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Does Competition Intensity of SMEs Moderate the Environmental Turbulence-Organizational Agility Relationship?

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Abstract: Small and medium sized enterprises (SMEs) among the essential economic cornerstones of our age, where many factors are constantly changing. Social paradigm shifts are both diverse and complex. In fact, the increasing number of SMEs as a result of this complexity also constitutes the reason for this complex structure. So much so that while entrepreneurs are the agents of social change, the driving force of economic change is SMEs. There are always opportunities and threats for businesses arise directly from the business and competitive environment hence analysing data from 1256 SME's the study shows that competition intensity moderates the environmental turbulence-organizational agility relationship.
Keywords: *Small and medium sized enterprises (SMEs), Competition Intensity, Environmental Turbulence, Market Turbulence, Technological Turbulence, Organizational Agility*

Introduction

Business activities are experiencing change and transformation as an extension of social movements. For example, until the second half of the 1970s, the general view that large-scale enterprises were the locomotive of business activities and employment (Mac an Bhaird, 2010). Birch's (1979) work titled "The Job Creation Process" pointed out that a new era had been entered in business and management activities in many aspects. Small and medium sized enterprises (SMEs) would be the determinants of the new world's labor market. Not surprisingly, SMEs accelerated at an increasing rate from the Second World War to the millennium, and as of 2000, they constituted 90% of businesses operating in the European Union and the United States economies (Karmel and Bryon 2002). Similarly, it has been stated by the Organization for Economic Cooperation and Development (OECD) that SMEs, which are defined as the power that creates innovation around new ideas in the market, constitute more than 90% of the enterprises in OECD countries. And it has been stated that approximately 75% of this rate operates in sectors that create added value in countries. (OECD, 2010). As the first quarter of the 2000s is coming to an end, we can see that SMEs account for two-thirds of the total employment across Europe and increase their share in the economy up to 99.8% (European Commission 2019). The statistics are instructive and guiding in terms of understanding the value and function of SMEs in economies.

Today, economies are intensifying with the pressure of international growth and expansion and the increasing rate of globalization (André, 2021). SMEs constitute an important part of both total enterprises and total employment in all developed and developing countries, and they have an important position in production, exports and added value (Teruel-Carrizosa, 2010; Erol,

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2010). Moreover, in this global period we live in, there are activities, events, or elements that can reflect mobility, complexity, and chaos in the environment in which businesses live. An uncertain and threatening situation arises for the organization when the change of these activities, events and elements in the environment is very rapid, their number is very large and their mutual relations are intense. However, modern businesses have to adapt to change in order to continue their activities in rapidly changing environmental conditions. In fact, global competition offers SMEs the opportunity to interact with large-scale companies without competing with them. This interaction opens new doors for SMEs (Naradda Gamage et al.,2020). Obviously, there is the possibility of new threats as well as new opportunities in flowing through this door. In brief every moment of contemporary business life is very dynamic. This dynamism can be in a different form, color, or tone for each sector. However, it contains various opportunities and threats for businesses (Chonko et al., 2002). Since the opportunities and threats for businesses arise directly from the business and competitive environment, this study is carried out to seek an answer to the question of whether the competition intensity of SMEs moderates the environmental turbulence-organizational agility relationship.

Theoretical Framework

Environmental Turbulence

Businesses are open system mechanisms that receive inputs from their environment and transform these inputs into outputs in order to achieve organizational goals by providing a sustainable competitive advantage (Mullins, 2007). Duncan (1972) stated that business managers should consider the whole picture of internal environmental factors such as technical skills, employee participation, conflicts between individuals and units, and various external environmental factors such as customer and supplier relations, general conditions of the labor market, competitive conditions, legal regulations and technological developments when transforming any input into an output that serves business purposes. It is not easy to describe an environment consisting of so many components. In this sense, environmental turbulence as an inability to predict the overall environmental elements of the enterprise affects the market performance and strategic flexibility of the enterprise (Rego. et al., 2021). High environmental turbulence, uncertainty, unpredictability, and mobility limit the business's range of motion and weaken the decision-making skills of managers (Papatya, Papatya & Hamşıoğlu, 2019).

Market Turbulence and Technological Turbulence

Although there are strategies that businesses use in struggling with environmental conditions, the way and degree of being affected by environmental factors are different for each business (Worthington and Britton, 2009). In other words, each business is uniquely affected by the change in its environment and reacts to the environment in a unique way. Because the customer mass and relationships of every business are different. Ultimately, change in the business environment is inevitable and continuous (Gideon, 2006). Businesses that want to gain an edge over their competitors should closely follow market conditions, customer preferences, and technological changes and be a part of this transformation (Vorhies and Morgan, 2005). From this point of view, market turbulence, which expresses the change in customer preference that causes a company's current market knowledge to become obsolete, and technological turbulence explains the uncertainty caused by the growth in the rate and the degree of innovation and technological changes in the market, come to the fore as the two basic elements of the turbulent environment (Han et. al., 1998; Gemici and Zehir, 2019).

