The Economic Benefit Analysis of High-tech Projects Settled in the Incubator

Weixi Zhang, Gaomin Han, Haopeng Shen
Tianjin Polytechnic University College of Economic and Management, Tianjin, China

Abstract: The level of development of high-tech industries to some extent reflects a country's comprehensive level, because the investment projects own high investment, high risk and high-yield characteristics, and as a carrier for high-tech entrepreneurship, the incubator provides a lot of help and support to the growth of high-tech enterprise. This paper based on the consolidated of financial, risk and social and economic analysis methods, using project's changes in the market of demand and supply into the incubator, and an integrated approach to conduct economic research, draws the appropriate conclusions and empirical analysis.

Keywords: high-tech projects, incubators, economic benefit analysis, demand and supply

1. Introduction

High technology is different from the ordinary, which has high-tech, high innovation, high investment, high efficiency, high competition, high-risk, high permeability and other characteristics, to bring scientific innovation, technological innovation and industrial innovation. It plays an important role in promoting economic development and changing the economic structure [1]. As China's economic development, more and more people will turn their attention to high-tech projects. However, due to its characteristics, there are some problems in the entrepreneurial of high-tech projects. Firstly, because its characteristic of high-tech, the separation of technical and management, to some extent affect the conduct of the project and enterprise development; Secondly, high-tech belongs to the innovation of science and technology, so there are some risk problems in many aspects, which affects the success of the project or not. However, if you make high-tech projects settled in the incubator, providing some support and reducing operational risk, it will solve some problems, thereby helping the venture grow gradually and promoting regional economic development.

2. The Project Market Analysis

The purpose of making market analysis is to provide detail date for feasibility analysis, and it is the fundamental part of project feasibility analysis. The main content of analysis is the supply and demand of the market, and the change of the relevant data of the project made by the change of various influence factors. To the high-tech project which is in the incubator, enterprise incubator provides all-round support for hatching enterprise, to reduce the start-up venture risk and costs at the same time. Then the incubator can achieve self-worth, promote the development of local economy, and make a significant impact on the national economy [2]. So for incubating companies, the economic analysis of entering the incubator before and after will be discussed by the manner of comparing below.

2.1. Comparative Analysis of Demand

Due to the characteristics of the high-tech project, it makes the bottleneck in the process of the project. If the enterprise assigns to the incubator, the enterprise can use its influence, networking and other conditions to open up the market, so that more people will know the existence of this project. Thereby consumers have more choices. Compared to before hatching, the consumer demand is increased significantly. In addition, since settled in the incubator, the high-tech enterprises enjoy various services in it, and it can significantly reduce the direct and indirect costs. Then this will lower product prices and increase consumers' demand.

2.2. Comparative Analysis of Supply

On the one hand, settled in the incubator, the company can use the resources in the incubator with free of charge or at low prices to reduce the company's direct costs. After enterprises to enter the market, the incubator provides market operations, market expanding and other aspects of training regularly or irregularly, which in turn reduces the indirect costs of the enterprise. In constant prices, corporate profits earned will increase, thereby the enterprise increase the supply. On the other hand, the incubator will detect and assist incubating enterprises to improve product, which make the enterprise improved production technology to increase supply under the condition of the established resources. In addition, in recent years, the level of the development of high-tech industries has risen to reflect a country's comprehensive national strength level, so the country issued many policies to support the development of high-tech industries, which will increase the number of enterprises to the supply of products.

3. Research of the Economic Benefit Assessment Method in the Incubator

Economic efficiency is that the contrast between when people carried economic activities achieved the fruits of labor and labor consumption, the contrast between the revenue, the utility and the cost. This article will research the economic benefits after entered the incubation from financial analysis, risk analysis and social benefits, and national economy analysis, three aspects.

3.1. Financial Analysis

According to the provisions of existing domestic economic, fiscal, the financial system, on the basis of prediction of market price when building, analyzing the prediction of cost and revenues of project, and thus carrying capital planning, inspecting the financial position of profitability after enterprise completed the project, the loan repayment ability of project financial status, and foreign exchange effects and so on. Financial analysis can be divided into before financing and financing analysis. This article mainly focuses before financing analysis to dynamic analysis (DCF)-based, static analysis (non-discounted cash flow analysis), and mainly introduces the net present value indicators and internal rate of return targets.

