

Research on the Externality and Compensation Mechanism of Green Finance

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Abstract: In recent years, environmental pollution has attracted widespread attention. How to effectively reduce environmental pollution and promote the sustainable development of the environment has become one of the most important issues in the world today. Over the past decade, major countries and international financial organizations in the world have actively developed the green financial industry to promote the sustainable development of human society. From the perspective of environmental externalities, the development of green finance in China is facing many challenges. The government should formulate corresponding policies from the compensation mechanism to vigorously promote the development of green finance in China.

1. Introduction

The concept of green finance originates from the development of green economy. Entering the 20th century, environmental protection has been paid more and more attention [1]. In 1992, the United Nations Conference on Environment and Development adopted Agenda 21, which clearly put forward the strategic objectives of tackling global environmental degradation and promoting sustainable social development. Over the past decade, major countries and international financial organizations in the world have been exploring financial support for green economic projects such as environmental protection and new energy development to achieve sustainable development of human society. Green finance is a series of activities that provide financial support for green projects such as environmental protection, new energy development and ecological stability. As soon as the concept of green finance was put forward, it has attracted wide attention [2]. At the G20 Hangzhou Summit, promoting the development of green finance is one of the important issues. According to the estimates of the People's Bank of China, during the 13th Five-Year Plan period, China's annual investment in green projects is expected to exceed 2 trillion yuan, of which only 10-15% of the funds are funded by the government, while the remaining 85-90% of the investment will be financed from the private sector. The government expects to promote the development of green economy through the development of green finance in order to achieve the ultimate goal of social sustainable development. From the perspective of economic growth, the development of green finance can not only meet the purpose of protecting the ecological environment and promoting the sustainable development of the society, but also promote the investment of green projects and the development of green economy through green finance in the current situation of global economic crisis and lack of growth power. One of the effective ways [3].

2. Knowledge of Green Finance

Since the 1980s, green finance has gradually become the focus of attention in the academic circles at home and abroad [4]. Developing green finance is not only the need of sustainable development of economy and society, but also the objective requirement of realizing sustainable development of financial institutions [5]. Developing green finance can not only improve the reputation of financial institutions in the industry, but also help financial enterprises better control risks. However, the risk brought by the green financial reform and innovation has become an important factor restricting the development of green finance [6].

By attracting social capital from the traditional high-energy and high-pollution investment fields

to the investment of low-energy and low-pollution green projects, green finance has increased the capital cost of traditional project investment, thus losing its investment value and eventually withdrawing from the economic field [7]. In this way, the development of green finance has changed the old inefficient economic growth mode at the expense of the environment, promoted the improvement of the quality of economic development, reduced environmental pollution, and achieved the ultimate goal of sustainable social development [8]. Despite the high expectations of green finance, the development of green finance in reality still faces many challenges. The development of green finance is not so smooth because of the externality of environment, the mismatch of time limit in financing process, the asymmetry of information, the lack of clear expression of green finance and the lack of analysis ability of green projects. Among them, the externality of the environment is the most important obstacle to the development of green finance [9]. The impact of Green Finance on environmental protection and the quality of economic development ultimately depends on whether green finance can attract social capital from high energy consumption and high pollution industrial projects to low energy consumption and low pollution green projects. However, the existing price system can not fully reflect the positive externality of green projects. The investment of the project is far lower than the optimal total investment of the society [10]. How to absorb and solve the problem of environmental externalities in order to attract social capital allocation to green industry is an important issue in the development of green finance, and also an important challenge for government policy.

