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Intangible Asset Valuation in Innovative Technology Firms: Misvaluation Risks and New Assessment

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Abstract: The rapid rise of modern scientific and technological innovation enterprises has injected vitality into the world's scientific and technological development, and at the same time, it has also brought changes and challenges to the traditional measurement methods of financial accounting. Research institutions, finance firms, and experts around the world are skeptical about the applicability of current methods of measuring intangible assets. One of the main reasons for these doubts is that intangible assets, such as patents, goodwill value, etc., play a huge role in the productivity development and profit growth of enterprises. However, this role is easily ignored and underestimated in the process of accounting recognition and measurement under the cost method. At present, the more common fair value valuation is estimated through the external market and the stock market, but the external valuation often leads to misestimation due to information asymmetry, which brings risks to the decision-making of information users. This paper uses the example method and literature analysis method to analyze the insufficient consideration of intangible asset valuation by the traditional intangible asset valuation method and the potential risks caused by M&A and financing. On this basis, the reasonableness of the current trial improvement measures is evaluated, and the relatively reasonable solutions are compared. It explains why the "deep disclosure method" is a relatively safe and operable strategy in the current accounting standards and environment.

Keywords: Intangible Asset Valuation, Fair Value Measurement, Disclosure and Reporting.

1. Introduction

With the continuous progress of science and technology in the world, new technologies and new products emerge one after another, and intangible assets have gradually become a hot topic in the accounting industry in recent years. With the expansion of some emerging industries such as medical technology, artificial intelligence, new energy and other industries, the scope and content of intangible assets have been greatly enriched, and their identification, evaluation and measurement have also become a new problem for accountants. For example, Professor Brunch Lev of New York University argues that the accounting measurement of intangible assets is in trouble, and the flawed application of the balance sheet (asset valuation) model has led to a growing mismatch between income and expenses of intangible assets in the dramatic shift of corporate value creation resources from tangible to intangible assets. As a result, balance sheets are largely devoid of information that creates the most important value for corporate resources [1].

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This problem stems mainly from the fact that the current accounting standards measure the value of intangible assets on the basis of acquisition and research and development expenses, and do not correlate the value of intangible assets with the income they generate. According to IAS 38, most intangible assets are measured according to the cost method: the initial measurement of an acquired intangible asset is the acquisition cost of the asset. For self-produced intangible assets, firstly, the expenses related to the research phase usually need to be directly expensed and not allowed to be capitalized. Costs that qualify for capitalization that enter the development phase can be recorded as intangible assets.

Most companies in the market need to make all R&D investments as expenses. These companies said that the IAS requirements for the recognition of intangible assets are too stringent, making it difficult to capitalize a large number of intangible assets. The uncapitalization of R&D investment will lead to a large disparity between the book value and market value of new economy enterprises, causing confusion for stakeholder groups and acquirers. Ma and Zhang believes that if most of the R&D investment is treated as an expense, it will directly reduce the company's profit in the same period [2]. To improve short-term financial performance, management may take the opportunity to cut R&D spending at the expense of the company's long-term interests.

2. Potential Problems Caused by Current Accounting Valuation Methods for Intangible Assets

2.1. Measurement in the True Fair Value of Intangible Assets

Accurately and timely reflecting the true value of intangible assets is crucial to enhancing the market value of enterprises, helping them in financing, mergers and acquisitions, and obtaining reasonable valuations.

However, due to the strict conditions for capitalization, most R&D expenses are expensed and cannot be shown in the balance sheet, which makes the market value of the company and the asset value on its balance sheet very different. For example, Saunders and Brynjolfsson’s paper reported that American companies hold more than $2.3 trillion in intellectual property assets and invest about $600 billion in such assets each year [3]. Corrado et al. believes that intangible assets in the US economy are almost $4 trillion [4]. Although these total estimates are very impressive, these figures lack relevant data at the corporate financial statement level.

