

Research on the Relationship between Corporate Social Responsibility and Innovation Performance Driven by Double Carbon: Taking China as an Example

Xiaoyi Gao^{1*}, Yan Li², Jiayi Lin³

¹University of New South Wales, Sydney Nsw, Australia

²Sichuan University of Culture and Arts, Mianyang, 621000, Sichuan, China

³Guangdong University of Finance and Economics, Guangzhou, 510320, Guangdong, China

*Corresponding Author

Keywords: Green credit, Corporate social responsibility, Carbon neutral, Innovative performance

Abstract: Performance includes the meaning of both “achievement” and “effect”. When we consider the performance of a company, we should not only focus on the “achievements” of the company, such as the value-added of GDP, annual revenue, operating profit, and capital turnover but also the overall “effects” of the development of the company. Effectiveness is a result that reflects the maturity of the company's management and the actual situation of its operation. The result should be viewed as a whole, not only in terms of wealth gain but also in terms of environmental protection, reduction of energy waste, etc. A sloppy development approach that ignores environmental protection will affect the outcome negatively, offsetting the positive aspects such as wealth growth, and fixing the environment will still cost monetized expenditures. The concept of harmonious coexistence between humans and nature advocated by the dual carbon goal uses economic benefits as an intermediary bridge to guide companies to shoulder their social responsibility. By including environmental factors in the performance assessment, companies will have a more comprehensive comparison of input factors and subsequent gains. Here the accounting of the harvest looks at both the output and the CO₂ emissions, i.e., deducting the loss of negative economic externalities. Corporate performance under a dual carbon goal often sees through the phenomena to find a balance between environmental protection and sustainable development.

1. Introduction

On September 22, 2020, China announced at the 75th session of the United Nations General Assembly that it will strive to peak its carbon dioxide emissions by 2030 and achieve carbon neutrality by 2060.

The achievement of the carbon peak and carbon neutral goals relies both on the replacement of traditional energy sources with new ones and on the initiative of people in countless enterprises. With the introduction of the dual carbon goal, the value of “green water and the green mountain is the silver mountain of gold” has become more popular. The concept of carbon peaking and carbon neutrality advocated by China will enhance the social responsibility of enterprises, as climate change will not only have a certain impact on the current production and life of human beings but also the future living environment. Enterprises are the concrete form of social production of human beings and are located in all corners of society. Companies with a high sense of responsibility not only pursue corporate profits and values but also pay attention to society, employees, shareholders, consumers, and the environment. With the introduction of the dual carbon policy and the improvement of related supporting systems, enterprises can only gradually reduce carbon emissions and take the initiative to carry out technological innovation to gain the favor of the market and win profits.

2. People and Environment

People and the natural environment are in a symbiotic relationship, and people in business also influence the face of the world through their actions. The emission of greenhouse gases such as carbon dioxide in recent years, the climbing of the earth's temperature, and the frequent occurrence of weather such as haze have seriously affected the space for human activities. According to the “China Carbon Dioxide Industry Operation Dynamics and Investment Prospect Assessment Report 2021-2027”, China's carbon dioxide emissions will be 9,893.5 million tons in 2020. And according to the China Listed Companies Carbon Emissions Ranking (2021), the CO₂ emissions of 100 listed companies in China in 2020 are 4,424 million tons, which accounts for about 44.72% of the total CO₂ emissions in China ^[1]. This shows that the key force for China to reach its double carbon target is still the widely distributed social enterprises. In 2020, China's GDP achieves 101.6 trillion RMB and its economy accounts for more than 17% of the global economy ^[2]. Corporate innovation under China's double carbon target will also create a new pattern of green industrial development.

3. Corporate Performance and Social Responsibility

3.1 Scope of Corporate Social Responsibility

Corporate social responsibility includes a responsibility to the country, society, all people, suppliers, and consumers. Under the double carbon target, enterprises can only adopt new technologies, equipment, and processes to continuously reduce energy consumption per unit of product and achieve energy saving and emission reduction. All enterprises in society work together to ensure the improvement of the country's natural ecological environment in general.

