Study on the Enhancement of Corporate Value Creation Capability through Ambidextrous Innovation: A Qualitative Comparative Analysis of High-tech Enterprises in Heilongjiang

Qiuling Zhao

School of Accounting, Harbin University of Commerce, Harbin, Heilongjiang, China

Abstract: In the context of global economic integration and China's economic transition, knowledge-based enterprises encounter a more complex and volatile competitive environment. From the capability perspective, this paper constructs a model of corporate value-creating capability, positioning ambidextrous innovation as the antecedent variable and the dynamic environment during the transition period as a crucial moderating variable. It also proposes relevant propositions. A total of 164 high-tech enterprises located in Harbin, including Huawei and Tencent, were selected as case samples. The Qualitative Comparative Analysis (QCA) method was employed test and analvze to how ambidextrous innovation enhances corporate value-creating capability. Finally, based on the results of theoretical and empirical analysis, combined with an indepth examination of the dvnamic environment during transition China's period. practical strategies and recommendations for enhancing the valuecreating capability of Chinese knowledgebased enterprises are provided.

Keywords: Ambidextrous Innovation; Dynamic Environment; Corporate Value Creation Capability

1. Introduction

Innovation capability, a key skill and unique asset possessed by enterprises, is critical to their value creation. Ambidextrous innovation, an approach based on organizational learning, emphasizes that enterprises should leverage innovation to fully utilize existing resources, maintain stable development, and sustain current profit models for continuous and stable returns. [1] It further stresses the importance of exploratory innovation to continuously expand into new technologies and market domains for long-term development. This innovation capability enhances a firms autonomy and pro activeness, making it a focal point of interest in both academic and practical fields in recent years.

2. Theoretical Analysis & Model Construction

The distinction between exploitative and exploratory innovation lies in their methods of dealing with knowledge. The former integrates and refines existing knowledge, while the latter generates new knowledge to find solutions beyond the current knowledge base. Therefore, they significantly impact a company's value creation differently.

2.1 Ambidextrous Innovation & Corporate Value Creation Capability

2.1.1 The impact of exploitative innovation on corporate value creation capability

The key to development and innovation lies in enhancing business efficiency and reducing operational risks, thereby increasing value creation. [2] Companies consolidate and strengthen their cost, quality, price, and brand advantages in the market by improving existing product designs, expanding product lines, enhancing distribution channel efficiency, and providing better services. This innovation method significantly increases satisfaction with products, thereby maintaining or even increasing market share. This development and innovation are based on the existing knowledge accumulation of the enterprise, using existing knowledge to improve current problem-solving solutions, refining and previously expanding the accumulated knowledge and skills of the enterprise. Therefore, innovation can be targeted and more efficient, and innovation behavior based on a stable customer base can receive quick

responses from customers, thereby reducing operational risks. As a result, development and innovation are often favored by enterprises due to their stable short-term value creation and low risk.

However, if a firm focuses solely on exploitative innovation, limiting its capabilities to past experiences and only making slight improvements while ignoring other potential opportunities, technologies, and markets, it will lose its ability to perceive and adapt to external risks, falling into core rigidity and capability traps. In the context of a turbulent and complex external environment, economic downturn, and changing demand in China, defending established experiential advantages will cause significant core rigidity, severely hindering and jeopardizing the organizations survival and development.

2.2.2 The impact of exploratory innovation on corporate value creation capability

innovation Exploratory entails timelv adjustments to production processes to meet consumer upgrade demands, developing new discovering potential markets, products. expanding market share, generating excess profits, and enhancing enterprise value creation. [3] This type of innovation is not constrained by existing products and markets; it surpasses industry competition, opens up blue oceans, and encourages firms to invest heavily in R&D of new products, services, and technologies, thereby creating new markets. Being a "first mover" in new technology positively impacts overall value creation. Adopting new management and organizational methods, along with exploring new market areas, will open up new blue oceans. This will have a significant and immeasurable positive impact on the long-term value creation of the enterprise. Although exploratory innovation may bring unprecedented monopoly benefits, excessive exploratory activities consume significant resources and have high uncertainty of returns. These uncertain radical ventures may lead to adverse consequences of failure, resulting in a "failure trap."

