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The effect of supply chain innovation on competitive advantage with the mediating role of robustness and flexibility and the moderating role of buyer-seller relationship

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ABSTRACT

Objective: Being in competitive conditions causes many managers to have mental concerns. Finding a factor that ensures the superiority of the organization over its competitors. In recent years, the focus of many organizations has been on achieving superior performance as a competitive advantage, and managers are trying to help the organization improve its performance . Therefore, the purpose of this research is to investigate the effect of supply chain innovation on competitive advantage with the mediating role of resilience and flexibility and the moderating role of the buyer - supplier relationship . It is.

Methodology ¬: The statistical population in this study includes cement companies, the number of which in 1400 is equal to 91 companies nationwide, of which 74 companies were selected by systematic random method based on the Cochran formula. Structural equation modeling approach and PLS software were used to analyze the collected data .

Findings ¬: The results of this study showed that supply chain innovation has a positive and significant impact on competitive advantage, robustness, and flexibility . Also , robustness and flexibility capabilities have an impact on competitive advantage. On the other hand, the findings showed that resilience and flexibility capabilities are good mediators in the relationship between supply chain innovation and competitive advantage , and ultimately the buyer - supplier relationship . They can be a good moderator in the relationship between supply chain innovation and resilience and flexibility .

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1. Introduction

In a competitive market, most companies are losing their customers, but this does not mean that the needs of customers are disappearing, but they are meeting their needs elsewhere. The issue of competition between firms has become a hot topic among managers and politicians today (Depreu and Krato, 2008). On the other hand, in World Competitive ,Today Companies In order to Gaining an advantage Competitive and Promotion Position Self In ,Market Must On Capabilities and Resources Key Focus Management Chain Supply Tool Powerful Direction Promotion Growth Companies and Creation Advantage Competitive Mozaffari et) (al., 2019.The supply chain is responsible for the transfer of information from customers to suppliers (quotation requests, purchase orders, and quality complaints) and also from suppliers to customers (order confirmation , inventory reporting , and shipping details) Modern technologies can perform these tasks efficiently and effectively for both customers . and suppliers (Shehzad et al . , 2024). Supply chain management processes, which span multiple organizations and focus on the flow of goods, information, and resources , can be very complex and require coordination and collaboration within the organization (Leo et al., As global market competition intensified in the 1990s, the challenges of getting products and services to the right place at the right time at the lowest cost also increased. Organizations have realized that increasing efficiency within an organization is not enough, but their entire supply chain must be competitive, so understanding supply chain management has become an essential prerequisite for competitiveness and increased profitability (Lee et al., 2011). In the framework of supply chain management from a global perspective, it has been identified that supply chain risks must be managed effectively to maintain competitive advantage. Klein, Schminck, and Pizell (2013) Companies that seek to Companies that are seeking to gain competitive advantage must introduce innovation into their supply chain , as it creates value for the organization (Lyles, 2014) . Supply chain innovation is a necessary solution for companies to respond to unpredictable and unpredicted changes and is the main driving force for increasing supply chain flexibility and also offering new products or services . YAP is a well-known (Shan et al., 2023) . Supply chain innovation is a complex process and a useful solution for exploiting technological processes and innovations with the aim of finding new ways to manage supply chain practices (Lee et al ,.2011 Innovation can be defined as .(a new or novel method of a company or a new product it produces. Innovation is perhaps the most important builder of competitive advantage. Ultimately, it is innovation that drives competition. Since innovation gives a company unique advantages , it can be a major source of competitive advantage. Being unique allows a company to differentiate itself from competitors and charge a higher price for its products or reduce its costs much more than its competitors (Mazloumi and Dadvand, 2012). Holt et al. (2004) believe that managers can discover practical options for problems and obstacles through innovation to maintain competitive advantage and prevent it from diminishing. Therefore, supply chain management acts as an enabler , which helps in various functions such as improving planning , purchasing,

forecasting , and monitoring in supply chain practices and strengthens the operational capabilities as well as the risk management capabilities of an organization (Afraz, 2021)

In the context of supply chain, we can talk about its structure and robustness, which are divided into two types : static robustness and operational (dynamic) robustness. In static robustness research, the size of the network of those elements as well as the connections between them are considered , while operational robustness research deals with dynamics (Monstori, 2018). Also, according to Kalibi et al. (2010), in the context of supply chain, robustness capabilities in also refer to the ability to deal with all possible future conditions an effective manner and are defined as having flexibility for many options regarding all future scenarios. Kalibi et al. (2010) confirmed the impact of supply chain on robustness capabilities in a study, they stated that robustness is more suitable for continuous events, regular fluctuations or logical changes to maintain regular supply chain innovations (Afraz et al., .(2021

