

Research on Information Disclosure of R&D Expenditure of Listed Companies in Biopharmaceutical Industry: A Case Study of Hualan Biology

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Abstract: Based on the information asymmetry theory and decision usefulness theory, combined with the requirements of China market for enterprise research and development information disclosure, this paper analyzes the current situation of research and development information disclosure of Hualan Bioengineering Co., Ltd., finds out the problems existing in the research and development information disclosure of Hualan Bioengineering, and puts forward corresponding countermeasures and suggestions.

Keywords: Information Disclosure, R&D Expenditure, Hualan Biology.

1. Introduction

1.1. Background and Significance of Topic Selection

Research and development information of biopharmaceutical industry is becoming an important basis for predicting the future development prospects and profit potential of enterprises. Therefore, improving the relevance and accuracy of information disclosure of research and development expenditures is a win-win choice for enterprises and stakeholders: on the one hand, higher-quality research and development information can enable investors and creditors of the company to make more effective and correct expectations of the company's performance and potential; On the other hand, when external stakeholders have more confidence in their own judgment, they are often more willing to contribute, which reduces the financing cost of the enterprise and improves the corporate image and the market price of the shares. Hualan Bioengineering Co., Ltd. is one of the enterprises in the blood products industry in China with high comprehensive utilization rate of plasma, many varieties and complete specifications. The forms and contents of information disclosure of research and development expenditures in Hualan Biological Periodic Report are also constantly changing, but there are still problems such as inadequate disclosure and selective disclosure of research and development contents. Therefore, Hualan Biology is taken as the case object for research and analysis, with a view to improving the quality of information disclosure of its research and development expenditures and deepening the further research on the related contents of information disclosure of research and development expenditures in China.

1.2. Literature Review

Regarding the research on the status quo of information disclosure of research and development expenditures, Gary M. Entwistle investigated the information disclosure of R&D of 113 companies listed on the Toronto Stock Exchange by means of questionnaires and empirical tests. The empirical results found that the proportion of R&D expenses, dual listing and industry had significant impact on the number of R&D disclosures. Yuan Ding, Gary Entwistle and Herve

Stolowy made a comparative analysis of the information disclosure of listed companies in France and Canada. The article found that the R&D information disclosed by Canadian companies is significantly higher than that disclosed by French companies, thus proving that cultural differences and differences in capital markets are the main reasons for the differences in R&D information disclosure between listed companies in the two countries. Xue Yunkui and Wang Zhitai investigated the current situation of R&D information disclosure of listed companies in China and the impact of R&D information disclosure on the usefulness of accounting information of listed companies in China. The research thinks that the serious shortage of R&D information disclosure may be one of the important factors that lead to the decrease of the usefulness of accounting information year by year. When studying the relationship between voluntary disclosure of intangible assets and corporate governance, Huang Xiaohong uses the scoring method to obtain the intangible assets information disclosure index, which includes the disclosure of research and development information. Wang Tongtong found that the disclosure form of research and development information of high-tech enterprises in China is scattered and the content is incomplete; The logical relationship between research and development data is chaotic, and the information disclosed in the annual report does not meet the criteria for identifying high-tech enterprises.

As for the research on the correlation between the information disclosure of R&D expenditures and corporate value, Xin Yunfeng proves through empirical analysis that the information of R&D expenditures disclosed by enterprises has a positive promoting effect on the stock price and the stock return rate. Huang Kun found that research and development expenses have a significant role in promoting the improvement of corporate value, and with the improvement of the disclosure degree of research and development expenses, its impact on corporate value is gradually strengthened. Wang Xinhong found that the R&D intensity of GEM listed companies is significantly positively correlated with the future stock prices disclosed in the annual report. Yao Huijuan found that there is a positive correlation between the corporate market value of high-tech enterprises in China and the disclosure of research and development

information. The more standardized the disclosure of research and development information, the greater the impact on the corporate market value. The impact of voluntary disclosure of research and development information on corporate value is greater than that of non-voluntary disclosure of research and development information. Luo Zhihui found that the disclosure of research and development information by listed companies can effectively improve the usefulness of corporate accounting information to a certain extent, so that investors can accurately predict the future market value of the enterprise, which in turn has a certain degree of promotion effect on the promotion of stock price.

