

The Effect of Organizational Culture on Supply Chain Integration and the Mediating Role of Environmental Uncertainty

Örgüt Kültürünün Tedarik Zinciri Entegrasyonuna Etkisi ve Çevresel Belirsizliğin Aracılık Rolü

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ABSTRACT

While companies are integrating into the business environment where organizational culture is effective, they cannot predict what the impact of the organizational culture will be and how to act in an unknown and changing environment. Thus, the mediating role of environmental uncertainty in the effect of organizational culture on supply chain integration will be determined in the current study. The model was tested with the structural equation model (SEM). The population of the study consists of manufacturing companies in the Free Zone and the Organized Industrial Zone in the City of Mersin. The study as a subject and sample is original. A total of 238 questionnaires were applied in the current study. As a result of the analysis, the effect of organizational culture on supply chain integration and the effect of environmental uncertainty on supply chain integration was found to be statistically significant. However, the effect of organizational culture on environmental uncertainty was found to be statistically insignificant.

ÖZET

Anahtar Kelimeler:

*Tedarik Zinciri
Entegrasyonu,*

Örgüt Kültürü

Çevresel Belirsizlik

Şirketler, örgüt kültürünün etkili olduğu iş ortamına entegre olurken, örgüt kültürünün etkisinin ne olacağını ve bilinmeyen ve değişen bir ortamda nasıl hareket edeceklerini kestirememektedirler. Bu noktada örgüt kültürünün tedarik zinciri entegrasyonuna etkisinde çevresel belirsizliğin aracılık rolü tespit edilecektir. Model yapısal eşitlik modeli (YEM) ile test edilmiştir. Çalışmanın evrenini Mersin ilinde Serbest Bölge ve Organize sanayi bölgesinde imalat firmaları oluşturmaktadır. Konu ve örneklem olarak çalışmaya orjinaldir. Bu çalışmada toplam 238 anket uygulanmıştır. Analiz sonucunda örgüt kültürünün tedarik zinciri entegrasyonu üzerindeki etkisi ile çevresel belirsizliğin tedarik zinciri entegrasyonu üzerindeki etkisi istatistiksel olarak anlamlı bulunmuştur. Ancak örgüt kültürünün çevresel belirsizlik üzerindeki etkisi istatistiksel olarak anlamsız bulunmuştur.

1. INTRODUCTION

Culture is the web of understandings, boundaries, common language, and shared expectations that the members of an organization embrace over time (Kim, 2011: 30). Culture is a powerful feature when it maintains and supports communication and facilitates organizational decision-making, control, collaboration, and fosters commitment in the organization (Bashah, 1989: 62). The function of culture is to construct meaning and reduce ambiguity by organizing experiences (Cooke and Rousseau, 1988: 247). In addition, culture influences the behaviour of the group as it consists of “a set of values and judgments” and determines “what is right and what is wrong, what is good and what is bad” (Şeşen et al., 2014: 95). Culture consists of elements that a random group learns over a period of time while solving “vital problems in the external environment and integration problems inside.” In fact, this process encompasses a “continuous behavioural, insightful and emotional” process (Akbaba, 2002: 6). Organizations have turned to new organizational forms and management approaches and new searches in order to quickly adapt to environmental changes. In this process, culture brings to the fore a new conceptual structure to be used in solving the problems that appear in the social domain (Ergün, 2007: 266).

Differences specific to the sector in which the organization is located affect the organizational culture and make the structures in the sector similar. The industrial sector in which the organization operates, the ideas it develops and its working principles determine its attitudes towards its customers, competitors and even governments. Managers continue to survive or produce with the strategies, structures and processes they develop in accordance with these (Özkalp, 1999: 437).

When both business life and the related literature are examined, it is seen that the concepts of organizational culture, supply chain integration and environmental uncertainty are becoming more important and the interest in these issues is increasing day by day. For this reason, it is important to examine the concepts of organizational culture and supply chain, their determinants, their effects and their relations with each other in terms of organizational life and success.