In the supply chain , A flexible relationship is one in which there is a partial reduction in procurement costs under different supply conditions . In a flexible relationship , the supply contract allows the buyer to transfer some of the adverse effects of customer uncertainty to reduces the risk for the buyer (Beg and Rahman , 2010) . The criteria for measuring flexibility include the ability to change the quantity of suppliers ' orders , the ability to change the delivery schedule based on customer demand , the ability to change production capacity The based on the market , the ability to reduce production time , and the ability to change and , type of order is based on market demand (Hossein and Aker Cement industry It is considered one of the oldest industries in the country , dating back about 100 years in Iran . Being rich Iran has developed in terms of limestone, clay , silica , and iron mines as raw . materials used for cement production . This industry has become a reality in the country Carrying Transporting and exporting cement over long distances is not economically viable Therefore , in countries with abundant resources , The mines are needed for cement . production , and a cement factory is being built to supply local markets . (up to a radius of km) is reasonable . In the cement production process , first the clinker product is produced 400 and after grinding it , the cement To Countries that do not have the necessary mineral resources Or they do not have the necessary technology to produce cement , they generally import the clinker product and , after a grinding step , convert it into cement . Considering the country's policies in the past decades , including the development of large civil engineering projects such as construction, dam construction , and The National Housing Project and the country's 1404 Horizon Vision are based on an annual economic growth of 8 percent , widespread licensing has been carried out to cement production units , so that it is predicted that , considering the licenses issued to cement factories , the country 's nominal cement production capacity will reach about 100 million tons in 1404. Currently , Iran The . tenth It is the largest cement producing country in the world

With Attention To Contents that Expression became, Like this Can be Said that In Companies Innovation, Flexibility and Capability Strength Chain Supply Command Very Important and Key is and Paying To This Subject From Issues Inevitable Managers It is . Managers and Experts Collections In Evening Present To Follow Preserve Advantage Competitive In

Between Other Competitors Therefore , according to the statistics and information presented in previous articles about the country's cement industries , Question Original Research This is That:

Impact Innovation Chain Supply On Advantage Competitive With Role Mediator Capability Strength and Flexibility and Role Moderator Relationship Buyer - Supplier in the country's ?cement industry companies How Is it

2.Theoretical foundations and background

Today Competition For Attract Customer and Increase Share Market Trend Ru To Growth Ha and Customers In System New Market Place Special They have found , Because customers have the right Choice More Had and For Shopping Self From Between Manufacturers To Those They have a positive opinion. that Needs and Values They particle for direct object From Opinion commodity and Services Better Persuasion Do. Porter (1998), Believes that " the advantage Competitive In Heart Performance Company In Markets Competitive " It is . " Therefore, Advantage Competitive To Meaning Having Cost Low, Advantage Distinction Or One Strategy Focus Successful Barney (2002) Believes That " one" Company Time Advantages Competitive particle for direct object Experience Does that Actions it In One Industry Or Market Value Economic Create at a time Slow that Number A little From Companies Competitor Involved Actions Similar " They are ." Barney In Continue Advantage Competitive particle for direct object To Performance Related Knows and Argument Does That " company" Time Performance Higher From Limit Normal particle for direct object To Hand Brings that From Resources that To Work Takes Value More From . Limit Waiting Creation Slow (Alokpo, 2016). Subba Tat (2007), this includes the ,(2006) capabilities that allow a firm to distinguish itself from its competitors . The empirical literature has been very valid in identifying price / cost , superior quality , transferability, and flexibility as essential competitive capabilities . In addition, current research includes time - based competition as a fundamental competitive need . Research by Weiss (1991); Handfield and Pansy (1995) ; Kessler and Chakrabarti (1996) and Zhang (2001) identify time as an additional source of competitive advantage . Advantage Competitive advantage exists when a company combines a product or service that is preferred by its target market customers over its competitors . Competitive advantage is the result of management actions and decisions that result in superior performance of the organization compared to its competitors (Rosseb .(et al . , 2021

Today, organizations and companies are forced to establish extensive and close collaborations with other companies in order to improve the quality of their products . Have competitors in the product supply chain . Innovation in the supply chain increases the quality of products offered to customers . and thus provides a competitive advantage (Sultanbey , According to Mayer (2017), supply chain innovation represents a conscious effort by .(2019 a company to develop and implement supply chains in the most attractive and productive . way (Raseb et al . , 2021)

Today Businesses Noticed have become that Improvement Efficiency Domestic Enough It is not, but Total Chain Supply They Must Improvement Find. Moysinaliev and Aktamov (2014) Reference They did that Chains Value particle for direct object Can In Any two Direction In

Opinion He took it. With Suppliers that From Resources Financial, Conditions Payment, Stability and Cover Orders Future Value Acquisition They do, While Customers From Products and Services Presented Value Receive They do . Janvier - James (2012) Management Chain Supply As Traditional By Manufacturers In order to Management Moving commodity and Services Use It would be . In Level Global, Chain Supply Possibility Competition In Between Actors Industry particle for direct object Provide It does . As a result Global To become Business International, Factors Production and Products Consumer From Destinations All over The world, Dependency Mutual Between Manufacturers and Wholesalers In Chain Supply International particle for direct object Increase They give . (Makombila, 2017)

Innovation Role Important In Competitiveness Company IFA Does . Role it As Wide In Level Product, Process, Organizational and Marketing Case Study Appointment Taken It is also With Use From One Opinion How many? Facet, With Concepts For Performance One Company, Analysis Done is . However, Although Processes Innovation From Opinion Company Important are, Role Networks Between Organizational particle for direct object Shouldn't Unseen He took it . That How One Company Processes Innovation particle for direct object In All over Chain Supply To Subscription It leaves, To The same Size that Processes Innovation In Inside Company Infrastructure Competitiveness Company (Moreira et al., 2018) . Innovation It is a revolutionary rather than evolutionary need and an inevitable necessity for survival and continuity in uncertain environmental conditions (Ibidoni et al. , . (2020

