

Research on the Problems and Methods of High-tech Enterprise Value Assessment

Wutong Xie*

School of Economics and Management, Southwest Petroleum University, Chengdu 610500, China

*Corresponding Author: Wutong Xie

ABSTRACT

With the rapid development of high-tech in the world, the high-tech industry system based on high-tech development has more and more room for development. High-tech enterprises have become the main industry for competition among countries in the world by taking advantage of their strong product correlation, high added value, low pollution and low energy reserves. This study explores the value assessment methods of high-tech enterprises and the characteristic problems existing in value assessment, and proposes corresponding solutions and coping strategies.

KEYWORDS

High-tech Enterprises; Value Assessment; Assessment Method.

1. INTRODUCTION

With the continuous change and development of society, economic globalization has become a foregone conclusion, and with it comes increasingly fierce competition among all walks of life. In such an environment, the verification of the value of an enterprise itself is particularly important, and the importance of enterprise value assessment is also evident.

High-tech enterprises have completely different meanings in different stages and periods. Electronics and electrical appliances, automobile manufacturing, microbial technology, etc. are all high-tech enterprises in different periods. High-tech enterprises are not simply limited to electronics, materials, biology, computers and other industries. Japanese scholar Chen Yilang believes that the mainstay of economic development is the main core technology in current products. There are many aspects involved in the recognition of high-tech, such as R&D expenses, high-tech income, enterprise talent structure, and transformation of scientific and technological achievements. High-tech enterprises have their own unique characteristics. When evaluating high-tech enterprises, how to choose the right method to allow enterprises to discover problems in their own development process and put forward corresponding solutions and countermeasures in a targeted manner is a problem worthy of in-depth study.

2. A REVIEW OF RESEARCH ON HIGH-TECH ENTERPRISE VALUE ASSESSMENT

High-tech enterprises are highly technology- and knowledge-intensive entities, and are important carriers for promoting high-quality development of the market. Their development has also promoted the adjustment of the national economic industrial structure and development mode. Unlike traditional enterprises, high-tech enterprises have the characteristics of high risk, high investment,

unstable expected returns, and a high proportion of intangible assets . There are even situations where the net profit of the enterprise is in the red but the market value is very high , so the equity market value is difficult to be reflected on the books through financial indicators. Considering that many high-tech enterprises are in the introduction period, have a short operating time , and their historical financial data fluctuate greatly, Fan Fengke et al. proposed that financial indicators such as revenue growth rate and cost are not referenceable. Wang Xiaorong proposed that when evaluating the value of high-tech enterprises, the role of traditional financial factors such as profit should be reduced, and the impact of non-financial indicators reflecting the competitive advantage and sustainable development of enterprises should be increased. For example, Wu Xianyun further proved from the perspective of stock prices that R&D investment in non-financial factors does have a significant impact on corporate value; Ren Fengmin et al. concluded through processing and analysis of relevant data that scientific and technological investment is the key reason for the development of high-tech industries, which significantly promotes the growth of the industry in the long run, but has limited short-term effects. It is proposed that for the long-term development of enterprises, scientific and technological investment should be increased. At the same time, Li Chuanhua, Cao Yong, and Wang Xiaowei combined theory with empirical analysis to conclude that the value drivers of high-tech enterprises include not only traditional financial indicators but also risk factors, governance structure, and non-financial indicators of enterprise opportunity value. They also proposed that analyzing the value drivers of enterprises from the perspective of value management can be more comprehensive and scientific, which provides an analytical perspective for this article. However, from the research literature at home and abroad, when evaluating the value of high-tech enterprises , most of them are limited to financial indicators, ignoring the impact of non-financial factors on enterprise value. Therefore, it is necessary to consider both comprehensively.

