Carbon Information Disclosure in The Network Environment

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Abstract. Facing global warming and environmental problems, enterprises should fulfill their environmental responsibilities in protecting the environment, reducing carbon emissions and improving environmental quality. With the development of computer network technology and the promotion of 5G technology, carbon information disclosure has become intuitive and individualized, which will, to a great extent, help enterprises disclose carbon information in a timelier manner. Based on the current situation of carbon information disclosure in the network environment, this paper studies and analyzes the problems with regard to carbon information disclosure in the network environment, so as to better satisfy the diversified demands of carbon information users in the network environment and provide assistance for decision makers.

Keywords: Network environment; Carbon information disclosure; Compulsory; Standard.

1. Introduction

With climate warming attracting global attention, low-carbon green economy has become an important issue concerning the sustainable development of governments and enterprises. An increasing number of investors, intermediaries and governments require enterprises to disclose the greenhouse gas emissions represented by carbon dioxide in their production and operation activities, and strengthen the internal and external supervision and management of enterprises. The carbon information of listed companies includes carbon accounting information in financial statement as well as non-financial data disclosed by enterprises.

According to the corporate social responsibility theory, instead of simply pursuing profits and economic benefits, modern enterprises must also attach importance to social benefits and consciously assume social responsibility. Environmental responsibility is an important part of social responsibility, and carbon information disclosure is the most important reflection of corporate environmental responsibility. Hence, while trying to maximize economic benefits, enterprises should also adhere to ethical corporate behaviors, make rational use of resources, reduce the emission of wastes, truthfully disclose carbon information and assume their environmental responsibility. However, in the current stage, a large proportion of enterprises still regard the disclosure of environmental information as a
burden rather than strive to develop green competitiveness, which goes against the entrepreneurial concept of “ethical management” advocated by the international community.

Listed manufacturing companies shoulder a greater responsibility than other ordinary companies when it comes to environmental responsibility, especially in carbon information disclosure, for the manufacturing industry itself serves as the pillar of national economic development and listed companies are the strong performers in the industry. The scientific development of the Chinese society requires listed manufacturing companies to assume more environmental responsibilities and play a demonstrating role in timely disclosing carbon information in the network environment.

Moreover, in the 5G era, intermediaries, e.g. news media and industry associations, play a more significant role in supervising carbon information disclosure of enterprises. The positive or critical attitudes of intermediaries towards the positive or negative reports on enterprises influence the investors and the public to some extent, thereby affecting the reputation and value of these enterprises.

2. Discussion and Analysis

2.1. Information Security
In the 5G era, due to the rapid development of mobile Internet technology, the Internet has become the primary approach of disclosing financial information. As for information processing and disclosure, the Internet possesses huge strengths such as faster information transmission and higher efficiency of information processing. However, the security risks with regard to technology, governance, supervision and application are increasingly prominent. Not only the new technologies but also the new applications have brought security risks, and poor information control has also led to huge challenges. Especially from an external point of view, once the system is invaded by hackers, the entire network system will be paralyzed, resulting in serious information security problems such as information loss and secret disclosure, which imposes unpredictable threats to the security of enterprises’ carbon information disclosure in the network environment. Besides, all these hidden risks bring great problems to the security of the information system.

2.2. Poor Technical Means
Carbon emission information reveals more about the energy use efficiency and low-carbon management capacity of enterprises. In the 5G era, the level of information networking has been improved rapidly in China. However, private listed companies invest relatively little in technical equipment for carbon information disclosure. Taking the most important infrastructure as the example, there are mainly two problems. First of all, the network support is insufficient, both carbon information disclosure and network coverage are inadequate to support the new type of carbon emission information disclosure system. Secondly, the impartiality of the data sources of carbon information between enterprises and clients remains to be further evaluated without the participation of third-party authorities. The commodity trading and carbon information disclosure of enterprises should be measured by unified international standards or relevant codes. In this regard, China fails to keep up with the world in terms of carbon trading and carbon information disclosure.

2.3. Current Situation of Carbon Information Disclosure
(1) General situation
To effectively deal with climate change, the government and relevant organizations have issued and improved relevant policies and documents. Under such circumstances, listed companies have enhanced the degree of carbon information disclosure. Nevertheless, the carbon information disclosed by many enterprises is mostly written descriptive content without being supported and analyzed by specific and perfect data. In addition, according to the Environmental Information Disclosure Inspection Report of Listed Companies in 2019 released by the media, more than 90% of the 3620 listed companies did not disclose environmental administrative penalties. Although environmental information is currently not required to be disclosed compulsorily, only less than 10% of the listed
companies are capable of disclosing environmental information, indicating a negative attitude of listed companies.

(2) Situation in different industries
The carbon information disclosure of high-emission listed companies features great prudence on the whole, and these companies’ low-carbon awareness remains to be enhanced when the external pressure is small. Compared with high-emission companies, low-emission companies disclose carbon information more actively, but the polarization is rather severe. The reason is that low-emission companies which are less restricted by policies do not need to face great external pressure, and their degree of carbon information disclosure is closely correlated with their own low-carbon awareness, indicating an absence of standardized operation of listed companies.

3. Suggestions
China is not only the largest developing country in the world, but also one of the countries with the largest carbon emission, it is of great urgency for China to fulfill its responsibility of reducing carbon emission. Therefore, listed companies should disclose high-quality carbon information and establish a responsible corporate image.

