Can Founder Control and Management Participation Affect Strategic Adaptation of Academic Ventures? Evidence from the Chinese New OTC Market

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Abstract. Strategic adaptation is pivotal to companies' survival and development. However, for new ventures with lower levels of structural inertia and responding quicker to the environment, especially the growth stage of academic ventures, governance and ownership has its own characteristics and combined with that academic ventures rely more on technology and knowledge from academic entrepreneurs, which leads to the fact that academic entrepreneurs can greatly influence ventures' strategies and behaviours. Therefore, the purpose of this study is to examine empirically whether academic founder control and management participation has an effect on strategic adaptation of academic ventures in Chinese context. This study used a large sample of the Chinese New OTC Market listed companies listed before 2016. The study shows that the academic founder control has a negative relationship with strategic adaptation of academic ventures, but the management participation of academic founder exerts a significant relationship with strategic adaptation of academic ventures. Furthermore, if there is a principal-agent structure in academic ventures, the relationship between of founder control and strategic adaptation is not significant. Because of professional managers, academic ventures tend to adopt opportunistic strategies. The study suggests that the academic ventures in the New OTC Market should grasp the current strategic adaptation and find out their strategic focus, and timely adjust the corporate governance structure for facilitating development.

1. Introduction

As the increase in academic entrepreneurship, scientists as academic entrepreneurs are likely becoming founders of academic ventures, by a series of entrepreneurial activities dedicated to the commercialization of new technology more than simple activities such as technology licensing and technology transfer [1]. According to report produced by BiGGAR, there are 136 spin-off firms from the University of Oxford, and the sales revenue of these firms around the world totalled 600 billion pounds sterling, which can provide strong evidence of the University of Oxford that has contribution to driving the region and the national economy, and international influence. It means that the ability of transformation technology to a specific market innovation will become the main driver of future economic development [2], and scientists with rich intellectual resources has gradually become the important entrepreneurs [3], academic entrepreneurs. At the same time, the survival and development of academic ventures play an important role in promoting economic development, so academic venture is the research focus.

Many scholars have made some advances toward understanding academic ventures and its development. Based on the life cycle model, the academic venture life is divided into the start-up stage and the growth stage [4]. However, most of the studies examined opportunity recognition and entrepreneurial commitment in the start-up stage [5], that is to say, how academic entrepreneurs

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recognize the commercial value of their technological achievements and create companies to commercialize technological achievements. Some researches revealed that academic entrepreneurship is a dynamic process composed of a series of events [6]. They found that the acquisition and reorganization of resources as well as the ability and network of academic entrepreneurs is central to academic venture establishment [5]. Other researches focused on factor integration [7], entrepreneurship orientation [8]. It is believed that the key point of academic ventures is the identification of entrepreneur role [8] and the integration of the three factors of scientists, academic organizations and environment [7]. However in the growth stage, the focus of academic ventures is on development instead of survival, so the founder's responsibility transforms from the technical research and development into important decision-making activities, including investment, competitive strategy, market access and acquisition [9]. The complexity of management of academic ventures brings even more of a challenge, while few studies explore academic ventures in the growth stage.

In the growth stage, the structure, hierarchy, division of roles, decision-making systems and formality gradually appears in academic ventures, especially the decision-making systems that contribute to optimal choices from various options usually shapes after the start-up stage [10]. Different from the principal-agent structure in the established companies, most founders of new ventures have the dual identities of chairman and general manager, which led to a more homogeneous governance structure as same actors often are recognized as participants across board of shareholders, board of directors and management [11], and founders have an important position at three levels. In academic ventures, especially, founders can be a provider of technology and knowledge, except that founders as the company controller can be the decision maker involved in actual operation and management. Therefore, in the governance structure of academic ventures, academic-founders may play a pivotal role. As scientists founders tend to make strict plans for the direction of corporate strategy based on very strict logical paradigms. In academic ventures, technology and knowledge from founders are the basis for formulating effective competitive strategies and the companies' development depends on the close combination of technology, knowledge and strategy [12]. As a company controller and a business decision-maker, founders can determine the direction of technology development, analyse the external environment and market competition, and control the risk by calling for an advanced level of ability in technology, business and finance. In view of such a special role, the founder will have an important impact on the strategic adaptation of academic ventures.