To Said Lee and Colleagues (2006) , Methods Supply chain management Also On Performance and Also Advantage Competitive Organization From Way Price / Cost, Quality, Capability Confidence Delivery, Time Arrival To Market and Innovation Product Impact Studies Previous Like Ragatz and Colleagues (1997), Badge They have given that Methods Management Chain Supply Like Participation Strategic Supplier Can Advantage Competitive particle for direct object From Way Improvement Performance Supplier and Reduction Time Login To Market Increase Give. Speckman and (1998), also Actions Like To Share Information and Quality Information As Positive To Satisfaction Customer Help Van does . Hook and (1999), strategies are not only Flexibility In Chain Supply particle for direct object Increase Gives , Rather Efficiency and Accountability To Customer particle for direct object Balanced does . In addition On This, Jay and Colleagues (2013) Existence One Relationship Strong Between Innovations Chain Supply and Advantage Competitive particle for direct object Confirmation Kurdish (hu) and Colleagues, 2021)

Dear and Samad (2016) found that Age Company Communication Between Innovation and Advantage Competitive particle for direct object Adjustment It does . That is . Companies Younger Ratio To Companies Older Probability More They have that Advantage Competitive Had Recently Golgi and Koivalainen (2019) Badge Gives that With Increase Age Company, Flexibility Chain Supply In Between Companies Türkiye Reduction According to Kuta , and (2011), Problems From Opinion Sharing Information In Companies Older Possible is Companies Younger particle for direct object To Side Flexibility and Positions Technology Souq D. Arendt (2014) Review Kurdish that How Age and Size

Company Communication Between Processes Increase Capability and Performance Company particle for direct object Conditional Does and Receive that Difference Meaningfulness Between Companies Young Or Older Existence (Shamut, 2021). Therefore, according to the above, the first hypothesis is:

Hypothesis1: ".Supply chain innovation has an impact on competitive advantage" :

Innovation Chain Supply As Some kind From Techniques New, Investment and Progressive In Chain Supply Evolution Wagner (2008), For To At least Delivery Risk, Reinforcement Resources and Configuration Again Process that Flexibility particle for direct object Increase Gives . Wieland and Wallenburg (2012) in Ecosystem Chain Supply, Strength Capacity Resistance In Equal Shocks Various, Errors Human-made and Diversity In Environment Business particle for direct object Specific It does. Therefore, Strength Role Important In When Disorder IFA Does Because Chain Supply and Networks Logistics Equipped With Awareness From Risk They can Occurrence Risk particle for direct object Reduction Data Or Delete (quack) and et al., 2018). Data With Quality and Ability Processing Data Can Disorder particle for direct object Reduction Give and Also Lack Confidence particle for direct object Reduction Give and Probably Strength Chain Supply particle for direct object Reinforcement Slow . Literature Available and Abstractions Existing, Potential Link particle for direct object In Between Variables Important Chain Supply Badge Gives, As Example : .(Capability Strength, Analysis Data Supply and Innovation (Lai) and Colleagues, 2018

Supply chain innovation Opportunities New and Better particle for direct object For Companies To Gift Brings, But In Same Now, Always One Danger Potential In Adopt This Opportunities Existence Petit et al. (2010) stated They do that Exploitation From Methods Innovative In Chain Supply Not only Level Complexity Processes particle for direct object Increase Gives, Rather Cause Creation Problems and Also Lack Certainty In Management Operation Chain Supply It becomes . In That's it. Now, Time that Processes Very Complex and Innovative Composition They become, Identification Risks More difficult It can be, that In Ultimate Businesses and Chains Supply Global particle for direct object In Status Uncertainty Appointment They give. To Said Fisher (1997) , Despite This Reality that Businesses To Reason Innovation In Chain Supply Performance Very Better They have, Can Cause Lack Forecast Demand To be that To Nobe Self On Chain Supply and Operation Logistical Impact Therefore , In This Conditions, Managers Must Meanwhile In Opinion Catch Risks and Opportunities Innovation Chain Supply, Approach Balanced particle for direct object Follow Do. In This Relationship, Managers Must Understanding Reasonable From How Use From Technologies New Had be Up to From Self In Equal Scenarios Risk Major Caused From Innovation Protection Do. One From Ways Achievement To This Goal, Preserve Balance In Flexibility Chain Supply and Capabilities Strength Companies It is . Petit and Colleagues (2010) found that Management Effective Risks Operational As Direct Performance Financial Companies particle for direct object Improvement Forgives . Hohenstein and Colleagues (2015) Strength particle for direct object Basis One Capability Flexible They know. and As One Launch Chain Supply Strong, Probability Disorders particle for direct object Reduction Gives and Effects Negative Potential it particle for direct object Attract Does . to Said Young and (2009) for Organizations Necessary is that How Can

