The Impact of Green Finance on Haze Management

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Keywords: Green Financial System, Green Financial Products, Haze Management.

Abstract. The traditional financial development model is difficult to alleviate the increasingly prominent problem of haze in China, so it’s of great urgent to develop green finance to promote haze management. On the basis of combing the previous studies, this paper explores the internal mechanism of the impact of green finance on haze management, and puts forward the effective path of green finance to promote haze management, which aims to provide effective guidance for theorists and decision makers.

The Inherent Mechanism of the Impact of Green Finance on Haze Management

In recent years, under the impetus of our government, China's green finance practice has made great achievements. The impact of green finance on the haze management mechanism can be shown by green bonds, green credit and carbon market. The roles of green financial instruments on the management of the haze path can be shown as follows:

Green Bonds

Green Bonds is a special financing for green industry projects with low risk, low cost, high liquidity. It can provide effective financing channels for medium and long-term green projects, as well as provide new channels for investors to participate in green investment. According to the "Green Bond Support Project Catalog" issued by the People's Bank of China in December 2015, industrial projects that meet the conditions of green bond financing contain the six primary classification, namely energy conservation, pollution control, resource conservation and recycling, clean transportation, clean energy, ecological protection and adaptation to climate change. Therefore, the green bonds are mainly through the classification of six paths to provide financial assistance for the haze governance. The “green” funds raised in the directory of ecological protection and adaptation climate change are mainly put in green projects to protect the environment and prevent environmental damage from the perspective of regional coordination to improve the air quality. Energy conservation and resource conservation and recycling projects under the “green” funds, respectively, are through the support of energy-saving technologies and resource recycling technology to improve the production and efficiency of the usage of energy in people’s living, which is to solve the haze problem from the source of emissions. There are several mechanisms of the impact of “green” funds on the haze management under the primary classification can be shown as follow: from the perspective of the source of emission of the haze, part of the funds of pollution prevention and control is through the support to construction and operation of pollutant treatment facilities to achieve emission reduction effect, governing haze from the source of emission; part of the funds of the environmental rehabilitation project is through the support to repair and improve the environmental carrying capacity of the project construction, governing haze from the perspective of regional coordination; part of the funds of coal Clean Utilization is through the support to coal energy upgrade devices and facilities applications, governing haze from the perspective of energy structure. The mechanism of the impact of "green" funds on the haze management under the primary classification can be shown as follow: from the perspective of the source of emission of the haze, part of the funds of the traffic construction is through the support to public transport facilities, construction and operation to achieve the effect of reducing emissions of traffic pollutants; part of the funds of clean fuel is through the support to oil upgrade, as well as part of the funds of new
energy vehicles through the support to auto energy consumption structure upgrade project, together controlling the haze from the perspective of energy structure; part of the funds of clean energy is mainly through the support to the sun, wind, water, ocean, geothermal energy and other renewable energy projects to expand the proportion of clean energy production in total energy production, governing haze from the perspective of energy structure and improving environmental benefits.

**Green Credit**

Green credit refers that banks are based on environmental improvement to grant loans dedicated to green projects. Green projects are mainly divided into two parts, energy saving and environmental protection projects and strategic emerging industries. Energy saving and environmental protection projects include green agriculture (forestry) development projects, industrial energy saving and environmental protection projects, nature conservation, ecological restoration and disaster prevention and control projects, resource recycling projects, waste disposal and pollution control projects, renewable resources and clean energy projects, rural and urban water projects, building energy saving and green building, green transportation projects, energy conservation and environmental protection services, international projects using international practice or international standards. Strategic emerging industries mainly includes energy saving and environmental protection projects, new energy and new energy vehicles. In energy conservation and environmental protection projects, nature conservation, ecological restoration and disaster prevention and control projects improve the environmental carrying capacity and achieve regional coordination of governance haze; garbage disposal and pollution prevention and control can reduce pollutant emission by means of the domestic waste disposal project and repair environmental carrying capacity by means of environmental management projects to achieve the effect of haze treatment; the green transport project reduces emissions and controls haze by means of the public transport of the "green" construction and transformation support; industrial energy-saving and water-saving environmental protection projects achieve energy efficiency improvement by means of energy-saving, water-saving facilities and achieve emission reduction by means of the reduction of the construction of pollutant discharge facilities to support haze governance; rural and urban water projects, building energy saving and green building, resource recycling projects are on the emission side to reduce the occurrence of haze by means of improving use efficiency of resources and energy; renewable resources and clean energy projects adjust energy structure by means of providing financial support for clean energy-related and renewable energy projects, such as the solar, wind, water, geothermal and other renewable energy and natural gas, and improve energy efficiency through financing support for smart grid projects, which can improve the environmental benefits and manage haze; the development project of green agriculture (forestry) industry quits the production mode that use pesticides or fertilizers causing environmental pollution so that it can achieve ecological balance by a series of sustainable agricultural (forest) industry technology and environmental protection under the green economic growth model, which can eliminate haze from the root; energy conservation and environmental protection services is not only beneficial to the adjustment of industrial structure, but also helpful to the smooth implementation of other haze management approach by means of the development of environmental technology services of the tertiary industry. Strategic emerging industries transform and upgrade China's industries, and afforest China's industrial structure mainly by means of the cultivation of environmental protection and energy conservation industries, new energy, new energy automotive enterprises.

