



Research on Enterprise Green Governance Mechanism and Role Effect

—Taking Dongfeng Motor Company as an Example

Xueqin Zeng, Jinping Shi

Business School, Hubei University, Wuhan, China

Email: xqz0214@163.com

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Abstract

Environmental pollution has become a major obstacle to China's sustainable economic development. With China's emphasis on environmental protection, new green governance models and new environmental technologies are emerging. In the high-quality development process of strengthening environmental protection and practicing the dual-carbon goal, the importance of green corporate governance and technological innovation has become increasingly prominent. Especially in the current economic diversification, enterprises as an important body of social development in the rapid development of the economy and the number of listed companies increasing year by year, the level of green governance directly promotes the performance of enterprises in economic efficiency, market share and social responsibility. This paper combed through the green governance-related research results, using theoretical analysis and case study methods to analyze the relationship between green governance, technological innovation and financial performance of Dongfeng Motor Company. The study shows that green governance promotes enterprise technological innovation from multiple dimensions, and technological innovation enhances the core competitiveness of the enterprise in terms of production and operation and conceptual culture, which ultimately affects the financial performance of the enterprise.

Subject Areas

Environmental Economics

Keywords

Green Governance, Technological Innovation, Performance

1. Introduction

At the general debate of the seventy-fifth session of the United Nations General Assembly, General Secretary Xi Jinping declared that China's carbon dioxide emissions would strive to peak by 2030 and that it would strive to achieve carbon neutrality by 2060, and that the "dual-carbon" goal demonstrated China's unwavering commitment to a green, low-carbon and high-quality development path. This shows that China attaches great importance to the development of a green economy and has taken a series of measures to mitigate the conflict between the economy and the environment and to promote the green development of enterprises. Green governance, as a new corporate governance concept, not only conforms to the historical development trend but also follows the trend of the times, which is of great significance to the sustainable development of human society and can effectively curb environmental problems from the source. Technological innovation, as an important part of corporate green governance, is largely influenced by the level of corporate governance. On the other hand, how to promote technological innovation to serve green governance so as to improve financial performance while improving environmental performance is also an important issue of corporate governance.

A number of articles have examined green governance, technological innovation and financial performance separately, but there are fewer studies on the relationship between the three. This paper takes Dongfeng Motor, a listed company in China, as a case study object, focuses on the green governance of the enterprise, the mechanism of the impact of corporate technological innovation on financial performance to do an in-depth analysis, and explores the impact of corporate green governance on the financial performance status and the problems encountered in the process of governance, so as to provide a certain reference for the automobile manufacturing industry to improve the green governance capacity and business performance.

2. Literature Review

Green governance has its origins in the green movement in Western countries. The concept of green governance in China has evolved from "building an ecologically civilized society" to "comprehensive, coordinated and sustainable development" and now to "green water and green mountains are golden mountains and silver mountains". Theories are constantly developing and concepts are deepening. Enterprises, as important subjects in green governance, are key actors in the governance process. The impact of the implementation of green governance on the business performance of enterprises is a factor that must be considered to establish a good green governance mechanism. Jiang Guangsheng *et al.* (2021) concluded from an empirical analysis of a sample of A-share listed companies in Shanghai and Shenzhen, China, from 2006 to 2016, that corporate participation in green governance and higher green governance performance can gain the recognition of green investors and increase their shareholdings, and

that although green expenditures are not conducive to corporate operating performance, both green actions and green governance performance can improve corporate operating performance [1]. Yu Liying *et al.* (2021) found that cross-regional synergistic cooperation, complementary advantages, and resource sharing help to enhance overall green governance capacity, improve green governance resource utilization, and achieve synergistic enhancement of green governance efficiency among the four types of cities through the inter-regional flow of input factors [2]. Lopin Kuo (2015) argued that managers should actively disclose green governance signals to avoid information asymmetry resulting in adverse selection, thus further reducing financing costs [3].