3.2 Corporate Profitability and Dual Carbon Targets

Enterprises are profit-oriented units, and if they turn their carbon emissions into carbon credits assets. From the perspective of sustainable business development, enterprises will inevitably save energy and strive to reduce carbon emissions, and sell excess carbon credits for economic profit. No enterprise exists in isolation, and as an individual enterprise focusing on the achievement of the dual carbon goal, it will not only look at the price of the products it purchases but will also pay attention to their quality and environmental friendliness. The cooperation between companies will create a natural incentive to improve the internal environment of the company around the dual carbon goal. For individual companies, it is necessary to extend the control of production costs from within the company to the entire supply chain to gain a lasting competitive advantage.

3.3 The Motivational Effect of Dual Carbon Targets

The cultural orientation and economic model formed by the dual carbon goals motivate companies to innovate. Motivation is the process of creating conditions that meet various needs of employees and motivate them to produce specific behaviour to achieve organizational goals. It includes not only material motivation but also spiritual motivation. Corporate culture includes corporate vision, values, corporate spirit, ethics, code of conduct, etc. The introduction of the dual carbon goal and the implementation of related supporting policies form a macro strategic orientation. Through signal under the guidance of the system, enterprises will adjust their management practices and form a new organizational culture. The behaviour of enterprises to reduce CO₂ also improves the working conditions of employees, and the improvement of the working environment will motivate employees to improve their performance.

4. Corporate Social Responsibility, Innovation and Performance

Corporate social responsibility is the internal driving force for micro-economic entities to promote the dual carbon goal. The state and the public are paying more and more attention to the protection of the environment, and the carbon emission management work is being carried out in an orderly manner by the pilot. The establishment of China's carbon emission trading market, the

balancing effect of forest carbon sink and carbon emission offsetting each other, and the first effect of improving the environment. In the framework of macroeconomic strategy, the development of enterprises is objectively bound to consider the issue of how much carbon emissions. In the past, the development of enterprises pursued more economic profits, and the cost of energy consumption and the environment was greater. Enterprises tend to ignore the management of carbon emissions, resulting in the waste of resources and energy, and excessive CO₂ emissions have a damaging effect on the environment, but the negative economic externalities do not require more social responsibility and economic penalties. The rapid development of urbanization and industrialization in China has come at the cost of environmental degradation. The introduction of the dual carbon goal has become a thrust for companies to innovate their technologies and management processes.

From an economic point of view, the scarcity of goods and resources is a realistic precondition for productive activities, which is not a departure from the protection of the social environment. There are various resource constraints, i.e., various types of development bottlenecks, in the process of their management activities, and companies need to improve their production operations through effective management of these restrictive resources to maximize their benefits^[3]. Only by better protecting the natural environment on which we depend can we use resources more effectively to develop the economy. Driven by the double carbon goal, the management of enterprises will take the national double carbon goal as the strategic goal of their organization in the process of planning, organizing, controlling, and managing through their daily work. To achieve a gradual reduction in carbon emissions, companies will inevitably need to optimize work processes, reduce unnecessary material waste, and innovate technologies in their production, which will both increase their economic performance and serve as a way for their travel agency to take responsibility. Enterprises refine their goals through decision-making and innovation, use new technologies and techniques to reduce energy consumption per unit of output value and reduce the total carbon emissions of the enterprise. Enterprises take up a social responsibility to form a virtuous circle of good reputation, and the more they can stand firm in market share through goodwill and other intangible resources.

Enterprise implementation of social responsibility is conducive to positively motivating corporate performance, and innovation capability and corporate performance also show a significant positive correlation, and the impact of corporate social responsibility and innovation capability on corporate performance has a synergistic effect^[4]. With the whole society actively advocating the concept of double carbon, microscopic corporate subjects can only achieve sustainable corporate development by keeping pace with the times, reducing carbon and increasing efficiency through technological innovation and increasing the proportion of clean energy in their enterprises, etc.

5. Pathways to Achieving the Twin Carbon Goals

5.1 Manage Green Credit

“Green” represents vitality, and as the name implies, “green credit” is the financing to support the green development of enterprises. Only enterprises that adhere to the path of green development can get access to green capital loans and inject funds to help them raise capital. In 2021, China released a new version of the “Green Financial Evaluation Program for Banking Financial Institutions”. The unification of standards regarding green credit requires data sharing among multiple departments, including the Ministry of Environmental Protection, commercial banks, and the Ministry of Industry and Information Technology, to reach a consistent endorsement of green standards. It is not enough to rely on commercial banks alone in the review process of green credit. As the indicators of green standards are formulated by professional management and highly specialized, it is obvious that accreditation by professional talents can better ensure the rigor of the audit work. Although the green credit work is done in commercial banks, it cannot be done without the support of relevant departments and staff.

