Valuation Risk Identification of Independent Game Companies Based on the DCF Framework

Chuyue Fang
School of Jinan Xinhang Experimental School, Jinan, China
**Corresponding Author*

Abstract: This article discusses the risk identification when valuing independent game companies based on the discounted cash flow (DCF) framework. First, introduce the logic of the DCF framework in the valuation of independent game companies. Then, deeply analyze the key risk factors affecting valuation from multiple dimensions such as market, project, financial operation, management team and talent, and technology. Finally, propose strategic suggestions for effectively identifying and managing risks under the DCF valuation framework to improve the accuracy of valuation.

Keywords: DCF Framework; Independent Game Company; Valuation; Risk Identification

1. Introduction

1.1 Research Background

In the current era of booming game industry, independent game companies have gained a foothold in the game market with their unique creativity and flexible operation models. According to Newzoo's report [1], the global gaming market size continues to grow, and indie games, as an important part of it, are also increasing in number and market share year by year. Independent game companies are often able to break free from the constraints of traditional game development and launch innovative and personalized game works to meet the diverse needs of players. For instance, some indie games have attracted a large number of loyal fans and achieved commercial success through unique narrative methods, artistic styles or gameplay designs.

Accurate valuation of independent game companies is of vital significance for investors' investment decisions, the company's mergers and acquisitions, as well as its own strategic planning. For investors, accurate valuation can help them assess the value and potential returns of investment projects and rationally allocate assets [2]. In corporate mergers and acquisitions and reorganizations, valuation is the key basis for determining the transaction price. A reasonable valuation can ensure the fairness of the transaction and the interests of both parties [3]. For independent game companies themselves, an accurate valuation helps them formulate reasonable development strategies, attract investment and partners, and achieve sustainable development.

1.2 Research Objectives and Significance

From a theoretical perspective, current research on enterprise valuation mainly focuses on traditional industries and large enterprises, while studies on the valuation of emerging enterprises with unique attributes such as independent game companies are relatively scarce. This study enriches the application of enterprise valuation theory in specific industries and provides a reference for subsequent related research. From a practical perspective, independent game companies encounter numerous uncertainties during their development process. Accurately identifying valuation risks can help company management, investors, and related stakeholders better understand the company's value creation process and potential risks, and make more informed decisions [4].

1.3 Current Research Status at Home and Abroad

Research on enterprise valuation abroad started earlier and has formed a relatively complete theoretical system and methods. In terms of the application of the DCF framework, many scholars have conducted in-depth research and improvements on it. For instance, Marchand and Hennig-Thurau [5] studied the competitive situation and consumer behavior in the game market, providing a reference for the market risk identification of game companies. However,

there are relatively few studies specifically targeting the valuation risks of independent game companies [6]. Some scholars have conducted research on the applicability of the DCF framework in the valuation of Chinese enterprises. In terms of risk identification, Ziqin Feng [7] analyzed enterprise risks from multiple dimensions such as finance, strategy and operation, and proposed corresponding risk management strategies.

For the gaming industry, domestic research mainly focuses on aspects such as the development trends, market patterns and business models of the gaming industry. For instance, Qiaolei Jiang et al. [8] analyzed the current development status and challenges faced by China's game industry, and provided suggestions for the strategic planning of game companies. However, systematic research on the valuation risks of independent game companies is still relatively scarce.

2. Application Logic of the DCF Framework in the Valuation of Independent Game Companies

2.1 Basic Principles of the DCF Framework

The Discounted Cash Flow (DCF) framework, also known as the discounted cash flow framework, is an enterprise valuation method based on the prediction of future cash flows. The core idea is to convert the cash flows that the enterprise is expected to generate in the future into current value at an appropriate discount rate [4]. This framework holds that the value of an enterprise depends on the cash flow it can bring to investors in the future, and the future cash flow needs to be discounted to reflect its current value, because money has a time value, and future money is not as valuable as present money.

2.2 Cash Flow Characteristics of Independent Game Companies

The main sources of income for independent game companies include game sales, in-game purchases, and advertising revenue, etc. Compared with large game companies, the cash flow of independent game companies is characterized by high uncertainty and volatility. A new game may quickly gain players' favor and generate high revenue after its launch, or it may perform poorly and earn very little due to various reasons, such as gameplay not meeting market demands or inadequate promotion and publicity. For instance, some indie games received substantial financial support during the crowdfunding stage, but failed to meet the expected sales targets after their launch, leading to tight cash flow for the companies. The game market is influenced by various factors such as seasonal factors, holidays, and promotional activities, which can cause significant fluctuations in the revenue and cash flow of independent game companies. During holidays, players have more time and energy to play games, and the revenue of game companies usually increases significantly. In normal times, income may be relatively stable.

