

The Interaction between Technological Innovation and Business Model Innovation and Its Interaction Effect on Competitive Advantage of Enterprises

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Abstract: Technological innovation and business model innovation are the main sources of competitive advantage of enterprises, and they play an extremely important role in the process of enterprise development. Based on the data obtained from the questionnaire, this paper studies the possible interaction between business model innovation and technological innovation, and the impact of the interaction on the competitive advantage of enterprises. The results show that there is a complementary relationship between business model innovation and technological innovation, but it needs to reach a certain threshold before there will be a significant effect. The interaction between the two has a significant positive impact on the positive interaction effect of enterprise competitive advantage. The results show that for those small and medium-sized technology enterprises listed on the GEM, business model innovation and technological innovation have different effects on promoting the competitive advantage of enterprises. Only by promoting the complementary relationship between them and ensuring the continuity of technological and business model innovation, can the core competitiveness of enterprises be improved more significantly.

1. Introduction

In recent years, with the rapid development of science and technology industry and the tremendous change of economic model, China has been seeking breakthroughs and development in the field of innovation. With the full application of artificial intelligence, network big data technology and the prosperity and development of the Internet economy, in addition to technological innovation, another rapid growth pole in China's economic development emerges - business model innovation. It is similar to but different from technological innovation. Although they all need to rely on the commercialization of the application and results of new technologies, business model innovation is more focused on the use of new technologies to regroup into a new business model, which provides new energy by transforming into the competitive advantage of enterprises.

2. Research Hypothesis

Technological innovation can promote the development of enterprises and enhance their core competitiveness. Thornhill's study, for example, found that there was a significant positive correlation between technological innovation and income growth among 500 Canadian manufacturing enterprises and below [1].

Similarly, through practice, we can conclude that business model innovation is equally important for the development of an enterprise, and business model innovation can also increase the competitive advantage of the enterprise. In view of the above, this paper concludes that there may

be some influence mechanism between business model innovation and enterprise competitive advantage, and puts forward the following conjectures:

Hypothesis 1: Technological innovation can significantly enhance the competitive advantage of enterprises.

Hypothesis 2: Business model innovation can also significantly enhance the competitive advantage of enterprises.

Innovating business models or reshaping business logic can often help an entrepreneur who focuses on sustainable development achieve his life value and business goals. Hu Baoliang's research finds that business model innovation affects business income growth, while technological innovation affects profit growth. There is a complementary relationship between them. Thus. The following assumptions are made:

Hypothesis 3: There is an interaction between business model innovation and technological innovation, and it has a clear positive impact on the competitive advantage of enterprises.

3. Research Methods

Under the ever-changing new economic environment of China, for many enterprises, the realization of competitive advantage can not only rely on technological innovation, but also need technology and business model innovation to go hand in hand. If technological innovation is to become a real competitive advantage of enterprises, it needs to cooperate with a good business model to achieve it. Technological innovation can bring certain competitive advantages to enterprises, but this competitive advantage depends on the successful innovation of business models to play a role in the market.

How to make use of the interaction between technological innovation and business model innovation has become the key to the innovation and development of enterprises in the new economic environment. Based on the questionnaire data, this paper calculates the relationship between the two and the competitive advantage of enterprises, hoping to provide guidance for enterprises to formulate innovation-driven development strategy.

From the overall point of view, the GEM listed companies in China generally have the characteristics of small scale, short establishment time and good performance. In addition, they also have the characteristics of "two high" and "six new".

This paper takes the annual report data of listed companies on GEM as the analysis sample, refers to Nietoa and Quevedo's measurement of technological innovation, calculates the proportion of R&D expenses to business income of each enterprise, and uses this as an index to measure technological innovation.

For the innovation research of business model, this paper chooses eight indicators as research criteria, which are innovative products, preferential measures innovation, discovery of new business participants, new combination of services and information, new transaction mode, new interaction mode of participants, patent dependence, diversity of commercial products, dependence on trade secrets or copyright. Measure and evaluate the innovation of business model from the angle of view [4].

