

Study on the Impact of the Quality of Environmental Accounting Disclosure from a Two-factor Perspective

-- Listed Chemical Companies as an Example

Tianke Gu, Jiawei Yang

School of Management, Northwestern University of Political Science and Law, Xi'an 710063, China

Abstract

To analyze and explore the factors that affect the quality of environmental accounting information disclosure by enterprises, the chemical industry is selected as a sample, and the reasons that affect the quality of environmental accounting information disclosure are explained based on two dimensions: external factors and internal factors. The laws and regulations of government departments are the compulsory force for enterprises to disclose environmental accounting information, and they are also the external motivation for enterprises to implement their behaviors, therefore, among the external factors, the laws and regulations on environmental accounting information disclosure are mainly analyzed. Meanwhile, enterprises make information disclosure based on the perspective of economic profit maximization, so it is believed that there should be a correlation between the financial performance of enterprises and the quality of environmental accounting information disclosure. Through the study, it is found that the quality of environmental accounting information disclosure of listed chemical companies in China is mainly influenced by external factors, and it is proposed to strengthen the synergy and guidance of policies and take into account the expectations and demands of multiple parties. The countermeasures to play the role of participation and promotion of third-party subjects are suggested.

Keywords

Internal and External Factors; Environmental Accounting Information; Disclosure Quality.

1. Introduction

The disclosure of environmental accounting information is an important aspect of environmental accounting, reflecting the fact that, unlike traditional accounting models that focus on the disclosure of economic benefits, most enterprises currently ignore the disclosure of information on their dependence on resources and the impact they have on the ecological environment. High-quality environmental accounting information disclosure can, to a certain extent, solve the information asymmetry problem of relevant stakeholders regarding the green management of enterprises, which can help to enhance the reputation of enterprises in undertaking environmental responsibilities, establish a green corporate image, enhance investors' confidence and thus alleviate the constraints faced by enterprises in the financing process. While high quality environmental accounting information disclosure will bring potential benefits to enterprises, enhanced disclosure will also increase management costs for enterprises. More environmental accounting disclosure may raise the profile of the company, which is beneficial to the company's development, but the higher profile also brings with it

higher demands. In a nutshell, there is uncertainty about the consequences and impact of high quality disclosure of environmental accounting information.

Thus, what exactly are the factors that affect the quality of environmental accounting information disclosure becomes the key to the theoretical discussion and practice. From the published literature so far, different scholars have different views regarding the main causal factors that affect the quality of environmental accounting information disclosed by enterprises. Some scholars have explored the influence of industry attributes on the disclosure of environmental accounting information by enterprises. Pattern (1991)[1] argues that the willingness of firms to make environmental accounting disclosures is higher in industries where environmental attributes are more sensitive. Golden, Hughes & Anderson (2001)[2], on the other hand, argue that firms that cause heavy environmental pollution consequences have a high rate of environmental information disclosure compared to light polluting firms. However, the study by Share & Spicer (1983)[3] concluded that there is no correlation between a company's environmental accounting disclosure and its performance. In addition, there are more studies on factors such as enterprise size and company performance affecting the quality of corporate accounting information disclosure, Steohen Pavehn & Brammer (2008)[4] concluded that the nature of the industry in which the company is located and the scale of the company's development have an impact on environmental information disclosure, and often the quality of environmental information disclosure is better for larger companies. Anbumozhi and LIU (2009) [5] showed that firms in developed regions and firms with good business efficiency are more voluntary in disclosing environmental information. Kong, Long and Zhang, Xianghua (2011)[6] tested CSR disclosure and corporate performance of listed banks in China and the study showed that the relationship was not significant. Zeng Yan (2018)[7] took an empirical analysis to find the following correlations between environmental accounting information, business performance and resource allocation: Firstly, the degree of disclosure of environmental accounting information and the economic performance of the firm are significantly and positively correlated; Secondly, the misallocation behavior of financial resources is significantly and negatively related to the economic performance of firms; Finally, by increasing the disclosure of environmental accounting information, the adverse effects of financial resource misallocation on business performance can be effectively curbed. The results of Luo, E. Y. (2020)[8] show that there is a significant positive relationship between the degree of fiscal incentives and the environmental performance of firms.