Organizational Agility

The fact that unpredictable changes affect institutions more in a climate where uncertainty is intensified has revealed the concept of agileness, which literally means the ability to think quickly, by acting agile and with a rational approach (Joiner, 2019). Since the nature of global competition brings with its constant change, today's business activities are dynamic and

customer-oriented. As the life span of products continues to shorten as technological changes accelerate, the changes force businesses to be agile in adapting to the environment (Vokurka and Fliedner, 1998). Organizational agility, with its simplest definition, is the capability of the organization to react instantly to an approaching opportunity or to take timely measures to an emerging threat, therefore, organizational agility is the capability to rapidly acclimate to environmental conditions (Sağır and Gönülölmez, 2009). In other words, organizational agility is not only the ability to act against unexpected environmental conditions but also to take a proactive attitude in terms of being prepared for change (Arteta and Giachetti, 2004). Creating value for customers, giving importance to individuals and the role of knowledge, ensuring internal and external cooperation in the organization, and being constantly ready for change can be thought as the basic principles of agile organizations (Yaghoubi, Kord and Azadikhah, 2011). As an essential skill, organizational agility, enables companies to survive in hyper-competitive environmental conditions by responding instantly to unexpected market changes (Zhang et al, 2022) and also contributes to the sustainability of the sectoral eco-system.

Competition Intensity

Finally, the concept of competition intensity which is assumed to have a moderator effect will be identified. Competition intensity is rate of pressure applied by businesses operating in a certain sector. According to some researcher's competition intensity considered the third dimension of environmental turbulence after marketing and technological turbulence (Jaworski ve Kohli 1993; Han et. al.,1998; Chonko et al., 2002). According to this marketing school view, the intensity of competition is one of the main characteristics that cause environmental turbulence. On the other hand, according to management school opinion competition intensity focuses on strategic competition management and is not just a feature of environmental turbulence. Pioneered by Porter (1979) in the five forces model, the intensity of competition is an integrated reflection of the general threat posed by technology and market conditions, as well as a substitute and complementary products, suppliers, and businesses that are likely to access to the market. As a common denominator of these two approaches, it can be said that the competition intensity is the most basic determinant of the profitability and general attractiveness of any industry. As a result, competition intensity is the weakness of the ability of firms to distinguish the environmental opportunities and resources due to increase in competitors as well as the general situation where competition is fierce due to the lack of potential for further growth (Koç et al. 2018).

The Relationship Between Environmental Turbulence, Organizational Agility and Competition Intensity

The first half of the 20th century is considered to be the period in which the modern industrial structure dominated by large-scale enterprises, developed with the support of governments all over the world. However, in recent years, the economy and incentive policies of many countries have been such that small-scale enterprises are more creative and innovative, and at the same time produce solutions for employment (Fukuyama, 2005). Indeed, the flexible structure of SMEs is an important factor in their more customer-oriented and proactive behavior. To the extent that this flexibility is supported by an innovative attitude, they can hold on as an actor that makes a difference in the global economic climate (Eggers, 2020). As a matter of fact, the study conducted by Pelham (1999) with 229 small-scale manufacturing company managers, indicate that small-scale enterprises can adapt more easily to the external environment due to the flexibility of their already limited strategic options. Lichtenthaler (2009), on the other hand, determines that technological turbulence and marketing turbulence has a positive and significant effect on organizational learning processes as a result of a survey conducted in 175 industrial companies. Bodlaj and Cater (2019) conducted a survey in 373 SMEs and found that environmental turbulence (market and technological) had a positive and significant effect on the perceived importance of innovation. It should be noted that while organizational agility

takes its foundation from the innovative mindset, it forms the basis for the construction of an innovative culture within the organization in the long run (Harraf et al., 2015). On the other hand, Kozielski (2018) analyzed the data obtained from 149 SMEs and 33 large-scale companies in their study, in which they investigated the determinants of business success of SMEs, and concluded that market knowledge, marketing orientation, organizational learning processes are directly related to business success. Companies will be able to survive and be successful to the extent that they can evaluate the information they can obtain from their environment in line with environmental demands and transform this into a learning process. As a matter of fact, Prasanna et al., (2019) stated in their systematic review study on the sustainability of SMEs that the main problems of SMEs are that they succumb to environmental turbulence and end their business life in the short term. It is understood that although there is a close interaction between environmental factors and SMEs, the degree and direction of impact may differ in various dimensions. At this point, the structure of the enterprise and its attitude towards the environment is important.

As businesses have become more global, information-sensitive, and complex, the level of environmental turbulence also become deeper. This situation has made organizational change inevitable (Cummings ve Worley, 2014). Whether the organizational change is the product of a conscious or necessary process, it has an innovative aspect for businesses. So much so that it triggers either a new product, a new process, or a new idea change (Lewis, 2019). Eby et al. (2000) conducted a study on the level of readiness of employees for a large-scale change in a gradual study in a national sales organization. Findings from this empirical study are that organizational characteristics as a whole must support change in order for employees to support the process as change agents. In other words, the organization should be sensitive and agile towards the external environment. Gemici and Zehir (2019) examine the relationship between environmental turbulence and organizational innovation in their study based on the data of 233 companies and revealed that technological turbulence and market turbulence positively affect organizational innovation. In other words, companies consider organizational innovation as the key to success when faced with technological and market turbulence. Bahrami et al. (2016) conducted a research with 371 administrative and medical personnel working in different hospitals and found that organizational agility alleviates the negative impact of technological turbulence on organizational creativity. This result is important in terms of showing the degree of sensitivity of companies to environmental interaction.