This paper calculates the growth rate of business income and profit of each enterprise relative to the previous year, and uses this as an index to calculate the competitive advantage of the enterprise.

4. Relevance Analysis

Through calculation, it can be concluded that business model innovation has no obvious impact on the growth of profits, but has a significant positive correlation with the growth of business income. And technological innovation is just the opposite. The interaction between technological innovation and business model innovation has a significant positive correlation with the growth of enterprise competitiveness. Therefore, it can be preliminarily explained that hypothesis 1.2 is valid and hypothesis 3 is valid.

In order to more clearly demonstrate the relationship between technological innovation, business

model innovation and the core competitiveness of enterprises, on the basis of the preliminary analysis results, this paper will use the stepwise regression analysis method.

With business model innovation, technological innovation and their interaction as independent variables and enterprise competitive advantage as dependent variables, stepwise regression can be obtained. The regression equation is eliminated for business model innovation and technological innovation, and only the interaction between the two enters the regression equation. This shows that only the interaction between technological innovation and business model innovation will have a significant positive impact on the promotion of competitive advantage of enterprises.

The results of these stepwise regression analysis prove the above conclusions again, and show that hypothesis 1/2 holds and hypothesis 3 holds completely.

5. Conclusion and Enlightenment

Taking the listed companies of GEM as samples, this paper focuses on the impact of technological innovation, business model innovation and their interaction on the competitiveness of enterprises, and draws the following conclusions:

(1) At present, most of the listed companies on GEM are weak in innovation, lack of innovation awareness and low investment in R&D funds.

(2) Innovation is a necessary factor to enhance the core competitiveness of enterprises.

(3) Single innovation can only improve the profit or business income of enterprises, and it has no significant positive impact on enhancing the core competitiveness of enterprises. If it is necessary to significantly enhance the core competitive advantage of enterprises, only technological innovation and business model innovation should be carried out simultaneously.

In summary, this paper puts forward the following suggestions based on the relevant theories of economics and the experience of other countries in this field.

Firstly, in order to enhance the core competitiveness of enterprises, we need to improve the overall innovation consciousness of enterprises and cultivate the innovation atmosphere of the whole enterprise. In today's environment, the government vigorously supports enterprises to carry out scientific research and technological innovation, and provides policy assistance to enterprises in terms of funds, talents, laws and so on. Enterprises should cooperate with the government, take the advantage of the situation, and make great strides forward in a good environment of innovation [5].

Second, to strengthen the innovation ability of enterprises themselves and achieve sustainable development. In the aspect of technological innovation, enterprises can introduce excellent innovative talents in the international scope, establish scientific research institutions, integrate resources and cooperate with international innovative enterprises. In terms of business model innovation, enterprises can focus on the development of diversified service system, system innovation according to the needs of users, to help enterprises to create greater market share.

Third, Emphasis should be placed on innovating the business model of enterprises, focusing on the emerging formats of service and manufacturing industries. In today's market, due to the rapid rise of high-tech applications such as the Internet and big data, the development of manufacturing industry has more possibilities, such as green manufacturing, artificial intelligence manufacturing and other new ideas will lead the world's manufacturing trend. For small and medium-sized science and technology enterprises, first of all, we should consider the innovation of business model, supplemented by low-end mature technology to quickly open the market, accumulate sufficient funds and then innovate at the technical level, so as to further enhance the core competitiveness of enterprises.

Fourth, According to the intensity of competition in the current market to choose the corresponding innovation strategy, when there are no or few other similar enterprises in the market to participate in competition, enterprises should seize the opportunity to innovate to expand the influence on the market and create greater market value. When the market competition is fierce, we should not blindly follow the trend. We should reduce the investment in innovation activities and shift the focus to the protection of innovation achievements. Enterprises should pay attention to maintaining the sustainable development of innovation.

In addition, the government should properly regulate and supervise the industry in order to prevent market chaos caused by malicious bidding, malicious monopoly operation and other malicious acts. Enterprises should be guided to truly enhance their core competitiveness through business model innovation and technological innovation, and then create a fair and healthy market.

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