There is also a large body of research that demonstrates the influence of government and public pressure on the disclosure of environmental accounting information. In general, the factors affecting the quality of environmental accounting information disclosure can be divided into two aspects according to their sources: external factors and internal factors of enterprises. In other words, the relevant institutional constraints and requirements and public concern are external factors, while the attributes and size of the enterprise are internal factors. However, few studies have been conducted to explore the impact of improving the quality of environmental accounting information disclosure based on a combination of internal and external factors.

China's theoretical research on environmental accounting began in the 1980s and 1990s, resulting in a series of rich research results and the formation of a systematic system of environmental accounting for enterprises in practice. As we all know, in the production process of the chemical industry, the pollutants produced and discharged are generally characterised by a large variety, large quantity and high toxicity. Likewise, a large number of toxic substances can be found in the processing, storage, use and waste disposal of chemical products, which will inevitably pose a great threat to the ecological environment and human life and health. Therefore, it is important to improve the level and quality of disclosure of environmental accounting information related to the chemical industry. This paper explores the factors

affecting the quality of environmental accounting information disclosure, and selects the chemical industry as a sample to explain the differences in the quality of environmental accounting information disclosure through two dimensions: external factors and internal factors, so as to provide a reference for improving the quality of accounting information in the heavily polluting industry.

2. Current Situation of the Quality of Environmental Accounting Information Disclosure in China's Chemical Industry

Nowadays, there is no unified standard for measuring the quality of environmental information disclosure at home and abroad. The literature shows that the main common measurement methods are quantitative scoring method and content analysis method, meanwhile, there are also a series of third-party social rating agencies such as "Runling Global Database" and "Hexun.com Database", which are characterized by These organizations are characterized by their independence and reflect the fulfillment of corporate social responsibility by providing ratings of environmental responsibility reports to society, which has gradually won the recognition of many scholars.

Chemical companies in China often disclose the environmental accounting information of this enterprise by annual reports, independent environmental reports, chairman's reports, prospectuses and generally accepted methods in the mass media, and the disclosed content not only encompasses qualitative information but also contains quantitative information. In this paper, 300 listed chemical companies in China are selected to compile the results of Hexun.com's ratings on the quality of environmental information disclosure from 2015-2019. Among them, Hexun's quality system consists of five categories of indicators: environmental awareness of enterprises, environmental management system certification, amount of environmental protection investment, number of pollution categories and number of energy saving categories. Of the 1489 rating results, 1421 rated zero, and only 68 Hexun.com gave positive scores, which were also low, distributed between 7 and 30, with an average score of 18.6.

3. Analysis of External Factors of the Quality of Environmental Accounting Disclosure

In response to the environmental pollution caused by chemical companies, China has introduced a series of laws and policies, the starting point of which is to curb environmental pollution and hope that companies will take the initiative to prevent, control and manage the environmental problems they cause. For listed companies, disclosure systems and regulations on environmental accounting information are in place, requiring mandatory disclosure of their environmental protection policies, the establishment of environmental protection agencies, the results achieved in relation to environmental protection, and the discharge and disposal of pollutants. As such, this compulsion is mainly derived from the relevant laws and regulations of government departments, which can be referred to as the external motivation for disclosure. This is not only an external motivation for the implementation of environmental accounting disclosure by listed companies, but also one of the most important external influencing factors to enhance the quality of disclosure. Therefore, this paper mainly analyses the laws and regulations on environmental accounting disclosure among the external influencing factors.

3.1. Relevant Laws and Regulations on Environmental Accounting Information Disclosure in China

China realised early on that environmental disclosure was an important way to keep a check on heavy polluting industries, and as early as 1989 it introduced the Environmental Protection

Law, in which various issues relating to people and the environment are set out in detail. It also requires companies to disclose in their prospectuses not only information related to their own development, but also detailed information related to the specific natural resources consumed by the company in the course of its operations. As far as we can see, the regulations involving environmental accounting information disclosure in China include: the Announcement on Corporate Environmental Information Disclosure, the Measures for Environmental Information Disclosure and the Guidelines for Environmental Information Disclosure by Listed Companies, see [Table 1](#).

