How Entrepreneurial Orientation Affects New Ventures Performance in the Era of Big Data

Congjuan Wang, Xiaohan Hu and Xin Zeng
Shanghai University, SILC Business School, Shanghai, China

*Corresponding author e-mail: 18800362516@163.com

Abstract. In the era of innovative big data, empirical data analysis can bring certain inspiration to firms. Based on the upper echelon theory and resource-based view, with the first-hand data of 220 entrepreneurship enterprises in Shanghai, the relationship among entrepreneurial orientation, the ability of external resource acquisition (Operational resource and Intellectual resource) and performance of new enterprises was deeply explored. Results show that the entrepreneurial orientation, external operational resource acquisition and performance of new enterprises are significantly related to the start-up performance respectively. Besides, external operational resource acquisition has a partial intermediary effect between entrepreneurial orientation and firm performance while external intellectual resource does not have the same effect. However, external intellectual resource acquisition positively moderates the relationship between entrepreneurial orientation and start-up performance.

Keywords: Entrepreneurial Orientation, External Resource Acquisition, Enterprise Performance, Innovation City

1. Introduction

While technology is rapidly changing human life, it has also put forward higher development requirements for various countries. To gain advantages in global competition, innovation is essential. Although many new companies are established, their business performances are different. Therefore, it is necessary to conduct an in-depth research on the factors that affect the performance of startups.

Resource-based theory points out that heterogeneous resources owned by an enterprise are powerful driving force to cultivate competitive advantages and long-term development [1]. However, traditional strategic research ignores the subjective initiative of strategic-decision makers. In 1984, upper echelons theory which emphasized the impacts of demographical difference was proposed. Grant & Robert further analyzed the relationship between resources and firm strategy [2]. In recent years, factor of entrepreneurial orientation (EO) has received more and more attention. However, the mechanism of how EO influence venture performance is little explored, therefore, this article mainly explores how EO impact the performance of enterprises. In the research, external resource acquisition is introduced as an important factor between the EO and corporate performance.
Based on the existing research, a new venture is defined as a company that has been established for less than 10 years.

2. Review of Related Research

2.1. Entrepreneurial Orientation
Miller & Friesen first introduced the concept of "entrepreneurship" in 1982. Miller first divided it into three dimensions: innovativeness, action advancement and risk tolerance [3]. Innovativeness refers to the innovative actions to develop and the tendency to make great changes to products or services. Action advancement refers to the rapidness of companies when introducing new products, services or R&D compared to competitors. Risk tolerance refers to the company's preference for high-risk projects and the degree of avoidance of uncertainty when making decisions. The three-dimensional division method has been more accepted by scholars.

Existing research shows that EO can significantly improve firms’ performance. Many empirical researches in different countries have demonstrated the positive influence of EO on corporate performance. Specially, EO is proved to significantly promotes both financial and innovation performance of enterprises [4]. Besides, the positive correlation between EO and the economic and social performance of start-ups has been confirmed as well.

2.2. External Resource Acquisition
Resource acquisition refers to the process by which enterprises or individuals obtain key and necessary resources. The resources obtain from the outside include both tangible and intangible resources. According to previous studies, external entrepreneurial resources can be divided into two categories: operational resource (OR) and Intellectual resource (IR).

Most of the existing researches focus on the impact of external resources acquisition on corporate performance, organizational resources such as human and technology have been proved to have positive impact on start-up performance. Besides, capital and familiarity with the business are also found to affect survival and growth of a company, external market information resources obtained by enterprises have a strong guiding effect on corporate performance as well. Some scholars believe that, after acquiring new resources, the integration ability is significantly positively related to start-up performance.

2.3. Enterprise Performance
Enterprise performance evaluation is an objective, fair and accurate comprehensive judgment of an enterprise during a certain period of operation. Evaluation methods of corporate performance are mainly divided into two categories. One is based on the growth rate of employees and sales. Another is based on the subjective evaluation of business leaders, which allows leaders to compare their own companies’ performance with competitors in the same industry in several different dimensions.

Scholars have explored various factors that can affect corporate performance: leadership style, personal characteristics of the entrepreneur, situation of the entrepreneurial team, characteristics of the enterprise level, and external environment etc. Specially, Zhang Yuli has confirmed that entrepreneurial cognitive monitoring has effect on corporate performance [5]. De Geest found that: adopting different employee motivation strategies can also significantly affect new venture performance [6]. Research by Lin et al showed that the family environment, business environment, and institutional environment have influence on the growth of enterprises [7].

