

The Role of Knowledge Sharing in the Effects of Intellectual Capital and Innovativeness on Firm Performance

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Abstract

The aim of this paper is to examine the role of knowledge sharing in the effects of intellectual capital and innovativeness on firm performance. Partial least square structural equation modeling method was used. This method is variance-based and non-parametric method since it does not have any distributional assumption. This method is preferred in the small sample size and non-normal distribution. According to the findings of this research, knowledge sharing plays mediator roles in the relationships between intellectual capital and firm performance. But knowledge sharing does not have any mediating effect in the relationships between innovativeness and firm performance. The most important limitation of this research is small sample size. Therefore, PLS-SEM is preferred in this research. This study reveals the importance of knowledge sharing on Intellectual capital and business performance. Main premise of this study is that the knowledge sharing would play mediator role in the relationship among intellectual capital and innovativeness and firm performance. This mediator role constitutes the research question of this study. In this context, therefore, the study contributes toward the literature for better understanding of the role of knowledge sharing.

Keywords: Firm Performance, Intellectual Capital, Innovativeness, Knowledge Sharing

Entelektüel Sermaye ve Yenilikçiğin Firma Performansına Etkilerinde Bilgi Paylaşımının Rolü

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Öz

Bu çalışmanın amacı, entelektüel sermaye ve yenilikçiliğin firma performansı üzerindeki etkilerinde bilgi paylaşımının rolünü incelemektir. Kısmi en küçük kareler yapısal eşitlik modellemesi yöntemi kullanılmıştır. Bu yöntem varyans temelli ve parametrik olmayan bir yöntemdir, çünkü herhangi bir dağılımsal varsayım yoktur. Bu yöntem küçük örneklerde ve normal olmayan dağılımda tercih edilir. Bu araştırmanın bulgularına göre, bilgi paylaşımı entelektüel sermaye ile firma performansı arasındaki ilişkide ara değişken rolü oynamaktadır. Ancak bilgi paylaşımının yenilikçilik ve firma performansı arasındaki ilişkide ara değişken rolü yoktur. Bu araştırmanın en önemli kısıtı küçük örneklem büyüklüğüdür. Bu nedenle bu çalışmada PLS-SEM tercih edilmiştir. Bu çalışma Entellektüel sermayenin firma performansı üzerindeki etkisinde bilgi paylaşımının önemini ortaya koymaktadır. Bu çalışmanın temel dayanağı, bilgi paylaşımının entelektüel sermaye ile yenilikçilik ve firma performansı arasındaki ilişkide aracı rolü oynayacağı yönündedir. Aracı rolü, bu çalışmanın araştırma sorusunu oluşturmaktadır. Bu bağlamda çalışma, bilgi paylaşımının rolünün daha iyi anlaşılması için literatüre katkıda bulunmaktadır.

Anahtar Kelimeler: *Firma Performansı, Entelektüel Sermaye, Yenilikçilik, Bilgi Paylaşımı*

Introduction

Today knowledge is playing an important role in competition. Uncertainty in organizational environment has reached unprecedented level due to globalization and fast technological advancement. Researchers have recently concentrated on the effective way of knowledge management in the organization (Akgün, Keskin, 2003, p. 175-188). Producing knowledge begins with personal learning activities. And also knowledge in an organization is an outcome of collective and personal learning. Effective learning in an organization creates knowledge. Knowledge is the most important element to sustain competition (Spender, 1996, p. 45-62). To achieve organization-based learning employees should share or embed knowledge in a repository that other participants can use with other organizational members (Easterby-Smith and Lyles, 2011). Formatting commercial information that creates value and using this information for organizational purposes are as important as knowledge production in organizations. Production of knowledge will not be enough for the success of the organization. Increasing initiative in the organization provide freedom to employees. Initiative consequently leads to increase in innovativeness and is the major tool of success. During innovation process, there are significant differences among the first idea and the outcome. Therefore giving initiative to the employees is extremely important. In this context, employees should have freedom in the decision making, provided that they do not deviate from organizational objectives. In addition, employees carrying out innovation should also be held responsible for its implementation and commercialization (Civelek, Çemberci, Kibritci Artar, and Nagehan, 2015).

In digital ecosystem, managing information has become vital for businesses and knowledge has turned into the most important production factors. Management of knowledge is essentially processing the information generated in the organization. The definition of the concept of knowledge management must be extended to include the business value creation. In the other part of the value chain, sharing knowledge can also provide new insights into increasing competitiveness for other partnering members (Gunasekaran, 2001). Partners can trust each other to increase tacit exchange of knowledge to promote innovation and learning because they have to share their knowledge to legitimize continuous participation that flows from continuous benefits (Sitkin, Cardinal, and Bijls, 2010). The most important part of