Environmental turbulence in the global business world reflects the general picture that businesses have to understand in order to survive. Businesses, on the other hand, try to develop actions against this picture with different skills and tools. For example, Ahmed et al. (2022), conducted a survey on 227 manufacturing SMEs, found that there is a positive and significant relationship between digital skills and the organizational agility of businesses. Similarly, Tallon & Pinsonneault (2011) also mention that organizational agility has a significant effect on firm performance in their study with 241 managers in the information technology sector. Ultimately, the relationship between environment, agility, and competition are also proportional to decision-making skills related to using different skills and tools (Adomako et. al., 2021). As a matter of fact, Ramaswamy (2001) in his empirical study comparing the performances of semi-public owned enterprises and fully privately-owned enterprises in India found that firms can act more agile towards private ownership, and the intensity of competition has a moderator effect on ownership and firm performance. As competition intensifies, the disadvantaged position of semi-public owned enterprises deepens. Roberts and Grover (2012), on the other hand, conduct a study with senior marketing executives by directly associating organizational agility with the competition. In addition, when the relevant literature is examined, it has been determined that the intensity of competition has a moderating effect on the relationship between various organizational attitudes and behaviors and organizational

outputs. For example, Purnama and Subroto (2016)'s research with 130 SMEs managers on the relationship between environmental uncertainty and information technology investments; Koc et al. (2018)'s research on 321 exporting companies on the relationship between firm innovation and export performance; Yıldız and Sayın (2019) 's research on 124 manufacturing companies on the effect of management on product innovation performance; Kaplan and Uçar (2021) 's research on hospital managers that the perceived environmental uncertainty in the effect of resource dependency level on competitive strategies; and Zhang et al. (2022) 's research on comparative impacts of political and business ties with 132 Chinese company executives concluded that the intensity of competition has a certain level of moderating effect. Finally, the results show that organizational agility directly affects both competition intensity perception and counter-response effectiveness to a high degree. As a result, as can be seen in detail in the research model in Figure 1, considering the relationships between the concepts, it is predicted that environmental turbulence and its sub-dimensions (technological turbulence and market turbulence) affect organizational agility, and competition intensity plays a moderating role in this relationship:

Hypothesis ^{1}: Market turbulence has a significant effect on organizational agility.
Hypothesis^{1a} : Competition intensity has a moderator effect between market turbulence and organizational agility.
Hypothesis ^{2}: Technological turbulence has a significant effect on organizational agility.
Hypothesis ^{2a}: Competition intensity has a moderator effect between technological turbulence and organizational agility.
Hypothesis ^{3}: Environmental turbulence has a significant effect on organizational agility.
Hypothesis ^{3a}: Competition intensity has a moderator effect between environmental turbulence and organizational agility.

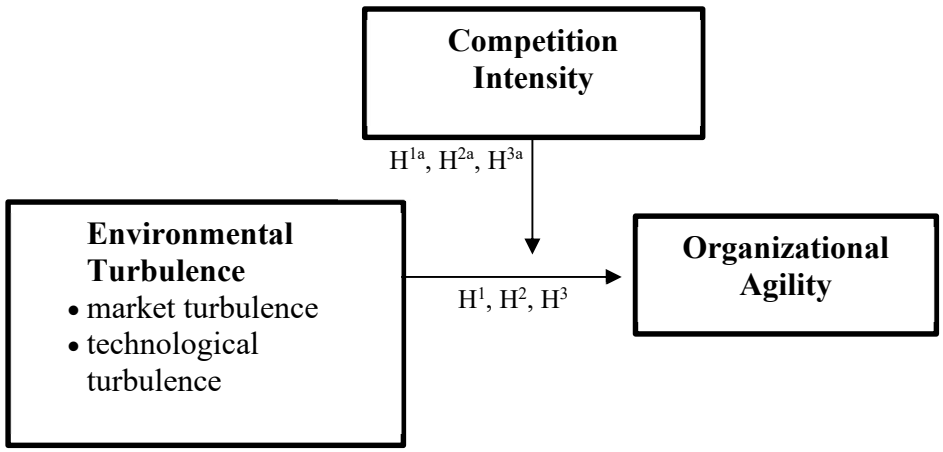

Figure 1. Research Model: The Moderating Role of Competition Intensity in the Effect of Environmental Turbulence on Organizational Agility

Research Design

Research Universe, Sample, and Data Collection Tools

The research was carried out in the cities of Bayburt, Erzurum and Erzincan located in the Northeast Anatolian Region of Turkey. These three cities represent the geographical region called TRA1 Level 2 Region, among 26 regional development levels created to accelerate regional development, ensure its sustainability, and reduce inter-regional and intra-regional development disparities in Turkey (KUDAKA, 2017). The universe of the research consists of 11543 businesses actively registered in the Small and Medium Enterprises Development and

Support Administration (SMEDSA institutionally known as KOSGEB in Turkish) database between 2015-2020 in these three cities. Using the stratified sampling method according to the number of SMEs in the provinces, 1500 questionnaires (750 Erzurum, 500 Erzincan, and 250 Bayburt) are distributed and 1256 questionnaires are processed. Before the implementation of the questionnaire used in the study, an application was made to the Erzurum Technical University Scientific Research and Publication Ethics Committee, and approval was obtained with the decision numbered 2021/4-1.