Strategic adaptation is generally regarded as a detailed process including selection, commitment, implementation, execution and action [13], reflecting the ability of coping with environmental uncertainty. Strategic adaptation, as an information processing process, contains three basic components: noticing, interpretation and action. Noticing and interpretation is the preconditions for new ventures' action, which defines its market and explains its intention and strategy through cognizing environment, and then new ventures take a series of actions from the important dimensions of product, technology and market [14].

In the principal-agent structure in the established companies, professional managers mostly adopt diversification strategy that involves business, organization and other levels, hence, the mature companies have stronger strategic adaptation. However, for academic ventures, a more homogeneous governance structure leads to the fact that founders can greatly influence academic ventures' strategies and behaviours. Under this context, the strategic adaptation of academic ventures may be different from that of mature companies. It means that we can take founders shareholding ratio in academic ventures and whether participation in the operation and management and the organizational actions taken by academic ventures for examining whether founder control and management participation affect strategic adaptation of academic ventures? Therefore, this paper used data from the Chinese New OTC Market listed companies listed before 2016 to analyse the relationship founder control, management participation and strategic adaptation. The answers to this question are of great significance to the survival and development of academic ventures in China.

2. Literature Review

As described in the principal-agent theory, corporate governance of mature companies refer to situation in which decentralized shareholders transfer control rights to professional managers, resulting in the separation of ownership and control rights, which thus gives rise to agency problems between managers and shareholders [12]. Different from the principal-agent structure of mature companies, academic ventures are established by the founders with skill and knowledge, and the corporate development depends on the closely integration of technology and knowledge and strategic [15]. In addition, most founders of academic ventures have the dual identities of chairman and general manager for participating in the actual operation and management, which led to a more homogeneous governance structure as same actors often are recognized as participants across board of shareholders, board of directors and management [16]. Therefore, the founder's goals, characteristics and strategic awareness may all have an impact on the strategic decision-making of companies [17].

Strategic adaptation is regarded as a detailed process including selection, commitment, implementation, execution and action [18], reflecting the ability of coping with environmental uncertainty. Strategic adaptation, as an information processing process, contains three basic operations: noticing, interpretation and action. Noticing and interpretation is the preconditions for new ventures' action, which defines its market and explains its intention and strategy through cognizing environment, and then new ventures take a series of actions from the important dimensions of product, technology and market [14]. It is worth to note that organizational actions can be regarded as specific behaviours of strategic adaptation. In this sense, it becomes one of the important channels to evaluate the strategic adaptation of companies by analysing the diversity and frequency of organizational actions. Kiss et al. found that organizational actions can be divided into the market, finance, new products, strategic alliance, competition, executive team transformation, human resources, production capacity, internationalization, IPO, structure, restructuring, service, corporate social responsibility, low cost. Their results showed that the strategic adaptation is much stronger when the diversity and frequency of organizational actions is high rather than low.

In the principal-agent structure in the mature companies, professional managers mostly adopt diversification strategy that involves business, organization and other levels, hence, the mature companies have stronger strategic adaptation. And for the founders-led company, due to that its business process, choice and performance may differ from that in a mature company with the principal-agent structure [4], therefore it has own uniqueness in terms of strategic adaptation. Fahlenbrach found that founder-led companies are more inclined to conduct research and development activities and have higher capital expenditure ratios [19]. Bonaccorsi stated that founders who have management experience due to their better social networks are better able to allocate resources, explore new market opportunities and solve complex management problems [20]. Connelly et al. argued that the increase in the share will make managers focus on protecting their benefits and tend to avoid risks [21].

However in academic ventures, on the one hand, as scientists founders tend to make strict plans for the direction of corporate strategy based on very strict logical paradigms. On the other hand, owing to Academic venture creation based on technology and knowledge, the companies' development is strongly dependent on technology and knowledge from founders. Therefore, from this perspective, academic-founders may play a pivotal role in strategic decision-making. In the fierce competition environment, facing a foreshortened product and business model life cycle, the company needs to constantly looking for new opportunities [22]. As a company controller and a business decision-maker, founders can determine the direction of technology development, analyse the external environment and market competition, and control the risk by calling for an advanced level of ability in technology, business and finance. In view of such a special role, the founder will have an important impact on the strategic adaptation of academic ventures. Under this context, the strategic adaptation of academic ventures may be different from that of established companies.