3. INTERNAL FACTORS AFFECTING THE VALUE ASSESSMENT OF HIGH-TECH ENTERPRISE DEVELOPMENT

3.1. Intangible Assets Account for a Large Proportion

High-tech enterprises mainly create value through high-tech products, form technological monopoly , and thus earn a lot of profits. Most of these technologies are intangible assets. In other words, the value of high-tech enterprises is mainly realized through intangible assets such as proprietary technologies and patents. This is in stark contrast to the fact that most assets of traditional enterprises exist in physical or monetary form. Asset appraisers often lack knowledge of intangible assets, so it is often difficult to accurately estimate the value of high-tech enterprises. For example, the value of tangible assets of Internet companies is often not high in the early stages of their establishment, but as the research and development of corporate technologies enter the market, the value of the company often doubles. Companies like Google and Facebook had almost no tangible assets in the early stages of their entrepreneurship, but became Silicon Valley giants through intangible assets such as algorithms and programming. Before these companies grow up , non-financial factors are difficult to consider. It is difficult to correctly understand the future development potential of the company and accurately estimate its true value based solely on the estimation of its tangible assets.

3.2. No Profit Or Little Profit, Unstable Cash Flow

Traditional enterprises are mostly labor-intensive enterprises. Due to their relatively stable development and business models, they are usually in a relatively stable stage in the enterprise life cycle, and the cash flow is relatively stable during the development process of the enterprise. However, due to the particularity of the industry, high-tech enterprises will consume a lot of manpower, financial resources and material resources in the upstream stage of research and development, and the development of enterprises should adapt to the changing social environment and needs, facing

many uncertain factors. For various reasons, the initial development of enterprises may have less income or loss, and the cash flow fluctuates greatly. Due to the volatility of cash flow and the influence of opportunity cost, when evaluating the value of high-tech enterprises, it is very likely to underestimate the income of enterprises out of conservatism or introduce budget relaxation in order to more easily achieve corporate goals, which will affect the accuracy of enterprise value evaluation, and the difference between actual and budget fluctuations will also affect the stability of cash flow. Moreover, as emerging enterprises, high-tech enterprises are usually small in scale and have limited financing channels in the initial stage, which makes the related enterprises inherently weak in risk resistance and has a negative impact on their credit rating. The above factors will directly or indirectly restrict the development of enterprises.

4. EXTERNAL FACTORS AFFECTING THE VALUE ASSESSMENT OF HIGH-TECH ENTERPRISE DEVELOPMENT

4.1. Valuation is Easily Affected by Cognitive Bias

Unlike the precise and objective nature of natural sciences, which is not subject to human will, the valuation of corporate value is subjective due to the involvement of human subjective will, and this feature is more profoundly reflected in the valuation of high-tech enterprises. As can be seen from the previous discussion of internal factors, in the valuation process, it is often necessary to predict and infer the future financial data of high-tech enterprises. However, since high-tech enterprises belong to emerging industries, people have a cognitive gap in high-tech enterprises, and it is difficult to accurately recognize the actual value of cutting-edge technologies in advance. Therefore, the valuation of high-tech enterprises is largely affected by the subjective assumptions of the appraisers. Especially for high-tech enterprises that have just gone public, people's assessment of their value often depends on their own subjective judgment. Therefore, people's valuation of high-tech enterprises is easily affected by cognitive biases.

4.2. Evaluation Methods are Difficult to Determine

The most common methods of enterprise value assessment are : income method, cost method, and market method. The income method is a method of estimating the net income of the assessed object under normal circumstances in the future by calculating the discount rate, expected income, and duration of expected income of the assessed asset from the perspective of the future. It takes into account the time value of money and is considered to be the most appropriate and ideal choice in international valuation standards. Its application premise is that the risks that the asset owner should bear and the future income of the assessed asset must be measurable in money ; the cost method is a method of judging the value of the assessed asset by deducting the estimated loss value of each item from the actual replacement cost of the assessed asset when assessing the asset. It is the most common method in China's current enterprises. Its application premise is that the relevant historical data of the assessed asset should be available, and the effective asset consumption and ineffective asset consumption related to it should fully reflect the average level of society or industry ; the market method is a method of determining the assessment of the assessed asset from the current perspective by comparing the similarities and differences between the assessed asset and similar assets recently sold, and adjusting the market price of similar assets. This method is developed around two aspects: corporate financial indicators and non-financial indicators. Its application premise is that the asset market where the assets being evaluated exist should be fully developed and relatively active. At the same time, the reference objects corresponding to the assets being evaluated and the various indicators, technical parameters and other information that can be used for comparison should be available. The three methods have different applicable conditions and considerations. Each method has its own advantages and disadvantages. We cannot generalize which method is the best.