knowledge management is the processing of information in the organization that would provide competitive advantage (Civelek, Çemberci, Kibritci Artar, and Nagehan, 2015). Knowledge sharing involves a dynamic human information exchange process to research and seek new experiences, values and insight and to apply this in a particular company's organizational routines, processes and innovative practices. On the other hand, knowledge can easily leak outside the organization, because common practices across organizational borders provide sharing channels (Wenger, McDermott, and Snyder, 2002). The sharing of knowledge can be described as making information accessible for others in the organization (Buckley, Halbesleben, and Wheeler, 2016). Knowledge sharing implies efficient transfers so that the receiver can comprehend it sufficiently well to take action (Becerra-Fernandez and Sabherwal, 2010). The sharing of knowledge is critical to understand why and how people choose to exchange knowledge with other members of the organization and also is a significant source of innovative knowledge (Martínez-López, 2013). The flow of information is one method for knowledge sharing, and the effectiveness of this flow directly exerts influence on the synergy in the network of innovation (Zou, Zhao, Wang, and Gu, 2017).

Rossi, C., Cricelli, L., Grimaldi, M., Greco, M. (2016) explains the strategic role of intellectual capital assets in creating value. The research exposes causality between the investments and value creation, which is also another important element of innovation. The intellectual capital assets are defined with elements and their interrelations such as corporate culture and internal relationships (e.g., the set of organizational values and relational dynamics), intellectual property and technology (e.g., the organization's patents and industrial secrets), knowledge and competence (i.e., knowledge that people within the organization own), processes (e.g., procedures to run projects), relations with customers (e.g., consumers, downstream firms), relations with institutions (e.g., local government, ministries), relations with investors (e.g., shareholders, banks, venture capitalists), relations with partners and suppliers.

The main objective of this study is to clarify the role of knowledge sharing in the effects of intellectual capital and innovativeness on firm performance. Main premise of this study is that the knowledge sharing would play catalyzer role to covert the intellectual capital and innovativeness into firm per-

formance. This role constitutes the research question of this study. In this context, four hypotheses were suggested and tested. Importance of this research is to demystify the role of knowledge sharing and to make contribution to the extant literature.

Conceptual Background

Firm Performance

Firm Performance refers to the success measurement of the companies. Managers use different methods, tools and techniques to evaluate and develop productivity, performance and quality. Performance is the most effective way to reach the organization's objectives can be directed (Daft, 1997, p.745). The objective of an organization is measured according to how long it has been performed in a timeframe at the beginning of its purpose or task (Turunç, 2006, p.131). The efficiency and productivity is the most important aim of companies when transforming into outputs in the form of goods and services. In this process, the rational behavior of production in a period of time is decisive (Tetik, 2003, p.222; Yürüşen, 2011, p.1). The efforts that are spent on operations for to realize the purposes of the business constitute the performance (Zerenler, 2005, p.1). Total productivity is also another measure for performance. In general productivity is the rate of total output per total input. The companies added to the financial performance indicators, such as Return on Investment, Return on Assets, Operating Profit Margin, Profit after Tax, Earning Per Share etc. also strategic elements. There are more inclusive views like Kaplan and Norton's 'balanced scorecard' which encompass customer and stakeholder satisfaction, internal processes, the organization's ability to learn and improve (Rathore, Mohanty, Lyons · and Barlow, 2005, p.1020).

Rathore, Mohanty, Lyons and. Barlow, (2005, p.1020) propose also a competitiveness report, which contains elements like technology, human resources, regulatory assets, functional assets, positional assets and cultural assets. Competitiveness and competitive assets could be expressed as:

Competitiveness = (competitive assets) × (competitive processes)

Competitive assets = f [technology, human resources, regulatory assets, functional assets, positional assets, cultural assets]

Targets and performances for institutions were measured with objective scales based on targeted subjective scales and exact criteria. There is a strong relationship between objective and subjective scales (Akman, 2003, p.58; Akman, Özkan and Eriş, 2008, p.94). It has been performed in objective and subjective data in measuring the performance. The absolute performance difference, as objective values; the subjective values of perceptions based on performance based on competitors or company expectations are considered. (Yıldız, 2011, p.12; Küçükkancabaş, Akyol and Ataman, 2006, p.134). The objective financial criterion implies an organizational performance (Chakravarthy, 1986, p.36; Dinçer and Tatoglu, 2003, p.195). Subjective criteria of institutions can be adjusted (Erkuş, 2006, p.189).

Basic ability types could be summarized as below (Karakılıç, 2008, p.20-25):

- Technological Capability
- R & D Capability
- Innovation Capability
- Management Capability
- Finance Capability
- Sales-Marketing Capability
- New Product Development Capability

The most suitable structure discussion for performance may require the selection of methods like fit theory: (Gerdin and Greve, 2004, p.304-305): (a) Cartesian approach: one by one between structure and performance dimensions structure and examines compliance in the form of performance pairs, (b) Regulation approach: the approach in which integrated investigations are made between structure and performance variables. The Cartesian approach can also be studied around two main phenomena (Gerdin and Greve, 2004: 304; Umanath 2003, p.552): (a) Similarity, congruence, criterion-independent approach, and (b) an approach according to certain criteria of contingency approach.