2.1.3 The impact of ambidextrous innovation balance on corporate value creation capability Ambidextrous innovation can significantly enhance enterprise value creation. However, if a firm overly focuses on one aspect for a prolonged period, it will lead to an imbalance. [4] Excessive focus on exploitative innovation leads to core rigidity and the "competency trap," causing the enterprise to lose long-term competitiveness. Excessive focus on exploratory innovation. characterized bv continuous unrewarding changes, carries significant risks that can jeopardize the entire enterprise. balancing and coordinating the relationship between ambidextrous innovations and fully leveraging the synergy between exploitative and exploratory innovations is crucial for enhancing enterprise value creation. Beyond the balance, there is a subtle between complementary relationship exploitative and exploratory innovations. The knowledge, technology, and insights gained during exploitative innovation activities can provide successful pathways for exploratory activities, promoting long-term value creation. knowledge from exploratory The new innovation activities can effectively support exploitative innovation processes. [5] The interaction effects of both will promote enterprise value creation significantly.

2.2 Depiction of the Dynamic Environment

The formulation of survival and development strategies for any enterprise must consider the environment as a crucial factor, with environmental uncertainty often being the primary driver for innovation. An enterprises value creation path and strategy must dynamically align with the competitive environment to ensure sustainable value capabilities. [6] creation The external environment, serving as the foundation for the survival and development of enterprises, includes factors that affect their sustainable development. External environmental factors encompass technological environment dynamism and market environment dynamism. Technological environment dynamism refers to the degree of change in the development of new products and technologies. Market environment dynamism refers to the degree of change in industry competition intensity and shifts in consumer composition and preferences.

2.2.1 Technological environment dynamism

Currently, internet and information technologies are developing rapidly. On one hand, they help reduce costs, expand markets, and accelerate innovation, thus creating possibilities for multidimensional and multilevel development of enterprises. On the other hand, technological advancements have drastically changed the way employees work and customers purchase, and they also introduce more competitors. The ways of competition and cooperation between enterprises will also change, which are new challenges that enterprises need to face. Moreover, the life cycles of products and technologies are becoming increasingly shorter. This requires enterprises to focus on launching new products and expanding new markets within a short period. It is worth noting that enterprises are no longer purely in competition; their cooperation is becoming increasingly important.

2.2.2 Market environment dynamics

Consumers knowledge about consumption is continuously enriching, and industry competition is intensifying. This leads to a trend of diversification and personalization in products and services, with customers increasingly inclined towards individual choices. Consequently, the standards for products and services are no longer production-oriented but are continuously evolving. Thus, the uncertainty of consumer demands is a reality that many companies cannot avoid and must address. To earn longterm customer loyalty and ensure consistent support for their products, companies must offer valuable, personalized services and goods, respond promptly to changing demands, and even predict and guide consumer needs to achieve a win-win situation for both the company and consumers.

2.3 Construction of Theoretical Models

Whether it is exploitative or exploratory innovation, both compete for the existing resources of the enterprise, requiring a strategic choice. On one hand, enterprises must improve existing products, capabilities, and processes with available resources through exploitative innovation. On the other hand, to maintain a long-term competitive advantage, enterprises must develop new capabilities, products, and even business models.[7] However, given the different opportunities and sunk costs associated with these two innovation paths, enterprises must monitor changes in the external competitive environment and adjust their strategies promptly to handle sudden and complex issues effectively. As demonstrated in Figure 1, the

balance of ambidextrous innovation influences enterprise value creation in a dynamic environment.



When the external environment is relatively stable, the focus should be on utilizing and improving existing capabilities and resources to enhance the efficiency of systems and processes. In such scenarios, exploitative innovation activities are more beneficial for the company's development. In a relatively stable environment, customer demands, key materials from suppliers, and changes in the product or production process are not too large or rapid. Therefore, the enterprise can focus on extracting additional value from existing products or services, efficiently utilizing existing knowledge or capabilities, and improving processes or techniques for more efficient output.

In contrast, if the business environment is highly uncertain. explorative practices characterized by the development of entirely new products or processes will bring value creation to the enterprise. [8] In a highly uncertain environment, customer needs key raw materials from suppliers, and product technology may undergo rapid and significant changes, requiring swift responses to these changes or proactive identification of opportunities. In such situations, exploration practices can better search for and identify new opportunities. Therefore, exploration practices are more beneficial for the enterprises development in a dynamic environment.

3. Research Design

3.1 Data Collection

To understand the actual situation of the surveyed enterprises, the questionnaires were primarily distributed to mid-to-senior managers of high-tech enterprises in Harbin, Heilongjiang Province.

The survey, conducted from March to

December 2023, involved the distribution of 260 questionnaires, of which 202 were collected, achieving a response rate of 63.8%. To ensure the reliability of the research data, 38 invalid questionnaires were deleted because six companies were established for less than a year and some questionnaires had obvious issues. This resulted in 164 valid questionnaires.

