The Effect of Dynamic Capability on Sustained Competitive Advantage of Enterprise: The Mediating Role of Ambidextrous Innovation Synergy

Jiahui Qian [1, *], Can Peng[2]

[1, 2]College of Economics and Management, Nanjing University of Aeronautics and Astronautics, Nanjing 210016, China

Email: qjh9693@nuaa.edu.cn

Abstract. From the perspective of ambidextrous innovation synergy, this paper identifies and verifies the mechanism of dynamic capability and their dimensions on the sustainable competitive advantage of enterprise, and examines the intermediary role of ambidextrous innovation synergy. Based on the empirical study of 220 sample enterprises, it is found that the opportunity utilization ability has a significant positive impact on the complementarity and balance of ambidextrous innovation, while the opportunity identification ability only has a significant positive impact on the complementarity of ambidextrous innovation; Ambidextrous innovation synergy and its dimensions have a significant positive impact on the sustainable competitive advantage of enterprise; Synergy and complementarity of ambidextrous innovation play a partial intermediary role between dynamic capability and enterprise competitive advantages, while the intermediary role of balance is not significant.

Keywords: Dynamic capability; Ambidextrous innovation synergy; Sustainable competitive advantage of enterprise

1   Introduction

Facing the increasingly competitive market environment, original competitive advantage of enterprise become more and more fragile with the changes of the external environment. According to the resource-based view, when an enterprise has valuable, scarce, irreplaceable and unmatched resources, it can obtain sustainable competitive advantages[1]. However, with the development of the enterprise and the change of the external environment, resources have certain timeliness. Focusing on the past resource base may cause the enterprise to fall into "inertia trap"[2]. In view of this, in order to avoid the static shortcomings of the resource-based view, Teece[3] put forward the dynamic capability theory in the 1990s, holding that the key for enterprise to obtain sustainable competitive advantages lies in the formation of endogenous capability, i.e., dynamic capability, to cope with environmental changes in the process of integrating various basic resources.

Based on this, from the perspective of innovation synergy, this study selects ambidextrous innovation synergy as the intermediary variable, dynamic capability as the independent variable, and enterprise sustainable competitive advantage as the dependent variable. Through theoretical analysis and empirical research, the mechanism and path of dynamic capability influencing enterprise sustainable competitive advantage through ambidextrous innovation synergy are explored.

2   Conceptual Development

2.1   Dynamic Capability

Dynamic capability refers to the ability of an enterprise to make rapid behavioral response and innovation according to the complex and changing external competitive environment, and to integrate, construct and reorganize the internal and external resource base purposefully and systematically [3]. This study draws lessons from the division of dynamic capability by Hang Wu [4], the dynamic capability is further divided into opportunity identification capability and opportunity utilization capability.

2.2   Sustainable Competitive Advantage of Enterprise

Day first introduced the concept of enterprise sustainable competitive advantage into the field of enterprise strategic management in 1984. He believed that an enterprise gained a competitive advantage when it implemented a competitive strategy that its competitors could not copy, and it gained a sustainable competitive advantage when the competitors could not imitate and copy this competitive strategy for a long period of time [5].

2.3   Ambidextrous Innovation Synergy

Ambidextrous innovation refers to the enterprise simultaneously carries out two kinds of innovation activities: utilization innovation and exploration innovation. Domestic scholars Jie Zhao et al.[6] attribute the mutually exclusive and complementary relationship between the two innovations to the balance and complementarity of ambidextrous innovation. Among them, balance refers to the relative balance level between exploratory innovation and utilization innovation; Complementarity refers to the mutual promotion between exploratory innovation and utilization innovation[7]. Lei Xi et al[8] based on the viewpoint of synergy theory, integrated the balance and complementarity of ambidextrous innovation into a new variable: ambidextrous innovation synergy, that is, a variable used to measure the degree of synergy between two innovation activities of an enterprise, including two dimensions: balance of ambidextrous innovation and complementarity of ambidextrous innovation.

