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THE MEDIATING ROLE OF SOLIDARITY BETWEEN RESOURCE DEPENDENCE AND INNOVATION PERFORMANCE

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Abstract

The purpose of this study is to investigate the mediator role of solidarity on the relationship between resource dependence sub-dimensions and innovation performance. The study was conducted with 398 employees working in Technocities across Turkey's seven regions between March 2017 and April 2018. The validity and reliability of scales were studied with exploratory and confirmatory factor analysis. The hypotheses were tested with structural equation modelling. The results of the analysis emphasized the importance of the dependence and uncertainty in obtaining the resources. As a result of study, solidarity within technocities has a full mediator effect on the relationship between resource scarcity and innovation performance. On the other hand it couldn't be obtained any other mediator effect on the relationship between the other sub-dimensions of variables. For this reason, the results indicated the partial mediator effect of solidarity on the relationship between the resource dependence sub-dimensions and innovation performance. These findings of this research are similar with the findings of previous researches.

Keywords: Resource dependence theory, innovation performance, solidarity, technocity.

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1. Introduction

In increasingly uncertain dynamic environmental conditions, organizations can successfully sustain their assets as long as they are able to harmonize their structures and technologies with their environments (Burns & Stalker, 1961; Mintzberg 2003). For this purpose, organizations benefit from solidarity for the creation of new products and services increasingly (Kim & Song, 2007; Capaldo & Petruzzelli, 2014). Besides, to protect their assets in the long term and to gain a competitive advantage, firms benefit from mutual exchange of scare resources with the help of solidarity between all actors (Śledzik 2014; Van Beers & Zand, 2014).

Business organizations operating in sectors such as information technology, where uncertainty is intense, have to create new products and services in order to be able to sustain their presence (D'Aveni 1995). With the help of solidarity among organizations the innovation capacity of firms may increase and they may become more advantageous than their competitors. Thus, organizations can reduce the negative effects of environmental uncertainty by trustful relations. Similarly, they can easily enter new markets by learning new skills and technologies and they can contribute on economy of scale (Eisenhardt & Schoonhoven, 1996; Lei, 2007; Katila, Rosenberger, & Eisenhardt, 2008; Drees & Heugens, 2013). Thus, organizations are be able to compete by increasing their performance.

Beside of these advantages, organizations not only can make strategic decisions for a better performance (Hohberger, 2014), but also they can increase the capacity of new information production through external sources (Tidd, 2001; Lucena & Roper, 2016). For this reason, organizations aim to be close to the resources and use them in reducing resource uncertainty (Dyer et al., 2008; Davis & Cobb, 2009). One of the main purposes of operating in technocities is to be close to the resources. The geographical proximity, eases solidarity between organizations in cultural, social, technological ways (Knoben & Oerlemans, 2006; Capaldo & Petruzzelli, 2014).

In establishing solidarity between organizations; proximity, innovative behaviors and outputs are seen as important determinants (Amin & Wilkinson, 1999). Organizations that possess critical resources and that are able to reduce the uncertainty of their environment, can have the advantage and power to manage in interdependence relationships (Pfeffer & Salancik, 1978; Thorelli 1986; Casciaro & Piskorski, 2005; Davis & Cobb, 2009). Innovation performance is one of these positive outcomes. Zeng, Xie & Tam, 2010 found a positive relationship between innovation performance and solidarity between firms in the study conducted on SMEs (Zeng et al., 2010).

In light of this information, resource dependency theory can explain the relationship between solidarity and innovation performance. In the related literature, small firms, which are weaker in terms of financial and human resources, appear to be more productive through university-industry solidarity (George, Zahra, & Wood, 2002; Hanel & St-Pierre, 2006; Marotta, Mark, Blom, & Thorn, 2007). It is emphasized that they can benefit from the creative and competent workforce who are not the actual employees at the current firms in order to create innovative products and services (Black & Lynch, 1996), and also stated that the firms that are in solidarity with the universities will be more effective in the innovation activities (Anatan, 2009). It is also stated that with the help of solidarity, business organizations are able to maintain the flow of resources despite of the environmental uncertainties (Wisnieski & Dowling, 1997)

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Since Research & Development studies are the most important pioneers of the innovation capacity Hollen, Van Den Bosch, and Volberda, 2013, and Roersen (2008) indicates that the technocities structuring plays a facilitating role for the solidarity among firms, university and industry Roersen 2008). Within this framework technocities are preparing suitable environments for strategic alliances. The purpose of the study is to construct the theory of resource dependence within the framework of strategic alliances and to investigate the mediator role of solidarity on the relationship between resource dependence sub-dimensions and innovation performance across Turkey's seven regions technocities.