It usually takes an independent game company a long time to develop a new game, from project planning, research and development, testing to launch, which may take several months or even years. During the research and development process, the company needs to invest a large amount of human, material and financial resources, including the salaries of R&D personnel, equipment procurement, technology licensing and other expenses. The revenue of the game is gradually realized after its launch, which leads to a significant outflow of cash flow during the R&D stage for the company, while the inflow of cash flow is relatively dispersed during the revenue realization stage.

2.3 Steps for Applying the DCF Framework to the Valuation of Independent Game Companies

2.3.1 Determine the forecast period

The determination of the forecast period needs to take into account factors such as the game project life cycle of independent game companies, market competition conditions, and the company's development strategy. Generally speaking, for independent game companies, the forecast period can be set at 5 to 10 years. During the forecast period, it is necessary to predict the future cash flow of the company's existing game projects, while also considering the impact of the development and launch of new game projects on the cash flow.

2.3.2 Predict future cash flows

Predicting the future cash flows of independent game companies is a key step in DCF valuation. It is necessary to analyze the life cycle of the company's existing game projects, including the revenue and cost characteristics at different stages such as the introduction period, growth

period, maturity period and decline period. At the same time, based on market research and industry data, make reasonable plans and predictions for the company's future new game projects, and estimate the free cash flow at each stage. Free cash flow refers to the cash that an enterprise can freely allocate. The calculation formula is: Free cash flow = earnings before interest and taxes ×(1- income tax rate)+ Depreciation and amortization-Capital expenditure-Increase in working capital.

2.3.3 Determine the discount rate

The determination of the discount rate needs to take into account factors such as market risks and specific risks of the company. The commonly used method for determining the discount rate is the weighted average cost of capital (WACC) method. WACC = Cost of equity capital × equity ratio + Cost of debt capital × debt ratio ×(1-Income tax rate). Among them, the cost of equity capital can be calculated through the Capital Asset Pricing Model (CAPM), that is, the cost of equity capital = risk-free interest rate + β× market risk premium. For independent game companies, due to their higher risks, the beta value is usually large, resulting in a higher cost of equity capital and, in turn, a higher discount rate.

2.3.4 Calculate the enterprise value

Discount the free cash flows of each period during the forecast period to the current point in time at a determined discount rate, and then add up the discounted cash flows of each period to obtain the enterprise value of the independent game company. If the company has a future value, it is also necessary to discount the future value to the current point in time and add it to the enterprise value. The final value is usually calculated using the perpetual growth model or the exit multiple method.

2.4 The Applicability and Limitations of the DCF Framework in the Valuation of Independent Game Companies

The DCF framework, based on future cash flow predictions, can reflect the core value creation capabilities of independent game companies. For independent game companies with stable cash flow and predictable future development, the DCF framework can provide relatively accurate valuation results. In addition, the DCF framework takes into account the time value of money and can more reasonably assess the long-term value of enterprises [9].

However, the DCF framework also has some limitations when applied to the valuation of independent game companies. First of all, the future cash flow of independent game companies is highly uncertain and difficult to predict accurately. Changes in market demand, the launch of new games by competitors, adjustments in policies and regulations, and other factors may all affect the revenue and cash flow of games. Secondly, the determination of the discount rate also has a certain degree of subjectivity. Different assessors may have varying judgments on market risks and specific risks of the company, resulting in different discount rates and subsequently affecting the valuation results. Finally, the DCF framework assumes that enterprises can continue to operate, but for some independent game companies facing significant risks or in a transitional period, this assumption may not hold true, thereby affecting the accuracy of valuation.

3. Valuation Risk Identification of Independent Game Companies Based on the DCF framework

3.1 Market Risk

3.1.1 Risk of fluctuations in market demand

The preferences of consumers in the game market change rapidly, and new game types, gameplay and themes keep emerging. Games developed by independent game companies may meet market demands when they are launched, but over time, players' interests may shift rapidly. For instance, once popular indie simulation and management games may gradually lose their market after a period of time due to the increasing demand from players for more thrilling and social games. If the company fails to promptly perceive market changes and adjust its R&D direction, the number of users and revenue of its existing games will decline, affecting future cash flow forecasts and leading to overvaluation.

3.1.2 Market competition risks

The competition in the gaming industry is extremely fierce. It not only features the intense competition from large game companies but also the homogeneous competition from numerous other independent game companies. Large game companies, with their abundant funds, advanced technologies and strong brand influence, can invest a great deal of resources in game research

and development as well as marketing promotion. For instance, in the field of open-world role-playing games, the products of large companies often have more advantages in terms of picture quality, plot richness and gameplay diversity, posing a huge threat to independent game companies. At the same time, there is frequent competition among independent game companies for similar products, which leads to the dispersion of market share, the increase in user acquisition costs, and the restriction of revenue growth, thereby affecting the company's valuation.

