PIONEER
ACADEMIC PUBLISHING LIMITED

# Dual Innovation, Financial Slack and Business Performance—Experiential Data from Private Enterprises

Jianfei Zhou[1]

[1] Tianjin University of Commerce
Correspondence: Jianfei Zhou, Tianjin University of Commerce.

## Abstract

Taking the data of 337 private enterprises in Shanghai and Shen Zhen from 2011-2017 as the research sample, constructing the relationship framework of "innovation-performance" based on the regulation effect of financial slack is established, and exploring the relationship between dual innovation and enterprise business performance. The empirical research shows that exploration innovation and development innovation are significantly positively correlated with enterprise performance, and development innovation is more conducive to the improvement of enterprise performance; financial slack plays a negative role in regulating the relationship between exploration innovation and development innovation and enterprise performance.

**Keywords:** exploratory innovation, development innovation, financial redundancy, regulation effect

## 1. Introduction

Innovation-driven development is the unremitting driving force and the eternal theme of social development. Only by constantly innovating in the process of development can a nation remain invincible forever. In China's current economic development, only by accelerating the implementation of the innovation-driven development strategy, establishing the basic pattern of innovation-driven development, building an innovation-driven platform with scientific and technological innovation as the core, and improving the innovation-driven mechanism, can the society always move forward. Under the background of fierce market competition and rapid upgrading of product technology, more and more enterprises have begun to change to the innovation-driven strategic mode in response to the changes in the external turbulent environment, occupy a favorable market position and maintain new competitive advantages. As an important carrier of the national innovation system, the high-tech enterprises are the key to the implementation of the innovation strategy to actively carry out the innovation activities, accelerate the innovation investment, and enhance the innovation ability. Enterprise in the survival and development of the uncertain market environment, should be good at development and utilization of existing resources, and to take the initiative to explore new products, technology, market, realize the two different natures of innovation:

developmental innovation and exploratory innovation, give full play to the innovation of "sex" duality, effectively enhance innovation strength, enhance the competitive advantage.

At present, the discussion of dual theory is small and most of it focuses on the field of organizational learning, while the exploration of dual innovation is mainly focused on the external situation factors such as macro economy, and it is rarely discussed in combination with internal factors. From the perspective of innovation of two different nature, try to combine "dual" concept and enterprise management practice, in exploring the basis of the relationship between innovation and performance, the introduction of financial slack as a regulating variable, further study its regulating role in the relationship between the two, for enterprise innovation management and organization resources expand new perspective, but also provide a reference for the enterprise innovation practice and performance promotion.

**2. Literature Review and Research Hypotheses**

*2.1 Dual Innovation and Enterprise Performance*

Duncan The concept of "organizational dual element" was first introduced in the field of management science. The organization needs to have both the gradual and breakthrough ability to cope with the changes in the external environment. Subsequently, March proposed the "dual learning", namely, exploring and developing two learning methods, which can effectively explain the dual ability of the organization from the perspective of organizational learning (MARCH J G., 1991). On this basis, Benner & Tushman introduced the concept of exploratory and developmental development in the field of innovation, and pointed out that these two different ways of innovation play different roles (BENNER M J & TUSHMAN M L., 2003). Exploratory innovation is the innovation activity carried out by enterprises by using new knowledge and new technology, focusing on the future, while development-type innovation is the innovation on the basis of expanding and mining the existing knowledge and technology. Lin Yun et al. (2016) found that the development and exploratory innovation of knowledge-based enterprises improved the innovation performance, and the dual interaction effect had the strongest impact on the performance (Lin Yun, Gao Xia & Zhang Min, 2016). Wu Xiaobo