3. Research Hypotheses

3.1. Entrepreneurial Orientation and Performance of New Ventures
EO reflects the tendency of the company's senior management team to dare to take specific risks, engage in innovative activities, and implement proactive strategies. According to the summary of the
literature, the tendency of the company's senior management team to take on specific risks, engage in innovative activities, and implement proactive strategies has enabled the company to take the lead in the industry and take the lead in seizing market opportunities, which has a significant promotion effect on the firm performance, thus bringing up the first hypothesis: H1: EO has a significant positive impact on corporate performance.

3.2. Entrepreneurial Orientation and Acquisition of External Resources
For start-ups with high EO, they will make every effort to launch new products ahead of competitors in the fastest time, so the desire and enthusiasm for obtaining external resources will be significantly higher than those with weak EO. For specific analysis, on the one hand, enterprises will increase their access to ORs, because these tangible assets can provide material security for the operations and production. On the other hand, these companies will try to acquire intellectual skills, such as hiring experienced employees and conducting professional consultations, which can help companies better develop marketing and product promotion as well as establish long-term competitive advantages.

Therefore, this article makes the following assumptions:

H2: EO is significantly positively related to the acquisition of external ORs
H3: EO is significantly positively related to the acquisition of external IRs

3.3. Intermediary Effects of Operating Resource Acquisition
The accumulation of resources is closely related to corporate strategy formulation, decision execution and management. The more operating resources a start-up company acquires, the more freedom it has to engage in production and management. The more diversified the company's strategic choices, the better the efficiency of its decision execution. Also, companies with strong EO will more actively acquire external tangible material resources. Through the accumulation of ORs such as capital and equipment, companies can give play to their autonomy in production and operation. Therefore, the performance of the company is more prominent than the start-ups with weak EO. So, this article proposes the following hypotheses

H4: The acquisition of external ORs is significantly related to the performance of start-ups
H5: The acquisition of external ORs has an intermediary effect between EO and new ventures performance.

3.4. Moderating Effects of Intellectual Resource Acquisition
Even if a new venture has a lot of material and human resources, it will be difficult for it to develop without a corresponding knowledge reserve. The intangible intellectual assets can be converted into employees' internal knowledge and enterprise productivity. Under the same reserve of ORs, the richer the IRs an enterprise can acquire and accumulate from the outside world, the more prominent its performance is.

EO of a company is also affected by the IRs that a company has when implementing strategies and developing new products. Specifically, IRs such as management knowledge, marketing skills possessed by marketers, will affect the perception and judgment of the market environment. For start-ups with a wealth of IR, they can better clarify their own conditions and establish competitive advantage in the industry. Therefore, we make the following assumptions:

H6: The acquisition of IR has a significant moderating effect between the acquisition of OR and the performance of new ventures.
H7: IR acquisition has a significant moderating effect between EO and corporate performance.

4. Research Design

4.1. Sample and Data Collection
In this study, companies with a history of less than 10 years are selected as the research object. The new ventures are all located in Shanghai. Shanghai is an international metropolis, it is highly inclusive and open. Additionally, Shanghai has inherent geographical advantages and resource advantages.

The questionnaires were distributed and answered online and offline, a total of 220 questionnaires were distributed and 188 questionnaires were received. The recovery rate was 85.45%. Among them, 162 questionnaires were valid, with an effective rate of 73.64%.

### Table 1. Sample descriptive statistics

| Contents            | Category                              | Frequency | Percent |
|---------------------|---------------------------------------|-----------|---------|
| Gender              | Male                                  | 109       | 67.3    |
|                     | Female                                | 53        | 32.7    |
| age                 | Below 20 years old                    | 3         | 1.9     |
|                     | 21-30 years old                       | 52        | 32.1    |
|                     | 31-40 years old                       | 86        | 53.0    |
|                     | 41-50 years old                       | 19        | 11.8    |
|                     | Above 51 years old                    | 2         | 1.2     |
| Education background| High school / secondary school and below| 1         | 0.6     |
|                     | College                               | 14        | 8.6     |
|                     | Undergraduate                         | 102       | 63.0    |
|                     | Master and above                      | 45        | 27.8    |
| Establishment years | 1-3 year                              | 74        | 45.7    |
|                     | 3-5 year                              | 52        | 32.1    |
|                     | 5-8 year                              | 22        | 13.6    |
|                     | 8-10 year                             | 14        | 8.6     |
| Employee number     | <=20                                  | 97        | 59.9    |
|                     | 21-50                                 | 48        | 29.6    |
|                     | 51-100                                | 12        | 7.4     |
|                     | 101-200                               | 2         | 1.2     |
|                     | 201-500                               | 2         | 1.2     |
|                     | >500                                  | 1         | 0.6     |
| Industry            | Manufacturing                         | 6         | 3.7     |
|                     | IT, computer services and software    | 63        | 38.9    |
|                     | Biology and Medicine                  | 8         | 4.9     |
|                     | Other                                 | 85        | 52.5    |

4.2. Variable Measurement

4.2.1. EO Measurement

EO measurement is based on the classical scale designed by Covin & Slevin, with appropriate changes [8], the scale uses the Likert 5-point scoring method, with 1 represents "strongly disagree" and 5 means "strongly agree".