Table 1. Relevant regulations and systems for disclosure of environmental accounting information in China

Time	Laws and Regulations
1997	"Guidelines on the Content and Format of Information Disclosure for Publicly Traded Companies No. 1"
2002	"Cleaner Production Promotion Law of the People's Republic of China"
2003	"Notice on environmental protection verification for enterprises applying for listing and enterprises applying for refinancing after listing"
2005	"The State Council on the implementation of the scientific concept of development to strengthen environmental protection decision"
2006	"Shenzhen Stock Exchange Guidelines on Social Responsibility of Listed Companies"
2007	"National Environmental Protection "Eleventh Five-Year" Plan"
2008	"Guiding Opinions on Strengthening Supervision and Management of Environmental Protection of Listed Companies"
2010	"Guidelines for Disclosure of Environmental Information by Listed Companies (Draft for Comments)"
2015	"Guidelines on the Content and Format of Information Disclosure by Companies Issuing Public Securities No. 1 - Prospectus"
2017	"Cooperation Agreement on Joint Development of Environmental Information Disclosure for Listed Companies"
2018	"Water Pollution Control Law"
2020	"Hazardous waste identification standards general rules"

The above table provides a more obvious insight into the general history of the development of relevant regulations on environmental accounting information in China. Furthermore, the earlier proposed statement on environmental accounting information disclosure in the Code of Governance for Listed Companies is that enterprises should disclose relevant information upon initial public offering of shares. In 2007, the State promulgated the Eleventh Five-Year Plan for National Environmental Protection, and only one year later the State issued the Guidance on Strengthening Supervision and Administration of Environmental Protection in Listed Companies. In 2010, the State issued the Guidelines on Environmental Information Disclosure for Listed Companies, in which it was recommended that listed companies should disclose timely, accurate and complete environmental information to the public, and should not have any This has optimised and improved the regulatory system for environmental accounting information disclosure. The Law of the People's Republic of China on Environmental Protection, which came into effect in 2002015, made it mandatory for heavily polluting enterprises to disclose their environmental information. 2 017years later, the State Securities Regulatory Commission issued Official Documents No. 17 and 18 of the Securities Regulatory Commission, which clearly required listed companies to disclose their main environmental information in their annual reports. 2 018years later, the Water Pollution Prevention and Control Law was introduced, and the State made new amendments to water pollution discharge, which made the

main responsibility for water pollution discharge clearer. The main responsibility for water pollution discharge was made clearer. In the second 020year, the publication of the "General Rules for the Identification of Hazardous Wastes" again broadened the scope of application of hazardous waste.

3.2. Inadequacies Still Exist in China's Relevant Laws and Regulations on Environmental Accounting Information Disclosure

First, in terms of time, China's environmental accounting information disclosure laws and regulations were introduced late and only began to be promulgated one after another in the late 1990s. Compared to developed countries around the world, the relevant systems and regulations have already entered a stage of convergence and improvement.

Secondly, policies and regulations require disclosure in a manner that is predominantly mandatory, with an appropriate mix of voluntary disclosure and a lack of provisions and regulations to encourage disclosure.

Thirdly, the lack of specific details in the disclosure content required by policies and regulations prevents companies from better grasping the key points and standards of environmental accounting information disclosure, and the accuracy and standardisation of information disclosure is lacking.

Fourthly, lack of involvement of social organisations.

4. Analysis of Internal Factors Affecting the Quality of Environmental Accounting Disclosure

Whether and how an enterprise discloses environmental accounting information is the result of a combination of internal pressure and external regulation. If the mechanism for disclosing environmental accounting information is inadequate, i.e. if external regulation is inadequate, this will prompt companies to disclose information based on an economic profit maximisation perspective. At the same time, as information asymmetry does exist, companies have a clear information advantage about the specifics of their companies internally as opposed to externally. It has been proven that having a high quality environmental responsibility rating helps companies to build a good corporate image in society, increases investor confidence in the company and has a positive impact on the long-term performance and value of the company. Based on the above analysis, this study concludes that there should be a correlation between corporate financial performance and the quality of environmental accounting information disclosure.