3.1. Addressing Security Problems in the Network Environment
In the network environment, carbon information disclosure is unable to be carried out without the Internet. The security problems about carbon information disclosure in the network environment can be solved from the following aspects. First of all, confidentiality of information should be further enhanced by setting up firewalls and installing corresponding security software to improve the confidentiality of the network. Secondly, carbon information should be correctly classified and effectively protected. Carbon information includes static data and dynamic data, the former of which refers to the data information stored in the central database or even in the distributed database, and the latter refers to the data information being transmitted. To realize the security of either static or dynamic data, carbon information software ought to be strictly managed. Hence, within the allowable scope of Chinese enterprise accounting standards, we can learn from the advanced XBRL software technology of other countries and develop a new type of XBRL software suitable for Chinese enterprises based on the XBRL classification requirements and currently available XBRL technology in China, so as to meet the requirements of the network environment in the new era.

3.2. Establishing Compulsory and Standard Carbon Information Disclosure
Without corresponding standards and framework for carbon information disclosure, it is difficult to make a fair comparison of the carbon information disclosure levels of listed companies in China, resulting in the inability to obtain the most reasonable analysis. Relevant standards and framework for carbon information disclosures should be established on the basis of ensuring reliability and standardization as soon as possible according to the international general CDP project standards and the practical situation of carbon information disclosure of Chinese listed companies. The basic components of the carbon information disclosure framework should involve accounting (the collection and analysis of emission reduction data and compilation of emission reduction reports), management (the formulation of emission reduction targets, the formulation and implementation of emission reduction plans and the compilation of reports on emission reduction effectiveness) and audit (audit of emission reduction reports, verification of emission reduction quantities and inspection of carbon quota delivery). The three elements are complementary and indispensable. Carbon accounting serves as the basis of management; the provision of reliable management information is realized by carbon audit; management level is one of the direct factors affecting the risk level of carbon audit. The training of professional audit talents should be strengthened to improve the audit quality.

The vice chairman of the China Securities Regulatory Commission (CSRC) said at the 2018 annual meeting of the Green Finance Committee of the China Society for Finance and Banking that the CSRC aims to make all listed companies to disclose environmental information compulsorily by the end of
2020. Environmental information disclosure should not be an environmental governance decision independently made by enterprises. As indicated by the “adverse selection” theory, without corresponding regulations on environmental information disclosure, if some enterprises make their environmental information open to the public while the other enterprises prefer not to disclose their environmental information, those who disclose their environmental information will be discouraged and adverse selection will occur. As a consequence, all enterprises will refuse to disclose their environmental information or disclose false information. In other words, enterprises with “a low disclosure level” will demoralize enterprises with “a high disclosure level”, thereby slowing down the improvement of the overall environmental information disclosure level, so it is of great necessity to conduct compulsory disclosure of environmental information.

3.3. Strengthening the Social Supervision Role of Media Reports

The role of the media cannot be underestimated in the information age. The media’s disclosure and coverage of carbon information will attract the attention of investors, provoke the social trust of the public and lead to the supervision of regulatory authorities. Therefore, under the joint supervision of stakeholders, enterprises often disclose high-quality carbon information to reduce the risks of negative news report, social condemnation and legal punishment, and establish a responsible corporate image. The more frequently a listed company is positively reported by the media in terms of carbon accounting information disclosure, the better the social reputation of this company will be. On the contrary, if there are many negative media reports on carbon accounting information disclosure of a listed company, not only will the social image of this company be damaged, but the support from the public and the government will also be weakened, which will ultimately devalue this listed company.

Table 1 shows the correlation between the positive/negative media reports on carbon information disclosure and enterprise value. As shown in this table, among the explanatory variables, explained variables and control variables, 6 variables are positively correlated with media reports, with only “long-term debt paying ability” being insignificantly related to media reports. This implies that the attitude of media reports plays an important role in the performance of enterprise operation indicators.

| Type of variables | Name of variables | Definition of variables | Correlation |
|-------------------|-------------------|-------------------------|-------------|
| Explanatory variable | Investor confidence index | The weighted average of the principal component factor load of the P/B ratio, the shareholding ratio of institutional investors and the growth rate of operating income | Positive correlation |
| Explained variable | Corporate value | \( \frac{\text{net debt market value} + \text{equity market value}}{\text{total assets at the end of the period}} \) | Positive correlation |
| Control variable | Profitability | Return on equity = net profit/average shareholder equity | Positive correlation |
| Control variable | Long-term debt paying ability | Asset-liability ratio = total liabilities/total assets | Insignificant correlation |
| Control variable | Short-term debt paying ability | Current ratio = current assets/current liabilities | Positive correlation |
| Control variable | Growth | Growth rate of operating income = (operating income of this year-operating income of last year)/operating income of last year | Positive correlation |
| Control variable | Assets utilization | Total asset turnover ratio = main business income/average balance of total assets | Positive correlation |
4. Conclusion
With more and more attention being paid to climate problems such as global warming brought about by rapid economic development all over the world, low-carbon green economy has been recognized. The government should improve the regulations and standards with regard to carbon information disclosure in the network environment without delay, and guide the principal part, content and regulatory mechanism of carbon information disclosure, so as to make enterprises’ carbon information disclosure timelier and standardized.

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