Research data were collected using the survey method. For the environmental turbulence scale, scales consisting of 14 items and two sub-dimensions developed by Jaworski and Kohli (1993) and Yayla and Hu (2012) are used. The organizational agility scale is prepared by Tallon & Pinsonneault (2011) as 8 items and one dimension. The competition intensity scale, consists of 4 items and one dimension prepared by Li & Calantone (1998).

Data analysis

SPSS 22.0 and AMOS 23.0 statistical programs have been selected and used for data analysis in this study. The validity of the scales is tested by confirmatory factory analysis and reliability measured with Cronbach Alpha values. In the evaluation of model fit, it is commonly classified as "Chi-square statistics to degrees of freedom ratio" (X2/sd, <5), "statistical significance of individual parameter estimates" (t value), "fit indices based on residuals" (SRMR, ≤0,08; GFI, ≥0,90), "fit indices based on the independent model" (NNFI, ≥0,90; CFI, ≥0,90) and "mean-square of approximate errors"(RMSEA, ≤0,10) fit indices have been used (Çokluk, Şekercioğlu and Büyüköztürk, 2010).

The Cronbach Alpha technique used for the reliability analysis which shows internal consistency and is usually expected to be above 0.70. Also, it is considered that items with an item-total correlation of 0.30 and higher distinguish individuals well (Büyüköztürk, 2011). Additionally, the Pearson correlation is used in the analysis of the relationship between the variables by making logarithmic transformations of the scores. Hierarchical regression analysis was applied to determine the effect of environmental uncertainty on organizational agility and the moderator role of competition intensity. The significance level (p) is accepted as 0.05 in the analysis.

Findings

Demographic and Business Characteristics Findings

Interviews are conducted in Erzurum with 59.5%, Erzincan with 26.9%, and Bayburt with 13.6% of 1256 SME employees/officials participating in the research. 86.2% of the participants are male and 13.8% are female. 16.5% of the participants are in the 18-24 age group, 27.1% are 25-31 years old, 21% are 32-38 years old, 18.6% are 39-45 years old, and 16.8% are 46 years and above. 46.4% of the participants are business owners, 4.8% are business partners, 16.1% are business managers, and 32.7% are business employees.

Within the scope of the research, 63.8% of the enterprises are sole proprietorships, 27.9% are limited liability companies, and 8.3% are joint-stock companies. 20.9% of the enterprises operate in the production sector and 79.1% in the service sector. 1-10 people work in 62.7% of the enterprises, 11-50 people work in 22.3% of the enterprises, 51-100 people in 8.8% of the enterprises, 101-150 people in 3.8% of the enterprises, 151-250 people work in 2.4% of the enterprises.

Environmental Turbulence Scale Validity and Reliability Analysis Findings

The 14-item and 2-dimensional (market turbulence, technological turbulence) structure of the Environmental Turbulence Scale was tested by confirmatory factor analysis. As a result of the removal of 5 items with unsuitable factor loadings (ET6, ET7, ET8, ET9, ET10) and three covariance connections (ET2-ET5, ET4-ET5, ET11-ET13), fit indexes reached desired levels (X^2/sd:4,437, SRMR:0,023, GFI:0,982, NNFI:0,980, CFI: 0,987, RMSEA:0,052). It was found that the factor loadings reached the appropriate level. The factor loadings, t values and

reliability analysis (item-total correlation, Cronbach Alpha) obtained as a result of the Environmental Turbulence Scale confirmatory factor analysis are shown in Table 1.

Table 1. Results of Environmental Turbulence Scale Confirmatory Factor Analysis and Reliability Analysis

Item and Size	Std. β	t	r	α
Market Turbulence				**0,87**
ET1	0,79		0,71	
ET2	0,85	31,29**	0,72	
ET3	0,77	28,83**	0,67	
ET4	0,67	24,17**	0,64	
ET5	0,73	25,45**	0,66	
Technological Turbulence				**0,85**
ET11	0,77		0,64	
ET12	0,82	27,36**	0,70	
ET13	0,86	28,31**	0,73	
ET14	0,64	21,75**	0,57	
Cronbach Alpha				**0,90**

r: Correlation of Item and Total **p<0,01

As a result of confirmatory factor analysis, it is seen that factor loadings of 9 items in the scale are higher than 0.40, and t values of all items are significant. The Cronbach Alpha coefficient for the entire Environmental Turbulence Scale is 0.90, the Cronbach Alpha coefficients of the sub-dimensions are 0.87 and 0.85, and the item-total correlation for all items is higher than 0.30 (range from 0.57 to 0.73). The results indicate that the Environmental Turbulence Scale is valid and reliable with its 9-items and 2-dimensional structure shown in Table 1.

Competition Intensity Scale Validity and Reliability Analysis Findings

According to the results of the confirmatory factor analysis carried out with the 4-item and one-dimensional structure of the Competition Intensity Scale, it was determined that the model fit indexes in the scale consisting of 4 items and one dimension were at good and very good levels (X^2/sd: 4,786, SRMR: 0,014, GFI: 0,996, NNFI:0,987, CFI: 0,996, RMSEA:0,055). The factor loadings, t values, and reliability analysis (item-total correlation, Cronbach Alpha) results obtained as a result of the confirmatory factor analysis of the Competition Intensity Scale are shown in Table 2.