4.2.2. Measurement of External Resource Acquisition
Measurement of external resource acquisition contains dimensions of OR acquisition and IR acquisition, with a total of 9 items. They are: “Obtain resources such as plant, device and equipment through purchase, Purchase for resources such as patents or technology, Get funds through external financing”, Gain external knowledge and skills to develop new markets, Get knowledge and skills to acquire new products / services from outside, Get skills for obtaining management knowledge from outside, Gain technical knowledge and skills from the outside, Gain marketing knowledge and skills from outside, Obtain information and skills for production operations from the outside. The scale also uses the Likert 5-point scoring method”.

4.2.3. Measurement of Start-Ups Performance
Measurement of new venture performance includes 6 items, covering sales growth, profit growth, market share growth, return on assets, return on investment and return on sales”. Variables were measured using the Likert 5-point scale, 1 means "relative to competitors, our company's performance is very low ", 5 means" relative to competitors, our company's performance is very high."

4.3. Reliability and Validity Tests
Reliability represents the consistency and stability of the test results obtained when the same method is repeatedly measured on the same test object. In general, the reliability coefficient of the total scale above 0.7 indicates that it is acceptable.

Validity refers to the degree to which the measurement tools used in the research can truly and effectively reflect the things being measured, and it can reflect the accuracy of the data. The KMO index and spherical test results of each variable met the requirements, and the minimum KMO was 0.738. The results indicated that the scale validity structure was good.

Table 2. Analysis of reliability and validity of each variable

| Name                        | Number of items | Cronbachα | KMO    | Variance explained% |
|-----------------------------|-----------------|-----------|--------|---------------------|
| EO                          | 9               | 0.799     | 0.791  | 56.522              |
| Operational resources       | 3               | 0.707     | 0.738  | 52.756              |
| Intellectual resources      | 6               | 0.840     | 0.860  | 55.892              |
| Firm Performance            | 6               | 0.905     | 0.874  | 67.831              |

5. Statistical Analysis and Results

5.1. Correlation Analysis
The results in Table 3 show that EO is significantly positively correlated with corporate performance (r = 0.345, P <0.01), OR acquisition (r = 0.325, p <0.01) and IR acquisition (r = 0.182, p <0.01). Hypothesis 1-3 have preliminary support. There is a significant correlation between OR acquisition and corporate performance, r = 0.321, P <0.01, hypothesis 4 is supported.

Table 3. Correlation analysis results

|             | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |
|-------------|------|------|------|------|------|------|------|------|------|
| 1 Gender    | 1    |      |      |      |      |      |      |      |      |
| 2 age       | -1.02|      |      |      |      |      |      |      |      |
| 3 Firm age  | -0.02| .196*|      |      |      |      |      |      |      |
| 4 Firm size | .034 | -.033| .438**| 1    |      |      |      |      |      |
| 5 Industry  | .227**| -.124| -.028| -.011|      |      |      |      |      |
| 6 EO        | .064 | .128 | -.054| .055 | -.028|      |      |      |      |
| 7 OR        | -.045| .027 | -.080| .000 | .048 | .325**|      |      |      |
| 8 IR        | -.057| -.035| .088 | .090 | -.011| .182* | .432**|      |      |
9. PER -.020 .072 .074 .051 -.057 .345** .321** .150 1

Note: ** indicates significant correlation at the 0.01 level (two-tailed), and * indicates significant correlation at the 0.05 level (two-tailed).

5.2. Hypothesis Testing

The traditional regression method of Baron & Kenny (1986) was used to test the mediating effect of OR acquisition [9].

**Table 4. Results of multiple regression analysis for mediation effect test**

| New venture performance | OR acquisition |
|-------------------------|----------------|
|                         | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
| (Constant)              | -.216   | .041    | .012    | -.121   | .119    |
| Gender                  | -.010   | -.072   | -.029   | -.120   | -.178   |
| age                     | .079    | -.001   | -.001   | .074    | -.001   |
| Firm age                | .050    | .101    | .118    | -.117   | -.069   |
| Firm size               | .036    | -.012   | -.016   | .062    | .017    |
| Industry                | -.046   | -.036   | -.054   | .063    | .072    |
| Independent variable:   | .352*** | .272**  | .329*** |
| EO                      |         |         |         |         |         |
| Mediation variable:     |         | .244**  |         |         |         |
| OR                      |         |         |         |         |         |
| R²                      | .012    | .437    | .530    | .016    | .417    |
| Adjusted R²             | -.020   | .402    | .446    | -.015   | .386    |
| ΔR²                     | .012    | .425    | .093    | .016    | .401    |
| F changes               | .380    | 21.146*** | 9.855** | .511    | 18.221*** |