2. Literature Review and Theoretical Framework

2.1. Resource Dependence Theory

The theory of resource dependence predicts that organizations need resources to sustain their lives. Besides, they can't provide and maintain these resources on their own; and there are also, other organizations that want to have the same sources in the environment (Pfeffer and Salancik, 1978). For this reason, organizations aim to secure the flow of these resources and thus reduce the uncertainty (Pfeffer & Salancik, 1978). At the same time, as the amount of resources covered by other organizations increases, the dependence on these organizations increases as well. The basic assumptions of the theory of resource dependency are the questions of how organizations can effectively reduce environmental uncertainty and resource dependencies, and how the process can be managed correctly (Hillman Withers & Collins, 2009). It appears that dependence on critical and important resources affects the actions of institutions and organizational decisions and actions are planned according to this level of dependence (Werner 2008).

In the related literature, the concept of dependence was first proposed by Thompson (1967), and used by Aldrich & Pfeffer, 1976; Pfeffer & Salancik, 1978). The theory of resource dependence explains how an organization's resource needs effect the organizations strategies, and argues that an organization must gather resources to survive (Pfeffer and Salancik, 2003). Company acquisitions and mergers (Haleblian, Devers, McNamara, Carpenter & Davison, (2009) are examples of these strategies. Organizational growth in terms of merger or acquisition is an indication of both profit maximization and being stronger in terms of reaching the source (Matthew 2014). Hence, the business is dependent on organizations that have strategic resources for success (Mudambi & Pedersen, 2007). Resource Dependence Theory is the strategic base for becoming prominent in competition and for increasing competitive power (Pfeffer & Moore, 1980; Mudambi & Pedersen, 2007).

The environment in which the organizations obtain resources may not compose a dependency relationship alone. What is important is the degree of dependence of the relationships established for the resource base and how vital the resource is for the organization (Yaşbay & Ataman, 2015). In the related literature sub-dimensions of Resource Dependence are stated as follows; resource concentration, resource scarcity, resource interconnectedness, ability to be a resource, resource availability uncertainty, importance of resource (original assets), and availability of alternative resources (Saidel 1991; Fink, Edelman, Hatten, & James, 2006; Pfeffer & Salancik, 2003).

This study focuses on the following topics; importance of resource and availability of alternative resources under dependence sub-dimension; ability to be a resource, resource scarcity and resource

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interconnectedness under uncertainty sub-dimension (Saidel 1991; Fink et al., 2006; Pfeffer & Salancik, 2003).

2.2. Solidarity Within Technocity

When the reasons for establishing solidarity are examined, it is seen that management of external information is a crucial processor so that easier access to resources, reducing the cost of operations (Dyer et.al, 2008) and the creation of new products can be ensured (Capaldo & Petruzzelli, 2014). For this reason organizations have to continue to search for (Hollen, Van Den Bosch, & Volberda, 2013) and access new information in order to gain competitive advantage and survive (Hohberger, 2014).

It is also stated that solidarity is beneficial for organizations to help to reduce environmental uncertainties, and to ensure the flow of resources (Pfeffer & Salancik, 1978; Wisnieski & Dowling, 1997).

Through the information obtained with the help of solidarity, the firms can adopt new technologies can decrease the dependency between buyers and suppliers and change the power relations between the organizations (Davis & Cobb, 2009).

Nowadays, it is seen that the strategic partnership between the firms have increased and the firms tend to grow by staying smaller.

In the related literature it is seen that the solidarity between companies in Technocities have been explained by Etzkowitz in the form of University-Industry-State association and intersection areas under the name of "Triple Helix" and later developed by Leydesdorff (Etzkowitz & Leydesdorff, 2000).

“Triple Spiral Model” which characterized by relations between University-Firm, Firm-Firm and Firm-Industry within the technocities indicates that firms possess alternative resources for their requirements (Cook, 1977; Provan & Skinner, 1989; Jacobs 1974; Etzkowitz & Leydesdorff, 2000; Lee, 2000; Gertner, Roberts, & Charles, 2011).

2.3. Innovation Performance

In order to successfully compete and survive in any sector, it is essential to create value for customers' current needs, anticipate and address their changing needs. Therefore, innovation performance lies at the heart of competitive power (Karpak, Kaya, & Eunni, 2010). In this context, one of the first studies on the creation of the firm-based innovation index has been realized by Feeny & Rogers, 2001, and another study on the creation of the innovation index has been announced by Stone et.al, 2008. Moreover, the necessity to develop solidarity between the university and industry and to increase innovation capacity have been indicated in terms of country policy of many OECD countries (Bjerregaard, 2009).

According to Sanchez, Lago, Ferras and Ribera (2011) innovation performance is the whole of the innovation activities, including the creation of an innovative vision, the harmonization of business strategies, the spread of the strategy across all organizational levels, the analysis of competitive mechanisms such as market trends, technologies and competitor movements (Sanchez, Lago, Ferras, & Ribera, 2011). Innovative performance being the combination of overall organizational achievements as a result of renewal and improvement efforts, encompass various performance indicators; such as new patents, new product

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announcements, new projects, new processes and new organizational arrangements (Günday, Ulusoy, Kılıç, & Alpkan, 2011). In this study, innovation performance has been searched in this context.