Due to the inherent defects of double-entry bookkeeping: assets are combined as the basis for measuring the financial value-added of enterprises, and assets have no independent value, which makes the concept and classification of assets vague [5]. However, since the definition of intangible assets is broader, covering various types such as patents, trademarks, copyrights, goodwill, customer relationships, etc., this exacerbates the difficulty of evaluating the value of specific intangible assets in actual operations. For intangible assets that have not been capitalized but are crucial to the company's value creation, the balance sheet generally includes them in the goodwill value, lacking detailed disclosure and fair consideration. Therefore, in the process of transferring intangible assets, the determination of prices depends more on the terms of the agreement reached between independent parties in comparable transactions, rather than simply focusing on accounting or legal definitions, which increases the difficulty of the fairness and compliance of subsequent transactions.

2.2. Risk in M&A Transactions

According to the analysis in the previous article, traditional financial statements lack the ability and requirements to evaluate the commercial value of intangible assets, and do not require corporate management and accountants to disclose the current market valuation of intangible assets in financial reports. This article takes HP's acquisition of Autonomy as an example to explain why corporate

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mergers and acquisitions may cause property losses due to miscalculation of the commercial value of intangible assets.

According to Denoncourt's paper, one of the most important reasons for the failure of mergers and acquisitions is that the value of Autonomy's intellectual property and goodwill is far lower than the value that HP's due diligence can confirm [6].

Initially, HP acquired the well-known software engineering company Autonomy in October 2011 in order to enhance its software business in the field of information management and analysis and help customers solve the most difficult IT challenges. In order to gain control of Autonomy, HP paid a total of US$11 billion to acquire 87.3% of Autonomy's shares, including US$4.3 billion in tangible assets and patents, and the remaining US$6.9 billion was generated by "goodwill".

But just one year after the acquisition, HP discovered that Autonomy's performance was far from what HP expected, and speculated that Autonomy had exaggerated the revenue and value of its technology patents. After hiring PricewaterhouseCoopers to conduct a forensic review, HP found that Autonomy had the following accounting irregularities:

First, Autonomy's hardware sales were described as revenue generated by licenses. Autonomy incorrectly characterized low-end hardware sales revenue with negative profits and little or no connection to software content as "IDOL products", and incorrectly included such revenue in organic growth and IDOL growth calculations, as well as using licensing transactions with value-added resellers to improperly accelerate revenue recognition, and even falsify revenue without end customers. The company also revealed that in the two years before the acquisition, Autonomy misreported low-profit hardware sales as software license sales, accounting for 10% to 15% of reported revenue [7].

This financial fraud case caused by the overvaluation of intangible assets has extremely serious consequences. In 2011, HP wrote down the value of Autonomy twice within a year, with a cumulative amount of $17 billion. This impairment directly led to a significant loss in HP's financial statements. HP's shareholders suffered a major blow. The decline in stock prices and the company's market value led to a decline in investor confidence. HP had to repair its financial situation by cutting costs and restructuring its business.

Due to the lack of accounting estimates and records of the market price of intangible assets, managers may not be able to reasonably estimate the brand value, patents, goodwill, etc. of the acquired party during the merger and acquisition process and may misunderstand the potential value and profitability of the target company, thereby making unfavorable acquisition decisions. Overestimation and underestimation of the market value of a company's intangible assets may result in hundreds of millions of unreasonable pricing, leading to serious economic disputes and unfair treatment.

2.3. Financing Capacity of Innovative Technology Companies

For innovative technology companies, companies will invest more money to support their R&D activities. Intellectual property has a high weight in the total assets of these companies, and the value changes of intangible assets have a greater impact on total assets than traditional industries. In existing accounting standards, the method that can replace mandatory amortization is usually impairment testing. However, since the testing process of the impairment test method is very complicated and requires detailed financial forecasts and evaluations, most companies usually choose the amortization method when making impairment estimates. For certain specific patents that do not have an objective service life, the company will also amortize according to the estimated service life. For example, Autonomy limited the service life of patents, licenses and trademarks to 1 to 3 years, or the contract period (whichever is longer) before it was acquired by HP; the service life of purchased technology

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was limited to 3 to 7 years, customer relationships to 3 to 11 years, and brand names to 3 to 10 years [8].