3.2 Sample Characteristics

The sample enterprises spanned various industries, including electronic information manufacturing, software development, system integration, information technology services, bio-pharmaceuticals, advanced manufacturing and automation, energy conservation and environmental protection, new materials, and green food.

The final sample enterprises had the following characteristics: 88.41% were established for over five years; 64.63% were private enterprises, and 20.73% were state-owned. Additionally, 91.49% had annual sales exceeding 5 million yuan, 81.82% had sales over 10 million yuan, 46.34% exceeded 50 million yuan, and 21.95% exceeded 100 million yuan.

3.3 Research Methods

Qualitative Comparative Analysis (QCA) is a set-theoretic method that calibrates research variables into sets of cases from a configuration perspective. When there are n conditional factors, these can combine in up to 2^n ways, leading to various outcomes. By analyzing the sufficiency, necessity, or counterfactual conditions, complex causal relationships can be revealed. [9]

This method is not limited by sample size or field and can be used to study issues at multiple levels, including countries, regions, and individuals. [10] In QCA research, changes in a single conditional factor can lead to different causal conclusions due to the complexity of the conditional configuration.

By comparing different cases, the QCA method can reveal which combinations of conditional variables lead to specific outcomes. Multiple paths may produce the same effect, and QCA can determine which factors are core conditions or peripheral conditions in these paths.

3.4 Reliability and Validity Testing

Reliability and validity of the questionnaire were assessed using SPSS 23.0 software.

3.4.1 Reliability testing

Typically, Cronbachs α should exceed 0.7, with values approaching 1 indicating higher reliability of the questionnaire data. According to Table 1, Cronbachs α coefficients for intellectual capital, ambidextrous innovation, corporate value creation capability, and environmental dynamism all exceed 0.7, indicating the questionnaires reliability.

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Table 1	. Reliability Te	est Results

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Variable	Number of Items	Cronbachs α Coefficient				
exploitative innovation	6	0.864				
Exploration innovation	5	0.746				
Enterprise Value Creation	8	0.924				
Technological Dynamism	4	0.845				
Market Dynamism	4	0.839				

3.4.2 Validity testing

The scale was divided into two parts: the antecedent condition scale for enterprise value creation and the enterprise value creation scale. Each variable underwent KMO sample measures and Bartletts spherical tests. the KMO value for the antecedent condition variable of enterprise value creation is 0.910, with Bartletts spherical test indicating significance. Additionally, the KMO value for the enterprise value creation variable is 0.930, with Bartletts spherical test also indicating significance. Typically, KMO values above 0.5 (and closer to 1 being better), alongside Bartletts spherical test significance below 0.05. indicate the suitability of sample data for factor analysis. Hence, this study employs factor analysis to test structural validity of the sample data.

4. Empirical Testing

4.1 Construction of the Fact Table

The antecedent condition variables include three ambidextrous innovation factors and two environmental turbulence factors, totaling 32 condition combinations. Table 2 illustrates the fact table, where capital letters indicate the presence of a factor ("value" = 1), and

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lowercase letters indicate its absence ("value" = 0).

Impact of AmbideAct ous Innovation						
Condition	Number of	Proportion				
Combination	Cases	roportion				
ER+ET+TT+MT	18	10.98				
ER+ET+tt+MT	27	16.46				
ER+et+TT+MT	6	3.66				
er+ET+TT+MT	12	7.32				
ER+ET+TT+mt	19	11.59				
ER+ET+tt+mt	16	9.76				
ER+et+TT+mt	3	1.83				
er+ET+TT+mt	16	9.76				
ER+et+tt+mt	9	5.49				
er+ET+tt+mt	8	4.88				
er+et+tt+mt	4	2.44				
er+et+TT+mt	2	1.22				
ER+et+tt+MT	6	3.66				
er+ET+tt+MT	11	6.71				
er+et+TT+MT	4	2.44				
er+et+tt+MT	3	1.83				

 Table 2. Fact Table of Case Tests on the Impact of Ambidextrous Innovation

Note: er is Exploratory Innovation, et is exploitative Innovation, tt is Technological Turbulence, mt is Market Turbulence.

4.2 Configuration Condition Analysis

The fact table was imported into QCA software, with a consistency threshold of 0.8 and a case frequency threshold of 1.

The results, shown in Table 3, indicate three main condition combinations that lead to the improvement of enterprise value creation capability. These combinations collectively account for 70 cases of improved enterprise value creation capability, with an overall coverage rate of 72.92% out of 96 cases, and a consistency of 86.24%, indicating a high level of necessity. Among them, the ER+ET condition combination has the highest coverage rate at 73.96%, covering 63 cases of improved enterprise value creation capability. Although the ER+et+tt+MT combination has a coverage rate of 25% and the er+ET+T+MT combination has a coverage rate of 9.38%, their consistency levels are both above 60%.