3. Research Design

3.1 Case Selection and Data Sources

To study the impact of founder control and management participation on strategic adaptation of academic ventures, drawing on the definition of the academic entrepreneurs, this study chooses researcher and scientists who are not only from universities but also from other research institutes, hospitals. These scientists including university researchers, engineers of public research organizations and director of the doctors have been conducting research and have the research achievements. The purpose of this paper is to examine the academic ventures in the growth stage rather than in the start-up stage, and have to account for observing organizational actions in one time period according to Kiss's evaluation and analysis method of strategic adaptation. All data are available from the National Equities Exchange and Quotations of China (NEEQ, also denoted as the Chinese New OTC Market) and the data collection period is from January 2015 to December 2016.

According to the reports disclosed in the NEEQ of China, with a total of 4125 the Chinese New OTC Market listed companies listed before 2016 as the initial sample, after examining the information about the controlling shareholders and actual controllers in 2015 semi-annual reports, 129 listed companies were selected based on rules of data collection. To ensure the consistency and effectiveness of the selected companies, the data was preliminarily selected in accordance with the following step. This paper excluded the companies in which controlling shareholders and actual controllers have changed during the data collection period from the 129 listed companies, and then 125 academic ventures were left as sample companies.

3.2 Research Framework

Academic entrepreneurs are likely becoming founders of academic ventures and participate in operation and management more than simple activities such as technology licensing and technology transfer. Compared with agent-led companies, founder-led companies have obvious difference in many aspects, such as corporate governance structure, investment decision, decision-making process, etc., as well as different corporate performance levels [8]. As different from the principal-agent structure of listed companies in the main board market and growth enterprises market, the ownership and operation of listed companies in the Chinese New OTC Market is concentrated in the hands of one or a small number of shareholders. Particularly, for academic ventures, founders can be a provider of technology and knowledge that is the foundation of academic venture creation, and also be an actual controller of academic venture, so most of them will participate in the actual operation and management of the companies and become a decision-maker.

Generally speaking, academic entrepreneurs, as founders of academic ventures, participate in the operation and management, which may affect the company's action decision. The higher the shareholding ratio of founders, the higher the influence on the company's action decision is higher. Hence, the research framework is shown in figure 1.

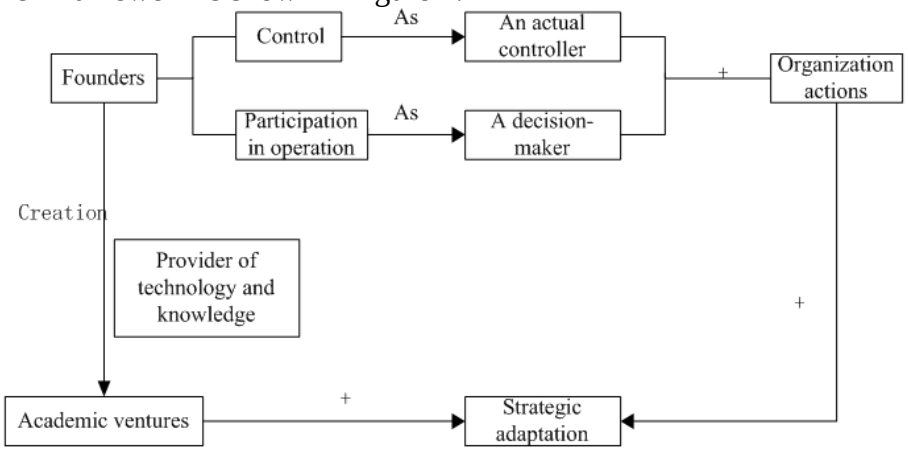

Figure 2 Research framework.