3.1.3 Policy and regulatory risks

The gaming industry is subject to strict policy and regulatory supervision, and changes in policies and regulations may have a significant impact on the operation of independent game companies. For instance, the adjustment of the game version number approval policy may lead to a delay in the launch time of new games, affecting the company's revenue plan. If a company originally expected a new game to be launched at a specific time period to gain a market advantage, but due to the delay in the approval of the game license, it may miss the best promotion period, resulting in user loss and reduced revenue. In addition, the strengthened review of game content may require companies to modify or adjust their games, increasing research and development costs and time costs, and affecting the company's cash flow and valuation.

3.2 Project Risks

3.2.1 Risk of project development failure

The core asset of an independent game company is the game project, but the game development process is full of uncertainties. During the R&D process, there may be technical challenges that cannot be overcome, such as obstacles when achieving complex physics engine effects or multi-person online synchronization technology. Creativity may not be perfectly presented, resulting in the game quality not meeting expectations. Internal conflicts within the team may arise due to poor communication, creative differences and other issues, which can affect the progress and quality of research and development. Once the project research and development fails, the company's large amount of R&D costs invested in the early stage will not be recoverable, the future cash flow forecast will be significantly adjusted, and the valuation will also decline accordingly.

3.2.2 Risk of poor performance after the project goes live

Even if a game project is successfully developed and launched, its market performance remains uncertain. After the game is launched, it may face the problem of difficulty in user acquisition. If marketing and promotion are not in place and players have insufficient understanding of the game, the growth of download volume and user number will be slow. At the same time, low user retention rates and low payment rates are also common problems, which may be due to poor game quality, unattractive gameplay or unreasonable payment models, etc. For instance, a new game launched by an independent game company, due to issues with game balance, led to a poor gaming experience for players, resulting in a significant loss of users and revenue far below expectations, which affected the company's free cash flow and valuation.

3.2.3 Project life cycle risks

Game products have typical life cycle characteristics, and the revenue and profit levels vary greatly at different stages. Independent game companies need to accurately predict the life cycle of game projects and rationally allocate R&D and marketing resources. If the prediction of the game life cycle is inaccurate and insufficient investment is made during the growth period, the best development opportunity may be missed and the market share cannot be fully expanded. Continuously investing a large amount of resources in maintenance and updates during the recession period will lead to a waste of resources and affect the company's cash flow and valuation.

3.3 Financial Operation Risks

3.3.1 Cash flow fluctuation risk

The cash flow of independent game companies is highly volatile. The research and development as well as promotion of game projects require a large amount of concentrated capital investment, while the realization of game revenue is characterized by lag and uncertainty. For instance, a company might invest a large amount of money in the development of a new game during a certain period, but the revenue from the new game's launch might not immediately cover the costs, leading to a tight cash flow situation for the company during that period. In addition, the game's sales revenue may be affected by seasonal factors, promotional activities, etc.,

experiencing significant fluctuations, which could impact the company's normal operation and development, increase financial risks, and thereby affect its valuation.

3.3.2 Cost control risk

Independent game companies need to control various costs during their operation, including research and development costs, marketing costs, operation costs, etc. If cost control is not properly managed, it may lead to excessively high costs and compress the profit margin. For instance, during the game development process, if the development progress and resource allocation are not managed properly, it may lead to an extended development cycle, increased labor costs and equipment usage costs. In terms of marketing promotion, if the marketing strategy is inappropriate, it may lead to excessive marketing expenses and poor marketing results, failing to bring about corresponding revenue growth and affecting the company's free cash flow and valuation.

3.3.3 Risk of opaque financial information

Some independent game companies may have problems with opaque financial information, such as non-standard financial statements and insufficient information disclosure. This makes it difficult for investors and valuation personnel to accurately understand the company's financial position and operating results, increasing the difficulty and uncertainty of valuation. The lack of transparency in financial information may lead to deviations in the valuation personnel's judgment of the company's future cash flows and discount rates, thereby affecting the reliability of the valuation results.

3.4 Management Team and Talent Risks

3.4.1 Management team decision-making risks

The decisions made by the management team of independent game companies have a significant impact on the company's development direction and valuation. If the management team lacks strategic vision and fails to accurately grasp market trends and the company's positioning, it may lead to mistakes in project selection, R&D direction and marketing strategies for the company. For instance, if the management team is overly conservative, insisting on developing traditional types of games while neglecting the market demand for emerging game types, it may lead to the company gradually losing its market competitiveness, affecting the company's future cash flow and valuation.