3   Research Hypothesis and Conceptual Model

3.1   Dynamic Capability and Ambidextrous Innovation Synergy

Sambamurthy[9] pointed out that the opportunity identification capability helps enter-prise to be in a better position in perceiving environmental changes, market demands and new opportunities, so that enterprise can make full use of the opportunities brought by the environment and make preparations for the organization to acquire the resources needed to carry out innovation activities, so that enterprise can pursue both exploitative innovation and exploratory innovation. In addition, exploitative innova-tion and exploratory innovation can promote each other, compensate each other's defects to a certain extent, and reach an interactive relationship[7].

Based on the above discussion, this study proposes the following assumptions:

H1 Dynamic capability is positively related to ambidextrous innovation synergy

H2a Opportunity identification capability is positively related to the balance of ambidextrous innovation

H2b Opportunity utilization ability is positively related to the balance of ambidex-trous innovation

H3a Opportunity identification capability is positively related to the complementa-rity of ambidextrous innovation

H3b Opportunity utilization ability is positively related to the complementarity of ambidextrous innovation

3.2   Ambidextrous Innovation Synergy and Sustainable Competitive Advantage of Enterprise

The balance of ambidextrous innovation promotes the simultaneous development and strategic implementation of exploitative innovation and exploratory innovation. To a certain extent, this balance buffers the uncertainty of innovation, enables enterprise to effectively avoid business risks and obtain long-term competitive advantages[10]. In addition, the implementation of balanced ambidextrous innovation is conducive to the utilization of idle resources by enterprise, which not only alleviates the competition for resources by utilization innovation and exploratory innovation, but also promotes the rational distribution of enterprise resources and maximizes the utilization value of resources[11]. Exploitative innovation promotes the effect of enterprise knowledge ex-ploration and resource development. Exploratory innovation promotes the improve-ment of existing products and the research and development of new products. The complementary effect of the two innovation activities in the long term maintains the flexibility and risk resistance of enterprise, thus promoting the establishment of sus-tainable competitive advantages of enterprise. Therefore, only when enterprise pay attention to the balance and complementarity of ambidextrous innovation at the same time can they promote the complementarity between the two innovation activities and obtain sustainable competitive advantages.

Based on the above discussion, this study proposes the following assumptions:

H4 Ambidextrous innovation synergy is positively related to the sustainable competitive advantage of enterprise

H4a The balance of ambidextrous innovation is positively related to the sustainable competitive advantage of enterprise

H4b The complementarity ambidextrous innovation is positively related to the sustainable competitive advantage of enterprise

3.3   Intermediary Role of Ambidextrous Innovation Synergy

Dynamic capability is to modify and change the original operation capability by integrating, constructing and reorganizing the internal and external resources of the enterprise, so that the enterprise can adapt to the dynamic and complex changing environment in different periods and finally obtain sustainable competitive advantages. In this process, it involves the transformation of the existing knowledge resources and management of the enterprise. Exploitative innovation constantly extends existing technology and knowledge to expand existing products and services, and exploratory innovation constantly pursues new knowledge and develops new products and services. Obviously, the enterprise's grasp of the balance and complementarity between exploitative innovation and exploratory innovation involves the transformative transformation of existing knowledge resources and management, and is the result of the enterprise's dynamic capability[12].

Based on the above discussion, this study proposes the following assumptions:

H5 ambidextrous innovation synergy plays an intermediary role between dynamic capability and sustainable competitive advantage of enterprise

H5a The balance of ambidextrous innovation plays an intermediary role between dynamic capability and sustainable competitive advantage of enterprise

H5b The complementarity of ambidextrous innovation plays an intermediary role between dynamic capability and sustainable competitive advantage of enterprise

3.4   Conceptual Model

Based on the above research assumptions, this study builds a relationship model between dynamic capability, ambidextrous innovation synergy and sustainable competitive advantage of enterprise, as shown in Fig. 1.
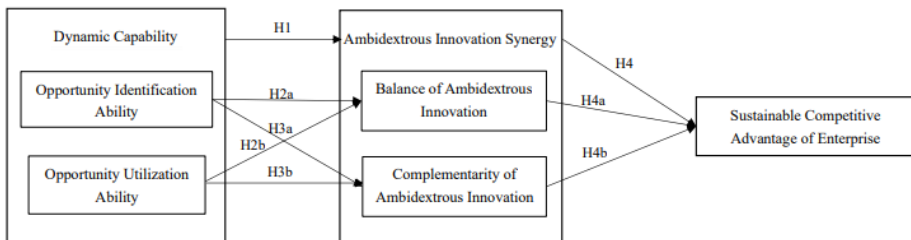