3. The Mediating Effect of Solidarity on the Relationship between Resource Dependence and Innovation Performance

In order to decrease their dependency to other organizations and also external environmental uncertainty, the organizations choose to operate in technocities. Work on the subject shows that the reasons for forming alliances are usually focused on environmental variables, and transaction costs and resources are treated as environmental variables (Dacin, Oliver, & Roy, 2007). According to the theory of resource dependency, when there is an uncertainty about resource access firm's contact with other firms that own required resources (Pfeffer & Nowak, 1976; Pfeffer, 2005). The most important instrument of this solidarity is know-how (Davis & Cobb, 2009). Uncertainty and lack of know-how leads to learning requirement (Bechman & Haunschild, 2002). In this context, alliances, through widening the organizational network, increase the capacity of the organization (Kogut 2000).

Hanel & St-Pierre, 2006 in their study about manufacturing firms in Canada stated that university-industry solidarity is more intense in knowledge-based industries. Firm that are in a lack of sufficient resources in order to reach know-how appeals methods such as: for minimizing resource dependency, taking advantage of stakeholders' core competencies and providing required workforce/know-how from the outside (Spekman, Kamauff, & Myhr, 1998). The way to reach them is also in solidarity. Our first hypothesis was developed as follows in the light of these findings in the literature;

H_1: Resource Dependence sub-dimensions have statistically significant effect on solidarity.

H_{1a}: Importance of Resource has a statistically significant effect on solidarity.

H_{1b}: Availability of Alternative Resources have a statistically significant effect on solidarity.

H_{1c}: Ability to be a Resource has a statistically significant effect on solidarity.

H_{1d}: Resource Scarcity has a statistically significant effect on solidarity.

H_{1e}: Resource Interconnectedness has a statistically significant effect on solidarity.

Firms, through solidarity among firm-firm, firm-industry and firm-university can provide and access flow of the limited resources (Katila et.al, 2008). Some of the studies focusing on the relationship between solidarity and innovation performance can be listed as follows; Etzkowitz & Leydesdorff, 2000; Roersen 2008; Bjerregaard 2009; Rasiah & Govindaraju, 2009; Ponomariov & Boardman, 2010; Gertner et al., 2011; Ömürbek & Halıcı, 2012; Gürbüz Turhal, & Uçurum, 2012.

In light of these reasons, our second hypothesis is developed as follows;

H_2: Solidarity has a statistically significant effect on the innovation performance.

Another condition for organizations to be able to sustain their assets and gain competitive advantage is to be able to carry out innovation. Firms engaged in product and/or process innovation seem to spend a high amount on Research & Development activities, design, training, marketing and other related activities and know-how etc. (Beneito 2006; Arora 201; Haned et.al, 2014), while spending on such areas affects firms' innovation performance positively. In the study conducted in Chile and Colombia by Marotta et.al, 2007 noted that the solidarity of manufacturing firms with universities and research centers has a significant influence on innovation capacities. Among the limited studies in the literature on the theory of resource

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dependence; there was no study evaluating the effect of technocity solidarity on innovation performance in terms of resource dependency theory.

This, however, is also important for research. In line with this information, our third hypothesis is developed as follows;

H_3: Resource Dependence sub-dimensions have statistically significant effect on the Innovation Performance.

Nowadays, the technology content of science through science-technology solidarity has strengthened the science content of technology and it has made science and technology interdependent and forced to cooperate in this context. In a sector where the resource necessity is intense, resource possession is crucial and resource scarcity is high, organizations can form strategic alliances to access and exchange resources (Hillman et.al, 2009; Johnson 1995). This basically predicts that the interdepartmental solidarity will have a mediator effect on the relationship between resource dependence sub-dimensions and innovation performance. The following hypotheses have been established in this framework;

H_4: There is a mediator effect of Solidarity between Resource Dependence sub-dimensions and Innovation Performance.