Table 2. Results of Competition Intensity Scale CFA and Reliability Analysis

Item and Size	Std. β	t	r	α
CI1	0,61		0,56	0,82
CI2	0,80	20,55**	0,69	
CI3	0,72	19,42**	0,65	
CI4	0,79	20,39**	0,68	

r: Correlation of Item and Total **p<0,01

According to the confirmatory factor analysis results in Table 2, it is seen that the factor loadings in the scale consisting of 4 items and one dimension are in appropriate ranges and the t values of all items are significant. The Cronbach Alpha coefficient of the scale is 0.82 and the item-total correlation for all items is found to be higher than 0.30 (range from 0.56 to 0.69). The results indicate that the Competition Intensity Scale is valid and reliable with its 4-item and one-dimensional structure.

Organizational Agility Scale Validity and Reliability Analysis Findings

Finally, confirmatory factor analysis was performed with 8 items and one-dimensional structure of the Organizational Agility Scale. Although the factor loadings were not lower than

0.40, item 7 had a high degree of correlation with others and covariance connections were observed with these items. Since it negatively affected the model fit indices due to the high correlation, the item in question was removed from the scale and the analysis was repeated. According to the results of the reanalysis, after removing the problematic item (OA7) in the scale, the model fit values attain to appropriate levels (X^2/sd: 4,786, SRMR: 0,014, GFI: 0,996, NNFI:0,987, CFI: 0,996, RMSEA:0,055) with two covariance connections (OA1-OA2, OA5-OA6) and item factor loadings were in appropriate ranges. The factor loadings, t values and reliability analysis results obtained as a result of the confirmatory factor analysis of the scale are shown in Table 3.

Table 3. Organizational Agility Scale CFA and Reliability Analysis Results

Item and Size	Std. β	t	r	α
OA1	0,70		0,64	
OA2	0,75	26,10**	0,69	
OA3	0,75	22,87**	0,67	
OA4	0,69	21,29**	0,63	0,86
OA5	0,53	16,71**	0,53	
OA6	0,72	21,97**	0,69	
OA8	0,67	20,92**	0,62	

r: Correlation of Item and Total **p<0,01

Factor loadings of 7 items obtained from confirmatory factor analysis were found to be greater than 0.40 and t values were significant. The Cronbach Alpha coefficient for the entire scale was 0.86, and the item-total correlation for all items was found to be higher than 0.30 (range 0.53 to 0.69). As a result, Organizational Agility Scale is valid and reliable with 7 items and one-dimensional structure shown in Table 3.

Descriptive Findings

The environmental turbulence scale score is 4.05±0.74, the market turbulence sub-dimension score is 4.08±0.79, and the technological turbulence sub-dimension score is 4.01±0.79. According to the scores obtained, it can be said that the environmental turbulence perception score of the participants is at a high level. The competition intensity scale score is 4.04±0.80, and the organizational agility scale score is 4.08±0.71. According to the scores obtained, it can be said that the perception scores of the participants regarding the intensity of competition and the organizational agility of their organizations are high. The descriptive statistics of the scale scores are given in Table 4.

Table 4. Descriptive Statistics of Scale Scores

Scale	N	Min.	Maks.	$\overline{X}$	SS	Skewness	Kurtosis
Market Turbulence	1256	1,00	5,00	4,08	0,79	0,27*	-0,57*
Technological Turbulence	1256	1,00	5,00	4,01	0,84	0,25*	-0,44*
Environmental Uncertainty	1256	1,00	5,00	4,05	0,74	0,24*	-0,40*
Competition Intensity	1256	1,00	5,00	4,04	0,80	0,20*	-0,45*
Organizational Agility	1256	1,00	5,00	4,08	0,71	0,39*	0,16*

*After logarithmic transformation

Findings Related to the Research Model

A positive and significant relationship is found between the independent variable environmental turbulence scores and the dependent variable organizational agility scores (r=0,60; p<0,05). A positive and significant relationship is determined between the study's independent variable, environmental turbulence scores, and the moderator variable competition intensity scores (r=0,71; p<0,05). When examined at the level of sub-dimensions, it is found that there is a positive and significant relationship between the market turbulence sub-dimension scores and the intensity of competition (r=0.70; p<0.05) and organizational agility

(r=0.56; p<0.05) variables. It is determined that there is a positive and significant relationship between the technological turbulence sub-dimension scores and the variables of the competition intensity (r=0.60; p<0.05) and organizational agility (r=0.55; p<0.05). A positive and significant relationship is found between the moderator variable competition intensity scores and the dependent variable organizational agility scores (r=0,55; p<0,05). Table 5 shows the results of the Pearson correlation test for the relationship between the variables.

Table 5. Correlation Analysis Results

Scale and Sub-dimension	**1**	**2**	**3**	**4**	**5**
1-Market Turbulence	1	0,66**	0,89**	0,70**	0,56**
2-Technological Turbulence		1	0,92**	0,60**	0,55**
3-Environmental Uncertainty			1	0,71**	0,60**
4-Competition Intensity				1	0,55**
5-Organizational Agility					1

*p<0,05**p<0,01

Table 6 presents the findings and hypothesis results of the model tests carried out to determine the relationship between market turbulence and organizational agility and the moderator role of competition intensity in this relationship.