Fig. 1. Conceptual Model (self-draw)

4   Data Analysis

4.1   Data Collection

Since this study includes three special variables, the selection of survey objects follows the following two principles: a. The target enterprises surveyed are from the high-tech field. b. In order to ensure the authenticity and reliability of the data, the middle and senior managers are selected as the research objects in this study. Through face-to-face, telephone, e-mail and WeChat research, 390 questionnaires were distributed and 220 effective questionnaires were recovered, with a recovery rate of about 56.41%.

4.2   Reliability and Validity Test.

As can be seen from Table 1, the structural variables involved in this paper have good reliability in the sample data used, and the structural variables involved in this paper have good convergence validity in the sample data used.

Table 1. Reliability and Validity Test of Variable (self-draw)

Variable		Item	Load	KMO	Cronbach α	CR
Dynamic Capability	Opportunity Identification Ability	A1	0.657	0.761	0.760	0.842
		A2	0.759			
		A3	0.669			
		A4	0.716			
		A5	0.788			
	Opportunity Utilization Ability	B1	0.691	0.721	0.770	0.845
		B2	0.750			
		B3	0.744			
		B4	0.746			
		B5	0.677			
Sustainable Competitive Advantage of Enterprise		C1	0.802	0.896	0.907	0.924
		C2	0.813			
		C3	0.787			
		C4	0.780			
		C5	0.801			
		C6	0.702			
		C7	0.666			
		C8	0.680			
		C9	0.782			
Ambidextrous Innovation	Utilization Innovation	D1	0.832	0.777	0.848	0.899
		D2	0.852			

		D3	0.777			
		D4	0.859			
		E1	0.819			
Exploratory Innovation		E2	0.806	0.813	0.836	0.892
		E3	0.826			
		E4	0.834			

4.3   Descriptive Statistics and Correlation Analysis

The results are shown in Table 2. It can be seen that the average value of ambidextrous innovation synergy, balance and complementarity of the sample enterprise is generally good; The mean values of other variables are at the "average" level. In addition, the dynamic capability and its dimension, ambidextrous innovation synergy, ambidextrous innovation complementarity are significantly positively correlated with the sustainable competitive advantage, and the ambidextrous innovation balance is significantly positively correlated with the dynamic capability, opportunity utilization capability, and sustainable competitive advantage of enterprise, which also preliminarily confirms some of the above assumptions.

Table 2. Descriptive Statistics and Correlation Analysis (self-draw)

	A	B	1	2	3	4	5	6	7	8	9
1	3.01	1.46	1								
2	2.85	1.15	0.364*	1							
3	5.61	0.70	0.255**	0.241**	1						
4	5.80	0.79	0.182**	0.154*	-	1					
5	5.41	0.87	0.198**	0.250**	-	0.432**	1				
6	0.80	0.11	0.173*	0.134*	0.631**	0.622**	0.616**	1			
7	0.93	0.07	0.079	-0.019*	0.170*	0.100	0.185*	-	1		
8	0.67	0.19	0.171*	0.163**	0.684**	0.684**	0.645**	-	0.269**	1	
9	5.40	0.86	0.048	0.056	0.660**	0.660**	0.588**	0.683**	0.246**	0.612**	1

Note: A: Mean value; B: Standard deviation 1. Enterprise age; 2. Enterprise scale; 3. Dynamic capability; 4. Opportunity recognition ability; 5. Opportunity utilization ability; 6. Ambidextrous innovation synergy; 7: Balance of ambidextrous innovation; 8: Complementarity of ambidextrous innovation; 9: Sustained competitive advantage of enterprise. ** and * indicate significant correlation at the $P<0.01$ and $P<0.05$ levels (two-sided), respectively

4.4   Regression Analysis

It can be seen from Table 3 that the dynamic capability has a significant positive effect on ambidextrous innovation synergy (β=0.738, P<0.001). The opportunity identification ability has a significant positive effect on the complementarity of amdexterous innovation (β=0.671, P<0.001). The opportunity utilization ability has a significant positive effect on balance of ambidextrous innovation (β=0.194, P<0.01), and

complementarity of ambidextrous innovation (β=0.639, P<0.001). Therefore, H1, H2b, H3a, H3b were verified.