After enterprises settled in the incubator, due to be supported in all respects, greatly reducing the cost, there will be a corresponding increase in subsidies, then the net present value NPV expression than before, cash outflows (CO_t) will be reduced and (CI_t) cash inflow will be increased, which means net cash flow increase, the calculated NPV will also significantly increased compared with before, enterprises can get more profits. Similarly, the internal rate of return will be significantly higher than the benchmark discount rate.

3.2. Risk Analysis

Any investment process has risks, in this word, any investment decision is risky. Risk analysis is the method of analyzing a variety of indefinite investment variables (referred to as risk variables below) through the process of investment, according to the probability characteristics of the risk variables deduces the probability characteristics of economic evaluation in the investment process, and thus assessing the investment project risk. Through risk analysis, decision-makers can have correctly understanding on and facing the risk to make a reasonable risk-reward the correct decision [3]. In this paper, we use the improved sensitivity analysis.

Because the sensitivity of project on every sensitive element has different sizes, each factor in the probability of project implementation is also different, so we introduce probability analysis to the sensitivity analysis. This paper selects expert investment method to correct the result of the probabilistic analysis. We use the weight of each risk factor to multiply with the level to get the risk factor score, and then summing up the score of each risk factor can be derived project risk scores. The higher the score is, the greater the risk description.

On the basis of using of probability analysis to improve the traditional sensitivity analysis to further define the change law of sensitivity factors, it can show

the extent of change as a sensitive factor in time, to let decision-makers take appropriate measures to control its future development trend of reducing project risk.

3.3. Social Benefit and National Economic Analysis

The analysis of project's economic and social benefits is the analysis and evaluation of investment projects for local and national economic development contributions, as well as local social conditions on the adaptability and acceptability of the project, in order to evaluate the project's social significance [4].

Project investment evaluation methods are mainly consist of quantitative and qualitative analysis, two methods. Typically, however ,economic and social benefits of the project investment analysis involves many factors, but also difficult to obtain accurate data, the impact is difficult to use data to measure accurately, therefore, the social benefits of project investment evaluation usually using the method of qualitative analysis.

4. ××Project Assigned Incubator Economic Analysis

For specific research on the economic benefits of high-tech project after into incubator, on the basis of the understanding of the analysis of economic benefit, this article will enumerate a positive of "×× projects settled incubator" to make a specific discussion to analyze the change of economic benefit and advantages after the project assigned the incubator.

4.1. Financial Analysis

××project assigned to the incubator, the enterprise own funds of RMB 500 million yuan. In the first year, the enterprise gets RMB 1 billion yuan from the bank, loan interest rate of 6%, and is defined as long-term loans, interest calculated on the basis of one year, the one year construction period interest rate is around RMB 60 million yuan. The payment of long-term loan is on the basis of an equal repayment, which is expected to be repaid for ten years. According to the state's tax policy, to the key supporting high-tech enterprises, the state reduces 15% enterprise income tax and the low rate of 3% VATF or units and individuals (including foreign-invested enterprises, foreign-invested research and development centers, foreign enterprises and foreign individuals) who engaged in technology transfer, technology development and related technology consulting, technology services, the business income shall be exempted from business tax. Within the incubator the city construction and other taxes shall be exempted.

According to the industry based on the discount rate at 8%, the NPV is RMB 3.85748 billion yuan. That is to say, if it excludes benchmark yields of xx project, and the enterprise still can obtain excess profits of 3.85748 billion yuan. Visible, the enterprise obtains very considerable profits after settled in the incubator.

4.2. Risk Analysis

4.2.1. Break-even analysis

The price of the product is RMB 3500yuan, and the per unit of the product cost is RMB 2000yuan, including the variable cost 1400 yuan and fixed cost RMB 600yuan. If annual production is 100,000 units, annual business income will be 350 million yuan. Total annual cost is 200 million yuan, including annual variable cost 140 million yuan and fixed cost 60 million yuan, then the annual business tax and additional tax is 22,500,000 yuan.

Because the total cost (TC) is equal to the total fixed cost (F) plus total variable cost $(C_v Q)$, then,

$$TR = TC \qquad (1)$$

Can be drawn:

$$F + C_v Q = PQ^* \qquad (2)$$

Deduced:

$$q^* = \frac{Q^*}{Q_c} \times 100\% = \frac{F}{Q_c(P - C_v)} \times 100\% \qquad (3)$$

q^* : Production capacity utilization on the breakeven point

Q_c : Design production

Then, the value of q^* is lower, the investment risk is smaller.

By the calculation, the production capacity utilization on the project's breakeven point is 32%. That is to say, as long as the production reaches 32 percent of design production, the company can break even.