Table 6. The Effect of Market Turbulence on Organizational Agility and the Role of Competition Intensity in This Relationship

	Independent variables	**B**	**SH_B**	**β**	**t**	**p**
Model 1	Constant	-0,317	0,014		-22,692	0,000
	Market Turbulence	0,485	0,020	0,562	24,045	**0,000**
	R=0,562 R^2=0,316 $F_{(1;1254)}$=78,144 p=0,000					
Model 2	Constant	-0,264	0,015		-18,117	0,000
	Market Turbulence	0,301	0,027	0,348	11,061	**0,000**
	Competition Intensity	0,266	0,027	0,305	9,690	**0,000**
	R=0,688 R^2=0,463 $F_{(1;1253)}$=357,431 p=0,000 $R^2_{Variance}$=0,147 $F_{Change\ (1;1253)}$ = 93,891 p=0,000					
Model 3	Constant	-0,257	0,300		-0,858	0,391
	Market Turbulence	0,446	0,087	0,516	5,128	0,000
	Competition Intensity	0,428	0,097	0,491	4,414	0,000
	PÇx RY	-0,037	0,012	-0,328	-3,120	0,003
	R=0,694 R^2=0,514 $F_{(1;1252)}$=239,684 p=0,000 $R^2_{Variance}$=0,051 $F_{Change\ (1;1252)}$ = 131,03 p=0,02 Durbin-Watson=1,698					

In the first step of the hierarchical regression analysis in Table 6, the effect market turbulence on organizational agility score is examined. It is seen that the first model established is suitable ($F_{(1;1254)}$= 78,144; p<0.05). The market turbulence variable explains about 32% (R^2=0.316) of the change in organizational agility. According to the first model, it is determined that market turbulence has a positive and significant effect on the organizational agility variable (β=0.56; t=24.04; p<0.05).

The second model, in which the competition intensity variable is included, is suitable ($F_{(2;1253)}$=357.43; p<0.05). With the inclusion of the competition intensity variable in the model, the explanation rate of the change in the organizational agility score is determined as approximately 36% (R^2=0.363). In the second model, the variance change explained by the inclusion of the competition intensity variable in the model is approximately 15% ($1st^{R2}$ – $2nd^{R2}$=0.147) and this difference is statistically significant ($F_{Change\ (1;\ 1253)}$ =93.89; p<0.05.).

The third model, which includes the market turbulence and competition intensity interaction variable, is appropriate ($F_{(1;1252)}$=239,684; p<0.05). With the inclusion of the interaction variable in the model, the explanation rate of the change in the organizational agility score is determined to be approximately 51% (^{R2}=0.514). In the third model, it is determined that the variance change explained by adding the interaction variable to the model is at the level of approximately 5% (1st.^{R2} – 2nd.^{R2}=0.051) and this difference is statistically significant ($F_{Change\ (1;1252)}$ = 131,03; p<0,05). According to the findings shown in Table 6, Hypothesis ^{1} (*Market turbulence has a significant effect on organizational agility*) and Hypothesis ^{1a} (*Competition intensity has a moderator effect between market turbulence and organizational agility*) are accepted.

Table 7 presents the findings and hypothesis results of the model tests carried out to determine the relationship between technological turbulence and organizational agility and the moderator role of competition intensity in this relationship.

Table 7. The Effect of Technological Turbulence on Organizational Agility and the Role of Competition Intensity in This Relationship

	Independent variables	B	SH_B	β	t	p
Model 1	Constant	-0,314	0,015		-21,622	0,000
	Technological Turbulence	0,465	0,020	0,547	23,167	**0,000**
	R=0,547 R^2=0,300 $F_{(1\ 1254)}$=536,724 p=0,000					
Model 2	Constant	-0,242	0,015		-16,182	0,000
	Technological Turbulence	0,289	0,024	0,340	12,142	**0,000**
	Competition Intensity	0,299	0,024	0,343	12,255	**0,000**
	R=0,612 R^2=0,375 $F_{(2\ 1253)}$=375,376 p=0,000 $R^2_{Variance}$=0,075 $F_{Change\ (1\ 1253)}$ = 150,179 p=0,000					
Model 3	Constant	-0,377	0,225		-1,677	0,094
	Technological Turbulence	0,245	0,077	0,289	3,200	**0,001**
	Competition Intensity	0,263	0,065	0,302	4,033	**0,000**
	ÇBx RY	0,025	0,009	0,032	2,777	0,032
	R=0,632 R^2=0,412 $F_{(1\ 1252)}$=250,244 p=0,000 $R^2_{Variance}$=0,037 $F_{Change\ (1\ 1252)}$ = 80,362 p=0,000 Durbin-Watson=1,501					

In the first step of the hierarchical regression analysis in Table 7, the effect of the independent variable of the research, technological turbulence, on the dependent variable organizational agility score is examined. It is seen that the first model established is suitable ($F_{(1;1254)}$=536.72; p<0.05). The technological turbulence variable explains about 30% (R^2=0.300) of the change in organizational agility. According to the first model, it is determined that technological turbulence has a positive and significant effect on the organizational agility variable (β=0.55; t=23.17; p<0.05).