It can be seen from Table 4 that ambidextrous innovation synergy (β= 0.697, P< 0.001), balance of ambidextrous innovation (β= 0.246, P < 0.001) and complementarity of ambidextrous innovation (β= 0.717, P < 0.001) have a significant positive effect on the sustainable competitive advantage of enterprise, then H4, H4a and H4b are verified.

4.5   Intermediary Effect Analysis

As can be seen from Table 5, the regression coefficient of dynamic capability is still significant after ambidextrous innovation synergy is added into Model 2, but the standardized coefficient value changes from 0.683 to 0.370, while the regression coefficient of ambidextrous innovation synergy is very significant (β=0.410, P<0.001). Therefore, ambidextrous innovation synergy plays a partial intermediary role between dynamic capability and sustainable competitive ad-vantages of enterprise, and hypothesis H5 is verified. Similarly, the complementarity of ambidextrous innovation plays a partial intermediary role between dynamic capability and sustainable competitive advantage of enterprise. H5b was also verified.

Table 3. Dynamic Capability and Ambidextrous Innovation Synergy (self-draw)

Variable	Ambidextrous Innovation Synergy		Balance of Ambidextrous Innovation			Complementarity of Ambidextrous Innovation		
	M1	M2	M3	M4	M5	M6	M7	M8
Enterprise Age	0.143*	0.026	0.099	0.086	0.075	0.128	0.031	0.049
Enterprise Scale	0.082	-0.053	0.056	-0.065	-0.095	0.116	0.048	-0.015
Dynamic Capability		0.738***						
Opportunity Identification Ability				0.094			0.671***	
Opportunity Utilization Ability					0.194**			0.639***
R^2	0.036	0.537	0.009	0.017	0.144	0.041	0.472	0.418
Adjusted R^2	0.027	0.531	0.000	0.004	0.132	0.032	0.464	0.410
F-value	4.017*	83.613***	0.979	1.275	14.613***	3.284*	64.270***	51.796***

Note: * * * p<0.001, * *p<0.01, * p<0.05, same below

Table 4. Ambidextrous Innovation Synergy and Sustainable Competitive Advantage of Enterprise (self-draw)

Variable	Sustainable Competitive Advantage of Enterprise			
	M1	M2	M3	M4
Enterprise Age	0.032	-0.068	0.008	-0.060
Enterprise Scale	0.045	-0.012	0.058	-0.038
Ambidextrous Innovation Synergy		0.697***		
Balance of Ambidextrous Innovation			0.246***	

Complementarity of Ambidextrous Innovation				0.717***
R²	0.004	0.472	0.064	0.497
Adjusted R²	-0.005	0.465	0.051	0.490
F-value	0.443	64.445***	4.929**	71.032***

Table 5. Intermediary Effect Test of Ambidextrous Innovation Synergy (self-draw)

Variable	Sustainable Competitive Advantage of Enterprise			
	M1	M2	M3	M4
Enterprise Age	-0.132	-0.143**	-0.137	-0.134
Enterprise Scale	-0.099	-0.077	-0.093	-0.085
Dynamic Capability	0.683***	0.370***	0.670***	0.284***
Ambidextrous Innovation Synergy		0.410***		
Balance of Ambidextrous Innovation			0.071	
Complementarity of Ambidextrous Innovation				0.504***
R²	0.430	0.507	0.435	0.527
Adjusted R²	0.422	0.498	0.424	0.519
F-value	54.247***	55.344***	42.316***	59.978***

5 Research conclusion and Enlightenment

5.1 Research Conclusion

Through empirical analysis, this study uses the research data of 220 high-tech enterprise to test the hypothesis and obtains the following conclusions:

a. Dynamic capability has a positive effect on the synergy of ambidextrous innovation. Opportunity utilization ability has a significant positive impact on the balance and complementarity of ambidextrous innovation. However, opportunity recognition ability only has a positive impact on the complementarity of ambidextrous innovation.

b. Ambidextrous innovation synergy and its two dimensions have a significant positive impact on the sustainable competitive advantage of enterprise.

c. Synergy and complementarity of ambidextrous innovation play a partial intermediary role between dynamic capability and enterprise competitive advantages, while the intermediary role of balance is not significant.

