THE IMPACT OF STRATEGIC INNOVATION MANAGEMENT PRACTICES ON FIRM INNOVATION PERFORMANCE

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ABSTRACT

In a highly competitive environment, innovation is the essential key to a firm obtaining a dominant position and gaining higher profits. Therefore, the understanding of which strategic innovation management practices lead to success is very important. The purpose of the study is to investigate the impact of innovation strategy, organizational structure, innovation culture, technological capability and customer and supplier relationships, which appear in the literature as strategic innovation management practices in business enterprises, on firm innovation performance. In this context, data collected from 132 managers at 66 firms operating in the manufacturing sector in the TRB2 zone of Turkey were analyzed. The partial least squares structural equation modeling (PLS-SEM) method was used to test hypotheses of study. The analyses revealed that innovation strategy, organizational structure and innovation culture significantly increased firm innovation performance. However, no significant impacts of technological capability and customer and supplier relationships on firm innovation performance were determined.

1. INTRODUCTION

Practices regarding strategic innovation management (SIM) in firms are one of the main topics of interest in business, politics and academic environments (Lopez-Nicolas & Merono-Cerdan, 2011). This interest is not surprising because innovation is assessed as the most important differentiation strategy to acquire a competitive advantage in the market. The concept of innovation is defined as a new structure or management process, a policy, a new plan or program, a new production process, or a new product or service produced in an enterprise (Lopez-Nicolas & Merono-Cerdan, 2011). Freeman (1982) defines the concept of innovation as marketing a new (or developed) product or as technical, design, production, management and commercial practices in the use of a new (or developed) process or equipment commercially for the first time (Bessant & Tidd, 2007).

SIM refers to the entire set of innovative practices involving the analysis of competition mechanisms, such as creating an innovative vision, harmonizing business strategy, expanding the strategy to all organizational levels, market tendencies, technologies and competitor acts (Sanchez, Lago, Ferras, & Ribera, 2011). Because the concept of SIM describes a process composed of many parts, there is not a common and clear definition on which all scholars agree regarding the content and components of the concept. To

overcome this confusion, Dankbaar (2003) suggested two approaches that are different from each other but, at the same time, complementary. According to Dankbaar (2003), SIM can be defined as either establishing preconditions in the enterprise that will encourage human creativity or the process of information usage. SIM refers to firms managing technology, business processes (customers, suppliers, financial and external resources, etc.) and human relationships (culture, communication, organization, etc.) in a way that will support and encourage innovation. In this context, the success of innovation depends on owned resources (human, equipment, technology, information, etc.) and the ability of the organization to manage these resources.

SIM is a process that has different components and, at the same time, requires the management of these different components as a whole (Igartua, Garrigos, & Hervas-Oliver, 2010). When the literature regarding SIM practices is examined, it is seen that the leading determinants of SIM practices are innovation strategy (IS), organizational structure (OS), innovation culture (IC), technological capability (TC) and customer and supplier relationships (CSR) (Igartua et al., 2010; Sanchez et al., 2011; Terziovski, 2010). The impacts of these SIM practices on firm innovation performance outputs are controversial within the literature. Scholars setting forth the resource-based approach argue that firms possessing the IS, flexible OS, IC, TC, effective CSR and innovative products that other firms do not possess will achieve high performance (Han, Kim, & Srivastava, 1998). In other words, according to these scholars, more innovative firms that are significantly different from their counterparts provide value to the customers, as a result of which is increased competitive advantage. Scholars asserting the contrary specify that less innovative products are less uncertain and may possess more synergy, leading them to be more successful (Calantone, Chan, & Cui, 2006).

The literature on firm innovation performance contains a limited number of studies dealing with the impact of the above-mentioned SIM practices in a manner independent from each other (e.g., Igartua et al., 2010; Sanchez et al., 2011; Terziovski, 2010). Moreover, there is not any research addressing the impact of these practices on firm innovation performance by modeling SIM practices as a whole. Therefore, the purpose of this study is to explore the impact of IS, OS, IC, TC and CSR, which appear as SIM practices in firms, on firm innovation performance.

The main contribution of this study to the industry and field of management will be the understanding of how SIM practices in firms affect innovation performance. Moreover, the limited research about innovation management and innovation performance relationship, which has just started to develop in the literature and has shown a controversial pattern of empirical research results, makes the current study important in terms of its contribution to the existing literature and for industrial applications.