**Carbon Market**

The carbon market is market-oriented environmental governance practice. The carbon market is a financial incentive mechanism under the constraint of constructing environmental carrying capacity, which can get instant results in haze management. At present, in China's carbon market carbon financial instruments are mainly divided into primary carbon financial products and derivative carbon financial products. Primary carbon finance products have carbon quotas and certified voluntary emission reductions. The carbon quota refers to the distribution of the initial carbon quota to the enterprise through the relevant government sector, which is the main subject matter of the
transaction in the current carbon quota trading market. Certification of voluntary emission reductions, that is Chinese Certified Emission Reductions (CCER), is to achieve the goal of greenhouse gas emission reductions by upgrading of relevant technologies. CCER can be used as a clearing quota to carry out the contract and offset part of the actual enterprise emissions. Thus it has the value of market transactions. From the current point of view, CCER transactions are still far less than carbon quota transactions. Derivative carbon finance products include carbon futures, carbon options, carbon swaps. The main purpose of developing derivative carbon finance products is to hedge, discover price and reduce transaction costs. Carbon market includes the original carbon financial products and derivative carbon financial products. The original carbon financial products in the carbon market are the main financial instruments to support the haze governance. The government implements carbon quota management for polluting enterprises on the basis of the strength of the environment self-purification ability in the region, establishing environmental constraints under the green economic model. The main function of derivative carbon financial products is to reduce the transaction cost of the original carbon finance products, to hedge the original carbon financial products and reasonably set a price. To some extent, derivative carbon financial products also play a speculative role. The main tools for the haze control of the carbon market are carbon quotas and CCER. Carbon quota is initially allocated by the government under the constraint of environmental carrying capacity, internalizing the externalities of pollution, forcing enterprises to improve energy efficiency, so that it can reduce pollution emissions, adjust the enterprise's own energy consumption structure, making high pollution and high emission enterprises in "excess" polluted areas of the eastern part of China change the original extensive business model to low pollution, low energy consumption and high output mode and fulfill transformation and upgrade, which will promote the environmental technology services industry to grow rapidly in the pattern of demand first in the current situation. The development of CCER, in line with Chinese pollution control policy that is from easy to difficult, can reduce emissions and promote the enterprises with low cost of energy efficiency to sell CCER to the enterprises with higher cost to reduce emission to obtain some benefit, so that the higher cost of business can make use of CCER clearance quota to achieve compliance.

The Impact of Green Finance on Haze Management

The impact of green finance on haze management is mainly reflected in the impact of green finance on business, financial institutions and investor behavior.

Business

The rise of green finance for enterprises is both an opportunity to change their own development pattern and a serious challenge to deal with. The opportunity is reflected in the rapid development of China's green financial system with the support of national policy. For enterprises, green finance can provide enterprises with a large number of projects and financing funds matching the capital cycle attract investors to buy green bonds, enhance the reputation of issuing enterprises and promote investor diversification and provide financial support for the transformation and upgrade of enterprises. Challenge is that some companies are lack of understanding on green finance and are skeptical about the development of green finance. Observing from the carbon trading market, companies involved in carbon trading need to understand their own current emission data and historical emission data, and some companies do not understand the carbon trading market rules and their own emissions history. In most cases, companies are only passively involved in the transaction. It’s not only difficult to determine the allocation of carbon emissions quota and emission standards, but also makes the cost of energy efficiency increase significantly. Observing from the green credit, that enterprises increase the cost of production by means of green credit technology upgrade will be inevitably. In short term, it will reduce the level of corporate profits; therefore, in the absence of
effective incentive policies, the enthusiasm of some enterprises to participate in green finance is weak.

Thus, the development of green financial system can affect the behavior of enterprises to achieve the goal of haze governance. Firstly, the development of green finance can enable enterprises to change the passive concept of passive participation in pollution control, take the initiative to understand the green financial system and tools and put the green financial philosophy into their own construction operations. Green financing can improve energy efficiency and enhance the design and development level of “green” products, which will help enterprises to reduce financing costs.

Secondly, guiding enterprises actively enhance the collection and analysis of sewage information capacity. In order to combine their actual situation to actively participate in green financial projects, only through monitoring the operation of the equipment can the enterprises understand their own energy consumption and pollution. Enterprises need to make real-time adjustments to find the path of realization of energy-saving environmental protection, so that it can achieve the effect of reducing operating costs.

Thirdly, guiding enterprises take the initiative to carry out industrial technology upgrade to reduce pollution emissions. On the one hand, enterprises need to learn from foreign enterprises green development experience, develop environment-friendly industrial transformation and upgrade strategy to promote their own "green" industrial chain and "green" supply chain construction, which is conducive to ensuring the enterprise sustainably healthy development. On the other hand, enterprises should accelerate the research and application of low-carbon environmental protection technology; increase the technological upgrade of major projects and equipment upgrade.