(2015) believes that different strategic orientation and innovation modes have a positive impact on enterprise performance, but the mechanisms of exploratory innovation and development-oriented innovation to provide competitive advantage for enterprises is different (Wu Xiaobo, Chen Xiaoling & Li Jingyan, 2015). Generally speaking, exploratory innovation can help enterprises to develop new products and develop new businesses, so as to help enterprises to develop the market, is conducive to the expansion of the enterprise market scale, is conducive to the long-term development of enterprises, and increase the future profits. At the same time, the development innovation can help enterprises to improve the previous products, to make up for the shortcomings of their products, better meet the needs of customers, to attract more customers, but also to upgrade the previous industrial chain, expand the previous production efficiency, better meet the market demand for the product, bring stable benefits and returns for the enterprise. At present, the private enterprises to the strong support of the country, private enterprises are in the growth period, the size of the market and the product technology demand is larger, whether open up new markets, new design, meet the demand of new customers, or the pursuit of efficiency and stability, transform existing technology and process, etc., embodies the enthusiasm and initiative of enterprise innovation strategy, a lot of practice also shows that these activities added value for the enterprise. In summary, the following hypotheses are proposed.

H1: Both exploratory innovation and development innovation are positively correlated with enterprise business performance.

Exploratory innovation describes the process by which companies acquire new knowledge, technologies and processes by investing in high-risk projects, with the core of contributing and creating new knowledge. Once achieved, these new knowledge, skills and processes can enhance the flexibility and diversity of product innovation, contribute to the design of new products, the development of new markets, the expansion of new channels, and can provide personalized products or services for target customers, thus improving the market position of enterprises. Greatly improve the business performance of the enterprise. Development

innovation reflects the application of resources to the current field to optimize and improve the existing knowledge, technology and operation process, and then maintain the consistency with the original organizational structure, with the purpose is to improve the overall efficiency and reliability of the organization. Therefore, compared with development innovation, exploratory innovation is more conducive to improving the business performance of enterprises.

H2: Compared with exploratory innovation, development-oriented innovation is more conducive to the improvement of business performance.

*2.2 The Regulatory Effect of Financial Redundancy*

According to the resource-based theory, the organization is a collection composed of various kinds of resources, and the performance differences between different organizations originate from the heterogeneous resources and capabilities. The possession of scarce, valuable, intangible and irreplaceable resources is the key to maintain its competitive advantage in the fierce competitive environment (Margaret A. Peteraf & Jay B. Barney, 2003). The gap between the available resources in the organization and the resources that maintain the development of the organization constitutes the redundant resources, and the sustainable development of the organization is the result of the joint action of the internal surplus resources and the cognition of resource characteristics. At present, the research on redundant resources is mostly based on the theory of organizational behavior and the principal-agent theory. Among them, the organization behavior theory that enterprises have redundant resources means that the cost and the increase in the efficiency of resource utilization, but the existence of redundant resources can help enterprises in accordance with the internal and external pressure status of policy and strategy adjustment, change, even help stabilize the current enterprise earnings, enhance enterprise long-term competitiveness. Therefore, the existence of redundant resources promotes the improvement of enterprise performance and enhances the competitiveness of enterprises. According to the principal-agent theory, redundant resources will aggravate the agent problem, lead to the inconsistent business objectives of enterprises, reduce the operational efficiency, and endanger the acquisition of sustainable competitive advantage of enterprises.

Agents will choose to maintain abundant resources within the enterprise to meet their pursuit of rights, reputation and wealth (Li Xiaoxiang & Liu Chunlin, 2011). In order to achieve the above goals, the agent will use redundant resources to make wasteful investments such as excessive diversification and excessive budget, resulting in the target deviation between the principal and the agent (Torsten Oliver Salge & Antonio Vera, 2013). On the other hand, the existence of a large number of redundant resources is also easy to induce agents to be irrational and optimistic, satisfied with the status quo of the enterprise, unable to timely respond to the changes in the external market, and even take inappropriate strategies, damaging the performance and competitive advantages of enterprises. Therefore, based on the perspective of agency theory, redundant resources are not conducive to the sustainable development of enterprises (Li Xiaoxiang & Liu Chunlin, 2011).