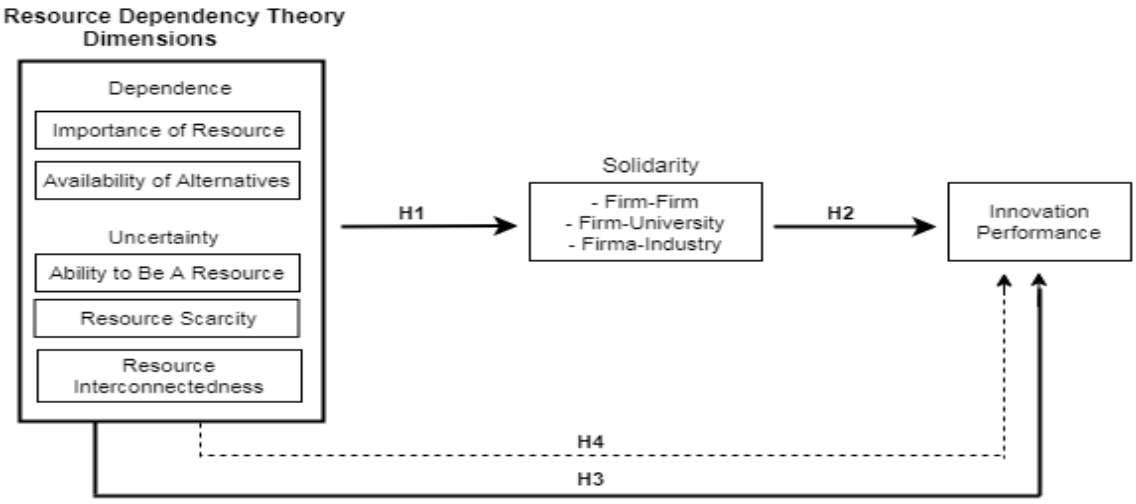

Figure 01. Research Models and Hypotheses

4. Research Method

4.1. Sample and Data Collection

The sample of the study includes 398 participants working in Technology Transfer, Project Management Office, Incubation Centers of the seven regions in Turkey. The survey lasted between April 2017 and March 2018. As the sample of the study, convenience (snowball) sampling technique is used. The survey has been conducted on participants by face-to-face interviews and e-mails. The details about descriptive analyzes are shown in Table 1. Exploratory and confirmatory factor analyses were conducted to evaluate the validity and reliability of the scales. Then, the research model and related hypotheses were tested by the structural equation modelling technique.

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4.2. Analyses

The first part of the survey encompass descriptive statistics. In the second part; within Independent Variables; In the context of Resource Dependency Theory, (i) "Dependency in Sub-Dimension; The Importance of the Resource (5 items) and the Availability of Alternatives (3 items) "; (ii) with "Uncertainty in Sub-Dimension; Ability to be a Resource (2 items), Resource Scarcity (3 items) and Resource Interconnectedness (3 items) and Mediating Variable Solidarity (3 items). These variables are constructed by help of Saidel 1991; Pfeffer & Salancik, 2003; Fink et.al, 2006 and Ömürbek & Halıcı, 2012. The Dependent Variable in the third section, "Questions on Measuring the Impact of Innovation Performance (6 items)", was adapted by the "Innovation Performance Scale" of Günday et.al, 2011.

The detailed results of Independent Variables which are obtained by Factor Analysis are mentioned in the next section. The KMO value of the Mediator Variable Solidarity is 0.650 and the KMO value of Dependent Variable Innovation Performance is 0.893, which is above the desired level of 0.50. Again for each of the 2 variables, it was found that the Bartlett tests were meaningful at the significance level of 0.000.

5. Findings

5.1. Descriptive Statistics

Table 01. Descriptive Statistics

		n	%			n	%
Gender	Woman	74	18,6	**Region**	Mediterranean	41	10,3
	Man	324	81,4		Southeastern Anatolia	8	2
Education Status	High School	11	2,8		Marmara	130	32,7
	Associate Degree	16	4		Eastern Anatolia	20	5
	Undergraduate	174	43,7		Aegean	53	13,3
	Post Graduate	116	29,1		Central Anatolia	124	32,2
	Doctorate	81	20,4		Black Sea	22	5,5
Work Experience	1-5 years	80	20,1	**Number of employees**	0-9 employee	278	69,8
	6-10 years	75	18,8		10-49 employee	103	25,9
	11-15 years	86	21,6		50-249 employee	13	3,3
	16-20 years	80	20,1		250 employee+	4	1
	21years +	77	19,3	**Operation Period of Your Business**	0-1 year	88	22,1
Tenure at the Technocity	0-1 year	133	33,4		2-5 years	154	38,7
	2-3 years	142	35,7		6-10 years	77	19,3
	4-5 years	57	14,3		11-15 years	28	7
	6-7 years	22	5,5		16-20 years	21	5,3
	8 years +	44	11,1		21 years +	30	7,5

5.2. Factor Analysis and Building Validity and Reliability

Exploratory factor analysis is done using Principal Component Analysis and Varimax rotation method in order to investigate whether the observed variables were theoretically predicted factor structure. The Kaiser-Meyer-Olkin (KMO) sample adequacy test and the Bartlett test were performed to determine the suitability of the data set for factor analysis. As a result, it was found that the Innovation Performance KMO value was 0.893, the Dependence KMO value was 0.782, the Uncertainty KMO value was 0.910 and Solidarity KMO value was 0,650, which was above the desired level of 0.50, and the Bartlett test was

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significant at 0.000. It has been also investigated the diagonal values in the "anti-image correlation" matrix and found that these values were above 0.5. Accordingly, it has been found that the sample data is suitable for factor analysis.