In the literature, there is not much research investigating the relationship between organizational culture and supply chain integration. There is also a relative lack of research on the impact of organizational culture in the operation management literature (McDermott and Stock, 1999: 521, Nahm et al., 2004: 580). The aim of the research is to examine the effect of organizational culture on supply chain integration and the effect of environmental uncertainty on supply chain integration. In this respect, a model was developed and hypotheses were tested with the structural equating model (SEM). In this connection, the research question of the study was set to be “Does organizational culture affect supply chain integration and firm performance?” The model, hypotheses, universe, reliability and validity analysis methodology of the research and the findings of the analysis were examined and, as an approach, the reliability and validity analysis of the general application was made after the pilot application.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

When the studies that scientifically investigate the relationship between organizational culture and supply chain integration are examined, it is seen that extremely competitive and dynamic market environment reveals the need for changes in organizational processes (Braunscheidel et al., 2010: 883; Cao et al., 2015: 25). Supply chain experts state that supply chain integration is a key factor in organizational improvements and the creation of sustainable competitive advantage (Cao et al., 2015: 36). Supply chain integration means reorganizing and linking the cultures of more than one company. Managers recognize that firms must not only optimize individual firm performance but also align operations with other channel partners to improve costs, delivery, service levels and performance (Braunscheidel et al., 2010: 884). Integration between channel partners includes major cultural changes such as building trust and eliminating negative behaviour to foster collaboration and partnerships between companies (Braunscheidel et al., 2010: 884). On the other hand, Lawrence and Lorsch (1986) define integration as the quality of cooperation between departments (as cited in Lee, 2001: 80).

Coordination of the supply chain is strategically important as new forms of organization have evolved and become unrestricted (Akyüz and Erkan, 2010: 5137). Supply chain integration is believed to be related to organizational culture and collaboration (Cao et al., 2015: 36). Relational view theorists point out that increased interaction among supply chain members improves the trust and relationship links that are critical to supplying chain integration (Johnson et al., 2014: 2).

Organizational culture is an intangible but ever-present reality that “provides meaning, direction, and the basis for action” (Oden, 1999: 68). Schein (1993) explained that organizational culture has a positive effect on behaviour, which is reflected in shared values and beliefs among the members of an organization (as cited in Porter, 2016:

5). Organizational culture influences internal behaviours such as knowledge sharing, ethical decision making, teamwork, and risk-taking (Porter, 2016: 6). Moreover, according to Cameron and Quinn (1999), organizational culture is divided into four different types that emerge when an axis with an internal focus on one end and external focus on the other crosses an axis with flexibility and dynamism on one end and stability and control on the other. In addition, Cameron and Quinn (1999) classified organizational culture into the types of Adhocracy, Clan, Hierarchy, and Market Culture and this classification was named as “Competitive Values Model”. Additionally, each of the types of organizational culture can contribute to the success of the firm, depending on the needs of the external environment and the strategic management of the organization (Acar, 2013: 11).”

Although integration is an important concept in supply chain management, it is not clear in the literature whether it is an activity, a process or the result of an organizational structure. Integration is the act of coordinating parts of the system to control it. Thus, supply chain integration refers to any measure taken to maintain control over the supply chain (Lee, 2001: 80). Güzel and Demirdöğen (2016: 364) say that integration is implemented in two parts as technological and logistics integration. According to the existing research, technological integration is defined as the remodelling process, new product creation and development, information sharing and transfer between any supplier and any buyer, while logistics integration requires cooperation and coordination in managing material and information flow throughout the supply chain (Vachon, 2003: 19). In the 1970s, the need for integration in the physical distribution of products was started to be voiced. In this direction, intense global competition has forced many organizations to form cooperative, mutually beneficial partnerships with suppliers and distributors (Wisner and Tan, 2000: 34).

Environmental uncertainty is a concept with different definitions in the literature such as complexity, variability and vulnerability (Kara and Kayis, 2004: 467). Environmental uncertainty poses a challenge for supply chains, and business leaders recognize that they must take action to manage it (Nagarajan et al., 2013: 785). Organizational theorists consider how companies should organize their structures to respond to uncertainty in the external environment. For example, Pagell and Krause emphasize the need for a more organizational structure as a firm’s environment becomes more complex and unpredictable (Pagell and Krause; 2004: 630). At the same time, much of the work in organizational theory deals with how firms should estimate environmental factors such as competitors, customers, and suppliers (Chang et al., 2002: 4767). In addition, decision theorists such as Knight (1921), Luce and Raiffa (1957) define uncertainty as situations where each outcome is a known probability and the likelihood of the result of any action against risk situations is not known (Duncan, 1972: 317).

Various authors have conceptualized and measured environmental uncertainty in different ways (Liao, 2006: 41). In this connection, Wernerfelt and Karnani (1987: 189) evaluated environmental uncertainty using four dimensions: demand, supply, competitive and external uncertainty. Process uncertainty refers to environmental uncertainties arising from supplier uncertainty, customer uncertainty, and control uncertainty (Liao, 2006: 41). According to Zhang et al. (2002: 562), uncertainty is related to customers, suppliers, technologies and competitors. Uncertainty can be such that it affects the decisions of firms in an industry individually or collectively (Wernerfelt and Karnani; 1987: 189).