Intellectual Capital

Intellectual Capital contains three dimensions like human, structural and social capital. Intellectual Capital focus on spending for gathering and using in-

formation for adding value. According to resource-based approach the information is a source for the companies like labor or land (Egbu, 2004, p.301). Intellectual capital offers a strategy theory instead of external factors than to internal factors where the changes in customer choices and technology are unpredictable. A competency-based strategy can raise the competitive advantage (Mouritsen, Thorsgaard and Bukh, 2005, p.11).

Human capital express the knowledge abilities and experience of an individual. Human capital is crucial for the entrepreneur because entrepreneurship is linked to innovation and change. Human capital influences the learning new things and benefitting from opportunities. Entrepreneur with high human capital cope better in new entries (Aldrich and Wiedenmayer, 1993, p.145-195). Small business manager with greater ability can see new information and understands its significance. The start-up know-how ensures the managers evaluation of new information. This information filter is very important for the entrepreneur because he/she can evaluate new opportunities, speed up the business creation practice and improve results.

Social capital refers external intangible assets like external powers for example market position and power of an organization. Social capital determined the networks in the organization. The entrepreneur can obtain the resources, which are difficult or expensive to reach. Social capital raises the information allocation about new opportunities, tools, financial capital and know-how (Granovetter, 1985; Coleman, 1988). Social capital can help small business managers to access resources that are difficult to find or to buy and reduce the cost of otherwise expensive resources. (Cromie et al., 1994; Portes, 1998; Lin et al., 1981)

Structural Capital includes organizational, technological and procedural elements. These elements are service variety, process efficiency, technology level, expenditure for research and development, organizational style, service diversity and operation error. Structural capital refers to the internal structure like strategies, core competencies and culture (Egbu, 2004, p.301).

Innovativeness

Innovation refers to a new product or service, or a new process technology, a new structure or administrative system, or a new plan or program pertaining to organizational members. Innovativeness is affected by internal elements

for example the innovative capability, size and structure, learning orientation and strategic orientation and external elements for example network of partners, external communication and the industry (Oskarsson 2003, p.4). Innovation can be described as a process of improving and application of a new idea. There are processes beginning with invention, development and implementation of new products, programs, services, or administrative arrangements continuing until the commercialization (Oskarsson, 2003, p.4).

The antecedents of innovation; innovation capability contains organizational learning, technological learning, professional background of founder/manager(s), skills of employees, internal efforts to improve technology and external orientation, intensity of networking, proximity advantages related to networking, receipt of institutional support (Oskarsson, 2003, p.4-5). Innovation management is creation of new ideas but technology management is the acquisition and implementation of existing innovations (Aksel, 2010, p.9).

Innovation capability of a corporate is related with many dimensions. Innovation can be supported through the effective use of financial and human resources. Human capital determine the innovation performance. Companies' implement their innovative activities systematically. The people of different opinion of different departments enhances the creativity. Innovation is not anymore the duty of the research and development department instead of that all the company indeed there are innovation department in many companies. The developments in the organization and administration effect the policies, resources distribution or social and organizational structural elements (Alameeri, Ajmal, Hussain, and Helo, 2017, p.119).

Knowledge Sharing

The Knowledge sharing is influenced by organizational leadership and culture in technology-intensive manufacturing firms (AlShamsi and Ajmal, 2018, p.119). Organizational effectiveness is affected by many factors. Knowledge enabling factors (KEFs) in construction companies have a significant impact on organizational effectiveness outcomes (Dang, Le-Hoai, Kim, 2018, p.759). Knowledge creation in an organization is actualized in three different methods such as individual experience knowledge acquisition, indi-

vidual communication and reflection and organizational knowledge learning. The complex product systems (CoPSs) performance is affected by knowledge internalization by practice (KIP). Individual innovation performance is realized with knowledge internalization by reflection and by knowledge internalization with practice. The knowledge combination and knowledge systematization provides organizational innovation performance (Min Li, Huimin Liu, Jing Zhou, 2018, p.887).

The flow of information has a key role in terms of inventory management and transportation of goods. Nowadays, businesses facilitate their communication suppliers and distributors with systems. Reduction of driving times is important in terms of resource utilization and reduces environmental impacts. Effective information flow facilitates monitoring and controlling the materials. (Çamlıca Z. and Akar, GS, 2014, p.108). Universal network quality perception has a positive impact on change readiness, and tacit knowledge. The organizational climate has a mediation effect. The deficiency of job content competencies and psychological indecisiveness affects the employee's responses and behavior (Hatjidis, Griffin and Younes, 2019, p.1442).

Knowledge is derived from the information from different resources, experiences, values. The knowledge is embedded in documents, storages, routines, processes, practices, and norms. Explicit knowledge is easily expressed formally. Tacit knowledge is derived from employee's experiences, beliefs, perspectives and the value system (Ekşi, 2008, p.17). There are many ways for knowledge generation and change from explicit to tacit or the opposite such as socialization, externalization and combination (Ekşi, 2008, p.18).