In the exploratory factor analysis, the factor loadings and the "Communality" values are considered to be 0.5. Variables that do not satisfy these values or are not loaded into the theoretical predicted factor structure have been excluded from the scale. The relevant factor structure is shown in the Table 2 below. Innovation Performance Total Variance was % 65,47, Dependency Total Variance was % 65,368, Uncertainty Total Variance was % 71,245 and Solidarity Total Variance was % 64,952. In the subscale of resource dependency, questions with similar factor weights remaining below the factor of sampling sufficiency of less than 0,50 were investigated Kalaycı 2016 and Dependency1_2 question, which is close to two factors, was excluded from evaluation. As a result of the factor analysis, it is seen that Dependency1_1 and Dependency1_5 expressions which are expected to be included in the "RImp (Importance of Resource)" factor are included in the "AA (Availability of Alternatives)" factor, whereas the Resource Availability Uncertainty subscale of the study is examined under the three sub-dimensions in the literature stage of the study. However, it was seen to be collected under 2 factors. As a result of the factor analysis, it is seen that the Uncertainty3_3 (Ability to be a resource) expression, which is expected to be included in the "RInt (Resource Interconnectedness)" factor, is included in the "RS (Resource Scarcity)" factor.

Table 02. Exploratory Factor Analysis

Factor		Factor Item	Factor Loading	Explained Variance	Cronbach's alpha
Innovation Performance	InP	InP1	.800	65.47	.891
		InP2	.811		
		InP3	.849		
		InP4	.840		
		InP5	.745		
		InP6	.806		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: .893; Bartlett's Test of Sphericity Approx. Chi-Square: 268.497; df::3; Sig.: .000; Total Explained Variance: 65,47					
Dependency Dimension	RImp	Dep1_3	.912	19,094	.798
		Dep1_4	.880		
	AA	Dep2_1	.833	46,273	.811
		Dep2_2	.836		
		Dep2_3	.686		
		Dep1_1	.651		
		Dep1_5	. 708		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: .782; Bartlett's Test of Sphericity Approx. Chi-Square: 949.965; df::21; Sig.: .000; Total Explained Variance: 65,368					
Uncertainty Dimension	RS	Unc1-2	.818	61,913	.904
		Unc2_1	.852		
		Unc2_2	.775		
		Unc2_3	.807		
		Unc3_3	.666		
	RInt	Unc1_1	.430	9,332	746
		Unc3_1.	.891		
		Unc3_2	.510		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: .910; Bartlett's Test of Sphericity Approx.Chi-Square: 1895.160; df: 28; Sig.: .000; Total Explained Variance: 71,245					
Solidarity	Sol	Sol1	0.848	64,952	.730
		Sol2	0.723		
		Sol3	0.841		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: .650; Bartlett's Test of Sphericity Approx.Chi-Square: 268,497; df: 3; Sig.: .000; Total Explained Variance: 64,952					

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Cronbach's Alpha value of each factor were above 0.7. Accordingly, it has been found that the inherent consistency of factor structures (Table 2). Confirmatory factor analysis is performed to verify the results of the Exploratory Factor Analysis (EFA) and to analyse the validity and reliability of the research scales. According to Kolmogorov-Smirnov normality test, it is seen that normal distribution was not observed. (Std P<0.05) and Confirmatory Factor Analysis was performed using an alternative method, the ULSMV Robust Unweighted Least Squares Method (Table 2) (DiStefano & Morgan, 2014; Xia 2016). Factor loadings, Standardize Residual Covariance values have been examined and it has not been necessary to be excluded from the study as the items, model goodness of fit indexes are good. In addition, the modification indices are investigated and error values with high modification value in the same factor are investigated. In this case, the fit index values were χ^2/df =3.001, TLI = 0.942, CFI = 0.950, SRMR = 0.051, RMSEA = 0.071). As a result, it was found that the fit indices were at the desired level (Hu & Bentler, 1999; Schumacker & Lomax, 2012). The relevant factor analysis results are given below Table 3.