2. THEORETICAL BACKGROUND AND HYPOTHESES

2.1. Innovation Strategy (IS)

According to Porter (1996), strategy is the presence of a set of activities that will enable the firm to differentiate itself from its competitors and to maintain its competitive position. Typically, the results of research have shown that firms possessing an IS are more successful when compared with those that do not possess an IS (O'Regan, Ghobadian, &

Gallear, 2005). IS is a guide that makes firms think about why they innovate before attempting to make an innovation. IS is composed of financial purposes and growth areas regarding a new good or service; it is the overall criteria providing a set of filters through which the notions of strategic roles and a new product or service should pass, thereby defining the strategic mission of new products or services. According to Lendel and Varmus (2011), IS is determining strategies shape the approach to aims, methods and ways to enhance and improve the innovative potential of the firm. IS enables top management to follow the activities of their competitors, to reach customer market information, to use firm resources effectively and to make efficient investments in research and development (Oke, Walumbwa, & Myers, 2012). These activities have been found to positively impact firm innovation performance (Verhees and Meulenberg, 2004).

Firms permanently conduct their activities under internal and external contingencies. From the contingency perspective, to manage uncertainties, organizations may try to improve their performance by applying effective strategies (Donaldson, 2001). For instance, under the environmental conditions of an increasingly competitive environment and constantly changing customer needs, managers will strategize and allocate resources appropriately to improve firm innovation performance. In other words, the application of an IS in a firm can ensure the implementation of successful innovations by decreasing critical internal and external contingencies. According to Tang (1998), there are three important questions that must be answered regarding IS: (1) Which (what type of) innovations will be performed by the enterprise? (2) How will the enterprise perform these innovations? (3) By which methods will the enterprise present its innovations to the market? The answers of these questions require regulations that are consistent with the strategy regarding all resources of the enterprise, business relationships and production processes. The general opinion in the literature is that IS has a positive effect on the quality of innovation and firm innovation performance (Wu & Lin, 2011).

Hypothesis 1: Innovation strategy is positively related to firm innovation performance.

2.2. Organizational Structure (OS)

A critical element for companies is the formation of organizational structures that make cross-functional knowledge and resource sharing possible, which ensures strategic decision-making, the resolution of disagreements, and the active and effective coordination of the process of innovation (Olson, Walker, & Ruekert, 1995; Song & Montoya-Weiss, 1998). Miller (1987) defines OS as permanently distributing work roles and administrative mechanisms to enable an organization to perform, coordinate and control its business activities and resource flows. OS is classified as organic and mechanic. It is assumed that tasks containing a high degree of uncertainty require organic structures, while tasks containing low uncertainty require mechanic approaches. When this theory is taken as a basis, complicated innovation projects cannot be carried out successfully in formal, official and bureaucratic structures (Miller, Droge, & Toulouse, 1988); however, flexible organic structures may facilitate innovation by increasing the power to conceptualize new technology (Matsuno, Mentzer, & Ozsomer, 2002; Olson et al., 1995). A flexible and organic organizational structure can facilitate both quick response to customer needs and attempts to share efforts toward workgroup development (Saleh & Wang, 1993). Effective distribution of acquired market information among all OS functions

and hierarchical stages requires organic (that is, flexible, informal and decentralized) organizational structures (Gupta & Wilemon, 1986; Matsuno et al., 2002). For example, Kim, Song, and Lee (1993) argued that successful firms have less formalized and centralized but more professionalized and managerially intensive OS that allows them to be responsive to external contingencies.

However, according to some scholars, an OS based on formal, functional specialization and formal control may increase new product development performance by enabling coordination among different functional units, increasing the level of cost effectiveness, decreasing uncertainty and minimizing mistakes (Schultz, Salomo, de Brentani, & Kleinschmidt, 2013). In other words, formal and centralized structures may facilitate innovation instead of suppressing it. For example, because exploitative innovation generally appears in the existing pursuit of strategic goals and fosters enhancement and developments in existing innovations, formalization may have a positive impact on exploitative innovation (He & Wong, 2004). However, because exploratory innovation requires withdrawing from current knowledge databases and creating new strategies, formalization may obstruct exploratory innovation (March, 1991). The dominant opinion in relation to the impact of OS on firm innovation performance defends flexible OS (Gupta & Wilemon, 1986; Matsuno et al., 2002; Olson et al., 1995); however, some scholars note that time and cost effectiveness are identified as mechanical structures (He & Wong, 2004; Schultz et al., 2013).

Hypothesis 2: Organizational structure is positively related to firm innovation performance.

2.3. Innovation Culture (IC)

IC is defined in different ways in the literature. According to Koberg and Chusmir (1987) and Deshpande, Farley, and Webster (1993), the key concepts associated with being innovative, from a cultural perspective, are creativeness, openness, accepting new ideas insightfully (not being closed to new ideas), taking risks and entrepreneurial mentality. While Capon, Farley, Lehmann, and Hulbert (1992) point to having an open and informal communication climate to define IC, Kuczmarski (1998) defines it as the formation of a holistic belief and mentality with regard to supporting innovations among employees. In other words, firms possessing an IC are places with an atmosphere in which entrepreneurship and risk taking are supported and rewarded, and employees and product development teams are not punished, even when new products become unsuccessful in market (De Brentani & Kleinschmidt, 2004).

