

The impact of environmental economic policies on firm development

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Abstract. Economic development and environmental protection are interdependent and interdependent. While vigorously developing the economy, environmental protection cannot be ignored. Enterprises are the main body to promote economic advancement. Consequently, it is extremely inevitable for policy makers to formulate scientific and reasonable sustainable development policies to drive the green development of enterprises. This paper studies the relationship between corporate green economic development and environmental policy by analyzing the impact of environmental policy on corporate competitiveness and innovation ability, using empirical analysis, data analysis and questionnaire methods. It is crucial to change the approach and improve the level of economic growth in the new economic advancement environment. The conventional approach of calculating economic gross and advancement foreground utilizing GDP and rate of economic growth is no longer appropriate given the present worldwide tendency that favors green and sustainable development. In order to achieve economic growth, it is required to develop accurate assessments of green economic efficiency indices that take into consideration how resource scarcity and environmental deterioration affect economic output. To contribute to China's coming green economic advancement and the execution of environmental legislation, it is thus imperative to thoroughly research the impacts of environmental legislation and green economic efficiency.

Keywords: Green Economy, Environmental Regulation, Enterprise Competitiveness, Enterprise Innovation.

1. Introduction

Environmental issues have emerged as one of the major concerns for people of all walks of life as a result of the steady and fast expansion of China's economy. Although science and technological advancements have greatly increased human substantial riches, they have also led to a number of passive issues, including a lack of resources, environmental destruction, unnatural climatic patterns, and ecological imbalance. The focal point for the green and low-carbon development of businesses is green innovation, which highlights increasing environmental performance. The actuating force behind company eco-friendly renovation is deficient due to its features of high input, high hazard, and dual externalities [1]. The analysis of this article is crucial for understanding how businesses behave in terms of the environment.

China's green economy has been steadily developing since 1980s. The primary drivers of ecofriendly growth in the economy are environmental civilization and social advancement. Economic growth comes second, while innovation-driven development is trailing. Policymakers should thoroughly integrate the spatial-temporal evolution of the sustainable future and its influencing elements in order to establish tailored policies [2]. Policymakers and executants are focusing on the synchronization of economic growth with ecological conservation as a result of the challenge from worldwide environmental deterioration [3]. Businesses are essential to attaining these low-carbon economic goals [4]. Manufacturing enterprises, the mainstay of industrialization, have greatly contributed to the growth of the national economics, but their high energy requirements and consumption significantly impede ecological sustainability. The energy consumption of manufacturing companies represents roughly 90% of all industrial energy depletion, according to the China Industrial Economy Report [5].

Governments of developed and developing nations, numerous international institutions, such as the United Nations, as well as nongovernmental organizations and academic institutions have all been devoted to making the case for “a green economy” or “green growth” as a means of addressing the environmental issues and the economic crisis [6]. The two words are frequently used alternatively to describe a variety of concepts also connected to low-carbon development [7].

The following are the main reasons for writing the essay and its main contributions: in the new condition of economic development, it is essential to alter the method and raise the standard of economic development. Under the current worldwide tendency that supports green and sustainable development, the conventional approach of estimating economic gross and development foreground using GDP and rate of economic advancement is no longer appropriate. It is urgent to create an accurate evaluation of environment-friendly economic efficiency indexes for economic increase achievement by taking into account the effects of resource limitations and environment degradation on economic productivity. As a result, studying the effects of environmental legislation and green economic efficiency is extremely vital for making contributions to China's future green economic advancement and the establishment of environmental legislation.

2. Background

2.1 Policies adopted by the China

In order to help realize the vision of carbon neutrality, this paper has sorted out the relevant policies of my country's active response to climate change in recent years, covering important guiding documents in three aspects: energy structure, carbon trading and green finance and low-carbon technology. Technological development is beginning to become the focus of policy attention. Achieving the "dual carbon" goal requires technological breakthroughs and policies to strengthen support for low-carbon technologies. In 2020, the Chinese government proposed to adhere to the principle of eco-friendly and low-carbon development during the "14th Five-Year Plan" period, and to improve the research and application of eco-friendly and low-carbon technologies. The latest "Opinions" also clearly propose to strengthen the layout of basic research and cutting-edge technologies, and accelerate the research and development and promotion of advanced technologies.