3.3. Study Sample Characteristics

The sample companies involve 29 industry segments (see Table 1). Furthermore, the industry segments involved in by 89 academic ventures mainly concentrate in the professional equipment manufacturing, chemical raw materials and chemical products manufacturing, computer, communications, and other electronic equipment manufacturing, software and information technology services, professional and technical services, instrumentation manufacturing and medicine manufacturing industry, which accounts for 71.2% of the total number of sample companies. And the other 36 academic ventures come from the other 22 industry segments. Hence, academic ventures are mainly concentrated in several industries in spite of the sample companies covering a wide range of industry segments.

Table 1 Industry segments involved in by sample companies.

Industry segments	The number of companies	Percent(%)
Professional equipment manufacturing	33	26.4
Chemical raw materials and chemical products manufacturing	18	14.4
Computer, communications, and other electronic equipment manufacturing	11	8.8
Software and information technology services	10	8
Professional and technical services	7	5.6
Instrumentation manufacturing	5	4
Medicine manufacturing industry	5	4
The other industry segments	36	28.8

4. Definition of the Variables

4.1. Identifying Founder Control and Management Participation

Because the founder control comes from ownership, hence the degree of founder control is measured by founder's shareholding ratio. In this paper, the management participation refers to that founders may play a senior executive and/or a salaried executive director. In this study, the changes of capital stock and the information about shareholders of 125 sample companies was examined, and then it was recognized that the founders' shareholding ratio and whether they participate in the operation and management of companies.

The statistical results of founders' shareholding ratio (given to two decimal places) are shown in Table 2.

Table 2 The statistical description of founders' shareholding ratio.

Items	Mean	Media	Maximum	Minimum	Std. Deviation	Variance
Founders' shareholding ratio	46.70	45.61	95.00	1.69	19.29	371.94

This paper uses dummy variables to characterize founders' management participation. The variable is given a value of 1 if they participate in the operation and management of companies, and 0 otherwise (shown in Table 3).

Table 3 Management participation

Items	Participation in the operation and management of companies	Not participation in
N	107	18

One can see from the data in Table 2 that the mean value of founders' shareholding ratio in sample academic ventures is 46.70%, so it shows that founders of academic ventures are likely to take control. But the bigger value of Std. deviation and variance reflects that there is a significant

difference and a higher dispersion degree in founders' shareholding ratio, which may be related to company size, company age and shareholder structure of academic ventures.

As can be seen from the data in Table 3, in the 125 academic ventures, the number of companies in which founders participate in the operation and management of companies are 125, and the proportion is as high as 85.6%. Hence it can be say that most of founders of academic ventures are participating in the actual operation and management, as a business decision maker, and taking control.

4.2. Identifying Strategic Adaptation

In the new ventures, one of the important means to evaluate the strategic adaptation is to analyze the diversity of and the frequency of organizational actions. Drawing on Kiss et. al's research on strategic adaptation, and combining with the characteristics of the Chinese New OTC Market, organization actions can be divided into 12 types of actions including marketing, finance, new products, strategic alliances, competition, top management team changes, human resources, capacity, international, structure, restructuring and corporate social responsibility.

By means of the 125 sample companies' reports including 2015 semiannual report, the 2015 annual report, 2016 semi-annual report and annual report in 2016, and the semi-annual memorabilia, annual memorabilia, management discussion and analysis including business model, operating, the main business, investment conditions and important matters including stock offering, related party transactions, asset disposal, the diversity of and the frequency of organizational actions of sample academic ventures in 2015 and 2016 is recognized. Based on sample data, the statistical description of organizational actions are shown in Table 4.

Table 4 The statistical description of organizational actions.

Items	Mean	Media	Maximum	Minimum	Std. Deviation	Variance
Marketing	1.45	1	11	0	1.98	3.94
Finance	2.61	2	9	0	2.02	4.08
New products	0.35	0	4	0	0.81	0.65
Strategic alliances	0.68	0	7	0	1.08	1.17
Competition	0.10	0	2	0	0.32	0.10
Top management team changes	2.10	1	9	0	2.37	5.61
Human resources	0.18	0	2	0	0.48	0.23
Capacity	0.18	0	2	0	0.50	0.25
International	0.21	0	3	0	0.57	0.33
Structure	1.27	0	12	0	2.08	4.33
Restructuring	0.01	0	1	0	0.09	0.01
Corporate social responsibility	0.03	0	1	0	0.18	0.03

It can be seen from the data in Table 3 that in 125 academic ventures, organization actions of most of academic ventures mainly focuses on marketing, finance, strategic alliances, top management team changes and structure, and other seven types of organization actions is less, especially the restructuring and corporate social responsibility, further the number of academic ventures that take the two actions of the restructuring and corporate social responsibility is not more than five.