Disorders Possible particle for direct object Forecast Kurdish and Ways For Preparation Effective and Confrontation With Disorders Possible Find Did . For Reduction Dangers Caused From Disorders With Use From Design Strong Chain Supply, Companies Must Strategies Strong Like Capacities Weak, Redundancies Or Reserves Safety particle for direct object In Chain Supply Self Implementation Do that Effects Negative On Performance particle for direct object Reduction Gives (divides) and (Employees, 2021) . Therefore, : considering the above, the second hypothesis is that

Hypothesis 2: ".Supply chain innovation has an impact on robustness"

In Length The 80s , Researchers They found that Flexibility More Leading To Performance Better and Decision -making Strategic Performance Organizational particle for direct object Improvement Forgives . Gupta and Summers (1996) found that Strategy Business Impact Directness On Admission Flexibility Production Yes, Flexibility Production Impact Directness On Performance Organization Yes and Strategy Production As Indirect On Performance Organization Impact Later , Term Chain Supply Instead of Production Case Use Appointment Got it . Sanchez and Perez (2005) is a Relationship Positive Between Flexibility Chain Supply and Performance Identification They did, But This Know Meaning Not that Any Dimensions Flexibility Share Sameness Yes . Adler and (1999) statement They did that Flexibility In One Next particle for direct object Can According to Need Increase Gad .(But With Cost Reduction Flexibility In Directions Other (household) and Jane, 2021

Chains Supply For Confrontation With Disorders, Issues Unexpected and Reduction Risk Must In a way Design To become that Ability Confrontation With Events Various and Presentation Answer Effective To Disorders particle for direct object Had They are . Must Ability Return To Status Primary Or Even Conditions Better From Before From Disorder particle for direct object Had be that Definition Flexibility In Chain Supply (Afraz et al., Lumos and (2003 (.(2021 The relationship between flexibility and chain Supply particle for direct object Like this Definition They do : Capabilities Chain Supply and Degree that Can Speed, Destination and Volume Chain Supply Self particle for direct object In Answer To Changes In Demand Customer Setting " Slow . " This Definition Requires Dimensions Various From Flexibility is that In First By Slack (1983) for Requires Range and Answer (cost) and Time (offer) It was . In addition On This, Upton (1994) This Concept particle for direct object Expansion Gad and Range, Mobility and Uniformity particle for direct object As Dimensions Flexibility Production Offer Kurdish . Lumos and Colleagues (2005) a Model particle for direct object Offer They did that Seven Type Flexibility in the supply chain particle for direct object Introduction They include : systems Operation, Processes Logistics, Network Supply, Design Organization, Systems Information, Satisfaction Customer and Assets Chain Supply . Note Important This is that This Model Badge Gives that Any two Element Hard and Soft For Development Flexibility In All over Chain Supply Case Need are With This Existence, In Exposure With Understanding Limited We From Transfer . Flexibility Operation Domestic To Operation Chain Supply Foreign and Wider , Existence Yes . Aviator and Swamidas (2007) Badge Gad that Matching Between Flexibility Manufacturer and Flexibility Supplier For Achievement To One Chain Supply Really Flexible Vital Gosling and (2010) also On Features Partner As One Parameter Key Effective

On Flexibility Chain Supply Emphasis does . In order to Achievement To Flexibility Chain Supply Optimal, They Offer They do that All Suppliers Potential Must From Opinion two Agent Important Evaluation Become : Sourcing and Flexibility Seller (Faizi and Zomordi, Therefore, considering the information stated regarding supply chain innovation and .(2015 :flexibility, the third hypothesis is

Hypothesis 3:".Supply chain innovation has an impact on flexibility" :

Companies With Environmental More innovative Possible is In Equal Disorders Environmental and Lack Certainties More flexible technology be, Because Innovation They particle for direct object Able Makes Capabilities Dynamics particle for direct object Reinforcement Do that Definitely On Corporate risk management Impact He leaves . Sabahi and Worshiper (2020) in One Review Literature Systematic They found that Innovation Can Directly On Capabilities Dynamic Companies From Sentence Subscription Knowledge, Agility and Flexibility Impact Let it go. that Then As Remarkable Flexibility They particle for direct object Increase Gives . In Method Similar, Kalibi and Colleagues (2010) stated They had that Companies Must Events Frequent With Risk Low Impact particle for direct object From Way Capability Strength Management (to divide) and Colleagues 2021 , Collection . Remarkable From Research From Role Important Innovation Chain Supply In Presentation Opportunities Multiple For Reinforcement Capabilities Management Risk Organizations Support Does . to Said Haimovitz and Keys (2002) , Time that One Company Has Capabilities Strength and Be flexible , Identification Risk particle for direct object Can be From Way Innovation Improvement Forgive . Process Innovative, If With Morale Real Execution To be, Vulnerabilities particle for direct object Outstanding Does and Attitude Subscription Knowledge particle for direct object In Between Institutions Chain Supply Creation Does that Continuity Process Innovation particle for direct object Facilitation Does and As Effective Occurrence Risk particle for direct object Reduction Gives. Therefore, Companies They can With Preserve Degree Suitable From Capabilities Strength and Flexibility , Risk Innate Processes Complex particle for direct object Diagnosis Data and Also Reduction Give (Quak) and Colleagues, 2018). Therefore, Aspect Important and Remarkable " Theory" Based On Capability Advantages " This is competitive " is that Companies They can With Adopt Activities Systematic that To They Possibility Achievement To Advantage Competitive particle for direct object Gives , Capabilities Distinctiveness (strength) and Flexibility (creation) In addition On This, " theory" Based On Source " believer" is that Any two Capability Strength and Flexibility With Advantage Competitive Related are . Grau (2009) received that Advantage Competitive Companies Only Can With Participation Active In Mobile supply chain With Capabilities Management Risk Better Preserve To be, that Guarantee Does that Resources They, In One Analysis Comparative, Better From Resources Their competitors Grant (1991) also Argument Kurdish that Supply chain one Stimulus Key In Creation Capabilities Management Risk is that In Ultimate Leading To Level Higher From Advantage Competitive It becomes (Afraz) and et al., 2021). Therefore, according to the above, the fourth and fifth hypotheses are, :respectively