The second model, in which the competition intensity variable is included, is suitable ($F_{(2;1253)}$=375.38; p<0.05). With the inclusion of the competition intensity variable in the model, the explanation rate of the change in the organizational agility score is found to be approximately 37% (R^2=0.375). In second model, it is determined that the variance change explained by adding the interaction variable to the model is approximately 7% (1st.R^2 - 2nd.R^2=0,075) and this difference is statistically significant ($F_{Change\ (1;1253)}$=150,18; p<0,05)

The third model, which includes the variable of interaction between technological turbulence and competition intensity, seems to be appropriate ($F_{(1;1252)}$= 250,244; p<0.05). With the inclusion of the interaction variable in the model, the explanation rate of the change in the organizational agility score is found to be approximately 41% (R^2=0.412). In the third model, it is determined that the variance change explained by adding the interaction variable to the model is approximately 4% (1stR^2– 2ndR^2=0.037) and this difference is statistically significant

($F_{Change\ (1;1252)}$ = 80.362; p<0.05). According to the findings shown in Table 7, Hypothesis[2] (Technological turbulence has a significant effect on organizational agility) and Hypothesis[2a] (Competition intensity has a moderator effect between technological turbulence and organizational agility) were accepted.

Table 8 presents the findings and hypothesis results of the model tests carried out to determine the relationship between environmental turbulence and organizational agility and the moderator role of competition intensity in this relationship.

Table 8. The Effect of Environmental Uncertainty on Organizational Agility and the Role of Competition Intensity in This Relationship

	Independent Variables	B	SH_B	β	t	p
Model 1	Constant	-0,258	0,015		-17,411	0,000
	Environmental Turbulence	0,560	0,021	0,600	26,583	**0,000**
	R=0,600 R^2=0,360 $F_{(1\ 1254)}$=706,655 p=0,000					
Model 2	Constant	-0,227	0,015		-15,205	0,000
	Environmental Turbulence	0,396	0,029	0,425	13,621	**0,000**
	Competition Intensity	0,217	0,027	0,248	7,964	**0,000**
	R=0,625 R^2=0,391 $F_{(2\ 1253)}$=402,635 p=0,000 $R^2_{Variance}$=0,031 $F_{Change\ (1\ 1253)}$ = 63,433 p=0,000					
Model 3	Constant	-0,442	0,297		-1,485	0,138
	Environmental Turbulence	0,332	0,093	0,356	3,565	**0,000**
	Competition Intensity	0,154	0,090	0,177	1,709	0,088
	ET x CI	0,042	0,011	0,064	3,818	0,002
	R=0,626 R^2=0,458 $F_{(1\ 1252)}$=268,494 p=0,000 $R^2_{Variance}$=0,067 $F_{Change\ (1\ 1252)}$ = 52,213 p=0,000 Durbin-Watson=1,473					

In the first step of the hierarchical regression analysis in Table 8, the effect of environmental uncertainty, which is the independent variable of the research, on the organizational agility score, which is the dependent variable, is examined. It is seen that the first model established is suitable ($F_{(1;1254)}$=706,65; p<0,05). The environmental turbulence variable explains about 36% (R^2=0.360) of the change in organizational agility. According to the first model, it has been determined that environmental uncertainty has a positive and significant effect on the organizational agility variable (β=0,60; t=26,58; p<0,05).

The second model, in which the competition intensity variable is included, is suitable ($F_{(2;1253)}$=402,63; p<0,05). With the inclusion of the competition intensity variable in the model, the explanation rate of the change in the organizational agility score is found to be approximately 39% (R^2=0.391). In the second model, it is determined that the variance change explained by adding the interaction variable to the model is approximately 3% (1st.R^2 – 2nd.R^2=0,031) and this difference is statistically significant ($F_{Change\ (1;\ 1253)}$ =63,43; p<0,05).

It is seen that the third model, in which the environmental turbulence and competition intensity interaction variable is included, is suitable ($F_{(1;1252)}$= 268,494; p<0,05). With the inclusion of the interaction variable in the model, the explanation rate of the change in the organizational agility score is found to be approximately 46% (R^2=0.458). In the third model, it is determined that the variance change explained by adding the interaction variable to the model is approximately 7% (1st.R^2 –2nd.R^2=0.067) and this difference is statistically significant ($F_{Change\ (1;1252)}$= 52.213; p<0.05). According to these results, Hypothesis[3] (Environmental uncertainty has a significant effect on organizational agility) and Hypothesis[3a] (Competition intensity has a moderator effect between environmental turbulence and organizational agility) are accepted.