Research in the organizational literature states that because a strong IC plays a key role in determining working environment, strategy, organizational behavior and processes, it increases firm innovation performance (de Brentani & Kleinschmidt, 2004). For instance, according to Hynes (2009), because culture defines employees, customers, competitors and suppliers, and their interaction with enterprise, there is a comprehensive impact of culture on the firm. Some scholars discussing IC in a general sense, especially in large and institutionalized firms, state that organizational culture is the most general obstacle in terms of innovation and firm success (O'Regan et al., 2005). On the other hand, some scholars specify that an entrepreneurial and innovative organizational culture has an indirect impact on firm success (Martin-de Castro, Delgado-Verde, Navas-Lopez, & Cruz-

Gonzale, 2013). The general opinion on this issue, according to both resource-based approach (Terziovski, 2010) and the information-based approach (Donate & Guadamillas, 2010), is that culture has a positive impact on information management practices regarding innovation and firm performance.

Hypothesis 3: Innovation culture is positively related to firm innovation performance.

2.4. Technological Capability (TC)

TC is defined in different forms in the literature. According to Cerulli (2014), TC is acquiring, harmonizing and improving information and capabilities and providing firms with sustainable innovative capacity and market success. Sobanke, Ilori, and Adegbite (2012) define TC as the sum of a firm's specific efforts and strategies regarding choosing, establishing, comprehending, orientating, enhancing and improving technology. Similarly, Terece, Pisano, and Shuen (1997) define TC as the ability of an enterprise to conduct technical activities and business, including efficiently developing a new product or process and other activities. Both technology and the ability to compete with technology-based capabilities underlie a firm's ability to be successful and maintain its continuity. Firms having TC will create effective processes in the firm by using these capabilities and effective processes, naturally, which will increase both the firm's innovation (product and process) performance and its general competitiveness strength (Ortega, 2010).

Firms are separated according to their technology capabilities. Vega-Jurado, Gutierrez-Gracia, Fernandez-de-Lucio, and Manjarres-Henriquez (2008), who consider innovation a potential source of competitive advantage, emphasize that TC—typically measured with research and development—is a determinant of innovation and performance. Technological developments may change market dynamics, weaken the positional superiority of established firms and enable new firms to successfully enter the market (Han et al., 1998). Firms have to stay agile to collect customer and competition information and to make use of the opportunities made available by new technologies so that they can survive and compete with other firms in these types of markets (Li & Calantone, 1998). Although there are contradictory findings in the literature regarding the impact of TC on firms' learning strategies and types of innovation (Zhou & Wu, 2010), the general opinion on this topic is that TC has an indirect or direct impact on new product development (Moorman & Slotegraaf, 1999).

Hypothesis 4: Technological capability is positively related to firm innovation performance.

2.5. Customer and Supplier Relationships (CSR)

Innovation encourages firms to have a market-based perspective. Thus, a company's strategic tendency towards both customers and suppliers plays an important role in the process of innovation (Atuahene-Gima & Ko, 2001). Evaluating customers and suppliers as partners will give the firm an opportunity to acquire maximum efficiency from scarce resources (Appiah-Adu & Singh, 1998) and gain new capabilities or develop present capabilities (Terziovski, 2010). This will also provide the firm with the opportunity to share risks with suppliers and customers (O'Regan et al., 2005). While Chung and Kim (2003) state that firms should cooperate with suppliers to increase their input quality and decrease production costs during process innovation, Von Hippel (2005) emphasizes the

importance of cooperation with customers as the source of new ideas regarding product innovation.

Firms' acquiring information from different areas and the synergy achieved through comprehensive cooperation with customers and suppliers will have a positive impact on firm innovation performance. For example, while suppliers may be a technological information source of the firm regarding production processes, customers may be the main source of information regarding the market (Belderbos, Carree, & Lokshin, 2004). According to the resource-based perspective, a firm can combine its resources with the resources of suppliers and maintain competitive superiority as a result of cooperation with suppliers. However, the information-based perspective emphasizes the crucial importance of relationships with suppliers and customers to fill in the information deficiencies of firms (Spender, 2007). Similarly, the cognitive perspective notes the impact of cooperation with suppliers and customers on firm innovation performance to meet the needs of enterprises for cognitive resources and to gain the capability of self-actualization (Nooteboom, 1999).

Hypothesis 5: Customer and supplier relationships are positively related to firm innovation performance.

3. METHOD

3.1. Sample and Procedure

To empirically investigate the effect of SIM practices on firm innovation performance and to identify the main SIM practices, a questionnaire based on previous studies was developed and a survey was conducted to collect data.

