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Research on Enterprise Performance Evaluation System Under Carbon Emissions Constraints*

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Abstract

On the basis of specifications to improve our carbon emissions constraints mechanism, making the appropriate improvements of the traditional performance evaluation index system. Increase carbon constraints performance indicators: the amount of carbon emissions trading, Carbon assets net profit margin, carbon-income ratio, the ratio of carbon costs, carbon assets turnover, unit profit of carbon emissions, CO2 emissions of Yuan output value, in order to fully assess the financial performance and non-financial performance, enable the enterprise performance evaluation system better and more responsive to the requirements of sustainable development, and more convincing.

Keyword : Carbon Emissions Constraints, Enterprise Performance,
Carbon Constraints Performance Indicators, Evaluation System

*This paper complies with the ethical codes set by NRA and AJBC.

1. Introduction

In recent years, energy consumption increased largely and the ecological environment has been deteriorating, especially the sharp increase in carbon dioxide emission, which leads to serious global problem of climate change. Thus, low-carbon revolution is on the rise and the government has also introduced a series of relevant policies to guide and encourage enterprises to give full consideration to relevant factors of carbon emission constraints during the process of pursuing economic interests, so they can have a win-win situation between enterprise economic benefits and social benefits. Chinese government in 2009 formally proposed that in 2020 the unit of GDP of carbon emission would decrease by 40% to 45% compared to 2005, as a binding target to incorporate them into the national economic and social development and long-term planning. In addition, People's Republic of China for National Economic and Social Development Twelfth Five-Year Plan released in March 17, 2011 made a very strict goal: "carbon intensity per unit of GDP would drop by 17%, and energy consumption would decrease by 16%". Enterprise performance evaluation, an important means of evaluating the completion of business goals, is the assessment of business performance, which points out the goals and directions for enterprises' future business development. Therefore, how to add relevant factors constrained carbon emissions into the performance evaluation system, and how to find the balance among economy, environment and social benefit to improve the overall efficiency, are significant for domestic enterprises' sustained and healthy development.

Our carbon tax had not yet been formally established, but in the recent China Reform Forum, John Hassler, one member of Nobel Prize in Economics jury, pointed out the necessity of establishing the carbon tax. Carbon tax will impact the profit of some enterprises in the short term, but in the long run, enterprises will sure to win the profit by taking appropriate measures to reduce the tax burden and the carbon emission. Carbon tax gives enterprises effective incentive, forming a bottom-up energy saving power and joins force with the top-down administrative measures to improve the effectiveness of energy conservation, stimulate industrial restructuring, and promote the transformation of economic development and low carbon economy.

China has launched seven carbon emissions trading pilot, and local legal framework associated with it has preliminary appeared until September 2014. Statistics show that Shenzhen has 635 emission-controlled enterprises, Beijing has about 490, Shanghai has 191, Guangdong has 242, Tianjin has 114, Hubei has 140 or so, and Chongqing has about 240. A total of more than 2,000 enterprises are included in seven pilot areas. To establish a national unity on the basis of carbon emissions trading market has become

predictable. According to the recent data, China's carbon market is progressing well and the achievement is very significant. Cite Shenzhen as an example, when compared with 2010, the carbon intensity of 635 emission-controlled enterprises' million RMB industrial added value fell by 33.5%, achieved the target of decreasing by 21% required in Twelfth Five-Year Plan ahead of schedule. Take Beijing for example, according to preliminary estimate, the overall cost on carbon emissions of key units reduced by an average of about 2.5% through the establishment of a carbon market. After the launch of carbon trading market, the whole society will increase awareness and understanding of carbon market, while the key units will gradually increase the awareness of saving energy and reducing carbon emissions, which will lay a good foundation for further promoting the establishment of a national carbon emissions trading market.

2. Foreign and Domestic Literature Review

All along, not only domestic but also foreign scholars focused on the study of the enterprise performance evaluation. Among them, scholars abroad began earlier and they have almost established relatively complete theoretical study system of the performance evaluation. Stern Stewart, a. consulting firm from USA, first proposed the concept of EVA (economic value added) and then a new method for assessing management performance has been developed. After that , Jeffrey proposed to evaluate business performance by revising the economic value added (REVA) on the basis of EVA, and it involved some aspects such as the enterprises' profitability, operational capacity and solvency(Bacidore et al., 1997); Robert Kaplan, a professor from Harvard Business School and David Norton, the president of the rehabilitation strategy Group, have proposed the concept of balanced scorecard in 1992 .The balanced scorecard could be divided into two categories: financial and non-financial indicators, and it assessed performance of enterprises from four levels such as financial, internal production, customers, learning and growth (Kapłan and Norton, 1992).