Hypothesis 4: Strength capability affects competitive advantage

Hypothesis 5: Flexibility has an impact on competitive advantage

Hypothesis 6: Supply chain innovation affects competitive advantage with the mediating role of robustness

Hypothesis 7: Supply chain innovation has an impact on competitive advantage with the mediating role of flexibility

Hypothesis 8: Buyer-supplier relationship moderates the relationship between supply chain innovation and robustness

Hypothesis 9: Buyer-supplier relationship moderates the relationship between supply chain, innovation and flexibility

3.Research methodology

This research is applied in terms of purpose and in terms of data collection method, it is a descriptive research and a branch of field studies and in terms of the relationship between variables it is a correlational research . For data analysis , the structural equation model was used, which is a complete structural equation model mixed with path diagram and confirmatory factor analysis. The statistical population in this research includes cement companies , the number of which in1400is equal to 91 companies nationwide, of which 74 The . companies were selected by systematic random method based on the Cochran formula measurement tool of the present research is a standard questionnaire. The final questionnaire after the necessary changes includes 22 questions. To evaluate the research questionnaire , a five-option Likert scale from completely disagree to completely agree has been used . To determine validity , a questionnaire is available . Experts were interviewed and their opinions were sought , and finally , with their approval, the validity of the questionnaire was confirmed. Cronbach 's alpha test was used to measure the reliability of the questionnaire . In Table1 , the reliability value for all variables has been calculated separately, and for all variables , the reliability value based on both Cronbach 's alpha criteria and the composite reliability coefficient above 0.7 was obtained.

Table 1. Validity and reliability of questionnaire questions by variables

Source	Number of questions	Variable	Row
Kwak et al. (2019) Lee et al . (2006) Afraz et al.(2021)	5	Supply chain innovation	**1**
Kwak et al. (2019) Golgissi and Ponomarev(2006) Afraz et al .(2021) Wieland and Wallenburg2012)	4	Durability	**2**
	4	Flexibility	**3**
Flynn et al.(2010) Jaja et al.(2017) Afraz et al.(2021)	5	Buyer-supplier relationship	**4**

Kwak et al .(2019) Lee et al. (2006) Afraz et al. (2021)	**4**	**Competitive advantage**	**5**

4. Data analysis and Findings

In this section, after the complete collection of research data, the collected data is entered intoSPSS The data were transferred and descriptive statistics were used to prepare tables and . software .graphs to describe the statistical populationPLS software was also used to examine the research hypotheses and test the model. Which is one of the structural equation methods, has .been used

Factor analysis results .1-4

In Pattern Approach Factor Confirmation We aretrying to To Consideration ,Statistical The meaning of one Pattern Factor Supposed particle for direct object Test .Let's do it and Specific Let's make that ?Is it Data Example Pattern Confirm . They do Or No, the results The result indicates From Factor analysis Confirmation It is available in two standard modes.

Table 2. Validity of the measurement model for capabilities Marketing Dynamic

Meaningfulness	Standard	Question	Variable
28/555	0/890	Q1	**Supply chain innovation**
35/742	0/888	Q2	
31/738	0/859	Q3	
19/934	0/833	Q4	
28/744	0/892	Q5	
12/101	0/754	Q6	**Durability**
18/629	800/0	Q7	
19/948	0/687	Q8	
37/360	0/634	Q9	
17/075	0/566	Q10	**Flexibility**
10/218	0/875	Q11	
15/639	0/885	Q12	
15/012	0/912	Q13	
18/254	0/801	Q14	**Buyer-supplier relationship**
16/759	0/739	Q15	
11/852	0/527	Q16	
11/213	0/536	Q17	
12/007	0/525	Q18	
14/699	0/682	Q19	**Competitive advantage**
12/886	0/568	Q20	
15/090	0/762	Q21	
14/371	0/728	Q22	

The results of this test showed that the factor loading of all questions in the significant mode was greater than 1.96 and in the standard mode it was also greater than 0.3. As a result, the research questions approved.

