innovation. This is not in line with the Esterhuizen *et al.*'s (2001) study. Observations and notes from interviews can help to explain this finding. The explanation is that those managers who have R&D unit in their firm, expect to receive innovative outcomes merely from R&D and therefore pay less or no attention to other sources of innovation, i.e. personnel, managers in different levels, customers and other possible sources of innovative ideas. However, their R&D unit is not capable enough to play the expected role. The result is that despite establishing the R&D unit, these managers are less successful in marketing innovation. This critical finding is an evidence for the necessity of training and enhancing the awareness of the managers and the R&D personnel of the RSFIs to improve their capacity for raising incremental MI.

There is a significant positive effect from product diversification on incremental MI. Those firms which are producing other products besides their main products are more probable to bring up incremental changes in their marketing procedure. As mentioned earlier, product diversification affects radical MI too. Beta coefficients show that the effect of product diversification on radical

innovation is more than its effect on incremental innovation. In other words, those firms which produce other products further than their main products mainly apply radical changes in their marketing procedures

The manager's years of experience in the field of small food industry has a significant positive effect on incremental MI. Years of experience, help managers to be successful in introducing incremental changes in marketing procedure. This is in line with the results of the studies by Soltani *et al.* (2010), Mohamad *et al.* (2009), and Gray and Allan (2002). This finding shows that the managers learn how to manage incremental MI through years of experience. This learning can be facilitated through training potentially, but training does not affect MI significantly. It seems that the provided trainings (which were very limited) should be enhanced in terms of both quantity and quality to help managers facilitate the process of learning about MI generally and incremental MI specifically.

The study concludes that MI should be improved in the studied RSFIs. Although both types of radical and incremental MIs should be taken into consideration, but incremental innovation in marketing is at a lower level and should be considered as the first priority. Encouraging product diversification results in improvement in both radical and incremental MI. More capacity of firms for production, higher level of manager education and older managers will result in improving the success of firms in radical MI. Therefore, we suggest appreciating the valuable experience of older managers and managers with higher level of education in managing radical MI. This experience which is not yet documented could potentially bring a considerable progress in managing MI within the studied firms. Moreover, practical and up dated trainings for managers, and improving the knowledge and skills of R&D personnel in the studied firms can be fruitful in facilitating the improvement of marketing innovation process.

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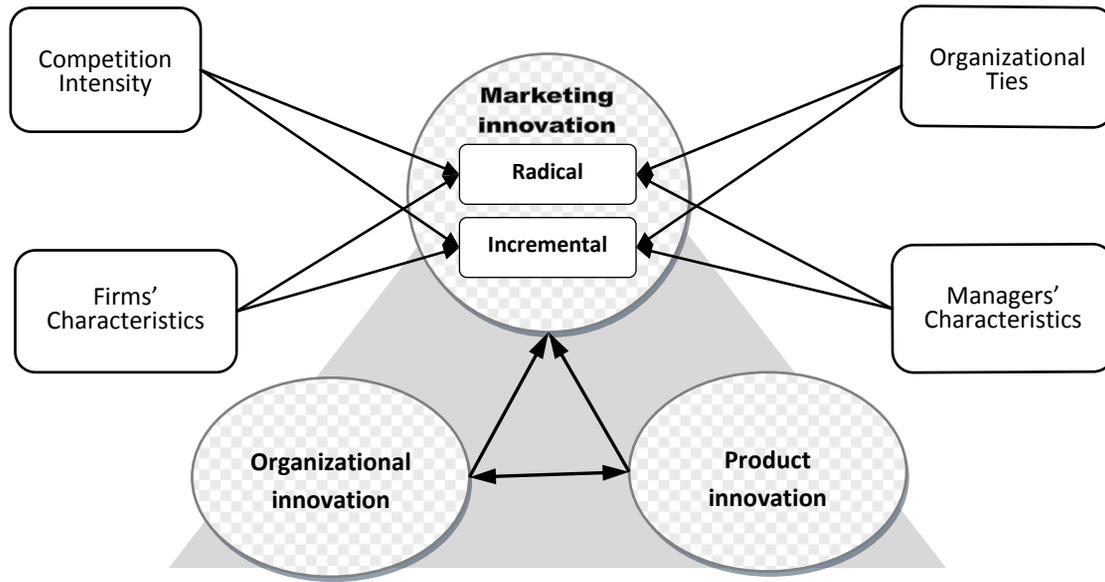
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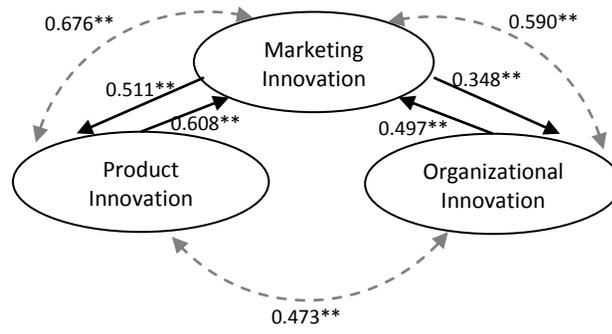
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**FIGURE 1** Conceptual framework of the study



**FIGURE 2** Relationship between MI, product and organizational innovation in the studied SIs.

→ Cause and effect relationship  
 ↔ Correlation  
 \* :  $P \leq 0.05$  , \*\* :  $P \leq 0.01$