Storey et al. (2005: 257) point out that organizational and behavioural barriers challenge supply chain initiatives and are a possible detriment to supply chain integration performance. Organizations may fail to meet their integration goals if there is no cultural harmony among channel members. It is important to understand that interaction is between an organization’s internal and external culture or organizational image. In other words, the perceptions of channel members are heavily influenced by the employees who manage business relationships (McAfee et al., 2002: 3). Internal organizational culture and external culture must be harmonized to ensure the effectiveness of supply chain integration (Porter, 2016: 6). Previous research has shown that collaboration and logistics integration is achieved within the boundaries of a business by connecting external suppliers, carrier partners and customers (Chen and Paulraj, 2004: 127).

Lin (2016) emphasizes that organizations are open systems and have to interact with the environment. In this connection, to survive, companies must make sound judgments about their environment and avoid costly mistakes. It is emphasized that although the environment has many features, the main point that can affect the reactions of companies is always the degree of uncertainty (Lin, 2006: 439). Many studies in organization theory deal with the issue of environmental uncertainty. In this context, most of these studies deal with the estimation of environmental factors such as competitors, customers and suppliers of firms (Chang et al., 2002: 4767). According to Tung (1979: 673), environmental uncertainty is defined as the rate of change or variability in the external environment of the organization, which primarily consists of customers, competitors, government regulations and labour unions. Ariöz and Yıldırım (2012: 173) define uncertainty as situations in which many different outcomes

of an option can occur in the decision-making process of businesses, but the probability of accomplishment of these different outcomes is unknown. Uncertainty, which affects the decision maker's view of the future and emerges as a surprise, can occur in three main ways: price uncertainty, technological uncertainty, and price-technology uncertainty. In light of the literature review, the hypotheses of the current study are worded as follows:

H₁: Organizational culture has a positive effect on supply chain integration.

H₂: Organizational culture has a negative impact on environmental uncertainty.

H₃: Environmental uncertainty has a negative impact on supply chain integration.

H₄: Environmental uncertainty has a mediating role in the effect of organizational culture on supply chain integration.

3. METHODOLOGY

The model was tested with the structural equation model (SEM). In the scales, it was expressed as a five-point likert, remaining true to the original structure. A total of 238 questionnaires were administered. The research was analyzed with SPSS and AMOS programs.

The structural scheme and hypotheses of the research model are given in Figure 1.

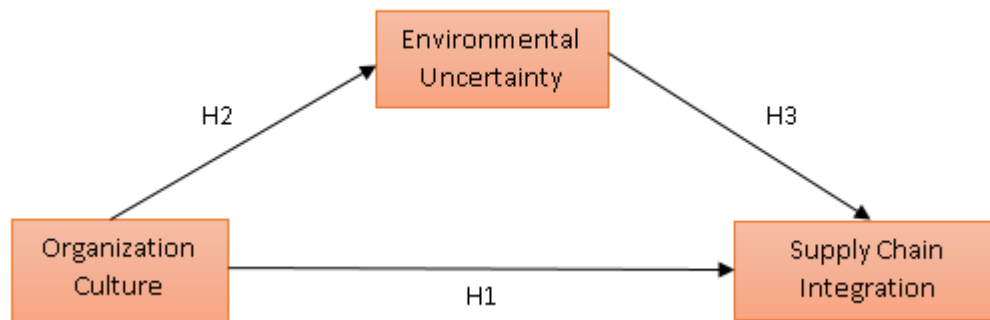


Figure 1. Structural scheme of the research model

Considering the principle that the research population should be similar in terms of field of activity and size, the population of the current study was determined as Mersin Free Zone and Mersin Organized Industrial Zone companies operating in the manufacturing sector in the city of Mersin. According to the framework and limitations of the study, it was deemed appropriate to have the sample size at the level of 95% confidence and 5% sensitivity. A total of 238 companies were administered a questionnaire. The simple random sampling method was used as the sampling method.

The data of the study were collected with the questionnaire method. The first part of the questionnaire included items to elicit information about the companies such as how long the firm has been operating, the number of employees, and the sector in which they operate. The second part of the questionnaire consists of scales related to the variables expressed in the research problem. The scales are in the form of a five-point Likert scale.