Structural equation model testing. The modelis presented in two modes, standard and meaningfulaccording to the assumptions

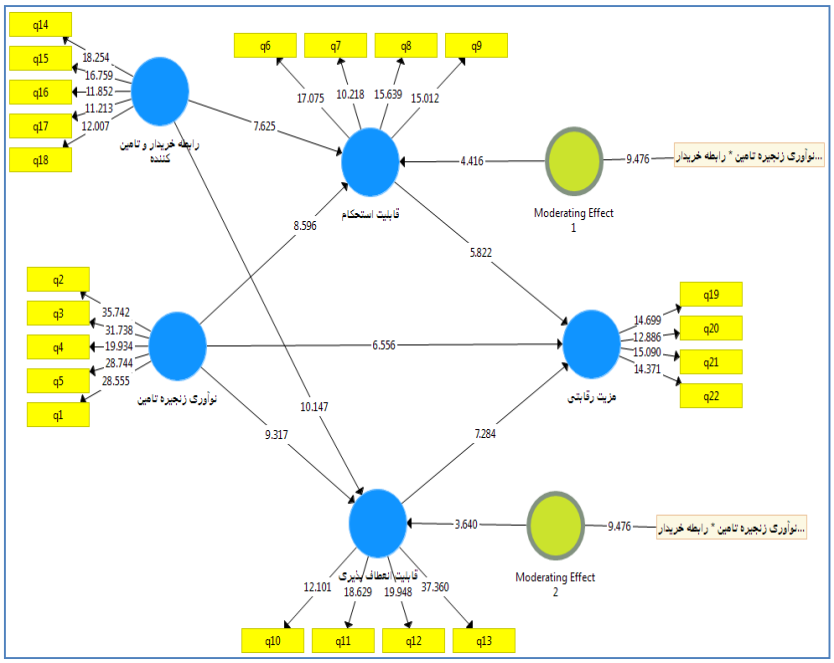

Figure 1. Research model in meaningful mode

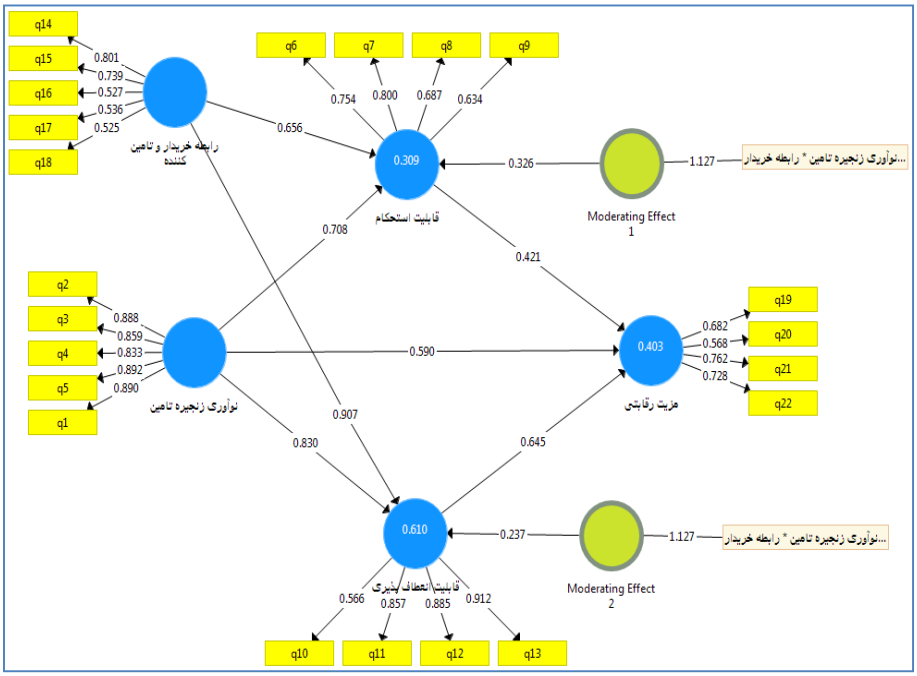

Figure 2.Research model in standard mode

Table 3. Table of results of hypothesis testing

Result	t - statistic	Path coefficient	Hypothesis	Row
Confirmation	6/556	0/590	.Supply chain innovation has an impact on competitive advantage	1.
Confirmation	0/596	0/708	.Supply chain innovation has an impact on robustness	2.
Confirmation	9/317	0/708	Supply chain innovation impacts flexibility	3.
Confirmation	5/882	0/421	.Robustness has an impact on competitive advantage	4.
Confirmation	7/284	0/645	Flexibility affects competitive advantage	5.
Confirmation	4/076	0/299	Supply chain innovation affects competitive advantage with the .mediating role of robustness	6.
Confirmation	3/090	0/201	Supply chain innovation affects competitive advantage with the .mediating role of flexibility	7.

8.	Buyer-supplier relationship moderates the relationship between supply chain innovation and robustness.	0/326	4/416	Confirmation
9.	The buyer-supplier relationship moderates the relationship between supply chain innovation and flexibility.	0/237	3/640	Confirmation

5. Discussion and conclusion

The purpose of the present study is to investigate the effect of supply chain innovation on competitive advantage with the mediating role of resilience and flexibility and the moderating role of the buyer - supplier relationship in cement companies . Based on the research findings each hypothesis is tested separately . The investigation will be conducted and the relevant , results will be presented.