4.3. High-tech Enterprises are Highly Risky

High-tech enterprises have a lot of capital investment and expenditure in technology research and development, product innovation, etc., and their high-yield characteristics also determine that they will inevitably face many risks in the process of development. These risks are often easily overlooked. Once the business managers of the enterprise fail to fully consider the risk factors in the process of enterprise operation, immeasurable losses will follow. According to statistics, although high-tech enterprises are developing rapidly in the current market, 70% to 80% of them have to withdraw from the market due to their insufficient ability to deal with risks. The big dive in the valuation of the NASDAQ market network in the United States in April 2001 fully illustrates this feature. " Risk " refers to the probability of a certain threat occurring, and the risk level is determined by the total asset value exposed to the loss exposure and the probability of such loss. Just as if you want to obtain relatively accurate evaluation results, the evaluation process will be relatively complex and cumbersome. The high returns of high-tech enterprises often correspond to high risks. The high risks of high-tech enterprises come from market fluctuations, technological innovation, demand changes and high-intensity demands for flexibility. "Survival of the fittest." In the era of economic globalization, affected by many risks, big and small, there are always companies that make rapid progress in the process of development, and it is inevitable that companies will decline and fall. Risks always coexist with opportunities. As an emerging enterprise, the vigorous development of high-tech enterprises will also correspond to a series of unknown factors and challenges. In order to ensure the sustainable and steady development of high-tech enterprises, it is particularly important to identify and avoid risks in related fields.

5. COUNTERMEASURES TO SOLVE THE PROBLEMS EXISTING IN HIGH-TECH ENTERPRISES

5.1. Reasonable Valuation of Intangible Assets

The cost method and the income method are often used in the valuation of intangible assets. The cost method needs to make many assumptions in the process of intangible asset valuation, and it will involve assumptions made by some relevant valuation experts. It is more suitable for the valuation of fixed assets. When the cost method is used to evaluate the value of intangible assets, some advantages of the cost method may not be fully reflected. The premise of the cost method for the valuation of intangible assets mentioned that the applicable premise of this method is that there are sufficient available historical data and the relevant consumption should fully reflect the social or industry average level. There are operational difficulties in actual application. Therefore, the income method is more suitable for the valuation of intangible assets. The income method is widely used in the valuation of intangible assets. This method fully considers the excess returns brought by intangible assets to the enterprise, and can give a more realistic reflection of the value of the assessed assets. The method is relatively rigorous and its evaluation results are more convincing. Although the calculation of the income method is more troublesome and the process is more complicated, it can more objectively and truly reflect the value of the assessed assets. When valuing intangible assets, different valuation methods should be adopted for different types of intangible assets in combination with the income method. The valuation of intangible assets should consider indicators such as weighted average, annuity, discount rate, risk-return rate, return on investment, and residual income. The SMART model can be used in the evaluation of intangible assets . In-depth analysis of intangible assets can be conducted from five levels : clear, measurable, sustainable, achievable, and time-determined. Flexible judgment of the appropriate evaluation method based on the characteristics of different intangible assets can further improve the accuracy of enterprise value evaluation, thereby effectively improving a series of negative impacts caused by overestimation or underestimation of the value of intangible assets, and converting the disadvantage of difficulty in evaluation due to the

high proportion of intangible assets into advantages as much as possible. Although the high proportion of intangible assets imposes a greater burden on enterprises at the value evaluation level, as long as reasonable methods are used to evaluate their value, it is very beneficial for enterprises to carry out operations, investment, and financing activities, and also helps enterprises make business decisions.