In terms of green governance and technological innovation, Song *et al.* (2020) investigated the impact mechanism of environmental regulation and other measures on green product innovation, and found that the impact of environmental regulation on green product innovation is closely related to its intensity [4]. Wang Fengzheng and Chen Fangyuan (2018) empirically analyzed the data of 45 listed companies in China from 2009-2014, and pointed out that board governance has a significant positive promotion effect on corporate green technology innovation [5]. Wu Yi *et al.* (2019) proposed that due to the characteristics of high risk and long duration of technological innovation, managers are reluctant to make innovation decisions out of risk avoidance considerations, while equity incentives can make managers produce a sense of ownership, prompt managers to produce interest convergence effect, and stimulate managers' motivation for corporate innovation and maintaining the sustainable operation ability of the enterprise [6]. Cheng Xinsheng *et al.* (2019) found that the design of the innovation incentive contract for executives must be able to provide sufficient risk compensation to achieve incentive compatibility in order to encourage executives to engage in innovation-related activities for the long-term development of the enterprise [7].

Considering the relationship between green governance, technological innovation and financial performance, Ji Chengjun *et al.* (2021) draw the following conclusions by taking the samples of listed companies in the heavy pollution industry of A-share in Shanghai and Shenzhen as their samples: firstly, environmental performance is negatively correlated with enterprise value; secondly, the level of green technological innovation is positively correlated with environmental performance; and thirdly, green technological innovation will weaken the environmental performance and enterprise value's negative impact of environmental performance and enterprise value, and sends a green signal to stakeholders that the enterprise will operate well and permanently, which will attract more investors, and at the same time, the government will also reduce its intervention [8]. Guo Meng (2021) concluded that technological innovation investment reduces short-term financial performance because it takes up a large amount of capital in the short term, thus bringing greater financial pressure to the enterprise; however, in the long term, it improves the financial performance of the

enterprise due to the inflow of economic benefits from the transformation of innovation results to the enterprise [9]. Yang Huixian and Zhang Weihai (2020) suggested that there is a significant threshold effect on the financial performance of energy enterprises' technological innovation inputs and comprehensive capabilities, while the performance of output capabilities is not significant [10]. Tang (2022) found that ESG performance significantly contributes to the quantity and quality of corporate innovations, and moderates them by alleviating financial constraints and agency costs [11]. Xiuli TAN *et al.* (2021) proposed the existence of an optimal decision space for utilizing green finance loans to implement technological innovation upgrading when there is insufficient funding for technological innovation in environmental governance, which in turn achieves the desired economic objectives [12].

3. Theoretical Analysis

3.1. The Impact of Green Governance on Corporate Technological Innovation

As environmental problems continue to worsen, not only is the healthy life of human beings threatened, additional health costs increase significantly, the quality of life of residents is seriously reduced, and the labor force of production workers declines, but also inhibits foreign investment activities, negatively affects the operational efficiency of the regional economy, and is detrimental to the development of the national economy, all of which have adverse consequences that do not conform to the concept of human-centeredness, and have a certain negative impact on China's economic soundness and development. All the negative consequences are not in line with the concept of people-oriented and have a certain negative impact on the good development of China's economy. With the deepening of people's understanding of the green concept, people are more inclined to buy green products. According to the concept of sustainable development, if enterprises want to achieve long-term development, they must integrate the green concept into all aspects of production and operation, reduce the harm to the environment and the waste of resources, and then make the enterprise green, healthy and sustainable development. Enterprises should consider the impact of their activities on the resources and environment while pursuing business goals, maintain the spirit of innovation, and actively forge ahead to ensure the stability of the production capacity, operational capacity, profitability and development capacity of the enterprise, as well as the courage to assume social responsibility, improve consumer popularity, and win the competition, so that the enterprise can be more stable and sustainable development. Relevant empirical research shows that whether with the progress of technology or because of the reality of the demand pull can prompt the enterprise's technological innovation. Enterprises to implement green governance-related strategies, the need for strong green technology as a guarantee, through green technological innovation, enterprises can reduce business risks, meet people's demand for

green products and high quality of life, and make the enterprise save resources, the rational use of resources, the use of green technology can also be better protection of the environment, reduce pollution, and promote the enterprise green governance strategy into practice, thus Improve the credibility of enterprises, access to more financing opportunities and policy support, enhance the sustained competitiveness of enterprises, so that enterprises continue to grow and have better prospects for development. Therefore, corporate green governance will force enterprises to carry out green technological innovation.