2. Research and Development Expenditure Information Disclosure Theory

2.1. Information Asymmetry Theory

The basic content of information asymmetry theory can be summarized into two points: 1. the distribution of information about a transaction between two parties is asymmetric, i.e. one party has more relevant information than the other; 2. Both parties to the transaction are clear about their relative positions in information possession; This asymmetry in the possession of relevant information leads to "adverse selection" and "moral hazard" before and after the completion of the transaction, which seriously reduces the efficiency of the market operation and may even cause the market transaction to pause in extreme cases. Due to the impact of this information disadvantage, lenders are often unable to make a reliable judgment on the credit quality of borrowers and the probability of repayment of funds. Therefore, when it is impossible to correctly compare the credit quality among many borrowers, it is possible to determine the price they are willing to purchase based on the average quality of all issuing companies. For securities with above-average credit quality, the price is less than its fair market value; For securities with below-average credit quality, the price is higher than their fair market value.

2.2. Decision-making Useful Theory

Decision usefulness refers to the attribute characteristics that accounting information can meet the financial reporting objectives and is used by external users to support investment, credit and other economic decisions, including two basic quality characteristics: relevance and reliability. Correlation includes three secondary quality characteristics: (1) Feedback value: accounting information can help users to further confirm or correct previously expected quality characteristics. (2) Forecast value: the quality characteristic that accounting information can help users to improve the possibility of correctly predicting the results of past or present events of the enterprise. (3) Timeliness: accounting information is available to decision makers before they lose their influence on decisions. Reliability consists of three secondary quality characteristics: (1) Faithfulness of reflection or faithful reflection: refers to the consistency of (accounting) measurement or description with the (economic) phenomenon it is intended to reflect. This is the basis for external users of accounting information to make investment, credit and other economic decisions. (2) Verifiability: to ensure that accounting information can (faithfully) reflect the economic matters it intends to reflect through consensus among the metrologists, or to eliminate errors and prejudices

in the application of the selected measurement method. (3) Neutrality: there is no bias in the reported information, which attempts to obtain a given result or induce a specific behavior pattern.

2.3. Voluntary and Mandatory Disclosure of Research and Development Information

In order to regulate the disclosure of R&D information, the Ministry of Finance issued "Accounting Standard for Enterprises No.6-Intangible Assets" in February 2006, which clearly stipulates the disclosure standard of R&D information of listed companies, and took the lead in implementing it among listed companies from January 1, 2007. The new standard clearly states that enterprises should disclose the amount of research and development expenses included in the current profit or loss and recognized as intangible assets by category of intangible assets in the notes. This is a mandatory information disclosure requirement for R&D under China Accounting Standards. In addition to the mandatory disclosure requirements in the new accounting standards, it is possible for enterprises to disclose more R&D information to meet the needs of users of financial reports. Therefore, after the implementation of the new accounting standards, the disclosure of R&D information in the financial reports of enterprises includes both mandatory information disclosure and voluntary information disclosure.

Under the mandatory disclosure system, although the company has provided sufficient information, the authenticity of the information disclosure is still lacking in varying degrees. In addition to false information disclosure, the following "secondary false" information disclosure phenomena have also occurred: (1) the disclosure lacks information content. Although some information is disclosed, it is mostly general and lacks substance. For example, the disclosure of information about management discussion and analysis, corporate governance and internal control is mostly "form" rather than "substance". (2) Serious manipulative disclosure, including delaying the disclosure of bad news or whitewashing the disclosure wording, etc.

Voluntary information disclosure is the initiative of information disclosure enterprises. Judging from the history of the development of information disclosure, the earliest information disclosure is a kind of voluntary and active behavior. It is a supplementary model to the mandatory information disclosure model. It can make up for the shortage of information under the mandatory disclosure model, and promote the development of information disclosure of listed companies towards perfection and authenticity. It has been gradually valued and recognized by all countries in the world. The corresponding theoretical bases are agency theory, signaling theory and capital market competitiveness theory, all of which focus on the motivation of corporate managers' voluntary disclosure, that is, corporate managers voluntarily disclose relevant accounting information in order to reduce agency costs and attract more funds. When managers have the initiative to disclose information, it is easier to ensure the adequacy and authenticity of information disclosure, so as to achieve the purpose of information disclosure and ensure the healthy development of capital markets.