5.2 Management Enlightenment

This study discusses the relationship among dynamic capability, ambidextrous innovation synergy and sustainable competitive advantage of enterprise, which has some management implications for the innovation practice of Chinese enterprises.

a. Enterprise should recognize the strategic significance of dynamic capability in the process of promoting ambidextrous innovation. When cultivating dynamic capability, enterprise should build different types of dynamic capability according to the

external environment and development needs. Specifically, if the enterprise pursues the balance effect and avoids the resource competition between two kinds of innovation activities, it should pay attention to the cultivation of opportunity utilization capability; If the enterprise is more inclined to pursue the complementary effect between the two kinds of innovation activities, it should pay more attention to the opportunity utilization ability while paying attention to the opportunity identification ability.

b. In carrying out ambidextrous innovation, enterprise should pay attention to the synergy and balance effect between two kinds of innovation activities, so that enterprise can always obtain and maintain competitive advantages and achieve long-term development in the turbulent and changing competitive environment.

c. Enterprise can realize the promotion of their sustainable competitive advantages by dynamic capability through ambidextrous innovation synergy. Specifically, the dynamic capability mainly realizes the promotion of the sustainable competitive advantage of enterprise through the complementary of ambidextrous innovation. Enterprise can use dynamic capability to realize the leverage effect of organizational knowledge and inertia between exploitative innovation and exploratory innovation, so as to enhance the competitive advantage of enterprise.

5.3   Limitations and Future Research

First, the data in this paper are mainly from the questionnaire information of high-tech enterprise, so there are obvious limitations in the industry. Future research can appropriately expand the industry field of research. Second, this aspect mainly refers to the research results of previous related literature. For example, there are still many disputes on the division of dynamic capability dimension, and there is far from a consensus. It is expected that authoritative theoretical results will be published in the future.

References

1. Barney J B. Firm resource and sustained competitive advantage[J]. Journal of Management,1991,17(1):99-120.
2. Burgelman R A. Intraorganizational ecology of strategy making and organizational adaptation: theory and field research[J]. Organization Science,1991,2(3):239-262.
3. Teece D J，Pisano G，Shuea A. Dynamic capability and strategic management[J]. Strategic Management Journal,1997,18(7):509-533.
4. Hang Wu. Dimension division of dynamic capability and its impact on Innovation Performance--Reflections on the classic definition of Teece[J]. Management review,2016, 28(3): 76-83.
5. Day.A., Rumle.Asset Stock of Accumulation and Sustain- ability in Competitive Advantage[J]. Management Science.Vol.36.
6. Jie Zhao, Zelong Wei, Li Yuan Research on the influence of executive incentive mechanism and combination ability on innovation ambidextrousity[J]. China Science and Technology Forum, 2012 (2): 108-115

7. Cao Q., Gedajlovic E., Zhang H. Unpacking organizational ambidexterity: Dimensions, contingencies, and synergistic effects[J]. Organization Science,2009,20(4): 781-796.
8. Lei Xi, Can Peng, Deqiang Li. The influence of intellectual capital on the synergy of ambidextrous innovation: the regulatory role of the behavior integration of senior management team[J]. Scientific and technological progress and countermeasures, 2016, 33 (6): 142-148.
9. Sambamurthy V,Bharadwaj A,Grover V.Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms[J]. MIS quarterly,2003: 237-263.
10. Chenlu Zhang, Hao Shen, Jie Zhang. Idle resources, ambidextrous innovation and sustainable competitive advantage -- from the perspective of resource patching[J]. East China economic management, 2017,31 (12): 124 – 133.
11. Liang Wu, Xinglu Zhao, Jianqi Zhang. Research on the relationship between ambidextrous innovation and firm performance with resource patchwork as the intermediary process[J]. Chinese Journal of Management,2016, 13(3):425-431.
12. Dhaliwal,S. Entrepreneurship: a learning process: the experience of South Asian female entrepreneurs and women in business. Education & Training,42(8),445-452.