4.1. Case Selection

The chemical industry is the basis and backbone of many countries' industries. In the economic composition of each country, it is generally in an extremely important position and accounts for a relatively large proportion. The chemical industry in China can be roughly divided into four categories: one is the chemical raw materials and products manufacturing industry, the second is the chemical fibre manufacturing industry, the third is the petroleum processing, coking and nuclear fuel processing industry, and the fourth is the oil and gas extraction industry. As the chemical industry requires purification and chemical combination in the production process, and chemical products are prone to produce a large number of pollutants in the production, processing, storage and transportation, and they are also highly corrosive and toxic, so the chemical industry is generally defined as a heavy pollution and high emission industry by countries around the world. Based on the data characteristics of the quality of environmental accounting in the chemical industry across the Strait in China, this paper will use a case study

approach to investigate the relationship between corporate financial performance and the quality of environmental accounting information.

In 2011, the US Chemical & Engineering News (C&EN) released the latest edition of the Top 50 Global Chemical Companies list, which ranks participating chemical companies by their main business sales for the 2019 fiscal year. Among them, Sinopec ranked second and is a somewhat representative chemical company.

4.2. Case Brief

Sinopec, known as China Petroleum & Chemical Corporation, is a subsidiary of the China Petroleum & Chemical Corporation, a wholly state-owned company. As one of the largest integrated energy and chemical companies in China, it is mainly engaged in the exploration and development, exploitation, pipeline transportation and sales of oil and natural gas. Sinopec is the largest producer and supplier of petroleum products and major petrochemicals in China, and the second largest producer of crude oil in China.

4.3. Analysis of the Impact of the Financial Performance of the Case Companies on the Disclosure of Environmental Accounting Information

Financial performance is a comprehensive scientific indicator of an enterprise's asset management and economic performance. Commonly used indicators to measure enterprise value include the net profit margin of total assets (ROA) and Tobin's Q value. This indicator refers to the ratio of the market value of an enterprise to its replacement cost. A higher Tobin's Q represents a better financial performance of an enterprise, which can reflect the financial performance of an enterprise well under the premise of a perfect capital market. However, due to the imperfect structure and system of the Chinese capital market, if a market-based indicator such as Tobin's Q is chosen to measure financial performance, it will be influenced by many factors, and the empirical results will not be accurate due to the inclusion of too many uncontrollable factors. In contrast, accounting indicators such as ROA, which are audited and verified by accounting firms, are more comprehensive in reflecting the capital profitability of enterprises, and are therefore more reliable than Tobin's Q in the case of imperfect capital markets, and therefore this paper chooses to measure the financial performance of listed companies in the chemical industry by ROA,, see Figure 1.

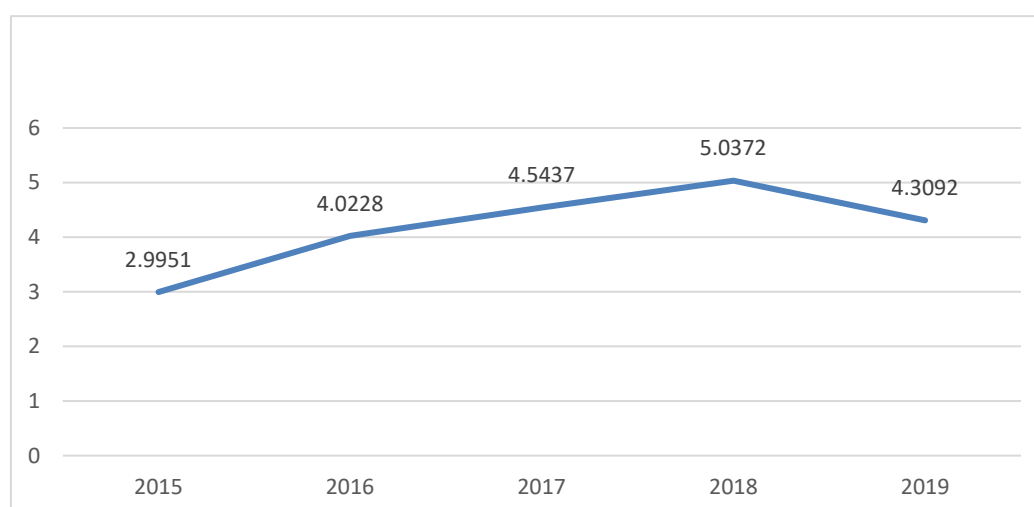


Figure 1. Comparison of financial performance of case companies, 2015-2019

From the above chart, it is clear that Sinopec's net asset margin shows a fluctuating trend. Sinopec discloses environmental accounting information through a special Environmental,

Social and Regulatory Report, mainly in the "Environmental Management" section of this report, which contains relatively little content, including "Basic Information, Resource Use, Cleaner Production". The environmental accounting information disclosed in Sinopec from 2015 to 2019 is basically similar, except for the change of monetary information. Thus, it is not intuitively possible to argue the relationship between the financial performance of enterprises and the quality of environmental accounting disclosure, and to determine whether there is a correlation between the two.