Table 03. Confirmatory Factor Analysis

Factor	Factor Item	B	Standart B	t	P	CR	AVE
Innovation Performance	InP1	1.000	0.793	30.054	0.000	0.918	0.654
	InP2	0.949	0.752	26.111	0.000		
	InP3	1.103	0.875	41.282	0.000		
	InP4	1.051	0.834	36.467	0.000		
	InP5	0.966	0.766	25.819	0.000		
	InP6	1.042	0.827	36.584	0.000		
AA	Dep1_1	1.000	0.700	23.341	0.000	0.845	0.535
	Dep2_2	1.188	0.83	41.934	0.000		
	Dep2_1	1.172	0.820	40.404	0.000		
	Dep1_5	0.996	0.697	24.298	0.000		
	Dep2_3	0.833	0.583	16.597	0.000		
RImp	Dep1_3	1.000	0.825	19.890	0.000	0.855	0.750
	Dep1_4	1.096	0.905	21.051	0.000		
RS	Unc2_1	1.000	0.862	50.650	0.000	0.922	0.706
	Unc1_2	0.973	0.839	45.142	0.000		
	Unc2_3	1.009	0.869	57.478	0.000		
	Unc2_2	0.984	0.848	49.575	0.000		
	Unc3_3	0.907	0.782	33.451	0.000		
RInt	Unc3_1	1.000	0.705	21.974	0.000	0.800	0.572
	Unc3_2	1.128	0.796	32.366	0.000		
	Unc1_1	1.087	0.767	28.807	0.000		
Solidarity	Sol1	1.000	0.801	31.682	0.000	0.771	0.542
	Sol2	0.773	0.619	18.730	0.000		
	Sol3	0.970	0.777	31.260	0.000		

All factor loads were statistically significant at p<0.001 level. Std B; Standardize refers to the factor load.
χ^2/df =3.001, TLI=0.942, CFI=0.950, SRMR=0.051, RMSEA=0.071

5.3. Correlations and Validity, Reliability Values

Correlation analysis shows that there is a positive and meaningful relationship between RImp, AA, RS and RInt, and it shows suitability for the structural equality model, which reinforces the validity and reliability analyses.

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Table 04. Correlations and Validity, Reliability Values

Correlation Matrix	Innovation Performance	AA	RImp	RS	RInt	Solidarity	SCR	AVE
Innovation Performance	**0.891**						0.918	0.654
AA	0.682	**0.811**					0.845	0.535
RImp	**0.498***	0.452	**0.798**				0.855	0.750
RS	**0.654***	0.949	0.342	**0.904**			0.922	0.706
RInt	0.642	1.000	0.422	0.908	**0.746**		0.800	0.572
Solidarity	0.705	0.895	0.378	**0.966***	0.811	**0.730**	0.771	0.542

*;p<0,05 **;p<0,01 ***;p<0,001

5.4. Research Models and Hypotheses Testing

5.4.1. Testing of Hypotheses Based on Direct Effects

Structural equality modeling method is used when research hypotheses are tested. The structural equation model is a comprehensive statistical method used to test causal relationships between observed and unobserved variables and is included in the related literature that is used to solve the problems related to formulating theoretical structures (Çelik & Yılmaz, 2013).

Table 05. Measuring Models and Research Models Compliance Test Results

Compliance Criterias	Good Fit	Acceptable Compliance	Measuring Model	M I	M II	M III	M IV
Chi-Square/DF	≤ 3	≤ 4-5	3,001	3.65	5.00	2.65	3.01
NNFI	0,95≤NNFI≤1.00	0,90≤NNFI≤0,95	0,97	0.957	0.951	0.957	0.942
CFI	0,95≤CFI≤1.00	0,90≤CFI0,95	0.963	0,948	0.964	0.963	0.950
RMSEA	0≤RMSEA≤0.05	0.05≤RMSEA≤0,08	0.065	0,08	0.08	0.065	0.071
SRMR	0≤SRMR≤0.05	0.05≤SRMR≤0.10	0.046	0,051	0.045	0.046	0.051

The results of the research hypothesis that shown Table 6 examines the relationship between Dependency and Uncertainty (H_1) and the structural equation model for testing the hypothesis.

H_1: Resource Dependence sub-dimensions have statistically significant effect on solidarity.

Table 06. Resource Dependency Sub-dimensions, Solidarity and Innovation Performance

Independent variable	Dependent variable	B	Std B	t	P
Availability of Alternatives	Solidarity	-2.155	-0.530	-1.838	0.066
Importance of Resource		0.445	0.109	1.814	0.070
Resource Scarcity		5.495	1.352**	2.794	0.005
Resource Interconnectedness		0.348	0.086	0.334	0.738
R2= 0,94 *;p<0,05 **;p<0,01 ***;p<0,001; χ^2/df =3.65, TLI=0.957, CFI=0.948, SRMR=0.051, RMSEA=0.08					
Independent variable	**Dependent variable**	**B**	**Std B**	**t**	**P**
Solidarity	Innovation Performance	1.031	0.718***	11.566	0.000
R2= 0.5 *;p<0,05 **;p<0,01 ***;p<0,001 ; χ^2/df =5.0, TLI=0.951, CFI=0.964, SRMR=0.045, RMSEA=0.08					
Independent variable	**Dependent variable**	**B**	**Std B**	**t**	**P**
Availability of Alternatives	Innovation Performance	-0.149	-0.530	-0.342	0.732
Importance of Resource		0.432	0.109***	5.288	0.000
Resource Scarcity		0.682	1.352**	2.946	0.003
Resource Interconnectedness		0.272	0.086	0.864	0.388
R2= 0,513 *;p<0,05 **;p<0,01 ***;p<0,001 χ^2/df =2.65, TLI=0.957, CFI=0.963, SRMR=0.046, RMSEA=0.065					

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According to Structural Equation Modeling, it was seen that Resource Scarcity (β; 1.352, p<0,05) statistically significant effect on solidarity.