Green credit also can not only focus on its pre-lending, loan the loan, after the loan to carry out the whole process of tracking and management. In this whole process, the bank and other departments need to communicate with each other promptly to ensure the smooth flow of

information, adjust their strategies promptly, and control and withdraw from the risks found. Both the loan and after the loan can be leveraged by third-party evaluation agencies, but also to the location of the enterprise applying for green credit, to understand the real situation reflected by the relevant stakeholders around.

Green enterprises have no economic externalities, these follow-up efforts are green credit needed to track the feedback. If a company is found to have provided false data, it is punished promptly. In the management of commercial banks that lend green credit, joint and several liabilities can be pursued. Banks can also be held liable if their risk control efforts are not done properly. Starting from the system, banks are prompted to take the initiative to monitor the business behavior of enterprises.

5.2 Carbon Credits

China proposed the construction of a unified national carbon emissions trading market in 2017, and by 2021, the national carbon market will be officially online for trading. Carbon emission rights are the rights that enterprises obtain by law to emit greenhouse gases into the atmosphere to obtain a certain amount of carbon emission credits. Carbon emission allowances are carbon emission credits allocated by the government to key emission units for a specified period and are the credentials and carriers of carbon emission rights. 1 unit of allowance is equivalent to 1 ton of carbon dioxide equivalent.

In 2021, to regulate carbon emissions trading and strengthen the control and management of greenhouse gas emissions, the Interim Regulations on the Management of Carbon Emissions Trading were announced, prompting the transformation of economic development to green and low-carbon. Carbon emission allowances are a breakdown of China's dual carbon targets into metric data that can be measured per unit. Each unit is given a certain initial set of carbon emission rights, which stipulates the upper limit of carbon dioxide emissions for enterprises. The excess carbon credits are treated as an asset that can be freely traded and circulated in the national carbon market. As an asset is expected to generate revenue for the enterprise, the enterprise is necessarily willing to sell as much of its carbon emission rights as possible^[5]. Indirectly, companies are motivated to reduce their CO₂ emissions and reduce the greenhouse effect. The assignment of the initial amount of carbon emission rights is a key point of management, how to determine the initial carbon emissions of each enterprise? It requires collaboration between the Ministry of Environmental Protection, the Ministry of Economy, and the Ministry of Industry and Information Technology to consider several aspects from the perspective of contribution to the economy, energy consumption of environmental resources, and the level of technological processes. Each aspect is given a certain score and weighting to calculate a final reasonable score. The initial value of carbon emissions is then linked to the size of the enterprise, and the initial value of carbon emissions is considered comprehensively, to avoid losing sight of the past situation, such as enterprises that are backward in production technology or waste more resources, but get more carbon emissions. The inequitable initial allocation of carbon emission allowances (as in Table 1) can penalize companies that actively reduce emissions instead, while lacking control over serious polluters [6].

China's carbon emissions trading was officially launched on July 16, 2021, and the product of the trading is carbon emission allowances. The "allowances" are provided by the government, and each unit of allowance allows the holder to emit one ton of greenhouse gases within the total emission volume following the rules. The concern of enterprises for carbon emission rights requires the establishment of a ledger for the calculation of the number of carbon emissions of the enterprise, which is both a responsible act of enterprises to protect the environment and a specific working method to implement the innovative performance of enterprises. The establishment of an enterprise carbon ledger and the accounting of carbon surplus and other quantities can reflect the corporate behavior of enterprises under the double carbon target. Through the effective connection of the carbon emission ledger and enterprise financial system and the incentive of individual behavior of enterprise employees utilizing performance pay, the purpose is to reduce the enterprise's carbon

emission and unit energy consumption, build an environment-friendly enterprise, and work in synchronization with the national double carbon goal.

