

Research Paper

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The effect of strategic supply chain management on the performance and orientation of the supply chain by analyzing the mediating role of resilience (A case study of the offshore sector of the oil industry)

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Abstract

Due to the intense global competition and the negative impact of disturbances on the financial, operational and market performance of industries, attention has been paid to issues such as strategic management of the supply chain and its resilience; and the oil industry, with its complex structure and processes, has an impact on the global and regional economy is not an exception. The aim of the current research, by using the structural equation modeling method, is to investigate the impact of strategic supply chain management on the performance and direction of the chain by analyzing the mediating role of resilience (agility and strength components) in Iran's marine engineering and construction company active in the offshore sector. The statistical population of the research consists of all the employees of the company, which was determined by the Klein method and the N:q rule, and the number of sample people was determined to be 270; and by the purposeful sampling method, people familiar with the various aspects of the supply chain of the offshore industry with work experience more than for five years were elected. Survey data after collection were analyzed using SMART-PLS software. The results showed: 1- strategic supply chain management has a significant direct effect on the direction of the supply chain, 2- strategic supply chain management has a significant indirect effect on the direction of the supply chain (through the agility and strength of the chain), 3- Strategic supply chain management does not have a significant direct effect on supply chain performance, 4- Strategic supply chain management has a significant indirect effect on supply chain performance (through agility and chain strength), 5- Chain agility plays a significant mediating role in the relationship between strategic management of the supply chain and the performance and direction of the chain. 6- The strength of the chain has a significant mediating role in the relationship between the strategic management of the supply chain and the performance and orientation of the chain.

Keywords:

strength,
resilience,
agility,
supply chain,
oil industry,
offshore

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Extended Abstract

Introduction

Supply chain management is related to the organization of materials and information throughout the organization, using facilities, i.e. vendors, product manufacturing, and distribution channels (Bokrantz & Dul, 2022). This importance is actually considered as the backbone for creating foundations and infrastructures in societies and businesses. Nowadays, in the field of business, the conditions are constantly changing and governed by uncertainty, and the consequences can be different at the level of impact, frequency and their origin (internal or external) (Heckmann et al., 2015), so organizations focus their efforts on supply chain management. Foster & Gardner (2022) define a supply chain as "a set of functional activities (transportation, inventory control, etc.) that are repeated many times along the flow channel by which raw materials are transformed into finished products and value." and reach the consumer."

Today, one of the most important issues in the supply chain is resilience. In a research, Rehman et al, (2021) stated that having a safety valve such as resilience helps companies to reduce the risk of instability and improve the sustainability of the supply chain. Supply chain resilience has been widely discussed in the literature, and its effects have been studied on the smooth functioning of global supply chain management networks. However, several events such as terrorist, political and economic crises have threatened the supply chain of organizations all over the world, and today under the protection of the supply chain, the resilience of the supply chain is an evolving issue (Hohenstein et al., 2015).

Therefore, the current research aims to answer the question that in the offshore sector of the oil industry and in the engineering and construction company of marine facilities in Iran, what is the effect of strategic supply chain management on the performance and orientation of the supply chain with the mediator role of resilience?

Theoretical framework

The supply chain has been growing over time, so it is not surprising that the supply chain is always damaged from incidents and tensions such as unfavorable climatic conditions and transportation obstacles, machine breakdowns, etc., which threaten to destabilize the performance and endanger the operation and its efficiency. Unforeseen events increase with more dispersion of the chain, and risks such as strikes, global terrorism, war, natural disasters, epidemics, and non-acceptance by suppliers are among the things that can change the direction of the supply chain or cause a decrease in performance (Urrutia, 2018).

The development of resilience in the supply chain is considered as an effort in facing unexpected and uncertain developments (Aven, 2016). Some researchers consider the two factors of agility and strength as the main indicators of supply chain resilience (Alshahrani and Salam, 2022; Kazancoglu et al., 2022; Khan et al., 2022). Hohenstein et al, (2015) state that supply chains may be disrupted at some stages of their maturity, however, there should be a system to quickly extricate from disruptions without absorbing any side effects, which depends on the agility of the supply chain.

Khan et al, (2022) conducted research in the oil industry and quantified the mediating effect of flexibility in the supply chain. The results showed that the flexibility of the supply chain plays a positive mediating role between the capabilities of the supply chain and the performance of the supply chain. The results also showed that robust supply chains have a more positive effect on performance compared to agile supply chains.

Juan & Hung (2022) investigated the relationships between the five components of resilient supply chain (SCRES), including emergence, speed, flexibility, robustness, and cooperation; and their effects on supply chain performance under disruption (SCPUD) with a structural

equation modeling approach. The results showed: 1- The cooperation component is an external driver of the resilient supply chain and has a direct impact on the emergence, speed, flexibility and strength of the disrupted supply chain. 2- The flexibility of the supply chain is the only component of the agility of the supply chain that directly affects Supply chain performance under disruption. 3- Supply chain flexibility is the only component of supply chain agility that has an indirect effect on supply chain performance under disruption. 4- The speed component has a direct effect and the emergence component has an indirect effect on supply chain flexibility. 5- The emergence component is one of the important elements of agility that has a positive effect on the speed and strength of the supply chain.

Methodology

The current research is applicable in terms of purpose, and descriptive and survey in terms of nature and research method. The statistical population of the research consists of all the employees of the company (N=1000), which was determined by Klein's method and the N:q rule, and the number of sample people was 270, and, people familiar with the various aspects of the supply chain of the offshore industry were selected with more than 5 years of work experience by the purposeful sampling method. Khan et al (2022) questionnaire was used to collect data related to research variables.

Discussion and Results

In order to investigate the hypothesis of the research, the modeling of structural equations, the method of structural equation modeling with the help of spss software was used to test the hypotheses from inferential statistics. Then PLS software was used to test the hypotheses or the conceptual model of the research, and the results showed that the strategic management of the supply chain has a positive and significant effect on both factors of resilience, i.e. agility and strength of the supply chain. The results of the current research also showed that the strategic management of the supply chain does not have a significant effect directly on the performance of the supply chain, but with the mediation of the agility of the chain, this effect becomes significant. In the results of the current research, it was also determined that the strategic management of the supply chain has a positive and significant effect on the performance of the supply chain both directly and indirectly through the mediation of chain strength. In the present research, results were also obtained showing that the strategic management of the supply chain directly and indirectly (with the mediation of agility and strength) has a positive and significant effect on the orientation of the supply chain.

Conclusion

The current research was conducted with the aim of the impact of strategic supply chain management on the performance and orientation of the supply chain with the mediating role of resilience (the study of the offshore sector of the oil industry). This finding is in line with researchers such as Um (2017) and El Baz& Ruel (2021) and Shamout (2019) and Tarafdar & Qrunfleh (2017) and Florescu et al, (2019) and Dhaigude & Kapoor (2017); The research of (Um, 2017) resulted that increasing the variety of products has a positive effect on the resilience and agility of the supply chain, which improves the performance of the supply chain. He stated that in order to reduce the cost of increasing product variety, it is possible to increase the agility of the supply chain and ultimately improve the performance of the supply chain by diversifying activities in the strategic management department. The results of his research on 363 British and South Korean manufacturing companies showed that the diversity of activities in the strategic management of the supply chain makes the chain more resilient and increases its performance.

According to the research results, it is suggested that in order to respond quickly to the needs of customers, more work should be done on the agility of the supply chain of this industry to be responsive in the tough conditions of the supply chain market. To increase performance, the role of agility in the supply chain of this industry should be emphasized more and always considered as an intermediate factor.