The scale developed by Cameron and Quinn (1999) was used to determine control flexibility and internal-external focus judgments in organizational culture. Çetindaş (2018) used a supply chain integration scale consisting of 14 questions from Wong, Boon-ittb and Wong, (2011) in his study of "The regulatory role of environmental uncertainty in the effect of supply chain integration on logistics performance in manufacturing enterprises". It was thought that the environmental uncertainty scale, which was prepared by making use of the study of Sreedevi and Saranga (2017), "Uncertainty and supply chain risk: Moderate role of supply chain flexibility in risk reduction" would be appropriate in this study.

4. FINDINGS

In this section, firstly, the reliability analysis information about the findings obtained in the research is given. After it was seen that the reliability and validity values of the scales used in the research were at the desired level,

the analysis of the research model was started. The first stage of the analysis is to determine that the research model meets the criteria of goodness of fit. At this stage, four criteria used in structural equation models were calculated and the findings were interpreted. After it was seen that the model met the criteria of goodness of fit, the findings obtained from the model were interpreted.

The Cronbach alpha coefficients for the scales and dimensions used in the questionnaire are given in Table 1. According to the findings obtained, it is seen that the reliability of the scales is high.

When the CFA findings for the structural validity of the scales used in the current study are examined in Table 1, it is seen that all the scales have acceptable goodness-of-fit values.

Table 1. The Cronbach Alpha Coefficients of the Scales Used in the Study and their Sub-Dimensions According to the Findings and CFA Findings for the Structural Validity of the Scales Used in the Study

Scales	CMIN/df	GFI	CFI	TLI	RMSEA	Number of Items	Cronbach Alpha
Critical Values	<5	<0.90	<0.90	<0.90	<0.08		
Organizational Culture	1.903	0.966	0.989	0.982	0.062	9	0.950
Environmental Uncertainty	2.052	0.973	0.983	0.971	0.067	6	0.848
Supply Chain Integration	1.983	0.945	0.983	0.973	0.064	12	0.937

The distribution of the participating companies across the sectors in which they operate is given in Table 2. According to the findings, 27.3% of the participating companies are companies operating in the food sector.

The distribution of the participating companies by capital structure is given in Table 2. According to the findings, 86.1% of the participating companies are companies with domestic capital, 10.1% with domestic-foreign partnerships and 3.8% with foreign capital.

The distribution of the participating companies according to the number of employees is given in Table 2. According to the findings, 60.9% of the participating companies have 1-50 employees, 19.3% have 51-100 employees and 19.7% have 101 or more employees.

The distribution of the participating companies according to how long they have been operating is given in Table 2. According to the findings, 22.3% of the participating companies have been operating for 1-5 years, 46.2% for 6-15 years and 31.5% for 16 years and more.

Table 2. Statistical Information about the Companies Participating in the Study

Sectors in which they operate	Number	Percentage
Food	65	27.3
Textile	33	13.9
Metal	24	10.1
Chemistry-Pharmaceutical	18	7.6
Others	98	41.1
Capital structure of the companies		
With domestic capital	205	86.1
Domestic-Foreign partnership	24	10.1
With foreign capital	9	3.8
Number of employees of the companies		

1-50 people	145	60.9
51-100 people	46	19.3
101 people and more	47	19.7
How long the companies have been operating		
1-5 years	53	22.3
6-15 years	110	46.2
16 years and more	75	31.5
Total	238	100

In the current study, the suitability of the scale and its sub-dimensions to the normal distribution was examined with the Q-Q plot method and it was decided that it was suitable for the normal distribution.

Table 3. Descriptive Statistics

Scales/dimensions	Mean	Std. Deviation	Skewness	Kurtosis
Control dimension	3.31	1.044	-0.006	-0.967
Internal-external control dimension	3.18	0.952	0.197	-0.728
Organizational culture	3.25	0.970	0.063	-0.933
Customer integration	3.16	0.857	0.131	-0.454
Internal integration	3.22	0.966	0.037	-0.774
Supplier integration	3.34	1.070	0.043	-1.029
Supply chain integration	3.24	0.852	0.116	-0.825
Environmental uncertainty	2.99	0.751	0.287	-0.507

The SEM model was established for the “Effect of Organizational Culture on Supply Chain Integration and the Mediating Role of Environmental Uncertainty”. The goodness-of-fit coefficients found for the model are given in Table 4. According to these values, the model satisfies the fit criteria.