The initial sample of the study consisted of manufacturing firms that have at least 10 employees in Turkey's TRB2 zone. According to the principles of the Nomenclature of Territorial Units for Statistics of the European Union Office of Statistics, taking into account neighboring provinces—which show similarity from an economic, social and geographical standpoint, regional development plans and population size—Turkey is divided into 26 zones under the Level 2 rubric maintained by the Turkish Statistical Institute (TUIK) and the Republic of Turkey Ministry of Development (DPT). The TRB2 zone, which comprises four provinces, is one of 26 such zones.

First, 600 manufacturing enterprises recorded in the databases of the Small and Medium Enterprises Development Organization (KOSGEB), the European Turkish Business Centers Network (ABIGEM) and the Chamber of Commerce and Industry (VATSO) were examined to select a sample conforming with the purpose of study. During the examination of the database, criteria such as the establishment dates of companies, sectors in which they operate, their legal status (corporation, limited liability company, etc.), their sizes, the goods and services they produce, their market shares, whether they export, their management styles, etc., were considered. To obtain accurate information on the companies according to the criteria, the web sites of the companies that were available in the databases were examined, news searches about the companies were conducted through Google, the opinions of experts at VATSO, ABIGEM and KOSGEB with information on the companies were obtained and direct phone calls were made to some of the companies. After obtaining detailed preliminary information on the companies, 80

companies operating in the manufacturing sector, which were the most suitable companies for the purpose of study, were selected for the sample. The companies selected for the sample consisted of enterprises producing new goods and services and marketing them to foreign countries, including countries in the Middle East, the European Union, Central Asia, etc., as well as the domestic market. Moreover, these companies consisted of those that were organized and managed in accordance with Western management styles and were carrying out their activities in conformity with ISO (International Organization for Standardization) and other European quality standards.

After the selection of 80 companies conforming with the purpose of study, the executives of the companies were contacted by phone, the purpose, scope and method of the study were described to them, and they were asked to participate in the research. 75 of 80 companies agreed to participate in the research and to complete the questionnaires. With the approval and guidance of the companies' general managers, two individuals from each company, who were in manager positions and who had the most extensive information on the activities of their company, were asked to complete the questionnaires. The purpose of obtaining data from two individuals from each company was to avoid single-source bias. Assurance was provided to individuals from whom data were obtained indicating that their responses on the questionnaires would remain confidential and would not be used for any other purpose. This assurance increased the willingness of the participants to cooperate with the researcher and enabled them to provide more sincere and realistic responses by increasing their motivation for participating in the research.

A total of 70 of 75 companies agreeing to participate in the research completed the questionnaires, and a total of 136 questionnaires were obtained. Four companies completed and sent back only one questionnaire, and 66 companies completed and sent back two questionnaires as requested. As the companies were asked to complete at least two questionnaires, the four companies completing a single questionnaire were excluded from the analysis. Thus, as the result of data collection process, 132 questionnaires received from 66 companies (two questionnaires from each company) were included in the assessment and were analyzed.

In the sample, 50% of the respondents to the questionnaire were top managers, 37.9% were mid-level managers, 6.8% were junior administrative officers, and 5.3% were individuals working in marketing and public relations departments. There were 10-20 employees in 40 companies, 21-30 employees in 15 companies, 31-40 employees in five companies, 41-50 employees in three companies, and more than 50 employees in three companies. These findings regarding the number of employees indicate that the companies were actually small- and medium-size enterprises. Moreover, the average of age of enterprises was determined to be 14.79, with a standard deviation of 14.12.

3.1.1. Common Method Variance

During the collection of data, the subject of common method variance (CMV) was considered. First, the data obtained from two managers from each company was assessed to overcome the CMV problem in the data collection phase. Second, Harman's one-factor test, which is the most well known and frequently used method to test CMV in single-

method research, was used, and it is tested whether CVM was a problem or not (Podsakoff & Organ 1986). Generally, all of the factors in a study are subjected to exploratory factor analysis (EFA) with the option of unrotated solution in this single-factor test. If, as a result, (1) a single factor is obtained in the factor analysis, or (2) more than one factor is obtained, and if the first factor explains a large part of the variance in the variables, then it is assumed that there is a CMV problem (Podsakoff & Organ 1986). In the present study, when the items of SIM practices and the items of innovation performance were both subjected to EFA, it was observed that neither of the conditions revealing CVM was revealed. As the result of the unrotated principal component factor analysis performed on all of the measurement items, six factors with an eigenvalue larger than one were obtained, and it was determined that these six factors explained 72% of the total variance. It was determined that the first factor was explained only 38% of the variance. In other words, a single factor was not obtained as the result of the factor analysis, and generally a single factor did not explain a large part of the variance. Thus, these findings provide strong evidence of a lack of common method bias in the present study.