For the decline in enterprise value creation capability, there is only one main condition combination: the er+et combination, with a coverage rate of 19. 12%, covering 13 out of 68 cases. Its necessity level is not high, but the consistency level of this combination is 100%, indicating that this combination inevitably leads to a decline in enterprise value creation capability. Therefore, ambidextrous innovation and balance inevitably affect enterprise value.

Table 3. Impact of Ambidextrous Innovation on Enterprise Value Creation under Environmental Turbulence

Condition Combination	Coverage Rate	Net Coverage Rate	Consistency	Overall Consistency			
High Value							
Creation							
ER	73.96	42.71	86.24	72.92			
ET							
er	25.00	20.65	62.53				
tt							
MT							
er	9.38	14.53	71.94				
Low Value							
Creation							

5. Research Conclusions and Implications

5.1 Research Conclusions

FSQCA adopts a configuration perspective to explore the ambidextrous innovation-driven paths of enterprise value creation, highlighting the complex relationships among antecedent conditions. Based on the core conditions and their underlying explanatory logic, three antecedent configurations driving value creation are summarized into distinct highvalue creation ambidextrous innovation paths for enterprises, and conclusions are drawn from these interpretations.

Table 3 reveals significant differences amongthethreeambidextrousinnovationconfigurationsforhighvaluecreation.Thespecific analysisis as follows:

(1) Configuration h1: Balanced Ambidextrous Innovation. This configuration involves high exploitative innovation and high exploratory innovation, enabling high value creation regardless of the external dynamic environment. In this path, the enterprise possesses abundant resources and capabilities to support the implementation of ambidextrous innovation strategies. For ambidextrous innovation, intellectual capital is a prerequisite, and technology is a core advantage. [10] The ability to bear risks in scientific research and innovation is also higher than that of other enterprises. Despite a fiercely competitive market, enterprises with sufficient intellectual capital and technological advantages can achieve a balance of ambidextrous innovation relying on their own strength.

(2) Configuration h2: technology-dominated

Type. This configuration involves high exploitative innovation, low exploratory innovation, high technological turbulence, and low market turbulence. In this configuration, the enterprise focuses on exploitative innovation. In the high-tech industry, the rapid pace of technological updates necessitates balancing explorative and exploitative innovation. This involves "two-handed grasp": exploring heterogeneous knowledge to expand R&D into non-core areas and delving deeply into core technology fields to develop more specialized innovative products. Therefore, enterprises under this model should focus on strengthening and expanding technology, even if they lack support in intellectual capital.

(3) Configuration h3: market-dominated type. This configuration involves low exploitative innovation, high exploratory innovation, low technological turbulence, and high market turbulence. In this configuration, enterprises focus on exploratory innovation. The main challenge for these enterprises is highly homogeneous products and services, with low market entry barriers and fierce competition. bravely explore They should new technological business models to prevent technological lock-in effects. While optimizing core technology and markets, efforts should be made to ensure the enterprise remains competitive by exploring new business models and markets.

5.2 Research Implications

Comparing the configurations of ambidextrous innovation paths leading to high value creation, three distinct innovation combination paths emerge from both theory and practice:

(1) Balanced ambidextrous innovation: When enterprises possess sufficient intellectual capital resources, they prioritize a balanced ambidextrous innovation strategy to enhance value creation and establish long-term competitive advantages.

(2) Technology-dominated type: When enterprises encounter highly turbulent market and technological environments, their technical staffs strong innovation capabilities enable continuous and uninterrupted exploitative innovation in products and services.

(3) Market-dominated type: When enterprises face high market turbulence and low technological turbulence, they tend to choose an ambidextrous innovation path dominated by exploratory innovation and supplemented by exploitative innovation. These enterprises typically have abundant relational capital, maintaining strong alliances with universities, research institutions, and the government, giving them an edge in obtaining and assessing market and policy information. They strive to explore new markets and business models, seeking blue ocean strategies to maintain competitive advantages.

Turbulent market and technological environments are external drivers for enterprises to implement ambidextrous innovation strategies.

Research and data analysis of case enterprises reveal that when enterprises face a stable, lowcompetition market and their products are monopolistic, low ambidextrous innovation occurs. Therefore, strong technical demand for market products and services can effectively stimulate enterprises to implement exploitative innovation to increase market share.

A fiercely competitive market environment will further test the human and relational capital of enterprises. The quality of talent and knowledge level can directly affect the innovation capability of enterprises, while good external relationships can continuously provide the latest information for economic activities, supporting innovation.

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