Financial Institutions

With haze problem becoming more and more obvious, the development of green finance has become the inherent requirement of the development of China's financial industry. At present, China's financial institutions are mainly composed of banks, and the dynamic monitoring and evaluation of environmental risks is the need of bank risk asset management. Timely incorporating environmental factors into the bank risk measurement system is the embodiment of social responsibility, but also the bank's management needs. The development of green finance can achieve the effect of haze governance by affecting the behavior of financial institutions.

Under the constraints of the green financial framework, it is beneficial to the financial institutions to take the initiative to integrate the green concept into the development mechanism so that they will take the initiative to pay attention to the environmental impact factors of the loan project, give priority to the projects with sustainable development potential and reject to grant loan to the serious environmental pollution enterprises. It optimizes the allocation of social resources and the financial institutions of the asset structure, as well as can reduce the non-performing loans at the same time it can form a virtuous circle of funds, and is conducive to haze governance.

Under the green financial system, financial institutions can enhance their profitability by innovating green financial services and products. In order to promote the development of green finance, our government has introduced a series of policy measures to improve the top structure of the green financial system and provide the guiding objectives for the development of green finance. It’s conducive to financial institutions in the green financial framework to rely on the network, large data and other modern technology to expand domestic carbon emissions rights, emissions rights (quality) financing, low-carbon credit card business and other new business, enhancing their competitiveness, but also providing strong support for the haze management.

In the new situation of green finance, in order to enhance their competitiveness and effectively control business risk and ensure sustainability, financial institutions must accelerate the development and reserve of green financial talents. With the accelerated development of green finance, whether it is green services, products, green financial system or management of innovation are in need of more and more professional green financial professionals, which also puts forward higher requirements for the quality of financial institutions practitioners. To improve the overall
quality of employees in the organization and speed up the cultivation of green financial professionals are the core to ensure that financial institutions in the new situation develop sustainably and healthily. At the same time, it can promote haze management.

Investors

The development of green finance requires not only the investment of public funds, but also the participation of a large number of green investors. In the context of China's green financial market infrastructure continuously improving, the space and opportunities of investors to involve in green finance are also increasing. Therefore, the green finance can get the effect of haze governance through the following ways:

Green financial products with low risk and high mobility and other characteristics are a major tool to diversify portfolio risk for investors. Promotion of green financial products is conducive to establishing investors’ green investment philosophy. On the one hand, establishing investors’ green investment philosophy and focusing on the environmental risk of financing projects are helpful to hedge the risk of environmental policy. On the other hand, investors can realize diversification of assets, optimize their own asset structure, and ultimately obtain economic and environmental benefits by the means of investing green financial products.

As the attractiveness of green financial products continues to increase, it’s necessary for investors to learn about the related knowledge of green investment and increase their understanding of the green financial system. The prerequisite that Investors carry out effective green investment is to have a certain basic knowledge of green finance. Thus, in order to carry out long-term green investment with stable, high credit and strong liquidity, investors not only need to understand the investment channels of green financial instruments, but also need to understand the green finance-related rating indicators.

The development of green finance is conducive to investors to actively participate in green financial markets. With the frequent occurrence of extreme global climate, China's major cities are almost experiencing a serious haze problem, making more and more investors aware of the importance of green development. A large number of investors begin to look for environmentally friendly investment projects. Institutional investors actively participate in green financial markets, and invest green financial products, which benefit the balance between economic benefits and environmental benefits and meet the need of the healthy development of environmental, social and green investment.

Summary and Policy Recommendations

China should to develop green finance, build a green financial system and optimize the allocation of social resources. From the aspect of industrial structure, energy structure, regional coordination, emissions and so on, the government should guide enterprises, financial institutions and investors to change the investment model and form “green” path dependence to get the goal of haze governance.

First, it needs to unify the standards and disclosure requirements of all types of green financial instruments. Under the principle of dynamic and development, regulators should strengthen policy coordination between departments to promote the establishment of unified green standards and information disclosure requirements, and to maintain the comparability between the standards.

Second, it needs to establish dynamic environmental cost measurement system. In the condition of ensuring that the indicators of green financial instruments are comparable, according to the local environmental characteristics and economic structure, the environmental benefits of the green financing projects are reasonably evaluated, which will help the underdeveloped areas in the central and western regions undertake the industrial transfer project from the eastern part within the local environmental carrying capacity, and is conducive to the coordinated development of regional economy.
Third, it needs to construct green rating and third-party certification bodies. At present, the main certification body in the green financial market is the international certification and rating agencies. The development of China's domestic green rating and third-party certification body is not complete. In order to achieve the smooth transformation of China's economy, we need to set up for the green rating and third-party certification body in China's special development phase.

Acknowledgement

The research is funded by the National Planning Office of Philosophy and Social Science. (Project Number: 15CJY039) and the Innovation Project on Theoretical Economics at Guangdong University of Finance. (Project Number: 20170203026).

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