3.2. Measures

To test the hypotheses of the study, multi-item scales used in the previous studies were compiled, and the dependent and independent variables of the study were measured. IS, OS and CSR constructs were measured using the scales used in the study of Terziovski (2010). The IS construct was measured with nine items, the OS construct with seven items, and the CSR construct with five items in total. The IC construct was measured with a scale consisting of seven items compiled and prepared from Martin-de Castro et al. (2013) and Terziovski (2010). The TC construct was measured with a scale consisting of eight items compiled and prepared from Su, Peng, Shen, and Xiao (2013) and Terziovski (2010).

The firm innovation performance constructs—the dependent variable of the research—was measured with a scale consisting of five items, which was used in the study of Oke et al. (2012). Some scholars have indicated that the perceived innovation performance actually has a significant and positive correlation with the objective innovation performance (Powell, 1992). In conformity with other studies (e.g., Oke et al., 2012), the present study focused on perceived firm innovation performance. The participants were asked to compare the innovation performance of their companies with the performance of competitive companies in the market in the context of the innovation performance indicators. IS, OS, IC, TC, CSR, and firm innovation performance constructs were measured using selfreport items on a Likert-type scale ranging from 0 to 10 (0 = strongly disagree, 10 = strongly agree).

In the present study, the parallel translation method was used to make sure that the scale items were correctly translated from English to Turkish. First, the scale items were translated from English to Turkish by one individual, and then the items were translated from Turkish back to English by another individual. Then, the two translators mutually studied the translations and came to an agreement on all of the differences. The compliance of the content and meaning of the Turkish version of items of questionnaire was subjected to a preliminary test on 10 graduate students already working in the

manufacturing sector. The graduate students specified that there were no problems regarding content and integrity of the meanings and they did not encounter any difficulty in comprehending the items. Moreover, to obtain their comments regarding the validity of items of scale, five academics working in the field of business management were contacted, and the items of questionnaire were revised based on their recommendations. After obtaining the final form of the questionnaire through these operations, the questionnaires were distributed to the firms by the researcher using the "personally administered questionnaire" method, and they were returned.   The items of the questionnaire are provided in the Appendix.

3.2.1. Control Variables

In addition to the dependent and independent variables, the size of the company (total number of employees at the workplace) and the age of the company (years of operation) - which are extensively used as control variables in research on innovation performance - were used as control variables. Some scholars specify that larger and more institutionalized companies will be more skillful and will have more strategic freedom regarding innovation compared to smaller and newer companies (Duysters & Hagedoorn, 2002). At the same time, firm size and age may also cause rigidity and inertia that can negatively affect innovation activities and overall firm performance (Kelly & Amburgey, 1991).

3.3. Analyses and Results

The partial least square (PLS) method was performed to develop a path model to estimate the measurement and structural parameters in the structural equation model (SEM) (Chin, 1998). In the organizational literature, Sosik, Kahai, and Piovoso (2009) have suggested that the PLS data analytical technique is a powerful means for organizational research because PLS (1) can test multivariate structural models with a limited sample size, (2) can be applied to develop theory in early stages of research, and (3) can use the bootstrapping technique to identify the 95% confidence intervals of the path coefficients, providing more accurate findings. Due to the relatively small sample size at the organizational member level (N=132), the present study followed Sosik et al.'s (2009) suggestion to use the PLS approach. The path model was developed and tested applying the statistical software application SmartPLS 3.2.0 for measurement validity and to test the structural equation model.

3.4. Measurement Validation

First, before examining the hypothesized structural model, the psychometric specifications of the measurement instruments need to be evaluated. For this, the procedure outlined by Hair, Ringle, and Sarstedt (2011) was performed to examine the measurement model for indicator reliability, internal consistency reliability, convergent validity, and discriminant validity, using reflective indicators for all constructs. Thus, indicator reliability was evaluated by the each of the indicator loadings. With respect to the SIM practices

constructs and the innovation performance construct, the standardized item loadings on their respective constructs ranged from 0.71 to 0.92, which were much larger than the minimum acceptable level of 0.70 (Chin, 1998) and were highly significant (p<.0001). As suggested by Henseler, Ringle, and Sinkovics (2009), indicators of each construct were highly correlated, reflecting the same underlying construct. The scores of a construct were correlated with all other constructs' indicators in its own block (Chin, 1998). Internal consistency reliability was examined by means of composite scale reliability (CR). For all constructs, the PLS-based CR ranged from 0.88 to 0.93, which exceeded the suggested cutoff value of 0.70 or above (Chin, 1998; Fornell & Larcker, 1981). Convergent validity was tested by inspecting the average variance extracted (AVE). For all constructs, the AVE ranged from 0.59 to 0.74, which was above the recommended 0.50 cutoff value and consistent with the recommendation of Fornell and Larcker (1981). The standardized indicator loadings, CR and AVE values are shown in the Appendix. Finally, the discriminant validity of the measures was evaluated by examining both the Fornell and Larcker criteria and the theta matrix (Ɵ) (Fornell & Larcker, 1981; Chin, 1998). For satisfactory discriminant validity, the square root of the AVE should be above the values of both horizontal and vertical correlations between constructs, and the loading value of an indicator on its own construct should be higher than all of its cross loadings (Chin 1998; Hair et al., 2011). The means, standard deviations, square root of AVE for each construct, and correlation coefficients for all constructs are displayed in Table 1. As recommended by Fornell and Larcker (1981), the latent factor correlations between pairs of constructs were smaller than the square root of AVE for each construct. As shown in Table 1, the highest correlation was between IS and innovation performance (r=0.63), which is less than the square root of the AVE for IS (0.79) and innovation performance (0.85). Additionally, the theta matrix (Ɵ) was checked and showed that the loading value of each indicator on its own construct was higher than all of its cross loads (Chin, 1998). According to these findings, the result was that all constructs show satisfactory discriminant validity. These findings suggest that the IS, OS, IC, TC, CSR and innovation performance constructs are reliable, valid and unidimensional.