Domestic scholars also actively explored methods of the enterprise performance assessment from a variety of different angles. Gao Qianshan put forward the theory of triple performance evaluation from the view of financial performance, social performance, and the performance of ecological considerations. It could be used to evaluate the performance of enterprises comprehensively (Qianshan Gao, 2006); after referring to previous related research papers, Jiang Zhenping and Wang Min established the evaluation system including financial and non-financial aspects. In financial aspects five dimensions, 12 indicators were involved, while in the non-financial aspects three indicators were involved (Jang Zhenping and Wang Min, 2007); Zhang Rui constructed

the performance evaluation index system related to strategic business on the base of the theory of balanced scorecard (Zhang Rui, 2009); Based on a low-carbon economy, Liu Yuan in 2010 built a comprehensive performance evaluation system from five dimensions for small and medium enterprises by using the analytic hierarchy process. The comprehensive performance is target layer, while financial indicators, internal business indicators, customer indicators, learning and growth indicators, as well as low-carbon index belong to criteria layer (Liu Yuan, 2010). Wu Xue, Chen Jin and others in 2012 built a performance evaluation system including three levels and 33 indicators(Wu Xue et al., 2012). Jiang Chenhui and Zhang Shuang established a performance evaluation system including finance, management, social, environment and resource for iron and steel enterprises in 2013(Jiang Chenhui and Zhang Shuang, 2013). Fan Cuiying and Bai Yukun in 2010 established a performance measurement system including carbon-containing fossil energy efficiency indicators, fossil energy consumption and alternative energy use indicators of economic added value under the new low-carbon development mode (Fan Cuiying and Bai Yukun, 2010).

To sum up, experts and scholars home and abroad have invested a lot of energy to study enterprise performance evaluation and achieved fruitful results. However, there are few studies to reflect the carbon constraint in the system and other relevant factors. With the development of society, the constantly change of business environment, especially under the hot environmental issues nowadays, performance evaluation system also needs to keep on improving to meet the requirements of social economics' sustainable and healthy development.

3. Analysis of Domestic Enterprise Performance Evaluation System

The enterprise performance evaluation system based on financial indicators evaluates the business situation by financial indicators. This evaluation method is easy to be accepted and widely used for its available to obtain and clear result. However, such an evaluation system gradually reveals its drawbacks with the development of society. Enterprises are easy to ignore other key factors affecting their development, but simply value the economic profit. Purely financial indicators cannot response business status and development dynamically and comprehensively, and it is harmful for the sustainable and coordinated development. Using the theory of economic added value to evaluate enterprise performance, although considered the increase in profits to reflect the capital value, it cannot give enterprises long-term development because the relevant factors of carbon emission constraints are not included.

Later with the introduction of Balanced Scorecard, it evaluates the business perfor-

mance in four dimensions including finance, internal management, customer, learning and growth, which balanced the financial and non-financial evaluation methods, short-term and long-term benefits, also achieved enterprise strategic goals and operating activities and so on.

Compared to the formers, China's current evaluation system has improved a lot, but there are still many deficiencies. Cite the degree of attention in financial and non-financial indicators as an example; financial indicators are more than non-financial indicators, which counts against to assess the enterprise objectively and scientifically. Emphasizing on short-term evaluation damages the ability of long-term development. There are no fully disclosing information of energy conservation and other measures to reduce pollution, which is not conducive to supervise and restrict the high energy consumption and high-polluting production methods.

Therefore, it is necessary to introduce some related factors about carbon emission constraints and rebuild the enterprise performance evaluation system in order to distribute reduction task easily, assess the work of various department, stimulate the staff's enthusiasm and increase efficiency. At the same time, it needs to continue to rectify according to the actual situation to take social responsibility, respond to the national call and obtain long-term development.

4. Performance Evaluation Index System established under carbon emissions constraints

4.1. Carbon Emissions Constraints

Carbon emissions constraints, including the binding conventions and agreements, carbon emissions accounting standard, energy index system, carbon tax, carbon emissions trading constraints, government subsidies, the relevant legal constraints, as well as the corresponding monitoring mechanisms, and so on. From a qualitative point of view, it includes the binding conventions and agreements, government subsidies, the relevant legal constraints, and the corresponding monitoring mechanisms, etc., from a quantitative point of view, it includes the carbon emissions accounting standard, energy index system, carbon tax, carbon emissions trading constraints. Both from a qualitative and quantitative perspective of carbon emissions constraints require the joint efforts of the state, enterprises and society, in order to achieve real carbon, to ensure sustained and healthy development of the social economy.

The Carbon Tax

Carbon tax refers to the tax levied for carbon dioxide emissions, according to the pro-

portion of the carbon content of taxation to achieve the purpose of reducing carbon dioxide emissions (Liu Chang et al., 2014). Its infancy as a tax tariff environment, using methods from the taxable amount, the tax basis for the taxable amount of carbon dioxide emissions, the tax rate is not lower than the current standard sewage charges. Tax collection and take the form of environmental protection departments with the tax authorities levied, that is environmentally friendly finds, in the form of tax collection levied; then will gradually independent, as a separate tax, and the tax rate appropriate regulations.