3. Hualan Biological Case Analysis

3.1. Company Profile

Founded in 1992, Hualan Bioengineering Co., Ltd. is a

national high-tech enterprise and a national innovative pilot enterprise engaged in the research, development, production and sales of blood products, vaccines, recombinant proteins and other biological products. In the field of vaccines, the Company has established a large-scale domestic vaccine industrialization platform and an emergency research and development system, which can respond quickly and effectively to emerging infectious diseases. At present, there are 9 kinds of vaccine products on the market, which is the first tetravalent influenza vaccine enterprise approved for production in China. In 2019, he was selected as one of the top 100 pharmaceutical enterprises in China. Selected as high-tech enterprise in 2020. In 2021, it was selected into the list of Henan Top 100 Enterprises. In 2021, he was selected into the list of innovative leading enterprises in Henan Province in 2021. In 2022, he obtained the qualification of National Enterprise Technology Center.

3.2. Status of Research and Development Information Disclosure

In recent years, people from all walks of life have paid more and more attention to the research and development information. As a leading domestic research and development pharmaceutical enterprise, Hualan Biology's research and development activities attract attention, as well as the disclosure of research and development information. As shown in the following table, the research and development investment and the number of research and development

personnel of Hualan Biological have increased rapidly, with the research and development expenses increasing from ¥154 million in 2018 to ¥316 million in 2022, and the annual research and development investment accounted for more than 4% of the operating revenue and the proportion of research and development personnel remained at more than 20%. The intensity of research and development investment has a strong correlation with enterprise innovation technology and new product development, and the importance of research and development information disclosure also increases. The amount of research and development investment of Hualan Biology increased by more than 100% and the number of research and development personnel increased by 36%, which means that Hualan Biology pays more attention to research and development activities and further improves its research and development and innovation capabilities. As for the capitalization of research and development investment, the capitalization amount and proportion of research and development investment of Hualan Biology decreased year by year, from ¥8,256,055 in 2018 to ¥1,636,905 in 2022, and the proportion of capitalised research and development investment decreased from 5.34% in 2018 to 1.15% in 2022. It can be seen from this that the success rate of research and development projects of Hualan Biological is decreasing year by year. It is impossible for Hualan Biological to predict whether its intangible assets will be profitable or not. The changes in the market will have a certain impact on the future expectations of Hualan Biological.

Table 1. Amount of R&D Investment of Hualan Biology

Age	R&D investment amount (yuan)	R&D investment as a proportion of operating income
2018	154,715,399	4.81%
2019	148,075,620	4.00%
2020	218,750,228	4.35%
2021	256,580,298	5.78%
2022	316,337,540	7.00%