Table 1 The Trading Product in the National Carbon Emission Trading Market is Carbon Emission Allowances

		Allocation of carbon emission credits			Carbon emissions			Initial space balance of carbon emission credits		
Type	Region	Quantity/ 10 ⁴ t	Percentage/ %	Ranking	Quantity/ 10 ⁴ t	Percentage/ %	Ranking	Quantity/ 10 ⁴ t	Ranking	
Block I 8.92%	Beijing	7.885	5.85	6	0.805	0.60	28	7.080	4	Full surplus
	Sahng hai	4.143	3.07	13	2.612	1.94	22	1.531	9	Moderate surplus
Block II 15.00%	Hebei	3.835	2.84	16	8.747	6.48	3	-4.912	27	Severe deficiency
	Zhejiang	4.050	3.00	14	4.586	3.40	11	-0.535	17	Mild deficiency
	Anhui	4.514	3.35	12	4.544	3.37	12	-0.030	15	Mild deficiency
	Hubei	6.098	4.52	8	4.163	3.09	13	1.935	7	Moderate surplus
	Hunan	1.738	1.29	21	3.995	2.96	15	-2.258	23	Moderate deficiency
Block III 20.63%	Jiangsu	8.765	6.50	5	8.667	6.42	4	0.098	14	Slight surplus
	Shandong	2.819	2.09	18	14.465	10.72	1	-11.646	30	Severe deficiency
	Henan	9.139	6.77	4	6.302	4.67	8	2.837	5	Moderate surplus
	Guangdong	7.109	5.27	7	6.698	4.97	7	0.410	13	Slight surplus
Block IV 6.37%	Tianjin	0.693	0.51	27	1.733	1.28	26	-1.040	19	Moderate deficiency
	Shanxi	0.591	0.44	29	9.118	6.76	2	-8.528	29	Severe deficiency
	Hainan	1.619	1.20	22	0.695	0.52	29	0.924	11	Slight surplus
	Chongqing	1.210	0.90	24	1.614	1.20	27	-0.404	16	Mild deficiency
	Guizhou	0.900	0.67	26	3.106	2.30	17	-2.206	22	Moderate deficiency
	Gansu	1.058	0.78	25	2.172	1.61	25	-1.114	20	Moderate deficiency
	Qinghai	1.476	1.09	23	0.642	0.48	30	0.834	12	Slight surplus
	Ningxia	0.382	0.28	30	2.570	1.90	23	-2.187	21	Moderate deficiency
Xinjiang	0.669	0.50	28	5.641	4.18	9	-4.972	28	Severe deficiency	
Block V 33.69%	Neimenggu	5.838	4.33	9	8.636	6.40	5	-2.798	25	Moderate deficiency
	Heilongjiang	11.704	8.68	3	4.058	3.01	14	7.646	3	Full surplus
	Sichuan	13.694	10.15	2	3.551	2.63	16	10.143	2	Full surplus
	Yunnan	14.209	10.53	1	2.458	1.82	24	11.751	1	Full surplus
Block VI 15.39%	Liaoning	3.008	2.23	17	7.289	5.40	6	-4.280	26	Severe deficiency
	Jilin	3.921	2.91	15	2.650	1.96	21	1.271	10	Moderate surplus
	Fujian	1.994	1.48	20	2.821	2.09	18	-0.827	18	Mild deficiency
	Jiangxi	4.855	3.60	10	2.752	2.04	20	2.103	6	Moderate surplus
	Guangxi	4.515	3.35	11	2.790	2.07	19	1.725	8	Moderate surplus
	Shanxi	2.470	1.83	19	5.020	3.72	10	-2.550	24	Moderate deficiency

5.3 Forest Carbon Sinks Drive Dual Carbon Goals

Forest carbon sink means that forest plants absorb carbon dioxide from the atmosphere and fix it in vegetation or soil, thus reducing the concentration of carbon dioxide in the atmosphere. The forest cover in China varies from place to place, with some places having more forests but relatively slow economic development, and some places having rapid economic development but less forest area. Considering forest carbon sinks in the process of carbon neutralization and carbon peaking links economic development and natural environment protection, and takes a comprehensive view of social development. Forests have various ecological functions such as water and soil conservation, wind and sand control, dust absorption and sterilization, air purification, and temperature regulation, which are important safeguards for maintaining the ecological security of the earth and can effectively reduce the greenhouse effect.