As China's capital market is not yet sound, for high-tech enterprises with great growth potential, they need to make exploratory innovation to explore new products and markets to quickly respond to environmental changes and meet customer needs. According to the resource-based theory, Lee (2015) points out that high-tech enterprises need to continuously allocate financial slack to achieve sustainable development (LEE S., 2015). The empirical study by Yao Xiaolin et al. (2018) found that the R & D investment of high-tech enterprises would increase with the increase of financial redundancy, which showed a significant positive correlation between the two (Yao Xiaolin, Li Jinglin & Liang Wen, 2018). Due to the exploratory innovation activities with high risk, high uncertainty, information asymmetry, make enterprise innovation activities from outside the capital, the existence of financial slack can ease enterprise financing difficulties, mining, the use of financial slack can make enterprises keep innovation vitality, enhance the competitive advantage. Therefore, the allocation of financial slack is also an organizational scenario for enterprises to carry out innovation activities to improve enterprise performance, which also affects the relationship between innovation and performance. Based on the above analysis, the hypothesis is presented.

H3: With other conditions unchanged, financial slack positively regulates the relationship

between exploratory innovation and business performance.

Financial slack includes cash, receivables, etc., and is classified as slack in high freedom adjudication. Due to the separation of ownership and management rights of modern enterprises, Bi Xiaofang et al. (2017) found that the retention opportunity of enterprise financial slack was affected by the self-interest decision of the controlling shareholders, resulting in the reduction of innovation efficiency (Bi Xiaofang, Zhai Shuping & He Qiongzhi, 2017). Because the development innovation is a kind of gradual innovation pursuing efficiency and stability, relying on the existing resources and technologies of the enterprise, the capital and resources needed to be invested are relatively small, and the risks are also controllable. With the increase of financial redundancy, managers' blind confidence or inertia will become more obvious, so they will use resources to pursue power, status, reputation and other own interests and increase self-welfare. Based on the agency theory, the financial slack accumulated by enterprises will aggravate the agency conflict and reduce the configuration efficiency of financial redundancy. The disadvantages of managers' free ruling on financial slack will have a negative impact on the relationship between development innovation and performance. Therefore, propose the hypothesis:

H4: With other conditions unchanged, financial slack negatively regulates the relationship between development innovation and business performance.

## 3. Empirical Study Design

### 3.1 Sample Selection and Data Source

The article takes the A-share private enterprises in Shanghai and Shenzhen from 2010 to 2017 as the research objects (excluding ST and ST * listed companies, excluding the samples with incomplete data such as the number of invention patent applications, practical patent applications and the number of design applications). After screening, the data of 337 listed companies are finally obtained, with a total of 2,359 observed values. Among them, the number of invention patent applications, practical patent applications and the number of design applications are from Wind database, and other data are from CSMAR database. In order to eliminate the influence of extreme values, the variable is treated in 1% and 99% Winsorize. Finally, the empirical analysis was performed using the Stata software.

### 3.2 Variable Selection

3.2.1 Interpreted Variable-Business Performance

The operating income index of listed companies is selected to measure. In order to make the data more stable and weaken the collinearity and heteroscedasticity of the model, the natural logarithm of the operating income is selected as the measurement index.

**Table 1.** Variable definitions

| variable | variable symbol | Variable name | Variable definition |
|---|---|---|---|
| explained variable | Y | Business performance of the enterprise | Natural logarithm of the operating revenue |
| explanatory variable | R | Exploratory innovation | Natural logarithm of invention patent applications + 1 |
| | D | Developmental innovation | Natural logarithm of utility model and design patent applications + 1 |
| regulated variable | Slack | Financial redundancy | Equity-liability ratio / current ratio |
| controlled variable | Eu | Cash flow from operating activities | Standard deviation of the first five years / average of the first five years |
| | N | Internal financial flexibility | Cash asset ratio and retained earnings ratio |
| | W | External financial flexibility | Z=0.012 * X1 + 0.014 * X2 + 0.033 * X3 + 0.006 * X40.999 * X5. In the formula, X1 is the ratio of working capital to |

all assets, X2 is the ratio of retained income to assets, X3 is the ratio of profit before interest and tax to all assets, X4 is the ratio of market value of assets, and X5 is the ratio of sales volume to all assets.