Table 4. Goodness-of-Fit Coefficients for the SEM Model

Goodness-of-fit criterion	SEM goodness-of-fit coefficients
CMIN/DF	1,925
GFI	0,915
CFI	0,908
RMSEA	0,062

In the analysis of the research model, the findings regarding the mediating role of environmental uncertainty in the effect of organizational culture on supply chain integration are given in Table 5. According to the analysis,

the effect of organizational culture on the supply chain and the effect of environmental uncertainty on the supply chain was found to be statistically significant, but the effect of organizational culture on environmental uncertainty was found to be statistically insignificant. When the effect coefficients are examined, it is seen that the effect of organizational culture on supply chain integration is positive and high. According to the total effect coefficient, it is expected that 1 unit increase in organizational culture will lead to 0.973 unit increase in supply chain integration. It is seen that environmental uncertainty has a negative effect on the supply chain. Accordingly, it is expected that 1 unit increase in environmental uncertainty will cause 0.212 unit decrease in supply chain integration. Since the effect of organizational culture on environmental uncertainty was found to be statistically insignificant, it was not statistically accepted that environmental uncertainty had a mediating role in the effect of organizational culture on the supply chain.

Table 5. Investigation of the Mediating Role of Environmental Uncertainty in the Effect of Organizational Culture on Supply Chain Integration

		Supply chain integration	Environmental uncertainty
Direct effect	Organizational culture	0.963 (p=0.000)	-0.046 (p=0.103)
	Environmental uncertainty	-0.212 (p=0.001)	
Mediating effect		0.010	
	Environmental uncertainty		
Total effect	Organizational culture	0.973	-0.046
	Environmental uncertainty	-0.212	

According to these results, H1 and H3 hypotheses were accepted; H2 and H4 hypotheses were not accepted.

5. DISCUSSION AND CONCLUSION

In the current study, the mediating role of environmental uncertainty in the effect of organizational culture on supply chain integration was examined. The model design was made by assuming the mediating role of environmental uncertainty in the effect of organizational culture on supply chain integration (Lee et al., 2009; Yunus and Tadisina, 2016; Wong and Boon-itt, 2018).

The effect of organizational culture on supply chain integration and the effect of environmental uncertainty on supply chain integration was found to be statistically significant. However, the effect of organizational culture on environmental uncertainty was found to be statistically insignificant.

When evaluated in terms of the number of employees and the age of the firm, although there is no statistically significant difference in the perception of environmental uncertainty of the companies, it is seen that the perception of environmental uncertainty decreases as both the number of employees and the age of the firm increase. Considering that the items of the environmental uncertainty scale are negative, this result can be concluded as the number of employees and the age of the firms increase. It can be concluded that they are less affected by environmental uncertainty.

When the effect coefficients are examined, it is seen that the effect of organizational culture on supply chain integration is positive and high. It is expected that 1 unit of improvement in organizational culture will lead to 0.973 unit change in supply chain integration. On the other hand, environmental uncertainty is seen to have a negative effect on the supply chain. Accordingly, it is expected that 1 unit increase in environmental uncertainty will cause 0.212 unit decrease in supply chain integration.

In the current study, the structural model of the interaction between organizational culture, environmental uncertainty and supply chain integration, which have an important place in the field of organization management, was revealed. Both the model itself and the statistical significance of the model are important contributions to the literature.

When the study is evaluated in terms of the sector:

It was revealed that organizational culture and environmental uncertainties are effective parameters in developing supply chain integration, which is an important goal for the company. Especially the negative effect of environmental uncertainties and the high positive effect of organizational culture is a result that should be taken into account.

As can be seen in the study, the model is designed on the role of the mediator. Again, when the relevant literature is reviewed, it is seen that there are also variables that have a regulatory effect on organizational culture and supply chain integration. An important example of these variables is whether the firm is a family business or not (Yunus and Tadisina; 2016). A new dimension can be added to the research by adding variables that have a regulatory effect on the study model.

In this study, it has been revealed that organizational culture has a high effect on supply chain integration. When examined from this aspect, the development of organizational culture should be seen as a necessity in terms of supply chain integration.

Managers should consider the organization's attitudes and behavior patterns when creating decision strategy, plans and policies in the supply chain integration process. In addition, projects should be developed and trainings should be organized in order to be faithful to the organizational values created in a way that the organizational culture will react to change and technological development early and to ensure the sustainability of corporate success.

One of the remarkable findings of the study is the negative effect of environmental uncertainties on supply chain integration. Sector managers and policy makers taking measures in this regard, that is, developing practices that minimize environmental uncertainties, will improve supply chain integration.

The findings obtained within the scope of the study are limited to the Free Zone and Organized Industrial Zone in the city of Mersin. For this reason, analyzing the relationship between the variables that are the subject of the current study on different populations and comparing their results with the results of the current study can bring a broader perspective to the field of organizational culture and supply chain integration.

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