Knowledge management aims to generate value for corporate targets with documentation and investigation of knowledge for planning and control of activities (Ekşi, 2008, p.19). The organizations are changing in time to react the environmental uncertainties and knowledge imperfections. The knowledge cumulates while the abilities and resources are improved. an incremental investment approach for new facilities within a strategically important manufacturing operation at a large aerospace company (Artie, 2006, p.494).

Knowledge is a core source of innovation even corporate performance. The improvement and distribution of knowledge through organizational learning for the advance of core competencies, and turning them into new

products and processes (Ekşi, 2008, p.20). The employees are a source of innovation in case of transporting and expending knowledge while interacting between employees and products, the routines and practices (Ekşi, 2008, p.21). Knowledge is considered as a key driver of innovation. Innovation is not easy to measure. Patent numbers, budgets and research and development expenditures are indicators for this subject. But it varies to industries.

The tacit knowledge sustains a dynamic internal adherence, strategic agility and rise the future performance (Hubert Saint-One, (1996, p.14)

The study in Australian Research Council Linkage Project grant in the period 2008-2013 indicates the negative organizational outcomes of knowledge loss. There are five knowledge loss concepts improved such as knowledge resources, psychological contract, learning organization capacity, risk management and organizational problems. 118 engineering and technical workers stated negative influences like lower productivity (morale), strategic misalignment of the workforce (ability gaps), resource cuts (unsatisfied stakeholders), declined work quantity and quality (inexperienced employees), work outputs not being used (customers mistrust), longer time to competence (learning cost) and difficulty with deadlines of the projects (increased search cycle time) (Zhining Wang, Nianxin Wang, Huigang Liang, 2014, p.230).

Research Model and Hypothesis Development

The conceptual research model is shown in Figure 1. The conceptual model contains four constructs and four hypotheses which were put forward to clarify the effects of intellectual capital and innovativeness on the firm performance through knowledge sharing.

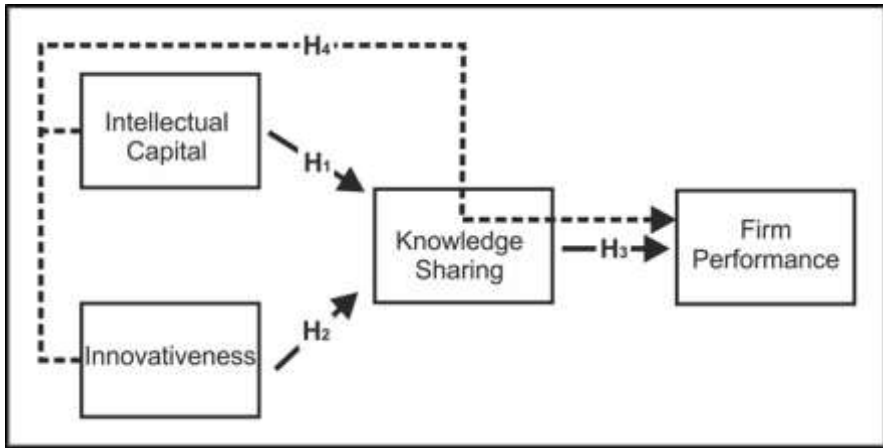


Figure 1. Conceptual Research Model

The Relationship between Intellectual Capital and Knowledge

The information is linked to intellectual capital. The tacit information of employees is a source of innovation. According to the resource-based perspective approach it is an asset (Egbu, 2004, p.301). Intellectual Capital involves all knowledge and knowing abilities. The term intellectual capital refers to the gap between an organization's book value and market value. Intellectual capital causes the knowledge loss in case of lack in organizational capabilities, organizational culture, routines, procedures, information systems, hardware, software, databases, company images, patents, copyrights, trademarks (Zhining Wang, Nianxin Wang, Huigang Liang, (2014, p.234).

There is positive relationship between intellectual capital and knowledge-sharing behavior. The organizational knowledge-sharing climate has a mediating role according to the surveys in three healthcare organizations (Radaelli, Mura, Spiller, and Lettieri, 2011, p.342). The companies keep the knowledge and enhance the knowledge sharing within teamwork. The collaboration and sharing of knowledge and sources employees with complementary skills and jobs enhance the performance and relationships in the organization (Zhining Wang, Nianxin Wang, Huigang Liang, (2014, p.236). Thus, in the light of the existing literature, we hypothesize that:

- H_1 : Intellectual Capital has a positive effect on Knowledge Sharing.