Table 1: Correlation Matrix and Descriptive Statistics

Variable	Mean	S. D.	1	2	3	4	5	6
(1) Innovation Performance	8.38	1.52	**0.85**					
(2) Innovation Strategy	8.33	1.46	0.63[**]	**0.79**				
(3) Organizational Structure	7.52	1.72	0.56[**]	0.49[**]	**0.77**			
(4) Innovation Culture	7.69	1.93	0.52[**]	0.42[**]	0.53[**]	**0.80**		
(5) Technology Capability	7.85	1.96	0.48[**]	0.48[**]	0.54[**]	0.51[**]	**0.84**	
(6) Custumor&Supplier Relations.	8.95	1.44	0.46[**]	0.47[**]	0.30[**]	0.39[**]	0.30[**]	**0.86**

Note. [**]*p*<.01(two-tailed); N=132; the square root of AVE was shown as bold numbers on the diagonals.

3.4.1. Multicollinearity

There is a need to test for multicollinearity because it could cause parameter estimation problems (Hair et al., 2011). To detect multicollinearity, variance inflation factors (VIFs) and tolerances were assessed for each construct component. The VIFs of indicators

ranged from 1.36 to 1.71, and the average was 1.61. Tolerances ranged from 0.58 to 0.73. All VIFs and tolerances were within acceptable threshold levels (VIF < 3.3, tolerance > 0.20) (Hair et al., 2011). These findings indicated that multicollinearity did not seem to be a problem.

3.5. Hypothesis Testing

PLS path modeling and the bootstrapping resampling method were performed to assess the stability and statistical significance of the parameter estimates in the structural model (Chin, 1998). That process entailed generating 500 subsamples of cases randomly selected, with replacement, from the original data. Then, path coefficients were produced for each randomly selected subsample. T-statistics were calculated for all coefficients, based on their stability across the subsamples, indicating which links were statistically significant. Table 2 shows the hypotheses, hypothesized links, the standardized path coefficients (β), t-values, R2 value, Q2 value and the results of all hypotheses. As shown in Table 2, values of IS (β=0.35, p<.01), OS (β=0.21, p<.05) and IC (β=0.19, p<.05) are positively associated with firm innovation performance, supporting Hypothesis 1, Hypothesis 2 and Hypothesis 3. However, no statistically significant association was found between TC, CSR and firm innovation performance, which indicated no support for Hypothesis 4 and Hypothesis 5. In addition, firm size and firm age are not significant predictors of firm innovation performance.

Table 2: The Results

Hypothesis	Hypothesized links	β	t-values	Results
Hypothesis 1	Innovation Strategy $\longrightarrow$ FIP	0.35	4,29[**]	Supported
Hypothesis 2	Organizational Structure $\longrightarrow$ FIP	0.21	2.51[*]	Supported
Hypothesis 3	Innovation Culture $\longrightarrow$ FIP	0.19	2.09[*]	Supported
Hypothesis 4	Technology Capability $\longrightarrow$ FIP	0.07	0.77	Not
Hypothesis 5	Customer and Supplier Relatioships $\longrightarrow$ FIP	0.14	1.63	Not
Control	Firm size $\longrightarrow$ FIP	0.05	1.15	
variables	Firm age $\longrightarrow$ FIP	-0.06	0.89	
R^2 = 0.55				
Q^2 = 0.38				

Note. [**]p<.01; [*]p<.05; FIP: Firm innovation performance.

The findings also indicate that the proposed model explains 55% of the variance in innovation performance. In other words, IS, OS, IC, TC, and CSR variables together explain 55% of the variance (R2=0.55) in firm innovation performance. The R2 index of the variables demonstrated a satisfactory level of predictability (Chin, 1998). In addition, Stone-Geisser's Q2 was measured using blindfolding procedures (Henseler et al., 2009). The Q2 value ranged above the threshold value of zero (Q2=0.38), indicating that the variables have predictive relevance for firm innovation performance, thus confirming the overall model's predictive relevance.