Table.1. Major policies related to carbon reduction. Source: China Government website

Domain	Year	Policy	Key Work
Energy Structure	2017	<a strategy to revolutionize energy production and consumption (2016-2030)>	Clarify the strategic goals of the energy revolution, and promote clean fossil energy and energy consumption revolution
	2021	<On the complete, accurate and comprehensive implementation of the new development concept>	Clarify the specific goals and implementation plans of the "double carbon", and promote energy conservation, pollution reduction and carbon reduction in an orderly manner
	2021	<The peak carbon dioxide emissions action plan by 2030>	Clarify the key tasks of carbon peaking, and solidly promote the carbon peaking action
Carbon trading and green finance	2016	<Guidelines on building a green financial system>	Support the green transformation of my country's economy by developing financial products and services and implementing relevant policy tools, and build a better green financial investment environment
	2017	<The Construction Plan for the National Carbon Emission Trading Market (Power Generation Industry)>	Accelerate the construction of the carbon trading market, expand the scope of the market to cover industries, and enrich the types and methods of trading
Low-carbon technology	2020	<The 14th Five-Year Plan for National Economic and Social Development and the Long-Term Goals of 2035: A Proposal by the CPC Central Committee>	Adhere to the principle of eco-friendly and low-carbon development, and promote the research and advancement of environmental-friendly and low-carbon technologies

2.2 Influence of Environmental Regulation on Enterprise

According to domestic and international academic research: (1) Environmental legislation would negatively affect an enterprise's performance in terms of green innovation. According to Wen et al. [8], executive remuneration has varied retardatory effects on the passive link between government direct environmental regulation (GDER) and anisotropic renovation input, enhancing it while impairing the passive association between GDER and research input. (2) Green innovation achievement of company benefits from environmental legislation. Liao [9] demonstrates that the three aspects of corporation environmental innovation are significantly influenced positively by market and information tools, whereas command and control tools only significantly positively impact ecological organization innovation. The innovation of ecological organization, ecological process and ecological product all have a significant effect in enhancing the prestige of businesses. Ma et al. [10] believe that creating scientific and appropriate environmental policy instruments can have a favorable impact on how well businesses perform in terms of green innovation.

According to GuLei Wang [11], it can draw the conclusion that ecological legislation controlled by requirements has a strong beneficial impact on the ecological achievement of corporate eco-friendly renovation. As a result, environmental regulatory laws that is pushed by the government has a significant impact. Currently, businesses are only marginally impacted by people's active engagement, making government agencies the most significant sources of environmental control. Additionally, government agencies should develop policies in a rational and scientific manner in accordance with the real state of businesses and industries, and develop more market-driven environmental rules. In order to increase participation from businesses and efficiently address environmental issues. It is transparent that environmental regulations requiring voluntary disclosure have a massive influence on how environmentally responsible businesses are able to operate. Since these regulations also encourage the general public to participate actively, we should increase public participation and raise environmental awareness.

3. Impact

3.1 Impact on enterprise competitiveness

Li et al. create a theoretical framework to explain how a company's capacity for green technology innovation affects its ability to compete [12]. Product differentiation serves as the mediating variable in this model while company scale serves as the moderating factor. Their research is on basis of a hierarchical regression analysis of figures from Chinese cataloged companies from 2011 to 2016 about environmental conservation and energy preservation. Their results demonstrate that an firm's capacity for green technological innovation has a substantial beneficial impact on the firm's competitiveness generally, but diverse elements have varying impacts. The connection between a corporation's capacity for green technological innovation and competitiveness is mediated by product differentiation, and the nature of this mediating impact depends on the elements the capacity for green technological renovation. The capacity of an organization to innovate in green technologies and its ability to differentiate its products from competitors are positively correlated.

In general, an enterprise's capacity for green technology renovation has a tremendous beneficial influence on the enterprise's competitiveness. Additionally, it also has a substantial beneficial impact on product differentiation; meanwhile, product differentiation also significantly mediates the link between a company's capacity for green tech innovation and its competitive capacity. This research suggests that enhancing an organization's capacity for green technology innovation has profit potential. A company's ability to satisfy the expectations of its customers for sustainable depletion increases with increased concentration on environmental technological advancement both inputs and outputs, which enhances its comparative strength through product variation.