The Relationship between Innovativeness and Knowledge Sharing

Knowledge management include people, process and systems, knowledge content and technology, organizational strategy and structure, culture, leadership and commitment, motivation and competition. The knowledge influences projects and organizations innovation in the construction industry (Egbu, 2004, p.305). The knowledge management can rise the innovation performance with soft HRM practices” and “hard IT practices”. The ignorance of human factor can affect the product innovation strategies negatively (Gloet and Terziovski, 2004, p.402; Schiuma, Andreeva, and Kianto, 2012, p.617; Chen, and Huang, 2009, p.104).

According to the research of Employment in Britain dataset accentuates the role of “competence building system” as a determinant of learning on innovation (Tomlinson, 2004, p.211). (Darroch, and McNaughton, 2002, p.222) accentuates to have a flexible and opportunistic organizational structure for evaluating and improving incremental and radical innovations.

The leader's role is very significant to enhance organizational performance by using strategic variables related to knowledge (knowledge slack, absorptive capacity, tacitness, organizational learning) and innovation. The study is conducted from 408 Spanish organizations. transformational leaders impact the employees for creating an organization where new solutions and ideas arise (García-Morales, Lloréns-Montes, and Verdú-Jover, 2008, p.299).

The interaction between innovation and learning supports strategic thinking and an information management strategy (Lund, 2004, p.69).

There is a positive relationship between knowledge sharing of employees and innovation. employees ‘knowledge, skill, and experience affects creativity. It is firm-specific, socially complex, and path-dependent. Firm’s capability to change and utilize knowledge define innovation grade like problem-solving techniques and new product for rapid response to the market demand. The employees share tacit knowledge (abilities or know-how) with their colleagues or explicit knowledge (institutionalized methods or applications) for generating new ideas or implementations. Organizational knowledge sharing creates a base for organizational learning. Knowledge sharing has a positive relationship with organizational human capital and is linked to organizational performance. Explicit information sharing is linked with verification

operational performance. and financial performance. Tacit information sharing has a positive effect on operational and financial performance. Company size shows past success and can influence current performance. It displays power of pricing and bargaining, and the prevalence of operation and management routines (Wanga and Wang, 2012, p.8902).

The research indicates the importance of public-private collaboration for knowledge creation and innovation. There are many ways for generating knowledge for product development projects (Drejer and Holst Jørgensen, 2004, p.285). The individual and collective knowledge creates organizational culture. There are external and internal information flow between corporations, outsourcing services such as suppliers and distributors, and research and educational centers. All of these information transforms to knowledge and can be used for gaining competitive advantage with innovative solutions (Ekşi, 2008, p.22). Thus, in the light of the existing literature, we hypothesize that:

- H₂: Innovativeness has a positive effect on Knowledge Sharing.

The Relationship between Knowledge Sharing and Firm Performance

KM strategies such as codification and personalisation have a positive impact on financial outcomes. Codification is system-oriented and personalization human-oriented. Codification focuses on person-to-documents needs heavy IT investment, connecting people and reusable knowledge with decision support systems, document repositories, knowledge maps and workflow best practices databases. Personalizations main focus is Person-to-person, needs moderate IT investment for facilitating dialogue and tacit knowledge sharing, the main tools are mentoring, video-conferencing, bellow pages, e-mail and discussion forum (López-Nicolás, and Meroño-Cerdán, 2011, p.502).

Strategy and leadership, Organizational culture, Organizational incentive system and Information technology are KM enablers. The most important KM process performance antecedents are strategy and leadership. The significance of performance indicators in knowledge creation and knowledge internalization on the operational and customer sides has a positive, significant relationship with financial performance (Ho, 2009, p.98).

Kamasak, Yozgat, and Yavuz, (2017, p.356) accentuates the importance of knowledge process abilities on innovation performance. Their research in 236 firms from various industries in Turkey show how the strategic flexibility and the improvement of knowledge process capabilities impact innovation performance especially in a markets changes are high. Thus, in the light of the existing literature, we hypothesize that:

- H3: Knowledge Sharing has a positive effect on Firm Performance.

The Role of Knowledge Sharing in the Relationship among Intellectual Capital, Innovativeness and Firm Performance

150 technology-intensive firms in Finland reveal that the external knowledge sharing arise innovation performance (Ritala, Olander, Michailova, and Husted, 2015, p.22). Technical knowledge management resource and social knowledge management resource are antecedents of knowledge management process capability. Knowledge management process capability is a backbone for developing innovation speed and innovation magnitude. The innovation capabilities rise firm performance (Liao and Chuang, 2006, p.1).

Wang, and Wang, 2012, p.8899) claims that the knowledge sharing in 89 high technology firms in Jiangsu Province of China influence innovation and indirectly firm performance. The explicit knowledge rises the innovation speed and financial performance. The tacit knowledge sharing raises innovation quality and operational performance. Thus, in the light of the existing literature, we hypothesize that:

- H4: Knowledge Sharing positively mediates the effects of Intellectual Capital and Innovativeness on Firm Performance.