Hypothesis1. Supply chain innovation impacts competitive advantage

Based on the results of the analysis Done , the above hypothesis is confirmed. Because according to the value of thet -statistic which is (6.556) which is greater than 1.96 . Therefore, it can be concluded that the hypothesis is confirmed with a confidence level of 95%. Also, the magnitude of this relationship is equal to 59/. The results obtained are also in line with the results of Taleghani et al. (1400), Abbasi Kasbi (2019) , Aziz and Samad (2016) , Leo et al. (2017) Golgassi and Koivalainen (2019) , Quack and (2018) , Iulia Pospita et al. (2020), : Therefore , the suggestions we can make are .Afraz and Colleagues)2021(

1. Cement company managers should To Innovation Pay attention to reducing costs in their production system, as this action improves their profitability (for example, given that these companies are heavily dependent on fossil fuels and electricity in their production system, they suffer severe losses when the government imposes restrictions during peak .(seasons of the year, so they can use alternative fuels by innovating in fuel consumption
2. Innovation in the process of export cooperation between companies : Given that excess cement production capacity has caused negative competition between cement companies, it is necessary for cement companies, in cooperation with the government, to innovate in the integrated management of cement exports and create interaction and cooperation between the country's export companies (to maintain a suitable price for exported cement) that will both make it profitable for all companies and maintain their market share. For example, by eliminating cement export intermediaries through cement exports by) (.manufacturers through the export ring of the commodity exchange
3. By updating new technologies in the country's cement industry, they can become a .driving force for competitive advantage in domestic and foreign markets

Hypothesis 2. Supply chain innovation has an impact on resilience :

Based on the results of the analysis The above hypothesis is confirmed because , according to the value of thet- statisticwhich is greater than 1.96. Therefore, it can be concluded (8.596) that the hypothesis is confirmed with a confidence level of 95%. Also, the magnitude of this relationship is equal to .708. The results obtained are also in line with the results of Kwak .and Colleagues (2018) , Lai and Colleagues (2018) , Afraz and Colleagues)2021(

Therefore , the suggestions we can make are

1. To We recommend that cement company managers : All Information Valuable particle for direct object In your supply chain Collection Do Up to Processes and Routes Commercial . Determine the possible Do it
2. Collaboration with the Ministry of Petroleum, the Ministry of Energy , the Ministry of Industry, Mines and Trade, and specialized cement industry associations to manage electricity consumption during peak seasons (when the government imposes restrictions on cement factories on energy consumption during these seasons). Through this collaboration,

the negative impact of these government restrictions on cement production and supply can . be managed

3. Partnering with startup companies nationwide in the areas of sales , supply management , production , new applications , and quality improvement and monitoring can help develop exports , improve the supply chain , and gain a competitive advantage for . companies

Hypothesis3:. Supply chain innovation has an impact on flexibility

Based on the results of the analysis The above hypothesis is confirmed because , according to the value of thet- statisticWhich is (9.317) which is greater than 1.96 . Therefore, it can be concluded that the hypothesis is confirmed with a confidence level of 95%. Also, the magnitude of this relationship is equal to .83. The results obtained are also in line with the .results of Sanchez and Perez (2006) and Afraz and Colleagues)2021(

: Therefore , the suggestions we can make are

1. Given the changes in countries' demand for clinker, it is necessary to shift production operations towards producing and exporting it in line with demand in order to reduce costs .and increase profitability

2. Cement company managers are advised to take effective steps to make and implement the right decisions in such crises by establishing an integrated information analysis system and investing in rapid response teams when facing unpredictable challenges such as the . coronavirus

Hypothesis 4. Robustness has an impact on competitive advantage :

Based on Results Result From Analysis Done, Hypothesis Above Confirmation It turns around . Because With Attention To The value of thet statistic (5.822) is greater than 1.96. - Therefore, it can be concluded that the hypothesis in question is Confirmation Therefore , it can be concluded that the hypothesis is confirmed with a confidence level of 95% . The magnitude of this relationship is also equal to 0.421 . The results obtained are also in line with the results of Kleibi's research . and (2010), Kwak et al. and (2018) and Afraz et al. and .Colleagues)2021(

: Therefore , the suggestions we can make are

1. To build resilience in an organization, it is essential to have a strong human resources system where expectations are properly understood and implemented by employees. Therefore, managers of cement companies should pay attention to: In order to Development Capabilities, Must Skills Various and Knowledge Between Organizational particle for direct .object Acquisition Done and Use them . Do

2. To build resilience, companies need to create a process for receiving, recording, analyzing data, and sharing it across different parts of their supply chain. For example, - cement company managers can ensure sound decision-making and preparedness for any disruptions by collaborating with think tanks that are focused on the same topic and cost less . than setting up an R&D unit

Hypothesis 5. Flexibility has an impact on competitive advantage :

On Basis Results Result From Analysis Done, Hypothesis Above Confirmation It turns around . Because With Attention To The value of thet -statistic which is greater than (7.284) Therefore , it can be concluded that the hypothesis in question Confirmation Therefore . 1.96 it can be concluded that the hypothesis is confirmed with a confidence level of 95% . The , magnitude of this relationship is also equal to 0.645 . The results obtained are also in line with the results of Kleibi's research. and Kwak et al. (2010) and (2018) and Afraz et al. and .Colleagues)2021(

Therefore , the suggestions we can make are:

1. Managers of cement companies should note that paying attention to the important factor of competition and modernization of technologies will force companies to be flexible in this turbulent economic market where everyone is dreaming of increasing export . performance. It pushes

Hypothesis 6: Supply chain innovation affects competitive advantage with the mediating : . role of firm capability

On Basis Results Result From Analysis Done, Hypothesis Above Confirmation It turns around . Because With Attention To The value of thet -statistic Which is (4.076) which is greater than 1.96 and is at a significance level of 0.000. Therefore, it can be concluded that the hypothesis in question Confirmation Therefore , it can be concluded that the hypothesis is confirmed with a confidence level of 95% . The magnitude of this relationship is also equal to 0.299 . The results obtained are also in line with the results of Afraz's research . and .Colleagues)2021(

Hypothesis 7: ffects competitive advantage with the mediating role of flexibility..