Based on a diverse range of action types of each sample, drawing on Kiss et. al's research, this paper also used Herfindhal-type index of competitive simplicity to capture the diversity of organization actions [21].

Diversity of organization actions = $\sum (Na/NT)^2$ (1)

Where, Na represents the number of an action, and NT represents the total number of organization actions of a sample company. The low index represent academic ventures that engage

in highly diverse actions and have the high strategic adaptation, which shows the academic ventures have high ability for coping with the risk of environmental uncertainty. While high index represent academic ventures that engage in less diverse actions and have the low strategic adaptation, which shows the academic ventures have low ability for coping with the risk of environmental uncertainty.

Based on processing data from 125 academic ventures and 12 types of actions including marketing, finance, new products, strategic alliances, competition, top management team changes, human resources, capacity, international, structure, restructuring and corporate social responsibility, the statistical description of diversity of organization actions is shown in Table 5.

Table 5 The statistical description of diversity of organization actions.

Items	Mean	Media	Maximum	Minimum	Std. Deviation	Variance
Diversity of organization actions	0.44	0.36	1.00	0.16	0.23	0.06

One can see from the data in Table 5 that the mean value of diversity of organization actions in 125 academic ventures is 0.44, in general, so it shows that academic ventures that engage in relatively high diverse actions and have the relatively high diversity index. Specifically, there are 30 academic ventures with a diversity index greater than or equal to 0.5, including 13 companies with an index of 1, and 95 academic ventures with an diversity index less than 0.5.

Based on a diverse range of action types of each sample, drawing on Kiss et. al's research, this paper counted the number of different actions initiated in 2015 and 2016 to capture frequency of organization actions [21]. The high value represents academic ventures that frequently engage in actions and have the high strategic adaptation. While low value represents academic ventures that engage in less frequent actions and have the low strategic adaptation.

Based on processing actions data of 125 academic ventures, by madding in statistics on the types of organization actions in 2015 and 2016, this paper calculated frequency of organization actions of each sample based on the number of organization action types. The statistical description of frequency of organization actions is shown in Table 6.

Table 6 The statistical description of frequency of organization actions.

Items	Mean	Media	Maximum	Minimum	Std. Deviation	Variance
Frequency of organization actions	3.67	4	9	1	1.65	2.71

It can be seen from the data in Table 6 that the mean value of frequency of organization actions in 125 academic ventures is 3.67, in general, so it shows that academic ventures that engage in relatively low frequent actions. Specifically, there are 36 academic ventures with a frequency value greater than or equal to 5, while 89 academic ventures with a frequency value less than 5.

5. Results

Drawing on the processed data about founders shareholding ratio and participation in the operation and management and the organizational actions, this paper examined whether founder control and management participation affect strategic adaptation of academic ventures. Firstly, this paper analyses the correlation among shareholding ratio, management participation and the diversity and the frequency of organization actions. The statistical results are shown in Table 7 and Table 8.

Table 7 Correlation between shareholding ratio, management participation and the diversity of organization actions.

Variables	Spearman	t	Prob.
Shareholding ratio	0.19	2.11	＜0.05
Management participation	0.08	0.89	＞0.05

Table 8 Correlation between shareholding ratio, management participation and the frequency of organization actions.

Variables	Spearman	t	Prob.
Shareholding ratio	-0.18	-2.08	＜0.05
Management participation	-0.10	-1.07	＞0.05

As can be seen from the data in Table 7 and Table 8, there is no significant correlation between founders' management participation to the diversity of and to the frequency of organization actions, while there is a significant correlation between founder's shareholding ratio to the diversity of and to the frequency of organization actions.