5.2. Strengthen Upstream Cost Control

High-tech enterprises spend a relatively high proportion of their total expenditure in the upstream R&D and design stages, and they also have a high demand for cash flow. The life cycle of an enterprise is closely linked. The upstream R&D and design determine the midstream and downstream operating and maintenance costs. Therefore, if you want to stabilize cash flow and maximize corporate profits, it is particularly important to control upstream costs. Decision makers should have a sufficiently in-depth understanding of the policies and systems in related fields when making decisions, and reduce the production costs of enterprises to a certain extent by utilizing reasonable institutional advantages ; managers can use Porter's competitive strategy to achieve the goal of improving efficiency and reducing costs through continuous technological improvements ; relevant departments should consider issues from a longer-term perspective, conduct reasonable analysis from multiple dimensions, eliminate subjective assumptions, adhere to the principle of seeking truth from facts when conducting corporate asset evaluation and information disclosure, increase information disclosure and transparency, thereby motivating employees and improving corporate vitality. After the vitality of the enterprise is improved, investors in related industries will have new insights into the development potential of the enterprise, thereby increasing their willingness to invest and the enterprise will obtain more stable cash flow support. When the cash flow problem is solved, the scale of the enterprise will be further expanded, thereby occupying the market more quickly, and the previous problems such as limited financing channels, cash flow shortage, and small enterprise scale will be effectively improved. The current situation where the company's profits are on the verge of breaking even will also be effectively solved, which will be beneficial to the long-term development of the company.

5.3. In-depth and Comprehensive Analysis to Overcome Psychological Preferences

According to relevant research, non-financial information is more useful than financial information in the valuation of high-tech enterprises. In order to avoid the valuation difficulties caused by the characteristics of high-tech enterprises that are difficult to determine their own risks and returns, and the subjective assumptions in the valuation process caused by people's lack of knowledge of high-tech in the absence of historical data, in the process of valuing high-tech enterprises, we need to analyze not only the fundamental data of the enterprise, but also the industry prospects of the enterprise, the external environment of the enterprise's development potential, the industrial chain and the position of the enterprise. Analyzing the industry prospects and development potential of the enterprise can help us more accurately understand the future earnings of the enterprise. Especially for high-tech enterprises with high knowledge content, it is crucial to have products with great market potential, products within the patent protection period, and the quality and quantity of products under research for the evaluation of enterprise value, such as the high-tech pharmaceutical industry. In-depth understanding of the external environment, industrial chain and enterprise status of the enterprise can help us discover the risks of the enterprise in the future in advance. These in-depth studies beyond the fundamentals of the enterprise can make up for the lack of data of high-tech enterprises, the large mutation of value, and the cognitive bias in the enterprise valuation process caused by people's lagging cognition, so as to estimate the real value of the enterprise in the future as accurately as possible.

5.4. Classification and Selection, Reasonable Substitution

Since high-tech enterprises have the characteristics of strong value mutation and a large proportion of intangible assets, in order to more accurately and reasonably evaluate the value of enterprises, high-tech enterprises can be classified according to factors such as development stage or asset type, and then the appropriate model can be selected to evaluate the enterprise value. Some sub-enterprises that are not suitable for traditional valuation methods can be replaced by innovative methods developed from traditional methods. For example, start-up high-tech enterprises that are difficult to apply traditional valuation methods can be valued by real option method and EVA method developed based on DCF. Among them, EVA method is more difficult to be manipulated and interfered by management personnel, but it has greater subjectivity, while real option method is more suitable for uncertain situations. At the same time, EVA can reasonably evaluate the intrinsic value of the enterprise, while option pricing method can determine the value of future development opportunities and flexibility of the enterprise. Therefore, the combination of these two methods can more comprehensively reflect the true value of start-up high-tech enterprises. In terms of enterprise development stage, high-tech enterprises can be subdivided into start-up, growth, development and mature enterprises, and then the valuation methods suitable for them are selected respectively, as shown in Table 4.1. High-tech enterprises in the start-up stage have basically not yet generated income and profits, and there is great uncertainty in their future development. Therefore, the combination of EVA method and real option method can be selectively used. Enterprises in the growth stage have taken shape, and their profits and sales have begun to show trend patterns. The key to evaluating such enterprises is to evaluate their future development possibilities and profit potential. At this time, both the real option method and the discounted cash flow method are difficult. Attention should be paid to the adjustment of indicators and the use of relative evaluation methods for assistance. For high-tech enterprises in the development and mature stages, the enterprises already have relatively sufficient profits and data, and the uncertainty of the future has begun to decrease. At this time, the discounted cash flow method should be used by the enterprises. In terms of corporate asset types, enterprises with large initial capital investment and large amounts of depreciation and amortization can use the enterprise value multiple method, while for some special industries such as game companies, they can be evaluated based on indicators such as the number of paying users and the ARPPU value of users.