4. DISCUSSION

The results of the analysis showed that IS had a positive impact on firm innovation performance. In other words, it was determined that enterprises possessing an IS were more innovative and successful. This result is consistent with the literature suggesting that IS has an impact on firm innovation performance indicators (e.g., Bessant & Tidd, 2007; Oke et al., 2012; Verhees & Meulenberg, 2004). In many studies, a positive correlation has been shown between the activities to be performed by top management within the scope of IS and firm innovation performance (e.g., Verhees & Meulenberg, 2004).

The results of this study showed that IC has a positive effect on firm innovation performance. In other words, it was determined that firms possessing an organizational environment that promote risk taking, rewards success, and provides freedom to experiment were more successful. This result is consistent with the research results determining a positive impact of IC on firm innovation performance (e.g., Damanpour, 1991; Oke et al., 2012; O'Regan et al., 2005).

At the same time, the results of this study showed that OS also has a positive effect on firm innovation performance. In other words, it was determined that firms possessing a flexible and organic OS were more successful. Although previous findings on this issue are controversial, there are many research results supporting this finding (e.g., Gupta & Wilemon, 1986; Song & Montoya-Weiss, 1998). The argument in the literature about the impact of OS on innovation performance is mostly related to innovation type. According to some scholars, a firm structure based on formal and functional specialty may be an advantage for performing small-scale exploitative innovations (He & Wong, 2004; Schultz et al., 2013). In addition, some scholars state that because it will create an important obstacle to change, formal OS will hinder exploratory innovation, which requires presenting new strategies (March, 1991; Matsuno et al., 2002).

This study did not determine a significant relationship between TC and firm innovation performance. As Terziovski (2010) noted, a probable reason for this finding is that SMEs consider technology capabilities as a supporting tool rather than a determinant of their performance. Another explanation of this topic may be business process reengineering (BPR). BPR requires radically changing business processes and depends on the successful application of information technologies (Bessant & Tidd, 2007). BPR programs fail when they are not harmonized with the strategic objectives of the firm. According to Holland and Kumar (1995), 80% of these types of programs fail.

At the same time, according to the results of this study, no significant relationship was confirmed between CSR and firm innovation performance. This result is in accord with the results in the literature. Although previous studies emphasized the importance of supplier relationships in terms of input quality and decreasing costs (Chung & Kim, 2003) as well as the importance of customer relationships as information source (Von Hippel, 2005), the findings on this topic are controversial. While some studies support a customer and supplier focus, others suggests that taking customers and suppliers as a base will cause

exploitative innovation to occur in the present products rather than exploratory innovation (Atuahene-Gima, 2005).

5. IMPLICATIONS

The results of this study show that some SIM practices applied by firms to gain competitive superiority in the sector in which they are active and to increase the number of new goods and services they produce and present to the market have a positive impact on firm innovation performance while others do not. In this context, the study has reached important conclusions from the viewpoint of understanding which SIM practices affect overall firm innovation performance. First, the finding regarding the positive impact of IS, OS, and IC on firm innovation performance presents significant implications for managers and sectoral implementers. Firms' possessing an IS in the phase of innovation management will probably improve their innovation performance (Terziovski, 2010). When the firms realize that IC is a basic part of the innovation process, it is likely that their performance and innovation management capabilities will improve (Terziovski, 2010). In other words, adopting an innovative culture including recognition systems and rewards may encourage generation of new ideas, rule breaking, and innovative behaviors by organizational members (Khazanchi, Lewis, & Boyer, 2007). Similarly, Khan and Manopichetwattana (1989) noted that formal organizational structure refers to resistance to change throughout implementation. In this context, to improve innovation performance, managers must adopt a flexible and organic organizational structure.

Although no a positive impact of TC and CSR on innovation performance could be confirmed in the findings of this study, many studies have underlined that when the mentioned practices were performed in conformity with strategic objectives of firms, they might have a positive impact on the innovation performance indicators. In this sense, firms should handle innovation not only from a technological point of view or in the context of customer needs but also in conformity with the market focus and strategic objectives of the enterprises (Bessant & Tidd, 2007).

6. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

There are some limitations of this study, and these limitations provide scholars with new suggestions. This study was carried out on the manufacturing sector operating in the TRB2 zone of Turkey. The sample used in this study was taken from SMEs. Consequently, the findings of this study are limited to this sample. Therefore, different results may be acquired when the future studies are performed on technology companies, other sectors or larger enterprises. In this study, customer and supplier relationships were considered together as a single construct. This situation may be problematic for generalizing the study's conclusions for relationships with both customers and suppliers. Future research may separate the relationships with customers and suppliers and discuss these topics as different constructs. In this study, although data were taken from two people in each firm, to eliminate single-source bias, future studies should take data from more firms and from more employees in each firm.