Research Methodology

In this study, partial least square structural equation modeling (PLS-SEM) method was used. PLS-SEM is variance-based analysis method (Civelek, 2018). In this method, measurement and structural models can be analyzed together. Therefore It is considered as second generation multivariate analysis method (Civelek, 2018). PLS-SEM is a non-parametric method since it does

not have any distributional assumption (Hair, Hult, Ringle, and Sarstedt, 2017) (Civelek, Comparison of Covariance-Based and Partial Least Square Structural Equation Modeling Methods under Non-Normal Distribution and Small Sample Size Limitations, 2018). This method is preferred in the small sample size and non-normal distribution. The most important limitation of this research is small sample size (84 observations). Therefore, PLS-SEM is preferred in this research. Quantitative data was collected in Likert scale (five-point ordinal) which is ranging from strongly disagree to strongly agree. The reliability and validity of the scales were initially tested. Subsequently, partial least square structural equation modeling method was used to test the hypotheses put forward in the initial research model. Three models compared each other's according to the method suggested by Baron & Kenny (Baron & Kenny, 1986). SmartPLS statistics program was used for the analyses conducted in this research.

Measures and Sampling

Knowledge sharing, innovation and firm performance scales are translated from Wang, Z., and Wang, N. (2012, p.8899-8908). The intellectual capital scale is from the article of Zhining Wang, Nianxin Wang, Huigang Liang, (2014) "Knowledge sharing, intellectual capital and firm performance", Management Decision, Vol. 52 Issue: 2, pp.257. More than 150 distributed, 84 valid questionnaires were gathered from prominent companies in Turkey in the fall of 2019. Sample consists of the middle managers. Two managers per company answered the questionnaire. Therefore, a limited sample size was achieved.

Construct Validity and Reliability

Firstly, the exploratory factor analysis was conducted to eliminate and purify the data. After this analysis, 19 items remained. Subsequently, the confirmatory factor analysis was performed. The confirmatory factor analysis was used to determine convergent validity of the constructs (Anderson & Gerbing, 1988). In SmartPLS the consistent PLS (PLSc) algorithm was performed in order to find outer loadings in factor model. In Table 1, outer loadings obtained as a result of confirmatory factor analysis are shown. The outer loads of each item are larger than or close to 0.7 and found as significant. These results means that the convergent validity of the scales was determined.

Table 1. Confirmatory Factor Analysis Results

Variables	Items	Outer Loads
Intellectual Capital	Ilse104	0.780
	Ilse105	0.903
	Ilse106	0.869
	Ilse107	0.805
	Ilse108	0.726
Innovativeness	Yehz76	0.916
	Yehz77	0.915
	Yehz78	0.908
	Yehz79	0.854
	Yehz83	0.834
Knowledge Sharing	Yehz84	0.885
	Bpay72	0.761
Firm Performance	Bpay73	0.696
	Fper91	0.770
	Fper85	0.929
	Fper87	0.764
	Fper88	0.801
	Fper89	0.718
	Fper90	0.729

$p < 0.05$ for all items

For the determination of discriminant validity, the square roots of average variance extracted values of each construct should be calculated. After that the calculated values should be compared with correlation values of the constructs in the same column. Fornell-larcker criterion was used to determine the discriminant validity of the constructs (Hair, Hult, Ringle, and Sarstedt, 2017) (Fornell and Larcker, 1981).

Table 2. Construct Descriptives, Correlation and Reliability

Variables	1	2	3	4
1. Intellectual Capital	(0.831)			
2. Innovativeness	0.775*	(0.891)		
3. Knowledge Sharing	0.753*	0.839*	(0.794)	
4. Firm Performance	0.710*	0.815*	0.729*	(0.800)
Composite reliability	0.910	0.956	0.696	0.907
Average variance ext.	0.691	0.795	0.632	0.641
Cronbach α	0.910	0.956	0.694	0.909
Mean	3.58	3.34	3.47	3.52
Standard Deviation	0.95	1.01	1.02	0.86

* $p < 0.01$

Note: Diagonal values in bracket show the square root of AVEs.

In Table 2, the diagonal values in bracket indicate the square root of AVE values of each variable. The square roots of average variance extracted values are larger than the correlation values in each column as indicated in Table 2, (Byrne, 2010). And Heterotrait-Monotrait Ratio (HTMT) was used to determine discriminant validity. As seen in Table 3, HTMT ratios of all construct are less than threshold level (i.e. 0.90) (Doğan, 2018). In order to determine reliability of each construct composite reliability and Cronbach α values are calculated. All the values are beyond or close to the threshold level (i.e. 0.7) (Fornell ve Larcker, 1981). Correlation values among variables, Cronbach α values, composite reliabilities, average variance extracted values, means and standard deviations are in Table 2.