4.2.2. Sensitivity analysis

After analysis, this paper study the sensitivity of the project on four factors, which are changes in operating costs (variable costs of the project), new construction investment (fixed costs of the project), operating income (sales or product price) and total investment. We discuss when these four factors float up and down 5% and 10%, the net present value how to change, the following table 1 :

Table 1. Sensitivity analysis table of ×× project

The change of operating costs					
Economic Indicator	Benchmarked Scheme	-10%	-5%	5%	10%
NPV	385748	437124.6	411436.3	360059.8	334371.5
Volatility		13.32%	6.66%	-6.66%	-13.32%
The change of the new construction capital					
Economic Indicator	Benchmarked Scheme	-10%	-5%	5%	10%
NPV	385748	385748	385748	385748	385748
Volatility		0	0	0	0
The change of the operating income					
Economic Indicator	Benchmarked Scheme	-10%	-5%	5%	10%
NPV	385748	287836.1	336792.1	434704	483660
Volatility		-25.38%	-12.69%	12.69%	25.38%
The change of the aggregate investment					
Economic Indicator	Benchmarked Scheme	-10%	-5%	5%	10%
NPV	385748	389546.6	387647.3	383848.8	381949.5
Volatility		0.98%	0.49%	-0.49%	-0.98%

From the above table, the most sensitive factor affecting the net present value is the operating income, namely the production or price, and it is the positive influence. Followed one is operating costs, the variable cost, and it is the reverse change. The last one is aggregate investments, and it is the positive change. The change of the new construction capital has no effect on the NPV, because it is no new construction capital in the enterprise development and stability period. Therefore, we focus on the production, selling prices, operating costs and aggregate investment below.

In order to correct the result of probability analysis, we choose the method of the expert investigation. After the expert investigating and comprehensively analyzing, we assign weights for these four factors (Table 2), the following table:

Table 2. The weight distribution of each factor

Factor	Production	Price	Operating cost	Aggregate investment

Weight	0.3	0.3	0.2	0.1

Then we determine the level of the risk. For smaller, larger, medium, large, big five levels, their grade are 0.2, 0.4,0.6,0.8,1.0 respectively. So for this case, we can calculable the score of the risk, the following table 3 :

Table 3. Risk score

Factor	Production	Price	Operating cost	Aggregate investment	Total
Level score	0.4	0.4	0.2	0.1	
Weight	0.3	0.3	0.2	0.1	1
Risk score	0.12	0.12	0.04	0.01	0.29

According to the above analysis, we conclude that the project risk score is 0.29 points. That is to say, the probability of these four factors to influence the project's net present value is 29%.

4.2.3. Social benefit and national economic analysis

××project assigned to the incubator is an effective way to make high technology achievements transformation. It makes the project start-up enterprise in the fierce market competition has a large cost advantage, and assumes the smaller the risk. After the enterprise completed, it not only has a significant economic benefits, but also contributes to the development of national economy. It has significant social benefits. Embodied in the following aspects:

(1) Technology Business Incubator has the role of making high-tech achievements transform. If high-tech project graduates successfully and exits hatch mechanism, which will encourage a large number of personals to make high-tech be achievable and industrialized, thereby to promote our country's development of high-tech and enhance international competitiveness.

(2) ××project settled after the incubator, which to some extent, can improve the local employment rate, and promote regional economic development.

5. Conclusions

High-tech project settled in the incubator gets all aspects of support. Financially, the enterprise can enjoy the low tax and other preferential policies, and share the equipment in the incubator facilities at the same time. These can reduce the cost and increase the profit obviously. And to achieve the requirement of the profit and loss balance production capacity utilization rate is low, so it is relatively easy to achieve. And according the sensitivity analysis, the operational risk of the project settled in the incubator is lower. And besides obvious economic benefits to the enterprise, it also promotes the development of the national economy, and has important social benefits. Thus, for high-tech projects, we should encourage them to assign to the incubator, which is not only conducive to the formation of industry and technology transformation, but it will be the important force to promote the economic development of our country.

Acknowledgment

References

[1] Li Xiaojin and Ping Yan, "The economic benefit analysis of the school teaching enterprise," in Northern Economy, 2002, pp.47-48.
[2] Gao Hongye, Westem economics (micro), Beijing: Tsinghua University Press, China, 2007.
[3] Wang Zhenzhen. "The research of the project risk assessment method based on sensitivity analysis". Hunan University, China, 2006.
[4] You Mingda, Technology economy and project economic evaluation. Beijing: Tsinghua University Press, China, 2009.