Based on Results Result From Analysis Done, Hypothesis Above Confirmation It turns around . Because With Attention To The value of thet -statistic which is (3.09) which is greater than 1.96. Therefore, it can be concluded that the hypothesis in question Confirmation Therefore , it can be concluded that the hypothesis is confirmed with a confidence level of The magnitude of this relationship is also equal to 0.201 . The results obtained are also . 95% .in line with the results of Afraz's research . and Colleagues)2021(

According to the results obtained from the mediation hypotheses related to the sixth and seventh hypotheses of the research , which examine innovation Chain Supply On Advantage Competitive With Role The mediator deals with the capabilities of strength and flexibility . , Thereforethe : suggestions we can have are

1. company managers should establish an energy consumption management system and a coordination unit with government ministries so that they can be effective in 1. reducing the negative effects of government restrictions on factories' energy consumption on their production and profitability, 2. cutting off the hands of middlemen and brokers, and 3. actively participating in political diplomacy with neighboring countries to reduce tariffs - .through cooperation with the government
2. Company managers Cement Must On On Construction Processes Innovative With Use From Technologies and Techniques Like Systems Information Smart, Processes Agile and . Response Top In order to Improvement Capability Management Risk Focus Do it
3. Given the high speed of innovation in the current competitive environment, it is better for company managers to implement flexibility through cooperation with creative and . knowledge-based companies in this field, which is a way to achieve sales goals
4. Identifying and launching channels Information in companies that have relevant information and knowledge This requires a strong team to gather the necessary information and knowledge in the market and from customers of the companies ' products , as well as . competitors
5. Attention to market-based flexibility by cement company managers can also enable them to gain competitive advantage. The ultimate goal of cement companies, in addition to improving export performance, is to gain competitive advantage among exporting companies Providing rapid response to diverse services, transportation or handling, the presence of a . skilled workforce, and small batch production Of the types of products , sharing information with suppliers , which are all sub-categories of operational flexibility, can mediate the effect

of company capabilities on competitive advantage , all of which require management focus . and attention to bring about a dramatic change in the export performance of companies

Hypothesis 8: The buyer : - supplier relationship moderates the relationship between supply . chain innovation and resilience

Based on Results Result From Analysis Done, Hypothesis Above Confirmation It turns around . Because With Attention To The value of thet -statistic is greater than which)4.41(Therefore, it can be concluded that the hypothesis in question Confirmation Therefore .1.96 it can be concluded that the hypothesis is confirmed with a confidence level of 95% . The , magnitude of this relationship is also equal to 0.326. The results obtained are also in line with .the results of Afraz's research . and Colleagues)2021(

Hypothesis 9: Buyer : - supplier relationship , supply chain innovation relationship , and . flexibility Adjusts

Based on Results Result From Analysis Done, Hypothesis Above Confirmation It turns around . Because With Attention To The value of thet is greater than 1.96 statistic is)3.64(- and is at a significance level of 0.000. Therefore, it can be concluded that the hypothesis in question Confirmation Therefore , it can be concluded that the hypothesis is confirmed with a confidence level of 95% . The magnitude of this relationship is also 0.237 . The results .obtained are also in line with the results of Afraz's research. and Colleagues)2021(

Considering the results obtained from the modifying hypotheses related to the eighth and ninth hypotheses that examine the buyer - supplier relationship , the supply chain innovation relationship , and the capabilities of robustness and flexibility , the following suggestions can : be made

1. In Presence Level Upper From Innovation Chain Supply, Cement company managers should engage with their main suppliers, who are the suppliers of energy and raw materials, in a way that ultimately leads to information exchange, participation in innovative production, and also negotiation with these companies to maintain strength in critical conditions. For example, in the Corona crisis and similar economic, social, and political crises, companies can resist and even grow in critical conditions by sharing information and .sharing costs among themselves

2. Given the importance of developing transportation capacities and reducing costs in this area, cement company managers are advised to provide opportunities for their suppliers to participate in supply chain transportation investments, as this will benefit all parties and .provide the basis for developing relationships to improve infrastructure

3. company managers should reassure their raw material suppliers that they have a long-term and profitable relationship for both parties. Through the dissemination of knowledge and information, holding meetings and seminars with supplier company managers , to provide the basis for the supplier's active presence and participation in innovation, as well as .the development of risk management tools (flexibility and robustness)

4. One example of reducing production and transportation costs for cement companies could be investing in the transportation of raw materials from the mine to the cement factory. Cement company managers can, by continuously negotiating with mining company managers and inviting them to invest in this field, both reduce transportation costs and consequently reduce production costs, and provide the basis for long-term contracts with **.**mining companies**.**

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