Most respondents believe that mandatory amortization will have an adverse impact on stock prices and reduce their ability to pay dividends [9]. The study on the correlation between the financial index and the value of intangible assets in 2024 by the University of Karachi showed that the value of intangible assets has a strong positive correlation with the net earning per share ratio (EPS) and a similar positive correlation with the return on asset ratio (ROA) [10]. Therefore, we can assume that when intangible assets are amortized as required, EPS, ROA and ROE will decrease.

For EPS and ROE, the changes in these indicators depend on the calculation of net profit. The amortization of intangible assets is directly reflected in the company's income statement, as an expense that will reduce the company's net profit, and EPS and ROE will decrease accordingly.

For the return on assets (ROA), the calculation of this indicator depends on the ratio of net profit to total assets (amortization will reduce both the book value of intangible assets and net profit). According to the actual test results of Fatima Shaheen & Danish Ahmed Siddiqui, the ROA index is basically proportional to the change in the book value of intangible assets. That is to say, when intangible assets are amortized, the ROA index will decrease accordingly.

The decrease in EPS and ROE usually reflects the weakening of the company's profitability. The decrease in EPS affects the weakening of the shareholder's return ability, making investors believe that the company's profit distribution ability has declined and thus reduce investment, resulting in a decline in the company's stock price. Creditors use ROA to evaluate the efficiency of the company's asset utilization and its debt repayment ability. The decline in ROA indicates that the company's asset profitability and efficiency have decreased. Creditors may have doubts about the company's asset management ability and debt repayment ability, and increase the borrowing interest rate or limit the financing amount. In addition, the decline in these ratios may even cause credit rating agencies to downgrade the company's credit rating, which means that the company will have to pay higher interest rates when borrowing in the future, increasing interest costs. A series of chain reactions will set up multiple obstacles for the company's financing.

3. Methods for Dealing with the Lack of Fairness in Intangible Asset Valuation

3.1. Fair Value Measurement Method

In recent years, many scholars and institutions have proposed to measure corporate intangible assets by fair value method, that is, to replace the cost value of intangible assets with fair value as the basis for inclusion in financial statements.

The debate between cost and fair value exists in the initial recognition and subsequent measurement of various intangible assets. However, the initial measurement of internally generated intangible assets and the subsequent measurement of various intangible assets are more controversial.

AASB’s discussion paper provided a basis for the implementation of the fair value measurement method for intangible assets generated internally in R&D [11]. Their survey showed that most respondents believed that the same recognition and measurement principles should be applied to intangible assets, whether they were generated internally or acquired through business combinations, because companies may know their own R&D projects better than those acquired in business combinations and are more likely to give accurate fair value estimates [11].

Theoretically, unifying intangible assets generated internally and externally can indeed make up for the shortcomings of intangible asset commercial value assessment, but the method of self-production and self-valuation by the enterprise is likely to inflate the true value of the assets, lack objectivity and transparency, and bring difficulties to the subsequent audit process. IFRS identified many thorny issues that may arise if a company is required to measure internally generated intangible

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assets at fair value, such as identifiability, separability and units of accounts, the source and reliability of fair value measurement, and which account to record periodic changes in fair value under the double-entry bookkeeping system [12]. Therefore, this paper believes that the fair value measurement method is not applicable under current international accounting standards and market conditions.

3.2. Adjustment and Amortization in the Value of Intangible Assets

The useful life of many intangible assets is often difficult to determine. For example, legally protected intangible assets such as patents and copyrights may have a clear legal protection period, but more intangible assets (such as goodwill or brands) may not have a clear useful life, and some self-produced intangible assets can be used for a long time, but their use value will also change year by year. In this case, the company needs to rely on the judgment of management to determine the amortization period, which is very subjective and uncertain.

Take the solar energy system independently developed by Tesla as an example. This solar energy system belongs to Tesla's core technology and is independently reported in the balance sheet. The valuation in 2023 is 5229 million dollars. Such a high value stems from the leading position of this technology in the global electric vehicle industry, and there are no more alternative products in the market.