Table 1. Selection of valuation methods for enterprises at different development stages

Enterprise development stage	Valuation Method Selection
Start-up period	Combining the Real Options Method and the EVA Method
Growth	Relative valuation method assistance
Development and maturity	Discounted Cash Flow Method

5.5. Strengthen Risk Management

Strengthening risk management can start from the internal control, performance management and data analysis of high-tech enterprises. Enterprise value assessment should comply with the cost-benefit principle. High-tech enterprises usually need to consume a lot of manpower, material and financial resources at the level of R&D expenditure. If they are not properly managed, they will not be able to make ends meet, which is extremely detrimental to the development of the enterprise. Reasonable internal control will play a role in reducing the probability of the occurrence of this risk, thereby reducing the scale of losses to a certain extent. Enterprise risk management should establish a sound internal control system, which can be combined with the COSO framework from the five elements of control environment, control activities, risk assessment, information and communication, and supervision, and should meet the three goals of its operating effectiveness and efficiency,

compliance with applicable laws and regulations, and reliability of financial statements ; enterprise performance management can efficiently collect relevant information from various channels, and timely discover problems before the problems worsen through data analysis results ; high-tech enterprises are inseparable from big data. Due to the large volume, variety and rapid change of big data, we can use descriptive analysis, diagnostic analysis, predictive analysis and normative analysis to reasonably analyze the past development status and future value of the enterprise, so as to propose the best plan for the future development of the enterprise. At the same time, business managers should conduct a comprehensive analysis and interpretation of their own decisions, dig deep into the root causes of the problems, and then carry out specific and practical reforms and improvements. While analyzing their own problems, they should also combine the market situation to achieve "knowing yourself and knowing the enemy". When a comprehensive self-analysis and combining the market situation are carried out at the same time, the root causes of the problems will be revealed, so that the right medicine can be better prescribed. Thus, the existing problems will be improved.

6. CONCLUSION

The development of science and technology is a continuous and endless process. Today, the development of high-tech enterprises is getting faster and faster, and high-tech is becoming more and more important to the entire human society. We should adopt a comprehensive and developmental perspective to view the development of high-tech enterprises, and better realize the value assessment of high-tech enterprises by continuously strengthening risk control and performance management, so as to keep pace with the times and better adapt to the progress and development of society.

CONFLICTS OF INTEREST

No potential conflict of interest was reported by the authors.

REFERENCES

- [1] Fang Chao, Li Chaohong. Analysis on the construction of high-tech enterprise value assessment model from the perspective of innovation value chain[J]. Commercial Accounting, 2024, (02): 111-114.
- [2] Wei Kai, Li Zhou. A review of research on value assessment of high-tech enterprises in the growth stage [J]. National Circulation Economy, 2023, (20): 76-79.
- [3] Wang Qian, Li Chaohong. Research on value assessment of high-tech enterprises from the perspective of value management [J]. Green Technology, 2023, 25(15): 259-264.
- [4] Gao Jiaqi. Problems and countermeasures in the value assessment of high-tech enterprises[J]. Modern Industrial Economy and Informatization, 2023, 13(03): 190-192.
- [5] Wu Jiongcheng. Problems and countermeasures in the value assessment of high-tech enterprises[J]. Modern Business, 2022, (36): 56-59.
- [6] Qiao Tonghui. Value Assessment of High-tech Enterprises in Growth Stage[D]. Inner Mongolia University of Science and Technology, 2022.