According to this study, the four aspects of a company's capacity for green technical advancement each have a unique impact on its ability to compete. Similar to this, the way in which product

differentiation mediates the many aspects of a corporation's capacity for green technical advancement tends to vary. The potential of green research and development employees to contribute both directly and indirectly to corporate economic strength through goods variation is one of these factors.

Cui et al. draw the conclusion that "Enterprise competitiveness" has diverse connotations depending on the context. A significant concern in the cyclic economic frame is how to increase firm competitiveness. This paper addressed the connection between cyclic economy and enterprise competitiveness and made suggestions on how to increase a company's competitiveness using this approach. To establish a company's competitiveness within the structure of the sustainable economy, it will be particularly beneficial to invest in environmental research and development, technological innovation and enhancement, pure manufacturing, and ecofriendly management. Additionally, state policies and service assistance are crucial [13].

Entrepreneurs who are driven to take actions that advance the accomplishment of their aims, which often involve enterprise performance, economic expansion, and sustainable development, are necessary for the formation and maintenance of successful enterprise speculations [14-15]. Entrepreneurial incentives, according to Robichaud et al., are the objectives that company owners want to accomplish by operating their companies. Through the activities and behaviors of the businessman, including manufacturing and managerial style, these entrepreneurial motives influence the achievements of the firm [16]. Based on complicated models that help clarify the causation between achievement and these aspects, Baum et al's study on the influence of personal features of entrepreneurs has progressively moved beyond relying on features to concentrate on elements such as competence, incentive and perception. The latest research makes assessments of the effects of entrepreneurial motives on business success based on earlier studies [17-19]. McClelland stated that excellent entrepreneurial behavior must be connected to accomplishment incentive [20]. The findings demonstrate a strong and favorable correlation between accomplishment incentive and business performance. Diverse company performance results may be achieved by combining entrepreneurial objectives, such as accomplishment and commercial prosperity against attainment and socioeconomic goals.

3.2 Impact on enterprise innovation

The move to a sustainable economy has been credited in large part to ecological entrepreneurs. According to O'Neill et al. [21], the interplay between green entrepreneurs' entrepreneurial spirit and environmental issues makes for an intriguing investigation into the liquid and varied nature of statements in the bioeconomy. This is especially pertinent now that the worldwide financial crisis has reignited the debate about how the economy and the ecosystem interact. Numerous studies have demonstrated that it may be difficult to balance commercial and ecological goals, and green entrepreneurs must choose which is more crucial when making decisions. However, based on extensive qualitative research, we provide a more thorough and subtle perspective of these challenges, demonstrating that for green business owners, this is rarely an alternative circumstance. Instead depending on aptotic classifications asserted in past categories, they give a flexible understanding of the growing nature that is how to "be" and "become" a green businessman. There was a comparable narration offered by their interviewees in Table 2, which reflected the many viewpoints of the eco-friendly economy seen in Table 3.