H_{1d}: "Resource Scarcity has a statistically significant effect on solidarity" supported.

H_2: Solidarity has a statistically significant effect on the Innovation Performance.

According to Structural Equation Modeling, solidarity (β;0.718, p<0,05) significantly influences innovation performance. H_2 is supported.

H_3: Resource Dependence sub-dimensions have statistically significant effect on the Innovation Performance.

According to Structural Equation Modeling it was seen that importance of resource (β;0.109, p<0,05) and resource scarcity (β;1.352, p<0,05) have statistically significant effects on innovation performance. H_3 was partially supported (H_{3a} and H_{3d} supported).

5.4.2. Testing Hypotheses Based on Intermediary

The method proposed by Baron and Kenny (1986) used in the structural equation modeling of Akgün et al. (2014) and the method proposed by Preacher and Hayes (2008) were used together. According to Preacher and Hayes, in order to mention the mediator effect, the mediator must have an indirect effect on the dependent variable after the model is included in the model. For this purpose, the "Bootstrap" method was used to measure the validity of the mediation effects in the study.

Four different structural equality models have been developed to test research hypotheses (Table 6). In the first model it was investigated the effect of Resource Dependence Sub-dimensions on Solidarity. According to the result of the structural equation modeling, it was observed that Resource Dependency and Uncertainty in Resource Availability have a statistically significant effect (β;1.352, p<0,05) on the solidarity. H_1 supported.

In the second model it was investigated the effect of Solidarity on Innovation Performance. It is obtain that Solidarity has a statistically significant effect (β;0.718, p<0,05) on Innovation Performance. H_2 is supported.

In the third model, it was investigated the direct effect of resource dependence sub-dimensions on the Innovation Performance. It is obtained that resource dependence sub-dimensions have statistically significant effect RS (β;0.109, p<0,05) and RImp (β;1.352, p<0,05) on Innovation

In the fourth model, it is investigated a mediator effect of solidarity on the relationship between resources dependence sub-dimensions and Innovation Performance. The result of the analysis showed that the importance of the dependence and uncertainty in obtaining the resources. As a result of study, solidarity within technocities has a full mediator effect on the relationship between resources scarcity and innovation performance. On the other hand it couldn't be obtained any other mediator effect on the relationship between the other sub-dimensions of variables. For this reason, the results indicated the partial mediator effect of solidarity on the relationship between the resource dependency sub-dimensions and innovation performance.

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Table 07. Structural Equity Models Tested for Intermediary Relations and Investigation of Indirect Effects

Independent Variable	Mediator	Dependent Variable	Indirect Effect[a]
Importance of Resource	Solidarity	Innovation Performance	0.049*
Availability of Alternatives	Solidarity	Innovation Performance	0.447
Resource Scarcity	Solidarity	Innovation Performance	0,468
Resource Interconnectedness	Solidarity	Innovation Performance	0.714

Importance of Resource-Innovation Performance. R^2= 0,94 Resource Scarcity-Innovation Performance. R^2= 0,60 and Importance of Resource-Solidarity R^2= 0,945
*p<0,05; **p<0,01; ***p<0,001; ad; %95 not meaningful in confidence interval
a; 5000 Bootstrap Sampling Level and 95% Confidence Interval χ^2/df =3.01, TLI=0.942 CFI=0.950, SRMR=0.051, RMSEA=0.071

When the mediator is included in the variable, it is possible to mention a partial mediation effect on the Innovation Performance of Resource Dependence Sub-Dimensions according to the previous model.

H_4: There is a mediator effect of Solidarity between Resource Dependence sub-dimensions and Innovation Performance.

According to this, H_{4d} is supported and it can be said that the relation between resource scarcity and innovation performance is an intermediary effect of Solidarity.

The diagram of the structural equational modeling is shown below.