3.2. The impact of Corporate Technological Innovation on Financial Performance

Core competitiveness is the ability of an enterprise to achieve competitive advantage over a longer period of time, and it is the scarce, irreplaceable, and hard-to-imitate technologies, resources, and capabilities held by the enterprise. Technological innovation can improve the production situation of the enterprise, save energy and reduce consumption from the source, reduce the production and management costs of the enterprise, and improve the quality of the product and its position in the commodity market. Therefore, technological innovation can help to improve the sense of identity of customers or consumers for the enterprise, enhance the trust and loyalty of customers or consumers, and ultimately convert into customer or consumer recognition of enterprise products and services, purchase behavior and word-of-mouth dissemination, and enhance the competitiveness of the enterprise. At the same time, in order to enhance the core competitiveness of enterprises, enterprises will continue to strengthen the investment in technological innovation, in order to maintain the market position and image of enterprises. Enterprise technological innovation through process innovation, product innovation, management innovation, cultural innovation and other aspects of innovation-driven development of core competitiveness can improve the competitive advantage of enterprises in all aspects, and thus promote the enhancement of corporate financial performance.

4. Green Governance at Dongfeng Motor Company

4.1. Background of Dongfeng Motor Company

Dongfeng Motor Co., Ltd. was approved by the China Securities Regulatory Commission and listed on the A-share market by way of public offering in 1999. The headquarters of the enterprise is established in Wuhan. The philosophy of the enterprise is to implement the scientific outlook on development and vigorously promote the concept of sustainable development. In addition, Dongfeng Motor is not only one of the world's top 500 enterprises but also one of China's top 4 automobile groups, with a mature production chain in automobile manufacturing. Its main business includes the manufacture of engines, automobile parts, passenger cars and commercial vehicles. Among them, the sales volume of medium and heavy trucks, SUVs and medium-sized buses are among the highest

in China.

Against the background of the national advocacy of dual-carbon policy and green sustainable development mode, DFL resolutely implements the concept of green development, comprehensively presses and realizes the main responsibility of energy conservation and emission reduction, and carries out the “Green Dongfeng 2020” and “Green Dongfeng 2025” actions in three aspects, namely, the creation of green factories, the green supply chain management, and the green product design and development management. “Green Dongfeng 2025” action has been carried out in-depth in three aspects: green factory creation, green supply chain management, and green product design and development management, to build a green manufacturing system, and has achieved excellent results in energy saving and carbon reduction. Compared with 2018, Dongfeng’s comprehensive energy consumption of 10,000 yuan of output value in 2021 decreased by 26.5%, and carbon dioxide emissions of 10,000 yuan of output value decreased by 35.1%.

4.2. Fulfillment of Social Responsibility by Dongfeng Motor Corporation

DFM generally adheres to the attitude of being responsible to society and consumers. In recent years, against the background of the country’s vigorous promotion of the concepts of carbon neutrality and carbon peak, Dongfeng Motor has actively taken on the social responsibility of environmental protection and continued to promote green transformation, investing resources in the research and development and promotion of new energy vehicles. In addition, many subsidiaries of DFM have also started to invest heavily in the treatment of VOCs exhaust gas emissions, in order to fulfill their social responsibility for environmental protection. For example, Dongfeng Nissan released the “Green Manufacturing 2020 Plan”, which puts forward a clear target for the reduction of VOCs emissions. DFM has established the core values of corporate development to improve the environment and conserve resources. The company believes that green transformation to reduce carbon emissions is a social responsibility that enterprises should undertake. Dongfeng Nissan, a subsidiary of Dongfeng, has put forward the environmental protection concept of “Harmony and Unity of People, Vehicles and Environment” since its establishment.