| | | |
|---|---|---|
| G | public subsidy | The natural logarithm of government subsidies for enterprises |
| C | rate of capital accumulation | rate of capital accumulation |

### 3.2.2 Interpretive Variable-Dual Innovation

In previous research, scholars usually used subjective data to measure innovation performance, such as Poorkavoos, obtained enterprise development innovation performance and exploratory innovation performance by issuing questionnaires to enterprise competitors; Zhang Feng et al (Zhang Feng & Wang Rui, 2016) Four and three questions were designed to measure the performance of exploratory and development innovation. In recent years, some scholars have considered the objectivity and representativeness of data, and proposed to use patent data to measure development and exploratory innovation performance. Such as Xu Luyun et al (Xu Luyun, Zeng Deming & Li Jian, 2017). Based on the patent classification number data to measure, Yang Xue, etc (Yang Xue, Gu Xin & Wang Yuanji, 2017). The number of different types of patent applications is used to measure the performance of enterprise developmental innovation and exploratory innovation. Considering that the invention patent is a new development for the market, which requires extensive knowledge integration to reflect the exploratory innovation achievements of enterprises; utility model and design patents mostly focus on technological improvement, which can reflect the developmental innovation achievements of enterprises. Therefore, based on the views of these scholars, the performance of exploratory innovation is measured by the number of invention patent applications, and the performance of development innovation is measured by the number of utility model and design patent applications.

### 3.2.3 Adjustment Variables—Financial Rredundancy

Drawing on Zhang Xiaoyu et al (Zhang Xiaoyu, Zhu Huiming & Wu Xuanming, 2014). Financial slack is measured by the ratio of potential financial slack and available financial redundancy, that is, the equity liability ratio / current ratio.

### 3.2.4 Control Variables

Select some variables related to operating income, including environmental uncertainty, internal financial flexibility, external financial flexibility, government subsidies, and capital accumulation rate.

### 3.3 Model Construction

(1) $Roa = \alpha + \beta_1 R + \beta_2 Eu + \beta_3 N + \beta_4 W + \beta_5 G + \beta_6 C + \varepsilon$

(2) $Roa = \alpha + \beta_1 D + \beta_2 Eu + \beta_3 N + \beta_4 W + \beta_5 G + \beta_6 C + \varepsilon$

(3) $Roa = \alpha + \beta_1 R + \beta_2 Slack*R + \beta_3 Eu + \beta_4 N + \beta_5 W + \beta_6 G + \beta_7 C + \varepsilon$

(4) $Roa = \alpha + \beta_1 D + \beta_2 Slack*D + \beta_3 Eu + \beta_4 N + \beta_5 W + \beta_6 G + \beta_7 C + \varepsilon$

Specifically, $\alpha$ is the constant term, $\varepsilon$ is the residual term, and $\beta_1 – \beta_7$ are all regression coefficients. Model (1) (2) are respectively used to test exploratory innovation, development innovation and the relationship between enterprise performance, model (3) (4) in the introduction of financial slack as adjustment variables, and join the financial slack and development innovation, exploratory innovation interaction, test financial slack of dual innovation and the relationship between the enterprise business performance adjustment effect.

## 4. Empirical Analysis

### 4.1 Descriptive Statistics

According to Table 2, the mean natural logarithm of business performance is 21.24492, and the standard deviation is 1.047274, and the sample company has a good performance. The minimum value of exploratory innovation (R) of private enterprises is 0, the maximum value is 5.361292, and the average value is 2.209039, while the minimum value of development innovation (D) is 0, the maximum value is

5.918894, and the average value is 2.534522, indicating that the overall number of exploratory innovations is less than that of development innovation. The standard deviation of the financial slack (Slack) is 0.3664119.