Note: * means P <0.05, ** means P <0.01, *** means P <0.001

5.2.1. Intermediary Effect of OR Acquisition

According to Model 2, EO is significantly positively correlated with corporate performance, which supports Hypothesis 1. According to model 5, EO is significantly related to the acquisition of OR, r = 0.329, P <0.001, which confirms hypothesis 2. Result in Model 3 indicated external OR acquisition has a partial intermediary effect between EO and corporate performance. Assumption 5 holds.

5.2.2. Moderating Effects of Knowledge Resource Acquisition

Results in Table 5 show that IR acquisition has a moderating effect between OR acquisition and startup performance, assumption 6 holds. Results in Model 11 indicate IR acquisition has a moderating effect between EO and new venture performance as well. Assumption 7 holds.

**Table 5. Regression analysis results of the moderating effect of IR acquisition**

|                         | Model 6 | Model 7 | Model 8 | Model 9 | Model 10 | Model 11 |
|-------------------------|---------|---------|---------|---------|----------|----------|
| (Constant)              | -.216   | -.176   | -.275   | -.216   | .017     | -.17     |
| Gender                  | -.010   | .030    | -.006   | -.010   | -.058    | -.02     |
| age                     | .079    | .055    | .082    | .079    | .009     | .037     |
| Firm age                | .050    | .089    | .079    | .050    | .092     | .099     |
| Firm size               | .036    | .016    | .040    | .036    | -.015    | -.01     |
| Industry                | -.046   | -.067   | -.080   | -.046   | -.036    | -.02     |
6. Conclusion and Inspiration

All of the hypotheses are supported. It can be concluded that, Both EO and the acquisition of external ORs are significantly related to corporate performance. Meanwhile, the stronger the EO of an enterprise, the richer the ORs and IRs it obtains from the outside. Besides, the external OR acquisition has a mediating effect between EO and corporate performance. Finally, the moderating effect of external IR acquisition exists. For start-ups, the more IRs they accumulate from the outside, the more positive the impacts of corporate EO and acquisition of ORs have on corporate performance.

Results in the research emphasize the important of accumulation of both ORs and IRs. For founders, they should actively mobilize the innovation and initiative of employees, strengthen investment in new products and R&D. Second, managers should use the network of relationships to seize market opportunities and obtain as many necessary resources as possible from the outside. For IR acquisition, managers must be patient, they should create an internal learning atmosphere, unblock the communication channels among employees to form long-term competition.

Acknowledgments

This work was financially supported by 2017 Chinese University Innovation and Entrepreneurship Education Reform Research Fund Project- (2017CCJG005)

References

[1] Barney J. Firm resources and sustained competitive advantage[J]. Journal of Management, 1991, 17(01):99-120
[2] Grant, Robert M. The resource-based theory of competitive advantage: implications for strategy formulation[J]. California Management Review, 1991, 33 (3) :114-135
[3] Miller D, Friesen P H. Innovation in conservative and entrepreneurial firms: two models of strategic momentum[J]. Strategic Management Journal, 1982, (03):1–25.
[4] Zhongfeng Su, Donghan Wang. Entrepreneurial Orientation, Control Systems, and New Venture Performance: A Dominant Logic Perspective[J]. Entrepreneurship Research Journal, 2018,08(23):1-14(in Chinese)
[5] Zhang Yuli, Liu Yiran, Yang Jun, Hao Xiling. Can Entrepreneur Cognitive Monitoring Improve Performance? An Integrated Model and Empirical Tests [J]. Research and Development Management, 2017, 29 (2): 1-9(in Chinese)
[6] DeGeest D S, Follmer E H, Lanivich S E. Timing Matters: When High-Performance Work
Practices Enable New Venture Growth and Productivity[J]. Journal of Management, 2016:1-28

[7] Lin S, Rogoff E G, Foo C T, et al. The effect of entrepreneurial context on the performance of new ventures[J]. Chinese Management Studies, 2015,09(02):197-220

[8] Covin J G, Slevin D P. Strategic management of small firms in hostile and benign environments[J]. Strategic Management Journal, 1989,10: 75–87

[9] Baron R M, Kenny D A. The moderator-mediator variable distinction in social psychological research: Conceptual,strategic,and statistical considerations[J]. Journal of Personality and Social Psychology,1986,51(6):1173-1182.