Conclusion and Discussion

The Covid-19 Pandemic, which knocked on the door of all humanity in 2019, has led to the emergence of various regulations and measures at the country and global level since its beginning. The aforementioned measures and regulations have brought along with the use of public space, suggestions, and sanctions on working and social life, many new regulations from commercial life, the use of masks and physical distance practices between people, in addition basically hygiene rules at the level of countries (Güneymen, 2021; Lim, 2021). While this development on a global scale causes mutual distance at the point of human relations for a certain period, on the other hand, it requires and encourages the mutual solidarity of people. While explaining the situation in their World Bank Report titled COVID 19: The Great Reset, Schwab, and Malleret (2020) states that "If there was only one word to distill the essence of the 21st century, it would be "interdependence" (p. 13). Indeed, the changes in social norms, social habits, technology adaptation, and economic model change caused by the global epidemic are the most important indicators that the level of "interdependence" will increase day by day. So much so that SMEs have been the most affected by the pandemic on a global scale due to the life that has come to a standstill and the supply chain that has been severely interrupted (Melnyk et. al., 2021). And this study is carried out during the Covid-19 pandemic period.

This research is conducted to answer the research question: “Does competition intensity of smes moderate the environmental turbulence-organizational agility relationship?” In this context, data collected from 1256 SMEs via surveys over a period of more than one year. Three important findings are obtained from the study. First, as the level of market turbulence in the business environment of SMEs increases ($\beta=0.56$; $t=24.04$; $p<0.05$), the level of organizational agility also increases, and the higher the competition intensity in the same business environment ($F_{Change\ (1;1252)} = 131.03$; $p<0.05$) increases the effect of the market turbulence on organizational agility. According to the second finding, as the level of technological turbulence increases ($\beta=0.55$; $t=23.17$; $p<0.05$), the level of organizational agility also increases, and the higher the competition intensity in the same environment ($F_{Change\ (1;1252)} = 80.362$; $p <0.05$) increases the effect of technological turbulence on organizational agility. According to the third and final finding, as the level of environmental turbulence increases ($\beta=0.60$; $t=26.58$; $p<0.05$), the level of organizational agility also increases, and the higher the competition intensity around SMEs ($F_{Change\ (1\ 1252)} = 52.213$; $p<0.05$) increases the effect of environmental turbulence on organizational agility. So, what do these results mean?

In the rapidly changing and developing global world, businesses should keep up with the change at the same speed, and even be the initiator of the change. Because, the first step to gain sustainable competitive advantage is to respond to the environment faster and more accurately (Yıldırım and Karabey, 2016: 428). In other words, as a result of great changes and transformations, organizations aim to be creative, innovative and up-to-date by adopting a learning character (Naktiyok, 2000: 202). In this sense, SMEs have a national and international mission, such as increasing employment rates, easy access to various goods and services, efficiency and sectoral competition in the ever-increasing global competition (Appiah, 2019: 297). However, it is not easy to serve this mission due to many different environmental factors such as financial situations, lack of information flow, problem of creating an effective value chain, lack of resources, government intervention and sanctions (Linan, 2020: 701). In fact, all these factors are related to the intensity of competition, which we can define as the picture of the vital areas of the enterprises. According to Porter (1980), the intensity of competition is the main determinant of the ability of firms in an industry to survive by earning an above-average income. In other words, it is the sum of the vital influence power of any business on its competitors (Barnett, 1997). While Başkan (2021) states that the main factors of entrepreneurship are mostly related to cultural codes and gender issue, still businesses have to

be agile against all the pressures arising from the external environment and the competition environment. For this reason, the fact that environmental turbulence has a positive effect on organizational agility is a normal result in terms of ensuring the sustainability of businesses. However, the agile organizational structure, which Dyer and Shafer (1998) call "the inside of the black box", represents a transparent structure identical to a shared vision, shared values, and shared performance criteria. In this regard, some studies conducted on SMEs in recent years that draw attention to the (regulatory) role of competition intensity on organizational attitudes, behaviors or situations (Wang et al. 2012; Purnama and Subroto, 2016; Koç et al. 2018; Bodlaj and Cater, 2019; Khan et al., 2019; Koçyiğit and Akkaya, 2020; Aliasghar, et al., 2022), that support the research results. On the other hand, contrary to the results of the research, some studies (Jaworski and Kohli, 1993; Slater and Narver, 1994; Kmieciak and Michna, 2018; Feng et al., 2019) have concluded that the intensity of competition does not have a moderating effect on the relationship between firm performance and market orientation, or moderates it at a very low level, especially on the grounds that the sample group cannot reach the sufficient number.

As a result, the business world has to follow global developments closely and be prepared for the stop environmental conditions. Today's economic orders and the business world eco-system are highly dependent on each other (Arıcıoğlu and Yiğitol, 2020). Environmental turbulence and hyper-competition limit access to resources, while accelerating their consumption. Obviously, there are many variables and social trends that businesses that want to provide sustainable competitive advantage have to consider, but it can be argued that businesses that produce new ideas, can be customer-oriented and have a proactive attitude towards the business environment will have a longer life (Çelik et al., 2014). In other words, organizations today have to be fast and flexible, in other words, agile in order to survive in an intensely competitive environment. Because in order to overcome the difficulties created by the intensity of competition, the organization needs to understand its environment well, make the right decisions and implement them quickly, and also adapt quickly to the changes required by the conditions (İşcan and Karabey, 2006: 14). As a final word, it should be noted that the 2000s will continue to be the years in which technological innovations widely shape market expectations, and businesses that can respond to these expectations in an agile manner will survive. In the final word, it should be noted that the 2000s will continue to be the years in which technological innovations widely shape market expectations, and businesses that can respond to these expectations in an agile manner will survive.

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