Table 3. Heterotrait-Monotrait Ratio (HTMT)

Variables	1	2	3	4
1. Intellectual Capital	-			
2. Innovativeness	0.890	-		
3. Knowledge Sharing	0.854	0.837	-	
4. Firm Performance	0.799	0.807	0.898	-

Test of Hypotheses

To test the hypotheses, partial least square structural equation path modeling algorithm was used. Bootstrap procedure must be used to calculate p values of the estimates in PLS-SEM. The need for bootstrap procedure stems from being nonparametric statistical method (Civelek, Comparison of Covariance-Based and Partial Least Square Structural Equation Modeling Methods under Non-Normal Distribution and Small Sample Size Limitations, 2018). In Table 4, hypotheses test results are shown.

Table 4. Hypotheses Test Results

Relationships	Path Coefficients		
	Model 1	Model 2	Model 3
Intellectual Capital → Knowledge Sharing		0.254*	0.362*
Innovativeness → Knowledge Sharing		0.475*	0.385*
Knowledge Sharing → Firm Performance			0.318*
Intellectual Capital → Firm Performance	0.347*		0.231
Innovativeness → Firm Performance	0.480*		0.353*

*p < 0.01

In Figure 2, path model and PLS-SEM analysis result are shown. As shown in Table 4, H₁, H₂ and H₃ are supported and H₄ is partially supported. According to the results of analyses, there is a positive and significant relationship between intellectual capital and knowledge sharing (H₁), between innovativeness and knowledge sharing (H₂) and between knowledge sharing and firm performance (H₃). Significant relationship between intellectual capital and firm performance was disappeared when knowledge sharing was included in the model. Significant relation in Model 1 turned into insignificant in Model 3. This means that knowledge sharing plays mediator roles in the relationships between intellectual capital and firm performance. But knowledge sharing do not have any mediating effect in the relationships between innovativeness and firm performance. Therefore, H₄ is partially supported.

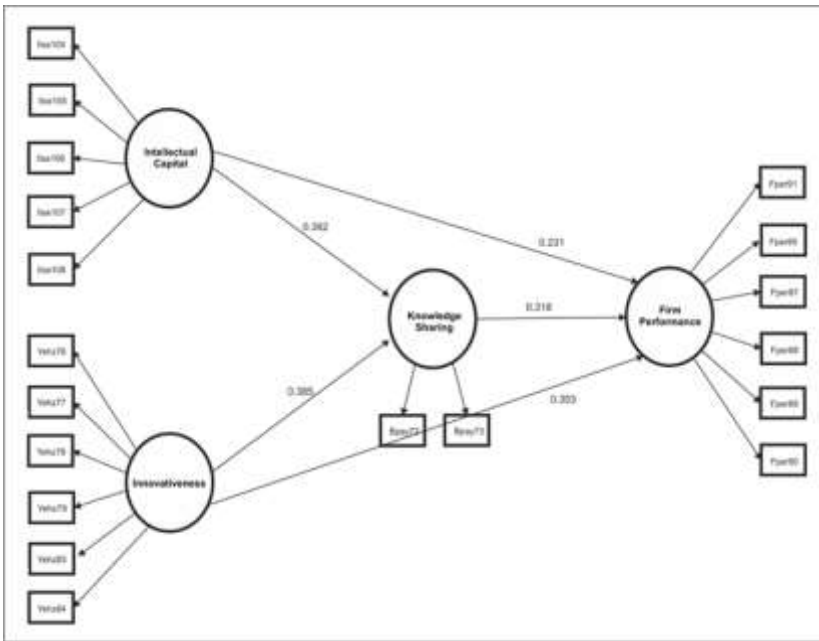


Figure 2. Results of PLS-SEM Analysis of Model 3

The coefficient determination (R^2) is the most used indicator for PLS-SEM path models. The coefficient determination indicates the predictive power of the model. Calculated for each endogenous latent variable separately which

indicates combined effect of exogenous latent variables. Also refers to variance explained (Hair, Hult, Ringle, and Sarstedt, 2017). According to the most used rule of thumb values above 0.20 can be regarded as high. As indicated in Table 5, the values are acceptable.

Table 5. R2 Values of the Dependent Variables

Variables	R ²
Knowledge Sharing	0.510
Firm Performance	0.668

The impact of a variable on another variable can be measured by effect size f^2 . In order to calculate effect size, the construct should be omitted from the model. Effect size f^2 essentially refers to the change in R2 if a variable extracted from the model. f^2 values below 0.02 are considered as small. Values between 0.15 and 0.35 are considered as medium. Values above 0.35 are considered as large effects (Cohen, 1988).

Table 6. Effect Size(f^2) Values

Relations	f^2
Intellectual Capital → Knowledge Sharing	0.09
Innovativeness → Knowledge Sharing	0.10
Knowledge Sharing → Firm Performance	0.15
Intellectual Capital → Firm Performance	0.06
Innovativeness → Firm Performance	0.12

Stone-Geisser's Q2 value (Geisser, 1974) indicates predictive relevance of path model and it is calculated for dependent variables in the model specifically. Q2 values can be calculated by means of blindfolding procedure. If the model has predictive relevance Q2 values must be larger than 0 for a dependent variable. On the other hand, values equal to zero or below zero means that there is not any predictive relevance. In Table 7, Q2 values of each dependent variable are indicated.