Table.2. Speeches of the green economy-- shaping green entrepreneur's statements

Frequently articulated in policy	↔	Rarely articulated in policy	
Incremental change	↔	Transformative change	
Conventional pro-growth/almost business as usual	Selective growth/greening the economy	Limits to growth/socioeconomic transformation	
Green entrepreneurs' narratives (below) as they relate to discursive framings of the green economy (above)			
It's not about hugging trees	Pragmatism and the impact of the mainstream economy	Compromise and hybridity	Radical transformations-activist entrepreneurs
I had focused on the recycling area as one of the commercial are as that would make the company viable and also deliver solutions in its own little sphere-we cannot all save the planet! I'm using me entrepreneurial skills, which I see as creative skills, not to exploit the planet's resources or other people, but to deliver environmental solutions, but also to run a commercial business on that basis. So commercially successful delivering environmental solutions(GB011-environm ental consultancy). ...there is fantastic opportunity to use environmental issues to help us work our way out of recession ... My prediction is simple it will be the environment that will be the next boom(GB010, environmental consultancy).	[If] a company says "look, I'm really not interested in being green but I'm trying to save money". That's their motivation. I'm not really worried what the motivation is...it's the impact that I'm looking at...and much as I might love everybody to wear sandals and hug a tree...there's very little point in being super eco and bankrupt...So whatever a business has to do, it has to make commercial sense. And I will push the environmental bit very much if it makes commercial sense(GP006, policy). Yeah I do support green issues...it's difficult though because we set out with an intention of making the green issues work for us as I said before with the PV, and the last thing we expected was the government to change the Feed in Tariff so drastically (GB033 green building business).	I'm not the biggest soapbox standing green ...you must do this; you must do that and the other! Um... I appreciate that we need to use these green issues within the business but I don't think we need...I'm not going to start waving the flags about it if you know what I mean?(GB033 green building business). I am very much a believer in sustainability, which is not seeing the environment just for the sake of the environment . But seeing it in the perspective of financial scene and the social scene and the social scene(GB018 Environmental consultancy).	I always felt I wanted somebody to take... my ideas and turn into a business and give me some income so I could then go on to other ideas. You know I felt I wasn't a businessman and I was the design and craftsman you know. And I didn't want to be running a business (GB012, Environmental technology business). We're really not getting down to what life is all about , and that's about quality, people, fresh air, clean food, clean water, space, the flora and fauna, the beauty of the planet we live on. It is just not hitting the agenda at all(GB011-environmental consultancy). It was a really good business model and... that differentiated us actually. In fact that we decided we would kind of quite actually not go and set stuff to people and just basically talking to people as they went through it. So I think people were attracted to the nice people side...(GB028, renewables company).

Table.3. Speeches of the green economy

Frequently articulated in policy Incremental change			Rarely articulated in policy Transformative change
Conventional pro-growth/ almost business as usual	Selective growth/ greening the economy	Limits to growth/ socioeconomic transformation	
● Greening as investment opportunity ● Restarting market economies ● Green Keynesianism ● Job creation	● Resource efficiency ● Low carbon growth ● Decoupling ● Clean technologies ● Ecological modernisation	● Steady-state economy ● Prosperity without growth ● Degrowth ● Social well-being	

Source: Adapted from Bina (2013) and Ferguson (2015).

Gulei Wang used environmental control as the primary research variable and distributed questionnaires. He conducted his research from five perspectives: the severity of environmental criterion, the company's awareness from environmental supervision departments, the company's limitations on product innovation, the cost of wastewater disposal to the company, and the penalties for breaking the rules. Using the research findings as a guide, he came to the conclusion

that environmental legislation led by government has a tremendous impact on the ecological achievement of business technology creation. Government agencies continue to be the most significant sources of environmental control since, at the moment, the effect of people's active engagement on businesses is minimal. Additionally, government agencies should lay down policies in a rational and scientific manner in accordance with the real state of businesses and industries, and they should develop more market-driven environmental rules. In order to increase participation from businesses and efficiently address environmental issues, together with the report's consequence, it is clear that environmental regulations requiring autonomous exposition have a active impact on businesses' efforts to innovate in a sustainable manner. Because these regulations encourage public engagement as well as full involvement by businesses, increasing public engagement and raising awareness of environmental conservat is essential.

In the aftermath of the deceleration in USA economic gain in the late 1970s, "the cost hypothesis" emerged. A set of academics started looking into the variables influencing productivity expansion. Among these, several studies on the effect of environmental agencies on industrial total element productivity and economic increase were conducted. As a result, the development and concentration on environmental legislation has greatly raised the manufacturing costs of businesses and led to a drop in the profits to the companies.

The eleventh Five-Year Plan (FYP) environmental legislation in China is an example of command-and-control regulation (CCR). Tang et al. [18] empirically analyze the effects of CCR on company green renovation achievements and utilize green renovation efficiency as the measure of renovation. In order to analyze 496 industrial businesses in China's Ashare market for the years 2002 to 2017, the Super-SBM DEA model, difference-in-differences (DID), and difference-indifference-in-differences (DDD) methodologies were used. According to the findings, the eleventh Five-Year Plan environmental administration often reduces cash flows, which has a short-term passive impact on company green reformation efficiency. More particularly, the eleventh FYP CCR has a negative impact on region businesses, small and micro businesses, and companies in western and eastern China. Generally, the empirical research recommends that while developing environmental legislation, the administrators should take the impact of CCR into account and concentrate on the company heterogeneity.