Source: Hualan Biological's Annual Report

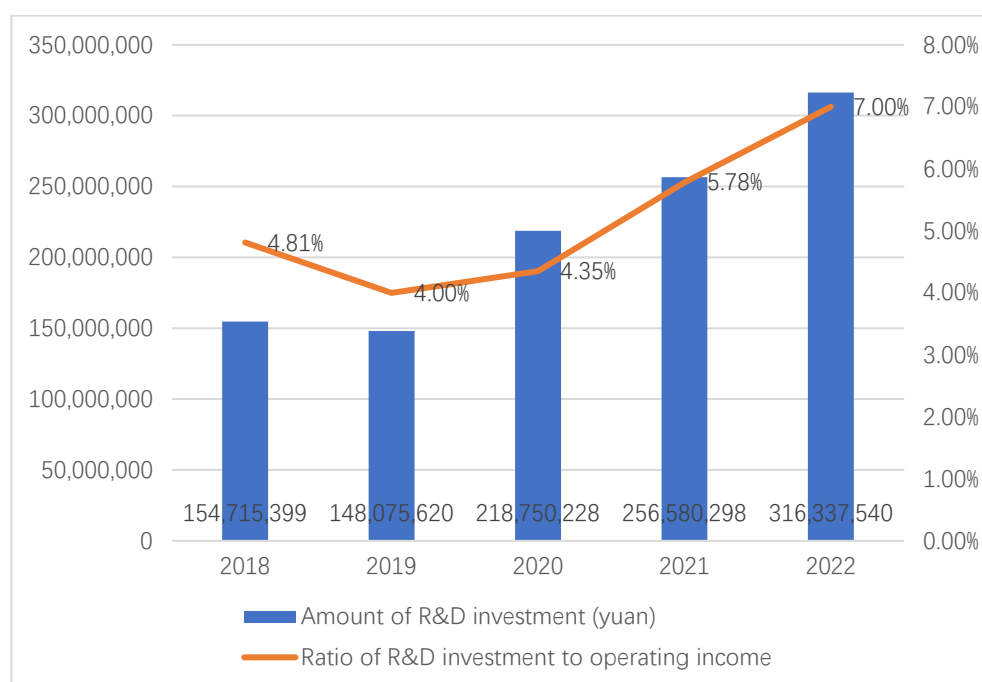
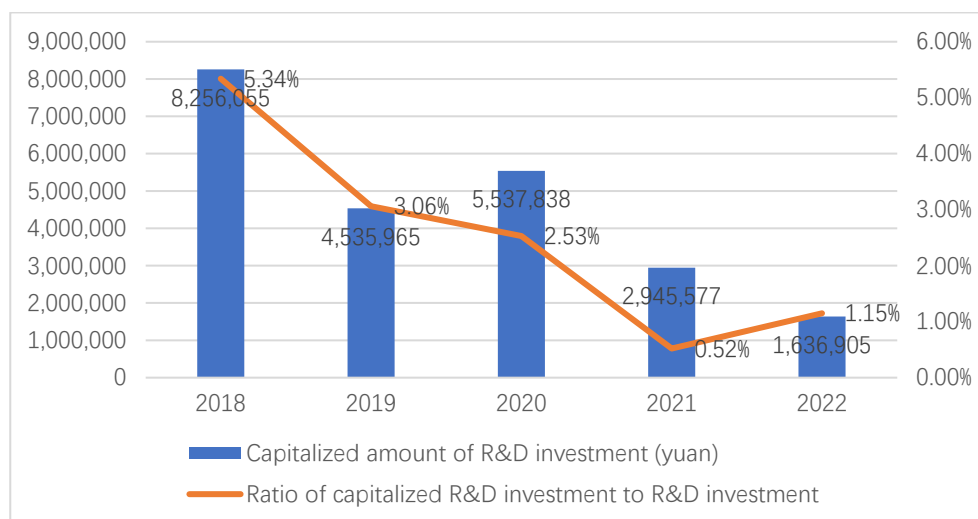


Figure 1. Amount of R&D Investment of Hualan Biology from 2008 to 2022

Table 2. Capitalization of R&D Investment of Hualan Biological from 2018 to 2022

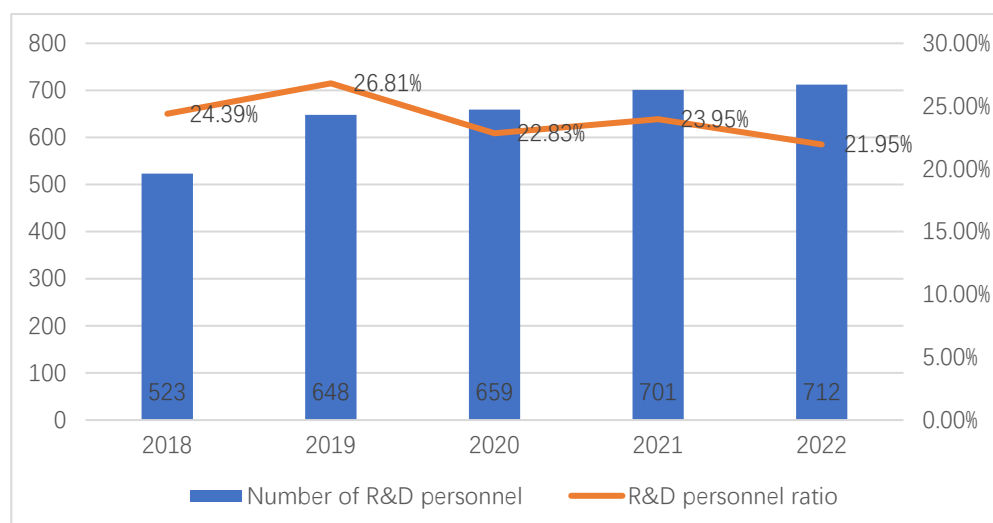
Age	R&D Investment Capitalized Amount (yuan)	Proportion of R&D investment capitalised to research and development investment
2018	8,256,055	5.34%
2019	4,535,965	3.06%
2020	5,537,838	2.53%
2021	2,945,577	0.52%
2022	1,636,905	1.15%