4.3. Green Governance Strategy of Dongfeng Motor Company

4.3.1. Introducing Green Products with New Energy as a Breakthrough

In January 2021, the Ministry of Industry and Information Technology (MIIT) re-emphasized that the development of new energy vehicles is the focus of promoting energy conservation and emission reduction. Adhering to the green and low-carbon technology routes such as electric, hybrid and hydrogen, Dongfeng is speeding up the development of new energy vehicles and plans to realize the electrification of new models of its main passenger car brands by 2024. To consolidate the industrialization and systematization capability of new energy ve-

hicle development, Dongfeng takes the lead in the layout. Located in Wuhan, Dongfeng New Energy Industrial Park has built an operational capacity of 400,000 sets of electronic control, 200,000 sets of flat-wire motors, 280,000 sets of electric drive assemblies, 100,000 sets of battery systems and 300,000 IGBT modules.

4.3.2. Build Cars in an Energy-Efficient and Environmentally Friendly Way and Create Green Factories

The management of Dongfeng Motor has invested a lot of money to optimize the original management system. Green factories and green industrial chains were set up, and new green manufacturing management standards were established. The level of green environmental protection in the production process has been greatly improved. For example, through green research and development, the original production process of light trucks was modified, and the amount of water used in the manufacture of light trucks was reduced by half; through the modification of the painting workshop and the use of oil-to-water spraying process, the emission of exhaust gases was reduced from the source; the original workshop lighting system was modified, and it was replaced with new green workshop lighting equipment, which saves more than 700,000 yuan of electricity costs per year; the original waste heat utilization system was modified, which saves 1,000,000 yuan of steam costs per year. The annual cost of electricity can be saved by more than 700,000 yuan. This has further improved the net profit of Dongfeng Motor.

4.3.3. Deepen Strategic Cooperation and Build a Green Ecology

Dual-carbon, not only accelerates the power revolution of the automobile industry but perhaps is also promoting a reshaping of the automobile industry pattern. In this new change to promote the green development of the automobile industry, Dongfeng is working with transportation, energy, information, finance and other industrial chains and ecosystem enterprises to create a green ecosystem and build a cross-industry green ecosystem. In addition, in 2012, DFM put forward a plan to build “carbon balanced” ecological and economic forests, and planted nearly 10,000 mu of ecological and economic forests in the following year, investing 6 million yuan in succession. The company’s investment in these green projects has offset part of the plant’s carbon emissions. The eco-forest can absorb 500 - 1000 tons of carbon dioxide annually. Dongfeng Motor also set up the “Wuhan Dongfeng Green Incentive Fund for Eliminating Yellow Label Vehicles” in Wuhan to incentivize vehicle owners to take the initiative to eliminate energy-consuming and inefficient vehicles.

4.4. Effectiveness of Green Governance at DFM

The investment in DFM’s green management program has not only yielded good social benefits but has also allowed DFM to further reduce the costs of its production process. In particular, the water content of sludge has been reduced by 50%. This allows the annual cost of sludge treatment and operation and

maintenance fees to be reduced by around 1.5 million RMB. These initiatives also earned DFM the “Best Public Welfare Practice Award of the Year for Listed Companies”. The feedback of these measures in the market was favorable, and more and more investors began to look favorably on the company, and Dongfeng Motor was able to secure more investments in the capital market. According to the half-yearly report released by DFM in 2021, the net profit attributable to shareholders of listed companies amounted to 504 million yuan, an increase of 71.68% year-on-year; the operating income amounted to 8.843 billion yuan, an increase of 36.88% year-on-year; the basic earnings per share amounted to 0.2522 yuan; and the net profit after non-recurring gains and losses attributable to shareholders of listed companies amounted to 488 million yuan, an increase of 43.35% year-on-year. From the financial reports released by Dongfeng Motor in the past five years, the net profit of Dongfeng Motor has been on a clear upward trend, indicating that the green transformation of Dongfeng Motor has been more successful.

In terms of the strategic layout of new energy vehicles, Dongfeng Motor has put forward the “Green 2022 Plan”. The new energy vehicles manufactured by Dongfeng Motor will take green and intelligent as the main R&D points. Dongfeng plans to invest a large amount of money to achieve 100% localization of key components for new energy vehicles within three years. It will also increase the proportion of sales of new energy vehicles to 30%. In recent years, due to the resources invested by the management of Dongfeng Motor in new energy vehicles, the sales volume of new energy vehicles of Dongfeng Motor has also risen sharply. In 2021, the company’s auto sales volume hit a new record high, reaching 182,700 units, an increase of 6.56% year-on-year. Among them, the sales of new energy vehicles realized a sharp rise to 14,442 units, up 100.92% year-on-year. Meanwhile, due to Dongfeng Motor’s greening of its production process in recent years, it has also seen its gross profit margin for new energy vehicles rise year on year.