According to the financial report of Tesla in 2023, this intangible asset uses the straight-line amortization method, and the amortization period is 35 years [13]. Solar energy technology will have a large technological iteration within 10 to 20 years. According to the news of China Energy News, it is expected that the global technological explosion of the photovoltaic power generation industry will be ushered in in 2025, which will greatly shorten the years of technological replacement. Therefore, Tesla's setting of the amortization period of solar photovoltaic technology at 35 years may be too optimistic, because with the actual market competition and technological progress, future technology may make existing technology obsolete in a relatively short period of time, and new products may be more efficient and cheaper than existing products, which may shorten the economic service life of the technology and lead to a decline in the market value of the original products. Although the company will complete the intangible asset impairment test and corporate restructuring plan as planned within a fixed period, the contraction of amortization expenses within this period will lead to miscalculations of the income and profit of the asset value and will also bring turbulence to the investment market. Therefore, the accounting industry association should require companies to appropriately adjust the amortization method according to the economic benefit model of the assets. Since different types of intangible assets bring different scales of economic benefits, the amortization method should be adjusted according to the specific use and economic benefit model. For example: for intangible assets that bring a lot of income in the early stage, the double declining balance method can be considered, while for intangible assets with stable ability to create economic value, the straight-line method can be used. If the intangible assets are increasingly affected by the market environment, the amortization method should be changed in accordance with regulations. In addition, for intangible assets whose amortization period needs to be changed, the determination of the amortization period should be more flexible. Management should regularly reassess the economic life of intangible assets and dynamically adjust the amortization period. For intangible assets of a single specific technology type, management may consider adjusting the amortization strategy based on changes in revenue.

3.3. In-Depth Disclosure of R&D Projects and Intangible Assets

Compared with replacing the existing intangible asset measurement method with fair value measurement method, it is more prudent and meaningful to improve the transparency of intangible asset-related information in accounting reports.

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Mazzi et al. recommended that accounting standard setters find ways to improve intangible asset narrative reporting and information disclosure (in-depth reporting of R&D project-related information in relevant sections of financial statements or company annual reports) rather than changing the existing intangible asset value measurement method [14].

First, in-depth disclosure of the use of R&D projects and intangible assets reduces internal and external information asymmetry and helps stakeholders have a more comprehensive understanding of the company's future growth potential, R&D strength and operating status. At the same time, this will also help alleviate the long-term problem of mistrust in the value of intangible assets and goodwill caused by insufficient disclosure.

The deep disclosure method provides investors with a basis for assessing risks and making decisions and helps auditors to more effectively verify the authenticity and accuracy of data, thereby improving the credibility of audit reports and reducing audit risks. In addition, it also avoids the workload caused by the introduction of fair value methods. In general, the deep disclosure method is a compromise and reasonable choice.

By measuring the income of intangible assets, the value of intangible assets can be more accurately assessed. The process of improving income measurement can provide reliable data support for the assessment of intangible assets, so that financial statements can better reflect the authenticity of asset value.

4. Conclusion

This study focuses on the impact of the financial reporting standards for the cost method of intangible asset value recognition on economic activities and accounting valuation. By analyzing the research report data, it points out that the cost method valuation cannot measure the true value of intangible assets, and the lack of mandatory disclosure requirements for the commercial value of intangible assets in the standards brings major decision-making risks and acquisition chaos to the investment market. In addition, for technology companies that need economic support but have a large number of independent patents and self-produced intangible assets, the cost treatment of intangible assets will increase their difficulty in profit visualization and financing.

This paper compares the improvement suggestions for intangible asset valuation that are highly sought in the research field: fair value measurement method and deep disclosure method. It is concluded that the fair value measurement method may cause more financial fraud problems by applying market-based pricing methods at the company level. The deep disclosure method helps stakeholders make effective decisions and reduce audit risks by increasing the disclosure of information such as the R&D process and the use of intangible assets. Therefore, the deep disclosure method is more suitable as the basis for the commercial valuation of intangible assets. In addition, on the basis of in-depth disclosure, accounting standards and industry associations should also pay more attention to the amortization expense of intangible assets and encourage enterprises to determine more accurate exploration years and amortization methods based on the specific asset usage and market industry conditions, so as to promote the reasonable measurement of the value of intangible assets and promote the healthy development of the capital market.

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