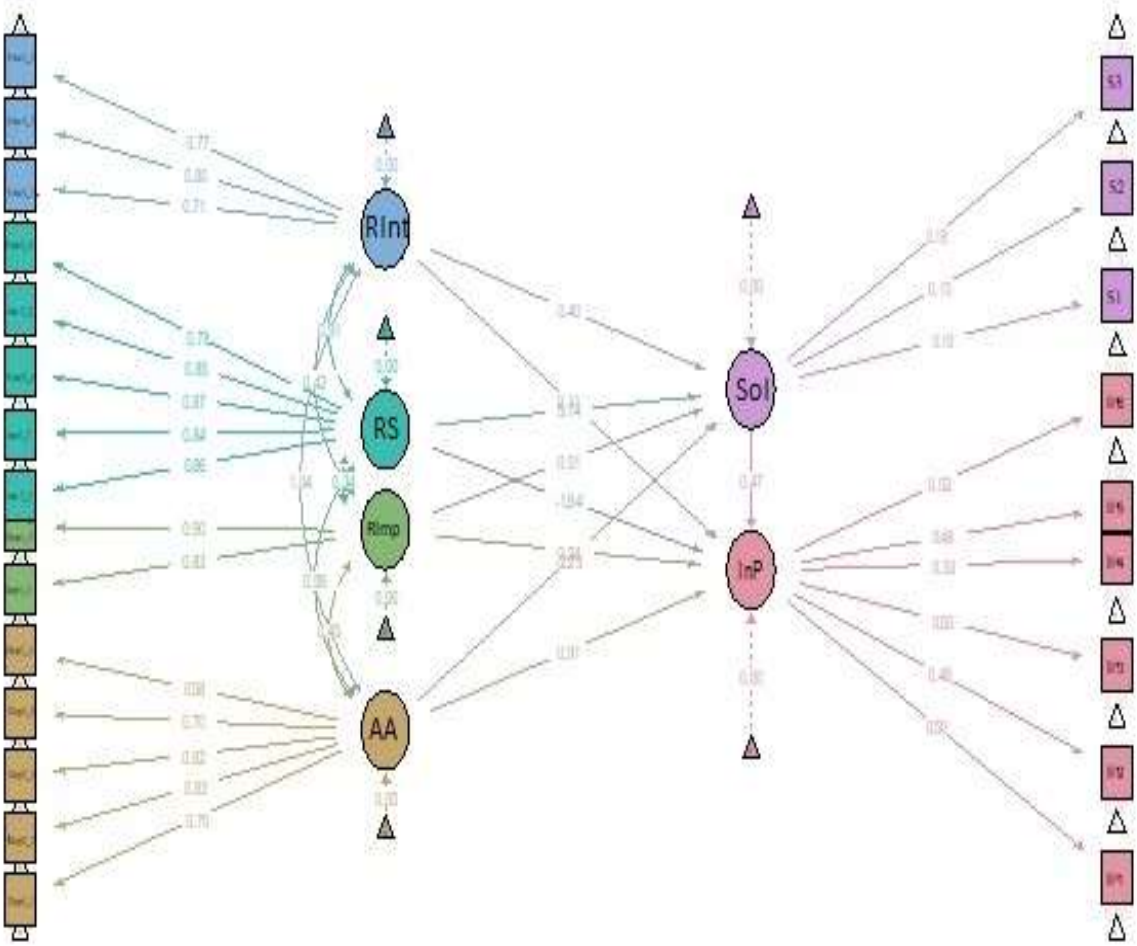

Figure 02. Research Results

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6. Conclusion and Discussions

Findings that are obtained from our hypothesis based on the theory of resource dependency are similar with the findings of Saidel 1991, Pfeffer 2003, Fink et.al, 2006 and Ömürbek & Halıcı, 2012.

According to the findings, some of the methods that are applied because of the lack of inadequate resources in creation of innovation and access to information are supported by H_1 ve H_{1a}. Methods such as, benefiting from basic skills of the stakeholders in order to minimize resource dependency, providing required qualified work force/know-how (Spekman et.al, 1998), benefiting through solidarity on the purpose of reducing uncertainty and of creation of trust worth relations (Eisenhardt & Schoonhoven, 1996; Katila et.al, 2008) are mentioned in the literature.

About the innovation in Solidarity, supporting H_2 we assert that the solidarity with various partners through solidarity increases the reassurance of businesses given to partners. By this means, transaction costs are reduced and performance of innovation are affect positively.

When access of important resources (Importance of Resource-H_{3a}) and sustainability of resource are managed correctly (Resource Scarcity-H_{3d}), innovation performance increases. Thus firms that are operate in extreme competition conditions and uncertainty have to make innovations regularly.

In the relation between innovation performance and resource scarcity (H_{4d}) solidarity had a mediator role. This results are demonstrate that, since it empowers science and technology, firms and universities has become interconnected and solidarity between them has become indispensable for the organizations. Similarly, we support H_{3a} and H_{3d}. Because, firm-university solidarity is also important for training qualified labor that are required for firms. It can be considered that among the reasons of the ineffectiveness of the mediator role of the solidarity in the other dimensions, culture structures and trust can be counted.

For the further studies, it is possible to research relational norms Fink et. al, 2006 that are different from solidarity. Further studies can be concentrate on different sectors of the subject or only one region. Because in this study we focused on seven regions of Turkey and we did not distinguish sectors and regions.

6.1. Constraints

In this study, as a relational norm that manages solidarity only the dimension of solidarity is researched. In the research dependency approach, only the dimensions of dependency and uncertainty of the resource are discussed. Effects of cultural differences on the solidarity are ignored.

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