Source: Hualan Biological's Annual Report

**Figure 2. Capitalization of R&D Investment of Hualan Biological from 2018 to 2022****Table 3. R&D Personnel of Hualan Biology**

Age	Number of R&D personnel (person)	Proportion of R&D personnel
2018	523	24.39%
2019	648	26.81%
2020	659	22.83%
2021	701	23.95%
2022	712	21.95%

Source: Hualan Biological's Annual Report

**Figure 3. R&D personnel of Hualan Biological from 2018 to 2022**

In the "Information Disclosure Standards" issued by the CSRC, enterprises are required to publish in their annual reports the management's direction and areas of concern for the future development of the enterprise, stating the strategic plan for the future development of the company, as well as the new businesses to be launched, new products to be developed,

new projects to be invested, etc. Therefore, this paper makes a statistical analysis of the annual report of Hualan Biological from 2018 to 2022 and makes an in-depth analysis of its research and development information disclosure methods. As shown in the following table, Hualan Biological disclosed its research and development expenditure amount, research

and development results, expensed research and development expenditure, the proportion of total research and development expenditure to net assets, the proportion of total research and development expenditure to operating income and future research and development plans in its annual report "Report

of the Board of Directors" and the discussion and analysis on the Company's future development, and disclosed its accounting policy for research and development expenditure in the notes to the statements.

Table 4. Disclosure Methods of Hualan Biological R&D Information

Entry 1	Entry 2	2018	2019	2020	2021	2022
Board report	management discussion and analysis	√	√	√	√	√
	Discussion and Analysis on the Future Development of the Company	√	√	√	√	√
balance sheet	development expenditure	√	√	√	√	√
Notes to the statements		√	√	√	√	√

Source: Hualan Biological's Annual Report

As can be seen from the following table, the length of research and development activities in the annual report published by Hualan Biological from 2018 to 2022 has gradually increased, and the frequency of occurrence in the annual report has increased. At the same time, the disclosure

content of research and development activities has been continuously increased and improved. The number of words and sentences and the number of data in the written narration are increasing year by year.

Table 5. Changes in Information Disclosure of Hualan Biological R&D

Age	Number of words disclosed	Number of disclosure sentences	data bulk
2018	202	1	18
2019	161	0	18
2020	173	0	18
2021	1438	15	36
2022	1573	16	36

Source: Hualan Biological's Annual Report

3.3. Analysis of Disclosure Problems

Research and development information disclosure is not standardized. Due to the lack of uniform standard in the format and content of research and development information disclosure by the CSRC, the research and development information disclosure of Hualan Biological is voluntary, so it has a high degree of arbitrariness. Moreover, there is a fault phenomenon in the information disclosure, the data are discontinuous, and the format and content of the disclosure are also different.

Inadequate disclosure of research and development information. In the accounting standards, the research and development activities of an enterprise are divided into two stages: research and development, and only the research and development expenditures in the development stage are allowed to be capitalised. The research and development information disclosed by Hualan Biology does not separate the use details of research and development investment, nor does it disclose the amount of research and development investment capitalised.

Research and development information is not fully disclosed. The disclosure of research and development information by Hualan Biology is somewhat arbitrary, which results in the lack of government-funded research and development investment, research and development investment for each project, research and development progress of each project, new product revenue information and the impact of research and development activities on the enterprise in the annual report.

4. Conclusions and Related Recommendations

With the increasing competition in the market, strengthening the innovation ability has become an important way for enterprises to stand out, especially for pharmaceutical enterprises with the highest technological demand. Research and development investment is an important indicator of the innovation ability of enterprises, and its position in the development of enterprises is getting higher and higher. Therefore, the disclosure of research and development information in the annual report of enterprises will also receive the attention of the market, thus affecting the development of enterprises. Based on the information asymmetry theory and the decision usefulness theory, this paper analyzes the annual report of Hualan Biological from 2018 to 2022, and finds that there are some problems in the research and development information disclosure of Hualan Biological, such as nonstandard disclosure, inadequate disclosure and incomplete disclosure. Therefore, this paper puts forward the following suggestions: improve the normative system of research and development information disclosure, strengthen the management's understanding of research and development information disclosure, and improve the content of enterprise research and development information disclosure.

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