Table 7. Dependent Variables Q2 Values

Variables	Q ²
Knowledge Sharing	0.356
Firm Performance	0.422

Conclusion

This research provides an important contribution to the existing literature by explaining the relationship among firm performance, intellectual capital, innovativeness, knowledge sharing. The finding implies that knowledge sharing acts as a mediator role in the relationships between intellectual capital and firm performance. But knowledge sharing does not have any mediating effect on the relationships between innovativeness and firm performance. According to managerial implications of this research managers should increase knowledge sharing in order to utilize the intellectual capital and to convert it into firm performance. The most important limitation of this research is the limited sample size (84 observations). In future researches, this research can be repeated with larger samples.

The distinction and the relationship between creativity and innovation is discussed in the literature. Creativity is a source of innovation (Ekşi, 2008: 7). There are many reasons behind the rise of innovation in the eyes of companies. Surviving is the first and the most fundamental purpose of the companies in the markets where they operate. The current business environment is rapidly changing and competition is inevitably becoming intense and destructive. Competitors continually create threats to each other indifferent ways. Companies improve adaptation capabilities to the industry for survival. They overcome the threats of their competitors by increasing the innovation capabilities of the company because innovation contributes to their ability to shorten their production process and speed up new product development in relation to that of their competitors.

Companies gain competitive advantages with differentiation in conformity mechanisms, innovation and productivity. The companies that can develop and improve formal systems for the intellectual property rights protection can be more productive. The relationship is higher in companies which show low performance in services, trade and service providers and manufacturing (Hall, and Sena, 2017, p.42). While innovation is a crucial condition for company survival, it is also vital for achieving higher market share or profitability. Organizations reach their business targets, increase their profitability and boost the market share. In order to achieve those targets and survive, companies need to strengthen their abilities to innovate. Indicators such as customer participation are used for adding value for customers. Channels of

participation have a positive impact on customer satisfaction. In this study, five different channels, namely face-to-face communication, phone communication, e-mailing, web and mobile applications, which could elicit customer participation have been identified along with the number of stages in which the customer is involved as well as customer satisfaction. The social capital crucial role on performance.

Change is faced with resistance in many cases hence this change management is very important. Mostly the management puts a lot of efforts in this. Indeed, in order to spread the innovation toward the base, creative thinking techniques are used by all employees. It is clear that more policies and systems instead of words must ensure that the most appropriate business system of those who guarantee the potential obstacles in mind or corporate removed. The Employees should be encouraged to generate ideas and new business thinking.

Innovation is a core process and a necessity for the survival of the companies. Innovativeness has to be pursued as "a systematic activity" (Ekşi, 2008, p.8). Sustainability is also important in innovation. Know-how needs to be developed for further improvement. Local differences guide innovative ideas. Feasibility is needed to turn ideas to innovations. Companies encounters problems like the inadequacy of the budget, the failure of the competitor to test a similar service years ago and failure, the failure of the multinational firm's subsidiaries in other countries to implement this idea, the patent problems, the contradiction of the corporate and marketing strategies, and the fear that external customers or company employees will not accept the idea. Cost cutting is also an obstacle in front of innovation. The difficulties can turn into opportunities if they are effectively overcome.

In order for the proposal systems to be successful, there are important success criteria like management support, program structure, transparency and program visibility, recognition and rewarding, respectively. If these framework criteria are supported by practical applications, success can be achieved more easily. For these, make sure that employees feel "confident" in the system. Encourage employees from various departments and disciplines to come together and include everyone at the edge of the system (from salesmen, to security officers) to the suggestion system. The well-informed employees and other departments' affairs and their influences increase the effi-

ciency of the proposal system. The idea should turn it into innovation by exploiting its creative essence. If necessary, create a team of innovation or suggestion system advisors within the firm, preferably voluntary employees. These people bring solutions to those who supply suggestions and close communication with solving the problems of immature ideas. The most important issue is the lack of trust over time. As soon as a quick entry is made, the confidence in the system is diminishes for those who fail to demonstrate successful results. As confidence decreases, the number of suggestions falls and the system collapses by entering a vicious cycle. Especially in large companies, company employees can only integrate the suggestions because they know only parts of their business processes, and they have a lack of vision on how to affect other parts of the business. The rewarding mechanism may not be as effective as spiritual rewarding works in firm culturally, as they move towards the upper echelons of management. When the system is based entirely on monetary rewards, sometimes everyone is hunting for their normal business and seeking out ideas, which can cause conflicts with their superiors. Innovation, however, If the company's employees are oriented towards opportunities to take the company forward, if the top management is rewarded and rewarded with beliefs, if the company employees have a strategy shared and applied by the layers of the company, if internal communication is based on trust. Our study also reveals the importance of knowledge sharing on Intellectual capital and business performance.

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