

Network Relationships

Subjects: **Business**

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As an important social resource for enterprises, network relationships can provide heterogeneous resources and opportunities for the development of SMEs.

network relationship

supply chain dynamic capability

geographical proximity

SMEs innovation

fs QCA

1. Introduction

In response to the development of international unilateralism and the intensification of international environmental turmoil, China has proposed a dual-cycle development strategy, which requires the promotion of innovation and development based on promoting the modernization of the industrial chain and supply chain. Among them, SMEs are one of the mainstays of Chinese economic development, and stimulating their innovative vitality is the key to building a new dual-cycle pattern ^[1]. However, on the one hand, due to increased environmental uncertainty, SMEs are facing greater innovation risks; on the other hand, they are limited by their scale, resulting in a lack of a resource base for SMEs' innovation ^[2]. In the supply chain network, more and more SMEs choose to cooperate and share with upstream and downstream partners to obtain access to resources in the supply chain ^{[3][4]}. Take computer manufacturers such as Lenovo and Dell as examples. After Microsoft independently developed a new hardware product—the Surface 2-in-1 tablet—in 2012, they cooperated with Microsoft to promote the development of their traditional products in the direction of becoming thinner and lighter. Therefore, exploring the influence mechanism of network relationships on SME innovation is not only the focus of implementing the dual-cycle development strategy, but also an inevitable requirement for SMEs to achieve sustainable development.

Although the current research on the influence of network relationships on the innovation of SMEs has been confirmed by some scholars, the specific influence mechanism still needs to be further explored. Dynamic capability refers to the ability of an enterprise to quickly integrate network resources according to changes in the external environment and reconfigure according to demand ^[5]. In the supply chain, the main performance is that upstream and downstream companies can quickly adapt to environmental changes, and effectively manage network relationships and internal and external resources according to market demand, thereby promoting corporate innovation ^{[6][7][8]}. Therefore, the role of supply chain dynamic capabilities in SME innovation needs to be explored.

Companies with close geographical distances generally have a high degree of similarity in social, market, and institutional environments, which makes it easier and faster for companies to acquire new knowledge [9][10]. At the same time, the frequency and efficiency of the interaction between upstream and downstream enterprises in the supply chain will also be affected by geographic spatial distance, thereby affecting the output of innovation results. Therefore, it is necessary to further analyze whether the geographical proximity of the supply chain will affect the innovation of SMEs.

2. Research on the Influence Mechanism and Configuration Path of Network Relationship Characteristics on SMEs' Innovation—The Mediating Effect of Supply Chain Dynamic Capability and the Moderating Effect of Geographical Proximity

2.1. Conclusions

We explore the influence mechanism of SME network relationship characteristics on innovation performance under the new dual-cycle development pattern, the mediating role of supply chain dynamic capabilities and the moderating effect of supply chain geographic proximity, and the configuration path of factors affecting SME innovation through fsQCA Carrying out empirical analysis. The following conclusions are obtained:

(1) The characteristics of the network relationship significantly positively affect the innovation performance of SMEs.

The characteristics of network relationships are mainly reflected in two levels of relationship strength and relationship quality. First, the increase in relationship strength can enhance the intimacy of each other's relationship, promote communication and interaction between network partners, and help companies quickly tap favorable resources for innovation; secondly, a good relationship quality can promote trust between network partners, to make the information and resources obtained by the enterprise more valuable, thus avoiding ineffective innovation.

(2) The dynamic capabilities of the supply chain play an intermediary role in the network relationship and the innovation relationship of SMEs.

A good network relationship can directly promote the innovation of SMEs and indirectly promote the innovation activities of SMEs through the intermediary role of the dynamic coordination and integration of the supply chain. Based on a good network relationship between SMEs and network partners, coordinating supply chain dynamic capabilities shared learning, and resource integration can accelerate resource replacement and information acquisition, thereby promoting enterprise innovation.

(3) The different levels of geographic proximity of the supply chain lead to different upstream and downstream coordination and interaction and knowledge sharing efficiency, which positively regulates the relationship between the dynamic capabilities of the supply chain and the innovation performance of SMEs.

The higher the level of geographic proximity of the supply chain, the closer the spatial distance between the company and other network entities, the more convenient it is for the upstream and downstream of the supply chain to coordinate learning and communication and interaction during resource sharing, reduce the asymmetry of information between companies, and thereby reduce the company innovation risk, improve the innovation performance of SMEs. Further through the empirical test of the moderated intermediary model, it is concluded that the geographical proximity of the supply chain not only regulates the relationship between dynamic capabilities and SME innovation performance, but also affects the intermediary effect of supply chain dynamic capabilities between network relationship characteristics and SME innovation. When the distance between the upstream and downstream entities of the supply chain is closer, the intermediary role of the supply chain dynamic capability between the network relationship characteristics and the innovation performance of SMEs is stronger.

(4) There are multiple concurrent causal relationships among the factors affecting the innovation of SMEs. Through the qualitative comparative analysis of fuzzy sets, it is concluded that there are three groups of configurations leading to a high innovation performance of SMEs: Geographical Proximity Adjustment Type (S1), Network Relationship Leading Type (S2), and Dynamic Coordination and Integration Type (S3).

2.2. Suggestions

We provide some valuable insights for SMEs with limited resources, to further rely on network relations to improve innovation performance and achieve sustainable development.

(1) Pay attention to the construction of SME network relations and strengthen external network connections. Network relationships are essential social capital for the development of SMEs. They can provide beneficial high-quality innovation resources for enterprise innovation activities. SMEs should actively participate in the supply chain network, fully tap and utilize the resources in the network, and seize the network. In this way, the innovation performance of enterprises can be improved, and the competitiveness of SMEs can be enhanced.

(2) Strengthen the upstream and downstream cooperation of SMEs to enhance the dynamic capabilities of the supply chain. The dynamic capabilities of the supply chain are conducive to SMEs in quickly responding to turbulent changes in the external environment, seizing innovation opportunities, and improving innovation performance. On the one hand, managers of SMEs can realize resource sharing by strengthening mutual coordination between enterprises and network partners, and on the other hand, by consolidating their foundation and cultivating learning innovation teams to improve the efficiency of the use of innovative resources.

(3) Pay attention to the influence of the geographical proximity of the supply chain, and do an excellent job of screening customers/suppliers. The geographical proximity of the supply chain affects the frequency of upstream and downstream interactions, which is conducive to reducing information asymmetry between enterprises,

reducing invalid innovation, and improving innovation efficiency. SMEs managers should choose upstream and downstream customers and suppliers reasonably to ensure that their interests are maximized.

(4) Evaluate the development status of the enterprise and select the innovation mode reasonably. Managers of SMEs should formulate innovation strategies according to their status and development needs. For example, newly established SMEs can quickly obtain innovative resources through dynamic supply chain capabilities. SMEs or science and technology enterprises, which do not dominate in the scale of enterprises, can strengthen the connection between partners by strengthening the network relationship construction and seize the innovation opportunities.

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