Secondly, on the basis of correlation analysis, this paper conducted a stepwise linear regression to explore relations among shareholding ratio, management participation and the diversity of and the frequency of organization actions. The statistical results are shown in Table 9 and Table 10.

Table 9 Shareholding ratio, management participation and the diversity of organization actions.

Variables	r	t	Prob.
Shareholding ratio	0.002	2.115	＜0.05
Management participation	0.033	0.357	＞0.05

Table 10shareholding ratio, management participation and the frequency of organization actions

Variables	r	t	p 值
Shareholding ratio	-0.016	-2.080	＜0.05
Management participation	-0.51	-0.551	＞0.05

As can be seen from the data in Table 9 and Table 10, there is no significant linear relationship between founders' management participation to the diversity of and to the frequency of organization actions, while there is a significant linear relationship between founder's shareholding ratio to the diversity of and to the frequency of organization actions. Specifically, founders' shareholding ratio is positively correlated with the diversity of organization actions (r=0.002, p=0.036). When the shareholding ratio increases by one percentage point, then the diversity index increases by 0.002. While shareholding ratio is negatively correlated with the frequency of organization actions (r=-0.016) (p=0.040). When the shareholding ratio increases by one percentage point, then the frequency of organization actions decreases by 0.016. In general, the diversity index is much higher and the frequency of organization actions is much lower when the shareholding ratio is high rather than low. That is to say, in the context, academic ventures have the more concentrated actions, but the number of organization actions is less at the same time, which means that the higher shareholding ratio, the lower the strategic adaptation.

Based on the stepwise linear regression, after classifying academic ventures into companies with a principal-agent relationship and companies with no a principal-agent relationship, this paper conducted linear regression on founder control and the diversity of and the frequency of organization actions. The statistical results are shown in Table 11 and Table 12.

Table 11 Founder control and the diversity of and the frequency of organization actions in the no a principal-agent relationship context.

Items	r	t 值	p 值
Diversity of organization actions	0.003	2.240	＜0.05
Frequency of organization actions	-0.015	-1.767	＞0.05

Table 12 Founder control and the diversity of and the frequency of organization actions in the a principal-agent relationship context

Items	r	t 值	p 值
Diversity of organization actions	-0.001	-0.262	＞0.05
Frequency of organization actions	-0.012	-0.581	＞0.05

As can be seen from the data in Table 11 and Table 12, for two cases of companies with a principal-agent relationship and companies with no a principal-agent relationship, there is a significant difference in relation between shareholding ratio and the diversity of and the frequency

of organization actions. When the founders don't act as the business decision makers, there is no significant linear relation between founder's shareholding ratio to the diversity of and to the frequency of organization actions. When founders act as the business decision makers, there is a significant linear relation between founder's shareholding ratio and the diversity of organization actions while there is no significant linear relation between founder's shareholding ratio and the frequency of organization actions.

Specifically, founders' shareholding ratio is positively correlated with the diversity of organization actions (r=0.003, p=0.027) when they participate in the operation and management of companies. When the shareholding ratio increases by one percentage point, then the diversity index increases by 0.003. At the significance level of 0.05, there is no significant linear relationship between founders' shareholding ratio and the frequency organization actions, while at the significance level of 0.1, founders' shareholding ratio is positively correlated with the frequency organization actions (r=-0.015) (p=0.080). In general, in the case of companies with no a principal-agent relationship, founders act as the business decision makers, the diversity index is much higher and the frequency of organization actions is much lower when the shareholding ratio is high rather than low. That is to say, in the context, academic ventures have the more concentrated actions, but the number of organization actions is less at the same time, which means that the higher shareholding ratio, the lower the strategic adaptation.

6. Conclusion

Based on 125 academic ventures from the Chinese New OTC Market listed companies listed before 2016, after identifying three indicators: founder control, management participation and strategic adaptation, drawing on empirical study, it was concluded that founder control and management participation can affect strategic adaptation of academic ventures, and there are some characteristics in relation among founder control, management participation and strategic adaptation of academic ventures as following.