**Table 2.** Descriptive statistical analysis of each variable

| Variable | Mean | Std.Dev. | Min | Max | Obs |
|---|---|---|---|---|---|
| Y | 21.24492 | 1.047274 | 19.08849 | 24.07925 | 2312 |
| R | 2.209039 | 1.247096 | 0 | 5.361292 | 2336 |
| D | 2.534522 | 1.399927 | 0 | 5.918894 | 2336 |
| Slack | 0.986149 | 0.3664119 | 0.2730532 | 2.371193 | 2313 |
| Eu | 03.08926 | 0.0698473 | 2.33e-16 | 0.4536315 | 2313 |
| N | 0.361028 | 0.1861167 | -0.295646 | 0.872751 | 2313 |
| W | 0.618626 | 0.289734 | 0 .1554057 | 2.174438 | 2313 |
| G | 16.22665 | 1.390465 | 7.824046 | 20.60701 | 2352 |
| C | 0 .151343 | 0.2647632 | -0.231984 | 1.927714 | 2312 |

*4.2 Correlation Analysis*

According to Table 3, the correlation coefficients of each variable are less than 0.6, indicating that there is no obvious collinearity problem between the variables. The regression coefficient of exploratory innovation (R) and business performance (Y) is 0.423 and significant at 1%, indicating that the exploratory innovation can bring positive influence on the performance, but

the results are significant and our conclusion requires further verification; the regression coefficient of developmental innovation (D) and business performance (Y) is 0.339 at 1% level, indicating that the development innovation improves existing products and technologies to improve production efficiency and enhance competitive advantage. The regression results preliminarily tested the hypothesis of H1.

**Table 3.** Association analysis of each variable

| | Y | R | D | C | G | N | W | Slack | Eu |
|---|---|---|---|---|---|---|---|---|---|
| Y | 1 | | | | | | | | |
| R | 0.423*** | 1 | | | | | | | |
| D | 0.339*** | 0.520*** | 1 | | | | | | |
| c | 0.128*** | 0.132*** | 0.077*** | 1 | | | | | |
| G | 0.566*** | 0.494*** | 0.305*** | 0.114*** | 1 | | | | |
| N | -0.136*** | -0.0130 | -0.078*** | 0.0150 | -0.109*** | 1 | | | |
| W | 0.465*** | 0.072*** | 0.099*** | 0 | 0.098*** | 0.00400 | 1 | | |
| Slack | -0.303*** | -0.146*** | -0.195*** | -0.042** | -0.232*** | 0.164*** | -0.115*** | 1 | |
| Eu | -0.00800 | 0.0210 | 0.0130 | 0.085*** | 0.049** | -0.243*** | -0.050** | -0.073*** | 1 |

$^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

*4.3 Analysis of the Regression Results*

According to the regression results of model (1), the regression coefficient of development-oriented innovation (D) and business performance (Y) is 0.127, which shows a significant positive correlation between the

two at the level of 1%, indicating that exploratory innovation has a positive impact on enterprise performance. Model (2) examines the impact of development innovation on enterprise performance. Exploratory innovation (R) is positively correlated with business performance (Y) and significant at the level of 1%. Compared

with exploratory innovation, the regression coefficient between development innovation and enterprise performance is 0.143. Compared with development innovation, exploratory innovation can bring greater changes to enterprises and help enterprises to bring greater leaps in business performance, while development innovation can only bring less and stable returns. Therefore, the two different innovation methods are conducive to the improvement of enterprise performance, and the exploratory innovation has a more significant role in promoting enterprise performance, which verifies the hypothesis H1 and H2.