5. Conclusions and Recommendations

5.1. Conclusions

Using theoretical analysis and case study, this paper investigates the green governance strategy and governance effectiveness of Dongfeng Motor Company based on the green governance concept and technological innovation theory. By analyzing the case study of Dongfeng Motor Company, this paper mainly draws the following conclusions: First, the green governance of Dongfeng Motor Company has a facilitating effect on corporate technological innovation. In the process of practicing the green governance concept, Dongfeng Motor Corporation has significantly increased its environmental protection expenditure and R&D investment. In the case study, DFM’s R&D expenditure indicators have shown a trend of leapfrog growth in recent years, and at the same time, it has actively carried out technological R&D cooperation and exchange activities, which

has improved Dongfeng's green technology reserves. Dongfeng Motor Company has produced good innovation performance by increasing its green governance. In order to reduce unitary energy consumption and treatment costs in the process of governance, the enterprise constantly tries to obtain relevant technology patents and actively promotes the optimization of the production process, which in turn improves the core competitiveness of Dongfeng Motor Company. Second, the green governance of DFM has a positive impact on the financial performance of the enterprise. The concept of green governance is implemented in the enterprise's process innovation and is also reflected in the enterprise's cultural innovation. The cultivation of the emerging green culture of the enterprise is the guarantee for the effectiveness of DFM's green governance actions, and this culture calls on all the staff of the enterprise to practice energy saving and emission reduction and to respond positively to green innovation. DFM's use of green technology as a driving force for corporate production has reduced the cost of production and contributed to the financial performance of the entire enterprise.

5.2. Recommendations

5.2.1. Enterprises: Actively Practicing Green Governance Guidelines

Enterprises should establish green management and green operation mechanisms, further implement green development strategies, keep green values and culture up-to-date, improve internal environmental management systems, and divide environmental protection positions and responsibilities. In the daily operation of the enterprise, it should establish a professional and efficient green division of labor cooperation system, drive the upstream and downstream industries to jointly apply new green technologies, realize the integrated green management mode from "supply-production-sales", improve the overall green management capability of the industry, reduce production costs, and achieve environmental protection and green management. In order to reduce production costs and realize the win-win situation of environmental protection and economy, it is necessary to establish a regular corporate green education system. At the same time, it is necessary to establish a formalized mechanism for green education in enterprises. Green education as part of employee performance evaluation, regularly carries out large-scale green cultural activities, comprehensively improves the level of green culture of employees, and adheres to the implementation of the green development concept.

5.2.2. Government: Improving and Perfecting Relevant Support Policies

The government should establish a green governance regulatory mechanism and play a regulatory function for the industry. On the one hand, the government should increase the intensity of supervision, insufficient supervision of enterprises with excessive emissions will lead to the emergence of the enterprise's fluke mentality, and insufficient punishment of non-compliant enterprises will make enterprises act on their own and repeatedly fail to change; on the other

hand, the scope of supervision should be expanded, the information of the regulated enterprises should be updated in a timely manner, and the regionalization and normalization of supervision of the enterprises' emissions should be carried out in order to promote the transformation of the enterprises to the green enterprises.

The government should also encourage enterprises to invest in innovation and environmental protection. The government should play its guiding role in establishing a cooperation mechanism for R&D and innovation, and encourage cooperation in R&D among different enterprises. At the same time, the government should also provide policy support for innovation and environmental protection in enterprises. For example, it should provide certain tax incentives for enterprises' environmental protection expenditures, subsidize the patents declared by enterprises accordingly, and provide loose policies on financing for enterprises' R&D investment. Through a series of incentives to create a good business environment that encourages innovation and environmental protection.

5.3. Research Limitations

This paper has only done theoretical analysis and case analysis on green governance, technological innovation and financial performance, without empirical research, which lacks a more precise measure. The cases selected are limited, and more samples should be added.

Conflicts of Interest

The authors declare no conflicts of interest.

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