**TABLE 1** The main indicators of the study and their constructs

Indicators	Measurements
<i>Marketing Innovation</i>	
1.Radical marketing innovation(New market)	a. 1/0 :if firm had any change in market (targeting new geographical area and new group of customers) during last 12 months b. Description of changes (Maximum 2 cases) c. The importance of innovation for firms' success in market (1:not important to 5: very important)
2. Incremental marketing innovation (New marketing approach)	a. 1/0 :if there was change in marketing approaches during last 12 months b. Description of changes (Maximum 2 cases) c. The importance of innovation for firms' success in market (5:very important to 1: very unimportant)
<i>Organizational innovation</i>	
	a. 1/0 :if firm had any change in organization during last 12 months b. Description of changes (Maximum 2 cases) c. The importance of innovation for firms' success in market (5:very important to 1: very unimportant)
<i>Product innovation</i>	
	a. 1/0 :if firm had any change in product during last 12 months b. Description of changes (Maximum 2 cases) c. The importance of innovation for firms' success in market (5:very important to 1: very unimportant)
<i>Firm characteristics</i>	
Firm size	No. of employees
Firm age	Firm age in years
formal R&D	1/0: if firm has formal R&D unit
Informal R&D	1/0: if firm has informal R&D unit
Fixed capital	Fixed capital (thousand USD)
Capacity of production	Firm potential capacity for production(tons)
Management style	1:Private, 2: Cooperative
Product diversification	Number of other products which is produces other than the main product
Production sort	1. Grain and cereal, 2. Dairy and meat, 3. Fruit
Profitability	1/0: if firm has been profitable during last 12 months
<i>Manager characteristics</i>	
Education	1: Less than high 2: Diploma 3.BSc. 4. MSc. 5. PhD
Age	Age in years
Experience	Years of experience in the current field
Training	Number of attended courses
<i>Intra-organizational ties</i>	
Linkage with producers of raw materials	5-point Likert scale, where 1 = very weak and 5 = very strong
Linkage with customers	5-point Likert scale, where 1 = very weak and 5 = very strong
<i>Inter-organizational ties</i>	
	5-point Likert scale, where 1 = no co-operation and 5 = very high level of co-operation in organization
<i>Competition intensity</i>	
	5-point Likert scale,1 = no competition and 5 = very high level of competition

**TABLE 2** Summary of the firms' and managers' characteristics.

Firms' characteristics		Managers' characteristics	
Mean of firm's size	24.3	Education	Bsc. (56%)
Mean of firm's age	7.6	Average age	42.4
No. of profitable firms	24	Average experience	19.2
No. of firms with formal R&D	12	Average no. of training courses per manager	0.32
No. of firms with informal R&D	36		
Mean of fixed capital	1610700 USD		
Capacity of production	8344.5 Tons		
No. of diversified firms	41		
No. of firms in each sector:			
1. Grains and cereal	22		
2. Meat and Dairy	30		
3. Fruits	8		

**TABLE 3** MI rate in the studied RSFIs

Type of innovation	Sector	No. of innovative firms	No. of innovations	Innovation score (Range:0-10)	
				Mean	Std. Deviation
Radical (major change in market)	Grain and cereal	17	27	4.41	3.60
	Meat and dairy	17	20	3.00	2.63
	Fruits	4	4	1.38	1.78
Incremental (minor change in marketing approach)	Grain and cereal	9	12	2.93	3.51
	Meat and dairy	8	10	1.33	2.28
	Fruits	2	2	1.19	2.32

**TABLE 4** The relationship between marketing, product and organizational innovation

Types of innovation	Correlation			Adjusted R <sup>2</sup>	Regression Models (β)		
	MI	PI	OI		Dependent variable		
					MI	PI	OI
MI	1	0.676**	0.590*	0.542	-	0.511**	0.348*
PI		1	0.473**	0.455	0.608**	-	NS
OI			1	0.346	0.497**	NS	-

MI: Marketing innovation; PI: Product Innovation; OI: Organizational Innovation

\* :  $P \leq 0.05$  , \*\* :  $P \leq 0.01$

**TABLE 5** Factors affecting radical and incremental MI (summary of the regression models).

Dependent variables:	Model 1			Model 2		
	Radical marketing innovation			Incremental marketing innovation		
R	0.579			0.397		
R <sup>2</sup>	0.335			0.158		
Adjusted R <sup>2</sup>	0.303			0.142		
F	F = 10.493		Sig. = 0.000	F = 10.032		Sig. = 0.000
Variables	B	T	Sig.	B	T	Sig.
<b>Firm characteristics</b>						
Firm's size	0.173	2.18	0.312	0.061	0.222	0.825
Firm's age	0.071	0.653	0.451	0.023	0.211	0.833
Formal R&D	0.14	1.001	0.325	-0.348**	-2.542	0.002
Informal R&D	0.101	1.213	0.217	0.015	0.139	0.890
Fixed capital	-0.099	-1.025	0.308	-0.072	-0.865	0.389
Capacity of production	0.261**	3.062	0.003	0.031	0.499	0.515
Product diversification	0.317**	3.575	0.001	0.245**	4.478	0.004
Profitability	0.039	0.400	0.690	0.007	0.065	0.948
Management style	-0.09	0.968	0.335	0.014	0.142	0.889
Competition intensity	0.057	0.626	0.533	-0.24	-0.257	0.798
<b>Manager characteristics</b>						
Education	0.229*	2.736	0.011	0.121	1.51	0.136
Age	0.221*	2.593	0.013	0.024	0.222	0.823
Experience	0.112	1.301	0.196	0.319**	2.58	0.001
Training	-0.97	-1.132	0.259	-0.023	-0.324	0.731
<b>Intra-organizational ties</b>						
Linkage with producers	0.067	0.781	0.437	0.088	1.01	0.311
Linkage with customers	0.081	1.057	0.293	-0.068	-0.576	0.566
<b>Inter-organizational ties</b>						
	0.047	2.18	0.654	-0.171	-1.88	0.063

\*: P &lt; 0.05, \*\*: P &lt; 0.01