3.4.2 Risk of talent loss

The gaming industry is a knowledge-intensive industry, and talent is one of the core competencies of independent game companies. The loss of core R&D personnel, marketing staff and management personnel may have a serious impact on the company's project R&D, market promotion and operation management. For instance, the loss of core R&D personnel may lead to delays in the progress of game projects or a decline in their quality, affecting the game's launch time and market performance. The loss of marketing personnel may affect the company's marketing promotion effect, reduce the game's popularity and user acquisition, and thereby impact the company's revenue and valuation.

3.5 Technical Risks

3.5.1 Risk of technological updates and replacements

The gaming industry is experiencing rapid technological updates and replacements, with new game engines, graphics processing technologies, and network technologies constantly emerging. If independent game companies fail to keep up with the pace of technological development in a timely manner and adopt outdated technologies for game development, it may lead to their games lagging behind their competitors in terms of picture quality, performance and gameplay innovation, which will affect the appeal and market competitiveness of the games. For instance, during the period when virtual reality (VR) and augmented reality (AR) games were on the rise, if a company failed to promptly lay out the research and development of related technologies, it might miss market opportunities and affect the company's future development and valuation.

3.5.2 Technical safety hazard risks

As the digitalization level of the gaming industry continues to rise, technical security risks are becoming increasingly prominent. Independent game companies may encounter problems such as game data leakage and server attacks, which not only harm the interests of players and the reputation of the company, but also may lead to legal proceedings and economic losses for the company. For instance, if a company's game server is attacked by hackers, resulting in the leakage of players' account information, players may lose trust in the game, reduce its usage, and this could affect the company's revenue and

valuation.

4. Suggestions on Valuation Risk Management Strategies for Independent Game Companies Based on the DCF Framework

4.1 Market Risk Management Strategies

Independent game companies should enhance market research, establish professional market analysis teams, closely monitor market dynamics and changes in consumer demands, and promptly adjust their game development directions and marketing strategies. At the same time, actively pay attention to changes in policies and regulations, make preparations in advance to deal with them, and ensure that the company's business activities comply with policy requirements. In addition, through diversified market layout, reduce reliance on a single market and disperse market risks.

4.2 Project Risk Management Strategy

During the game project development process, it is necessary to strengthen project management, establish a scientific R&D process and quality control system, and identify and solve technical problems in advance. Conduct thorough market testing and collect user feedback, and adjust the game design and functions in a timely manner based on user needs. For the performance of the project after its launch, strengthen data monitoring and analysis, optimize the game operation strategy based on user behavior and market feedback, and increase user retention rate and payment rate. Arrange the life cycle of game projects reasonably and strike a balance between the research and development of new game projects and the operation of old ones.

4.3 Financial Operation Risk Management Strategies

Independent game companies should enhance cash flow management, formulate reasonable capital budget plans, optimize capital allocation, and ensure that the company's capital needs are met at different stages. Strengthen cost control, establish a cost assessment mechanism, improve the efficiency of resource utilization, and reduce operating costs. Standardize the disclosure of financial information, enhance financial transparency, and provide accurate and reliable financial information for investors and valuation personnel.

4.4 Management Team and Talent Risk Management Strategies

The company should strengthen the construction of its management team, enhance the strategic vision and decision-making ability of the management team, and regularly organize management training and learning exchange activities. Establish a sound talent incentive mechanism, offer competitive salary and benefits as well as good career development opportunities, and attract and retain core talents. At the same time, we should strengthen the construction of corporate culture, create a good working atmosphere, and enhance employees' sense of belonging and loyalty.

4.5 Technical Risk Management Strategy

Independent game companies should increase their investment in technological research and development, pay attention to the technological development trends of the industry, and promptly adopt new game engines, graphics processing technologies and network technologies to enhance the quality and competitiveness of their games. Establish a complete technical security protection system, enhance data encryption and server security protection, conduct regular security checks and vulnerability fixes, and ensure the information security of the company and players.

5. Conclusion

Valuing independent game companies based on the DCF framework is a scientific and reasonable method. However, due to the particularity of independent game companies themselves, they face many risks in the valuation process. This article identifies and analyzes the valuation risks of independent game companies based on the DCF framework from multiple dimensions such as the market, project, financial operation, management team and talent, as well as technology. It proposes that in order to improve the accuracy and reliability of the valuation of independent game companies, companies should adopt effective risk management strategies and strengthen the management and control of various risks. At the same time, when valuation personnel apply the DCF framework for valuation, they should fully consider these risk factors, reasonably adjust the free cash flow forecast and discount rate, so as to more accurately reflect the intrinsic value of

independent game companies. In the future, as the gaming industry continues to develop and change, research on the valuation risks of independent game companies still needs to be further deepened and improved to adapt to the new market environment and valuation demands.

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