5. Main Research Findings and Countermeasures to Improve the Quality of Environmental Accounting Information Disclosure

This paper attempts to explore the factors influencing the quality of environmental accounting information disclosure and selects the chemical industry as a sample to explain the differences in the quality of environmental accounting information disclosure based on two dimensions: external factors and internal factors. Based on the above analysis, this paper concludes that the quality of environmental accounting information disclosure by listed chemical companies in China is mainly influenced by external factors, and that the quality of environmental accounting information disclosure by enterprises can be further improved through the following measures. First, strengthen the synergy and guidance of policies. The formulation of regulations and policies is an important external pressure on enterprises to disclose environmental accounting information. In collaboration with various departments, we will develop diversified and multi-level approaches, regulations and policies on environmental accounting information disclosure, enrich the content and methods of disclosure, strengthen supervision while guiding enterprises to disclose environmental accounting information and regulate the content of disclosure.

Secondly, it takes into account the expectations and demands of many parties. The internal motivation for enterprises to disclose environmental accounting information is their own need to choose what to disclose based on the principle of profit maximisation. Enterprises and their stakeholders are not only closely linked on an economic level, but also have an increasingly strong influence on each other in terms of society and the ecological environment. Stakeholders provide resources for the development of enterprises, and the disclosure of environmental accounting information is one of the key concerns of their stakeholders, and is a way for them to understand information about the sustainable management of the enterprise.

Thirdly, the participation and promotion role of third-party bodies is brought into play. Third-party bodies in developed countries have actively participated in the process of research, formulation and promotion of environmental accounting, fully demonstrating their active role and playing the role of a bridge between the government and enterprises. Thus, while strengthening the government's promotion, there is a need to increase the active participation of civil organisations and academic groups in the research, formulation and promotion of environmental accounting information for enterprises, and to improve the quality of environmental accounting information disclosure in multiple ways.

References

- [1] Pattern D. Exposure. Legitimacy and Sociel Disclosure [J]. Journal of Accounting And Public Policy. (1991) No. 10, p.291-311.
- [2] Hughes S, Anderson A, Golden S. Corporate Environmental Disclosure: Are They Useful in Determining Environmental Performance?[J]. Journal of Accountings ad Public Policy,(2001) No. 3, p. 217-240.
- [3] SharePB, SpicerH. Market Response to Environmental Information Produce Outside the Firm [J]. The Accounting Review.(1983) No. 18, p.521- 538.

- [4] Stephen Brammer, Steoben Pavelin. Factors Influencing the Quality of Corporate Environmental Disclosure. *Business Strategy and the Environmental*, (2008)No. 17, p.120-136.
- [5] Liu, X. B., Anbumozhi, V..Determinant factors of corporate environmental information disclosure: an empirical study of Chinese listed companies. *Journal of Cleaner Production*, (2009)No. 17, p.593-600.
- [6] Kong Long, Zhang Xianhua. Analysis of the correlation between corporate social responsibility information disclosure and corporate performance a case study of listed companies in the banking industry [J]. *Lanzhou Journal*. (2011)No. 10.
- [7] Zeng Yan. Environmental accounting disclosure, financial resource misallocation and corporate economic performance [J]. *Finance and Accounting Newsletter*, (2018)No. 36, p.60-64.
- [8] Luo E. Y. Fiscal incentives, green technology innovation and corporate environmental performance [J]. *Finance and Accounting Newsletter*, (2020)No. 20, p.46-49.
- [9] A study on the disclosure of environmental accounting information by listed companies [J]. Wang Yan. *Modern Business*. (2020)No. 8.
- [10] Exploring the factors influencing environmental information disclosure - taking listed companies in the building materials industry as an example [J]. Huang Pauline, Zhou Yuping. *Ecological economy*. (2020)No. 8.