First of all, in academic ventures, the founders have a relatively high shareholding ratio and actually control their companies, and most of them participate in the operation and management of companies as a business decision maker. Academic ventures have the relatively high diversity index. Organization actions of most of academic ventures mainly focuses on marketing, finance, strategic alliances, top management team changes and structure, and other seven types of organization actions is less. And academic ventures engage in relatively low frequent actions and have the low strategic adaptation.

Though analysing the correlation among shareholding ratio, management participation and strategic adaptation, the paper found that there is a significant correlation between shareholding ratio to the diversity of and to the frequency of organization actions, while there is no significant correlation between founders' management participation to the diversity of and to the frequency of organization actions. Though regression analysis, this study demonstrated that there is a significant difference in relation between founders' management participation and strategic adaptation. And academic ventures have the low strategic adaptation, in case those academic ventures have the more concentrated actions, but the number of organization actions is less at the same time when the shareholding ratio is high rather than low. However, there is a significant difference in relation between shareholding ratio and strategic adaptation when companies establish a principal-agent relationship. In the case of companies with a principal-agent relationship, there is no significant linear relation between founder's shareholding ratio to the diversity of and to the frequency of organization actions. In the case of companies with no a principal-agent relationship, founders act as the business decision makers, there is a significant linear relation between founder's shareholding ratio and the diversity of organization actions. And academic ventures also have the low strategic adaptation, in case those academic ventures have the more concentrated actions, but the number of organization actions is less at the same time when the shareholding ratio is high rather than low.

Based on the life cycle model, the academic venture life is divided into the start-up stage and the growth stage [23]. In the start-up stage, the purpose of academic ventures is the acquisition of

resources to achieve entrepreneurial commitment through unified command and strategic focus. However in the growth stage, facing challenges in the complexity of management of academic ventures growth, the focus of academic ventures is on management innovation and obtaining more external funds by coordination and communication. Academic venture creation is based on technology and knowledge from academic entrepreneurs, the companies' development is strongly dependent on technology and knowledge from founders. Most founders of academic ventures participate in the operation and management, so the founder's goals, characteristics and strategic awareness may all have an impact on the strategic decision-making of companies [17], which affects the strategic adaptation of academic ventures. Owing to the embeddedness of academic ventures in technology and knowledge from founders and the more homogeneous governance structure, academic ventures in the growth stage are difficult to obtain heterogeneous resources [24]. This leads to that strategies adopted by founders mostly focus on business level, rarely involve the organization level, resulting in lack of innovative company strategy and low strategic adaptation. So under such a background, it is difficult for founders to balance the technology development and business environment. However, when companies establish a principal-agent structure, the governance structure becomes heterogeneous due to appearing professional managers. Professional managers with rich management experience tend to adopt more opportunistic strategies to acquire the required capabilities and resources for their companies through cooperation and joint investment [25]. In terms of organizational structure, functional specializations can improve the ability to identify risk, for discovering technological opportunities for innovation [26], and in terms of business activities, strategies such as business and organization can be adopted, so that both can strengthen the strategic adaptation of companies. From the start-up stage to the growth stage, the management of academic ventures can obtain innovation through decentralization. Through the coordination the duality of founder role and CEO role, unique information can be shared and integrated in cross-border activities, recognition of development opportunities can be improved, and higher strategic adaptation can be achieved [4].

References

[1] M Fritsch, S Krabel. Ready to leave the ivory tower?: Academic scientists' appeal to work in the private sector[J].Journal of Technology Transfer,2012,37(3):271-296.

[2] Hanuch H, Pyka A. Elgar companion to neo-Schumpeterian economics[M].Chehenham, Northampton:Edward Elgar,2007.

[3] Jong S.How organizational structures in science shape spin-off firms:The biochemistry departments of Berkeley, Stanford and UCSF and the birth of the biotech industry[J].Industrial and Corporate Change,2006,15(2):251-283.

[4] Daniel Tzabbar, Jaclyn Margolis. Beyond the startup stage: the founding team's human capital, new venture's stage of life, founder-CEO duality, and breakthrough innovation[J]. Organization Science,2017,28(5):857-872.

[5] Vohora, A., Wright, M., & Lockett, A. (2004). Critical junctures in the development of university high-tech spin-out companies[J]. Research Policy, 2014, 33, 147–175.