By monetizing the purchase of forest carbon sinks in less economically developed regions, the measurement of the economy is more reasonable after deducting the cost of environmental impact. For less economically developed regions, although they are not directly engaged in production activities, afforestation is also improving the environment and expanding the carbon absorption capacity of ecological space. As early as December 2010, China's first pilot platform for forestry carbon sink trading, the East China Forestry Property Rights Exchange, was established. The first batch of Zhejiang Province 2022 Zhejiang forestry carbon sink project emission reduction development and trading, project development pilot mostly located in the mountainous 26 counties. The contracted representatives of Zhejiang Province purchased a total of 3602 tons of forestry carbon sinks, with a total turnover of 360,187 yuan^[7]. In addition, other regions are also actively exploring the forest carbon sink economy.

5.4 Enterprise Scientific Accounting

Since 2021, the Chinese government has issued the “Energy Efficiency Benchmarking and Benchmarking Levels in Key Areas of High Energy-Consuming Industries (2021 Edition)” and the “Implementation Guide for Energy Saving and Carbon Reduction Transformation and Upgrading in Key Areas of High Energy-Consuming Industries (2022 Edition)”, which provide directions for the dual carbon strategy from a macro perspective. The use of economic instruments, including tiered electricity prices and tax incentives, ensures that carbon peaks and carbon neutrality are achieved on schedule, and improves the energy efficiency of economic operations. Carbon emission statistics and accounting is an important foundation for the work of carbon peaking and carbon neutrality. China in the release of the “Implementation Plan on Accelerating the Establishment of a Unified and Standardized Carbon Emissions Statistics and Accounting System” proposed that by 2025, the carbon emissions statistics and accounting system will be further improved and the accounting system will be unified and standardized. Under the leadership of the Bureau of Statistics, the Environmental Protection Bureau, and other relevant departments, the accounting of enterprises to consider green GDP, and GDP accounting to deduct the amount of carbon dioxide emissions converted to the corresponding negative value. The accounting system is unified and standardized, the accounting caliber is consistent with the accounting system, and the basic emission factors are correctly measured and calculated. The management of carbon emissions is integrated into the supervision and accounting of accounting, and the protection of the environment is promoted from an economic perspective. Improve data quality in all aspects to provide comprehensive, scientific, and reliable data support for the work of carbon neutralization of carbon peaks.

6. Conclusion

In early 2023, China officially submitted the 2022 Report on China's Progress in Implementing the National Autonomous Contribution Target to the UNFCCC Secretariat. The report states that China has achieved new results in controlling greenhouse gas emissions in key areas and that China's carbon emissions intensity (CO₂ emissions per unit of GDP) will be 3.8% lower in 2021 than in 2020, with a significant reduction in coal consumption per unit of GDP. By the end of 2021,

the national forest coverage rate will reach 24.02% and the forest accumulation will reach 19.493 billion cubic meters.

The double carbon target is China's solemn commitment to embody the role of a great power and is the choice of the times to cope with global warming. Through government policies and measures, enterprises are guided to implement various tasks to promote the achievement of the dual carbon target. The work on carbon emission quotas, green credit, monitoring, and accounting needs to be further improved, which will certainly promote the whole society to achieve a new situation of green development.

References

- [1] Fawen Yu, Shan Lin. "Strategies for promoting green transformation development of enterprises under the goal of "double carbon"[J]". Reform, No.336(02):144-155, 2022.
- [2] Information Office of the State Council of the People's Republic of China. China's overall well-off [M]. Beijing: People's Publishing House, 2021.
- [3] Chunxiang Fu, Xiaoai Chen. "Social responsibility fulfillment, R&D intensity and innovation performance of small and medium-sized enterprises - based on resource constraint perspective [J]". Science and Technology Entrepreneurship Monthly, No.35(06):19-25, 2022.
- [4] Xiaojing Wang. "Do corporate social responsibility and innovation capability help promote corporate performance growth? --An empirical analysis based on A-share listed companies[J]". Journal of Hubei College of Economics (Humanities and Social Sciences Edition), No.19(08):52-55, 2022.
- [5] Yuehong Pang. "Research on the transformation and upgrading of China's industrial enterprises under the double carbon target [J]". Economist, No.394(12):50-51, 2021.
- [6] Hao Yang. "Research on the impact of carbon trading on China's enterprise innovation under the goal of "double carbon"[J]". Modern Marketing(Next Issue), No.771(05):8-10, 2022.
- [7] Jiawei Gu. "Research progress on forest carbon sink and carbon sequestration capacity of tree species[J]". Modern Horticulture, No.46(01):26-29, 2023.