7. CONCLUDING REMARKS

The purpose of this study was to explore the impact of IS, OS, IC, TC and CSR, which are strategic innovation management practices used by firms to be innovative, on firm innovation performance. The study was conducted with data collected from 132 managers in total by obtaining data from 66 manufacturing firms in the TRB2 zone of Turkey. The results of the analyses showed that IS, OS and IC have a positive and significant impact on firm innovation performance. However, it could not be determined whether TC and CSR had any significant impacts on firm innovation performance.

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APPENDIX: Scales

Standardized loadings of items are given in parentheses.
AVE: Average variance extracted; CR: composite reliability.
[*]Dropped item because the standardized item loading was smaller than the minimum acceptable level of 0.70 (Chin, 1998).

Innovation Strategy (Terziovski, 2010)

IS1) Vision or mission of the firm includes a reference to innovation (0.83)
IS2) Our innovation strategy helps the firm to achieve its strategic goals (0.87)
IS3) Increasing the production rate in the firm is an important indicator of process innovation (0.78)
IS4) Improving managerial routines in the firm is seen as part of innovation strategy (0.80)
IS5) Internal cooperation in the firm is seen as an essential part of innovation strategy implementation in the firm (0.78)
IS6) Customer satisfaction in the firm is seen as an essential part of the firm innovation strategy (0.79)
IS7) Increasing the quality of product or service continuously is one of our most important basic goals of innovation strategy (0.77)
IS8) Formulating innovation strategy improves employee skills (0.71)
IS9) Improving the commitment and morale of employees in the firm is an essential part of our innovation strategy[*]
CR = 0.93
AVE = 0.63

Organizational Structure (Terziovski, 2010)

OS1) Managers allocate all resources between departments to be used by cross-functional workgroups (0.74)
OS2) Employees follow changes in emerging technologies (0.78)
OS3) Employees use their failures as opportunities to learn[*]
OS4) Managers always provide communication systems to simplify formal communication in the firm (0.78)
OS5) Operational plans or timelines and procedures are used to observe development (0.78)
OS6) The general manager encourages all employees to resist the status quo[*]
OS7) The organizational structure of our firm promotes searching for and incorporating different viewpoints (0.77)
CR = 0.88
AVE = 0.59

Innovation Culture (Terziovski, 2010; Martin-de Castro et al., 2013)

IC1) Behaviors related to creativity and innovation are rewarded in our organizational culture[*]
IC2) Informal meetings and interactions are encouraged in our organizational culture[*]
IC3) Employees are encouraged to observe their own performance in our organizational culture (0.75)

IC4) Our employees ordinarily take risks by experimenting with new methods of doing things[*]

IC5) Employees are encouraged to share knowledge with each other in our organizational culture (0.83)

IC6) Our culture takes into account the long-term performance of teamwork (0.81)

IC7) Our organizational culture always encourages innovation, creativity and new ideas (0.80)

CR = 0.88

AVE = 0.64

Technological capability (Terziovski, 2010; Su et al., 2013)

TC1) Our organization has the same or similar technologies as our competitors'[*]

TC2) Managers divide resources to share technology (0.77)

TC3) Our company considers the use of technology as a determinant of business growth[*]

TC4) Our company's technological objectives guide the appraisal of new ideas (0.87)

TC5) Our employees search for new information, ideas and technologies (0.88)

TC6) Employees work consistently with the specific technological goals or objectives (0.86)

TC7) Company capability in forecasting technological change in the industry is high (0.87)

TC8) Company capability in technological development is high (0.79)

CR = 0.93

AVE = 0.71

Customer and Supplier Relationships (Terziovski, 2010)

CSR1) The reputation of our firm is very important to its competitive advantage (0.77)

CSR2) Our firm has the same or similar technologies as our customers[*]

CSR3) Customer satisfaction is essential for the firm's competitive advantage (0.92)

CSR4) Supplying goods or services is essential for the competitive advantage of firm (0.89)

CSR5) Our firm has the same or similar technologies as our suppliers[*]

CR = 0.89

AVE = 0.74

Firm Innovation Performance (Oke et al., 2012)

FIP1) Our firm is better than our competitors at developing new products to meet customers' needs (0.85)

FIP2) Our firm is perceived by our customers more innovative than our competitors. (0.86)

FIP3) Our firm is more effective than our competitors at capturing ideas and convert them into new products (0.86)

FIP4) Our firm is better in terms of the number of innovations (new products) than our competitors over the last 2 years (0.84)

FIP5) The duration it takes between the conception of an innovation and its introduction into the market place by our firm is better than the industry average (0.85)

CR = 0.92

AVE = 0.73