Model (3) on the basis of model (1), financial slack (Slack) is introduced as the adjustment variables, and the interaction term of financial slack and exploratory innovation (Slack * R) is added to test the regulatory role of financial slack between exploratory innovation and performance. After adding financial redundancy, exploratory innovation (R) and enterprise performance (Roa) is still at 1% level, the interaction of financial slack and exploratory innovation (R * Slack) and business performance (Y) regression coefficient is 0.0818, significant negative correlation at 1% level, indicating that financial slack plays a regulatory role in exploratory innovation and enterprise performance, but negatively adjust the relationship between exploratory innovation and enterprise performance, assuming H3 is not verified. The possible reason is that, on the one hand, there are great differences in the exploration, and the redundant financial resources are different.

**Table 4.** Regression results

|  | (1) ols_1 | (2) ols_2 | (3) ols_3 | (4) ols_4 |
|---|---|---|---|---|
| c | 0.218*** (0.0380) | 0.216*** (0.0373) | 0.226*** (0.0380) | 0.226*** (0.0377) |
| G | 0.131*** (0.0179) | 0.140*** (0.0190) | 0.133*** (0.0167) | 0.142*** (0.0178) |
| N | -0.799*** (0.118) | -0.740*** (0.120) | -0.838*** (0.119) | -0.781*** (0.122) |
| W | 0.931*** (0.107) | 0.919*** (0.112) | 0.936*** (0.104) | 0.927*** (0.111) |
| Eu | 1.034*** (0.247) | 1.117*** (0.253) | 0.990*** (0.227) | 1.034*** (0.229) |
| R | 0.143*** (0.0121) |  | 0.226*** (0.0240) |  |
| D |  | 0.127*** (0.0136) |  | 0.218*** (0.0238) |
| Slack*R |  |  | -0.0818*** (0.0196) |  |
| Slack*D |  |  |  | -0.0933*** (0.0181) |
| _cons | 18.39*** (0.317) | 18.21*** (0.334) | 18.36*** (0.299) | 18.20*** (0.316) |
| $N$ | 2138 | 2139 | 2102 | 2103 |
| $R^2$ | 0.406 | 0.399 | 0.432 | 0.433 |

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

The possible reason is that, on the one hand, exploratory innovation is an uncertain, irreversible and high-risk radical innovation. With the increase of financial redundancy, the dependence of enterprises on redundant resources will also increase, causing the loss of enterprises

With the sensitivity and flexibility to the external environment, excessive financial slack for exploratory innovation may lead to greater survival crisis for enterprises; on the other hand, from the perspective of agency theory, the goal of managers is to seek short-term returns and avoid the risks of long-term investment. The agency problems caused by the increase of financial slack will affect managers' choice of enterprise strategies. Their less risky and stable conservative operation is not used for exploratory innovation investment with high risks and long cycle, thus affecting the performance of enterprises.

According to the results of the model (4) can be found that development innovation (D) and business performance (Y) at 1% level, regression coefficient is 0.218, the interaction between financial slack and exploratory innovation (Slack * D) is significantly negatively correlated with business performance (Y), the regression coefficient is 0.0933 and passed the test at 1% level, indicating that financial slack negatively adjust the relationship between development innovation and enterprise performance. Due to the development of innovation into capital is less demand, small risk, and management of financial slack has high discretion, with the increase of financial redundancy, agent problem gradually highlighted, managers blind confidence or inertia makes the use of money blindness and wanton, no financial slack to develop innovation for the pursuit of personal interests, improve self-welfare, thus weaken the development of innovation on enterprise performance. This empirical result fits the view of agent theory and verifies the hypothesis H4.

**5. Conclusion and Suggestion**

Based on the data of CSI A-share private enterprises from 2015 to 2018, this paper empirically tests the relationship between exploratory innovation and enterprise performance, and establishes the relationship framework of "innovation and performance" based on the financial slack regulation effect,

and concludes as follows: (1) exploratory innovation and development innovation are significantly positively correlated with enterprise performance; (2) compared with exploratory innovation, development innovation is more conducive to the improvement of enterprise performance; (3) financial slack plays a negative role in the relationship between dual innovation and enterprise performance.