China's economy has lately been growing more slowly, and the nation confronts constraints because of its scarce resources and delicate general environment. Although vital, it is inadequate for investigators and decision-makers to limit their attention to CCR's impacts from an environmental standpoint. Innovation capacity is directly tied to China's prolonged economic growth. As a consequence, relevant academics and decision-makers should take into account the influence of CCR on firm innovation performance so as to improve the environmental quality while increasing the economic achievements. They examine 496 businesses in China's A-share market for the years 2002 to 2017 in order to reduce the blank in previous research by determining the influence of CCR on company implementation of sustainable performance. To assess corporate green reformation efficiency, a synthetic index evaluating green reformation capability, the Super-Slack-Based Measure Data Envelopment Analysis (Super-SBM DEA) model is used. They investigate whether CCR has had an impact on the effectiveness of business green innovation using the difference-in-differences (DID) and difference-in-difference-in-differences (DDD) approaches. Following that, they then do some conservatism research and heterogeneity tests, finding that, the eleventh FYP CCR short-term reduction in cash flows often has a destructive effect on company eco-friendly reformation efficacy. In conclusion, empirical research recommends that when formulating relevant policies, the administrators should take the impact of CCR on the economy into account and establish appropriate objectives for each period. The corresponding application of CCR and MIR may assure the influential decrease of contaminations and lower the associated societal expense of environmental legislation, taking into account the possible adverse effect of CCR on firm innovation. The research also implies that while formulating environmental laws, decision-makers should take

company heterogeneity into consideration. The regulator might create adaptable, focused, and flexible policies for businesses with various sizes, properties and situations.

3.3 Policy advice

Reflect the distinctions and increase the severity of policy execution. From a regional standpoint, it is essential to improve the implementation of environmental laws, do away with the heedless drive of GDP, and seek its lifelong duty for environmental protection harm. Simultaneously, it is important to consider regional variations in how environmental rules affect the effectiveness of the bioeconomy, to reflect regional variations, and to implement more specific motivation and constraints for various regions on the presumption of adhering to consolidated environmental criteria. Make environmental legislation implementable rather than avoiding it.

Offer environmental legislation your complete attention. Environmental regulatory requirements' beneficial effects on economic efficiency must also take into account the scripted nature of financial advancement, capitalize on the beneficial externalities produced by regional financial benefits, fully utilize the benefits of local capabilities, technologies, and investment, and strongly encourage the industry. Similar to this, rationalizing and modernizing the configuration encourages an increase in the environmental economy's effectiveness.

4. Conclusions

To sum up, environmental legislation has both positive and negative effects on the green renovation performance of corporates. Therefore, the formulation of rational and scientific environmental policies is crucial to the innovation and sustainable development of enterprises. Among them, high-polluting industries should carry out green technology renovation and reduce carbon emissions and pollutant emissions. The government formulating reasonable support policies can better promote the eco-friendly technology renovation of corporates. Meanwhile, environmental legislation promoted by the government is also conducive to environmental protection. In addition, the interaction between green entrepreneurship and environmental issues is well worth studying. Excellent entrepreneurial behavior is closely related to achievement. Scientific policies suitable for enterprise development also have a positive impact on entrepreneurs and contribute to their green economic decisions.

In general, environmental regulation and enterprise development influence each other and promote each other. Scientific and rational environmental policies can facilitate the advancement of corporates, and meanwhile, the development of enterprises promotes the emergence of new environmental policies. This virtuous circle can not only promote the further implementation of environmental protection, but also boost the growth of green economy and achieve a win-win situation.

Some points of future outlook are also discussed below:

Make use of more scientific techniques to more precisely compute the sustainable economy and gauge how closely the environment and the economy are synchronized. There is less study on quantitative analysis of sustainable economic productivity since China's work on integrated growth of the sustainable economy is still in its infancy. Future research may be done to determine whether industrialized nations have a strong green finance sector, building a more rigorous framework for evaluating green economies and analyzing their efficacy.

(2) Make the variable indexes used to gauge the effectiveness of the green economy better. The choice of the undesirable actual output for the input variables used to measure environmental effectiveness can be more varied. The better input and output are chosen contrasted to the efficiency blank measurement.

(3) The field of research can be narrowed down for the analysis of environmental legislation and sustainable economic efficiency mechanisms. To do a thorough investigation of a certain sort of business, examine the main workings of the items the firm produces, and provide specific recommendations for the business.

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