Carbon emissions trading

Carbon emissions trading, means that regards carbon dioxide emissions as a commodity, to form a transaction of carbon dioxide emissions rights. Carbon emissions trading can trade the carbon emissions allowances in the local market, and other approved varieties can operate. Carbon trading unit can be an integer multiple of 10 tons or 10, some price volatility for the sub-units, and some 0.1 million.

4.2. Principles of Performance Evaluation Index System Construction under carbon emissions constraints

Operability

The selection of innovative indicators is important for building enterprise performance evaluation system, but the difficulty is high. So far there is no reason why companies generally recognized acceptable performance evaluation system. Because of the lack of innovation, but the blind pursuit of innovative tend to ignore the index system operability. Operability requirements for index selection should take full account of the reliability and difficulty of data acquirement, choosing affective, readily available data.

Financial and non-financial indicators index combines

Traditional indicators evaluating business performance often starting from the financial aspects of your business, so you can more easily access data from corporate financial statements, it is converted into a financial ratio analysis. Financial indicators are the main part of the enterprise performance evaluation, and it's straightforward, easy to accept. However, simple financial indicators have been increasingly unable to meet the needs of performance evaluation. The introduction of stakeholder theory reflects more non-financial indicators, which also reflect the ability of long-term development of enterprises. Non-financial indicators are particularly important in low carbon mode enterprises. Accordingly, the financial indicators and non-financial indicators are indispensable.

The combination of quantitative and qualitative

Quantitative indicators more objective, scientific performance evaluation system should try to select quantitative indicators as evaluation criteria. But in reality, not all evaluation can easily be quantified. Even after a certain treatment methods can be quantified, but there may be subjective intervention, and some also need to invest a lot of resources to be determined, it is difficult to quantify these qualitative indicators selection is also very realistic. However, quantitative indicators cannot cover all the factors affecting business performance, especially not cover factors of enterprises bearing social responsibility. We need a way to supplement the qualitative. Therefore, the combination of quantitative and qualitative indicators, two indicators of correct selection, is to establish a sound system of performance evaluation of key principles.

4.3. Performance Evaluation Index System established under carbon emissions constraints

Financial Indicators

In this paper, financial indicators refer to Enterprise Performance Evaluation operating rules (Amendment), focusing on capital efficiency evaluation of enterprise status, asset status, condition and capacity development solvency status; increase carbon constrained performance indicators, evaluating business status of implementation of carbon reduction.

- Profitability indicators: return on assets, return on equity, return on sales, operating margin, return on net assets;
- Solvency indicators: debt ratio, current ratio, quick ratio, interest coverage ratio;
- Operating capacity indicators: total asset turnover, current asset turnover, accounts receivable turnover ratio;
- Development capacity indicators: revenue growth, operating profit growth, capital preservation and increment rate, capital accumulation rate, total asset growth, technology investment ratio;
- Carbon constrained performance indicators: the amount of carbon emissions trading, Carbon assets net profit margin, carbon-income ratio, the ratio of carbon costs, carbon assets turnover, unit profit of carbon emissions, CO2 emissions of Yuan output value;

Carbon assets: corporate past transactions or projects generated by international or national certification recognized by official institutions, owned or controlled by enterprises with liquidity or value of the property transaction, emission rights can be used to

reduce greenhouse gas emissions or emission credits . Include not only today's assets, including future assets. Includes not only the CDM (Clean Development Mechanism is one of the flexible mechanisms of the "Kyoto Protocol" into the core content is allowed Parties (developed countries) and participants (developing countries) reductions were offset project level transfer and obtain the amount, the implementation of greenhouse gas emission reduction projects in developing countries.), including all the result of the implementation of low-carbon strategies year, arising out of the value chain.

Non-financial indicators

- Social responsibility indicators: social contribution rates, customer satisfaction;
- Environmental responsibility indicators: comprehensive utilization of resources, carbon dioxide emissions per unit of output, investment in environmental protection;
- Cultural responsibility indicators: employee recognition, corporate industry rankings;
- Technological innovation indicators: alternative energy usage, the ratio of low-carbon products, with a total investment of low-carbon technologies.

5. Conclusion

With the requirement of social development of low-carbon economy, enterprise performance evaluation takes the important social responsibility instead of only considering their development, and the importance of enterprise performance evaluation becomes more prominent. This essay considers two quantifiable carbon emissions constraints, the carbon tax and carbon emissions trading right. Through the establishment of enterprise performance evaluation system under the constraint of carbon emissions, it aims to enable enterprises to pursue the smallest carbon emission in the production process, achieve the best efficiency and environmental benefits, establish a good image and maintain a long-term sustainable development in the environment of low-carbon economy by integrating the concept of carbon emission into all aspects of enterprise performance evaluation. This is more suitable to build an enterprise performance evaluation system in low-carbon economy.

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