This paper puts forward the following suggestions: (1) under the background of the current high-quality development, in order to quickly adapt to the changes of the market environment, high-tech enterprises need to increase the implementation of innovation strategy and enhance the ability of independent innovation. On the one hand, explore new knowledge and new technology, explore new markets, and explore the innovation; on the other hand, develop and utilize the existing resources, maintain the competitive advantage, and conduct the development innovation. Exploratory innovation affects the future benefits of enterprises, and development innovation determines the current efficiency and stability of enterprises. Enterprises should pay attention to exploratory innovation and development innovation at the same time, and give full play to the positive impact of the dual nature of innovation on enterprise performance. (2) the configuration of financial slack is the enterprise innovation to obtain performance of an organizational situation, adjustment affects the relationship between innovation and performance, so the managers to financial slack to innovation activities, improve the utilization efficiency of financial redundancy, realize the combination of innovation investment and resource allocation, so as to promote the maximization of enterprise value. (3) Due to the emergence of agency problems caused by the separation of the two powers, enterprises should strengthen the supervision of the management, ensure the scientific and rationality of managers' strategic choices and economic decisions, and restrain the inertia and self-interest behavior of managers.

**References**

MARCH J G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*(1), 71-87.

BENNER M J, TUSHMAN M L. (2003).

Exploitation, exploration, and process management: The productivity dilemma revisited. *Academy of Management Review, 28*(2), 238-256.

Lin Yun, Gao Xia, Zhang Min. (2016). The dual drive of utilization and exploratory innovation for the innovation performance of knowledge-based enterprises. *Soft Science, 30*(5), 59-63.

Wu Xiaobo, Chen Xiaoling, Li Jingyan. (2015). Research on the influence mechanism of strategic orientation and innovation mode on enterprise performance. *Scientific Research, 33*(1), 118-127.

Margaret A. Peteraf and Jay B. Barney. (2003). Unraveling the resource-based tangle. *Managerial and Decision Economics, 24*(4), 309-323.

Li Xiaoxiang, Liu Chunlin. (2011). The situational study of the relationship between redundant resources and enterprise performance and discuss the quantity change of redundant resources. *Nankai Management Review, 14*(03), 4-14.

Torsten Oliver Salge and Antonio Vera. (2013). Small Steps that Matter: Incremental Learning, Slack Resources and Organizational Performance. *British Journal of Management, 24*(2), 156-173.

LEE S. (2015). Slack and innovation: Investigating the relationship in Korea. *Journal of Business Research, 68*(9), 1895-1905.

Yao Xiaolin, Li Jinglin, Liang Wen. (2018). Technology internal directors, financial slack and R & D investment—Empirical evidence from Chinese high-tech enterprises. *Scientific Decision-making*, (6), 21-40.

Bi Xiaofang, Zhai Shuping, He Qiongzhi. (2017). Does financial slack reduce the innovation efficiency of enterprises? Also discuss the governance role of equity checks and balances. *Research and Development Management, 29*(2), 82-92.

Zhang Feng, Wang Rui. (2016). Government Regulation and Dual Innovation. *Scientific Research, 34*(06), 938-950.

Xu Luyun, Zeng Deming, Li Jian. (2017). The influence of knowledge network center potential and knowledge diversification on the dual innovation performance of enterprises. *Journal of Management, 14*(02), 221-228.

Yang Xue, Gu Xin, Wang Yuanji. (2017). Empirical study of the impact of external technology search balance on enterprise performance—the regulation of enterprise scale. *Science and Science and Technology Management, 38*(07), 62-72.

Zhang Xiaoyu, Zhu Huiming, Wu Xuanming. (2014). Research on the influence of financial slack structure on enterprise performance under dynamic environment regulation—Take China's manufacturing industry as an example. *Soft Science, 28*(8), 125-129.