[6] Friedman,J.,& Silberman, J.,University technology transfer: Do Incentives, Management, and Location Matter?[J]. Journal of Technology Transfer, 2003, 28(1):17-30.

[7] Huajing Li. Scholar, Academic Organization and Environment: A Review of the on Academic Entrepreneurship [J]. Science of Science and Management of S.&.T..2009, 30(2):51-54.

[8] Youli1 Huang, Ting Xue, Hong Zhou. A Study on Role Identity Evolution Patterns of Scholars in the Background of Academic Entrepreneurship [J]. Chinese Journal of Management,2013,10(3):438-443.

[9] Zahra S A, Filatotchev I, Wright M. How do threshold firms sustain corporate entrepreneurship? The role of boards and absorptive capacity ☆[J]. Journal of Business Venturing, 2009, 24(3):248-260.

[10] Kazanjian R K , Drazin R . An Empirical Test of a Stage of Growth Progression Model[J]. Management Science, 1989, 35(12):1489-1503.

[11] Ensley M D, Hmieleski K M. A comparative study of new venture top management team composition, dynamics and performance between university-based and independent start-ups [J]. Research Policy, 2005, 34(7):1091-1105.

[12] Patel, P. Pavitt, K. The wide spread of technological competencies in the world's latest firm: a challenge to conventional wisdom[M]. The Dynamic Firm.Oxford University Press, 1997.

[13] Andreea N. KISS, Pamela S. Barr. New venture strategic adaptation: the interplay of belief structures an industry context[J]. Strategic Management Journal.2015, 36(8):1245-1263.

[14] Foss N J , Lyngsie J , Zahra S A . The role of external knowledge sources and organizational design in the process of opportunity exploitation[J]. Strategic Management Journal, 2013, 34(12):1453-1471.

[15] Clarysse B, Tartari V, Salter A. The impact of entrepreneurial capacity, experience and organizational support on academic entrepreneurship[J]. Research Policy, 2011, 40(8):1084-1093.

[16]Palash Deb, Johan Wiklund. The effect of CEO founder status and stock ownership on entrepreneurial orientation in small firms[J].Journal of Small Business Management. 2016, 55(1):1-24.

[17] Ensley M D, Hmieleski K M. A comparative study of new venture top management team composition, dynamics and performance between university-based and independent start-ups [J]. Research Policy, 2005, 34(7):1091-1105.

[18] Choi Y R, Shepherd D A. Entrepreneurs' decisions to exploit opportunities[J]. Journal of management, 2004, 30(3): 377-395.

[19] Fahlenbrach, R. Founder-CEOs, investment decisions, and stock market performance[J].Journal of Financial and Quantitative Analysis.2009,44(2):439-466.

[20] Bonaccorsi, A, Giannangeli. One or more growth processes? Evidence from new Italian firms[J]. Small Business Economics, 2010,35(2):137-152.

[21] Connelly, B. L., R. E. Hoskisson, L. Tihanyi, S. T. Certo. Ownership as a form of corporate governance[J]. Journal of Management Studies. 2010, 47(8):1561-1589.

[22] Covin J G, Slevin D P. A conceptual model of entrepreneurship as firm behavior[J]. Entrepreneurship: Critical perspectives on business and management, 1991, 3: 5-28.

[23] Boeker W , Karichalil R . Entrepreneurial Transitions: Factors Influencing Founder Departure[J]. The Academy of Management Journal, 2002, 45(4):818-826.

[24] Christopher S. Hayter. Constraining entrepreneurial development: A knowledge-based view of social networks among academic entrepreneurs[J]. Research Policy, 2016, 45(2):475-490.

[25] Kale P , Dyer J H , Singh H . Alliance capability, stock market response, and long-term alliance success: the role of the alliance function[J]. Strategic Management Journal, 2002, 23(8):747-767.

[26] Tzabbar D , Vestal A . Bridging the Social Chasm in Geographically Distributed R&D Teams: The Moderating Effects of Relational Strength and Status Asymmetry on the Novelty of Team Innovation[M]. INFORMS, 2015.