3. Externality and Compensation Mechanism of Green Finance

3.1. Externality of green finance

Research on green finance and carbon emissions trading can not be separated from the guidance of externality and property rights theory. Among them, externality is an important feature of green finance, and property rights theory provides an important path for the development of green finance. According to externality theory, externality causes the inconsistency between private marginal cost and social marginal cost. The strategy to solve this inconsistency is to solve externalities: when there are externalities, private marginal net output always differs from social marginal net output value, so market mechanism is fully used to realize resources. The optimal allocation is impossible and can only be solved by taxing or subsidizing the government. Environmental pollution is a typical example of externality. The externality of environmental pollution makes the private (producers and consumers) unwilling to pay for the use of ecological environment, which may lead to the over-use of the ecological environment by the private until the marginal benefit is zero, and does not care about the marginal social cost increase. Therefore, the market mechanism is difficult to encourage private initiative to carry out environmental protection, only relying on government intervention.

Similarly, green finance also has externalities. From the point of view of system engineering, financial industry is a system and ecological environment is a system. There are three situations in the relationship between the two systems: one is that the financial system only considers commercial interests when providing funds, and does not consider ecological environment factors. As a result, the financial industry has seized on them. The best business opportunities may destroy the ecological environment system, and therefore do not bear environmental responsibility. Second, the financial system considers both commercial interests and ecological environment factors when providing funds. As a result, it is beneficial to the ecological environment system, but the financial industry may lose the best business opportunities, but the financial industry has not. Third, the financial system provides funds to the ecological environment industry, which not only gains commercial benefits, but also protects the ecological environment. In this case, green finance should be provided by the government.

3.2. Recent developments and risks of green finance

The green credit model has been basically formed, as shown in Figure 1. The scale of green credit

increased steadily. By the end of 2016, the balance of green credit in Zhejiang Province was 744.3 billion yuan, accounting for 9% of the total loans in the whole province, up by 10.1% year on year, which was 3.1 percentage points higher than the average growth rate of loans, as shown in Figure 1. In terms of green credit product innovation, Zhejiang Province has successively launched the “green syndicate” model to support the five water co governance, the “comprehensive credit” model to build a beautiful countryside, the “green lease” model to promote machine replacement, the “energy saving loan” model to support small and micro enterprises, and the “emission mortgage loan” to promote energy conservation and emission reduction. Mode and so on. By the end of 2016, the balance of green credit in Huzhou reached 45.47 billion yuan, accounting for 16.5% of the total loan balance, which was far higher than the average level of the province. At the same time, the balance of green credit in Quzhou reached 12.424 billion yuan, an increase of 99% over the same period, which was higher than the average growth rate of various loans by 6.12 percentage points.

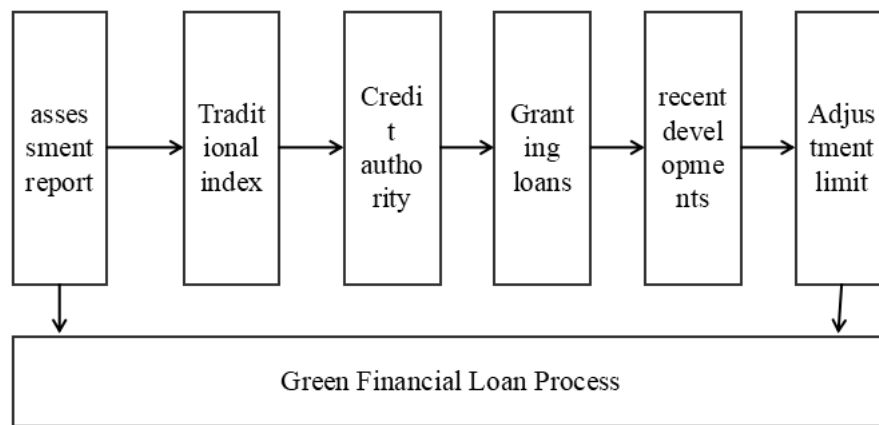


Fig.1. Green financial loan process

Based on the macro green financial policy and the industrial characteristics of the pilot area, the main risks faced by the construction of green financial reform and innovation pilot area are analyzed. Financial institutions and enterprises attach more importance to “economic benefits”, more to environmental protection as an important means to cater to government policies and maintain the reputation of enterprises. In the construction of green financial reform and innovation pilot area, if there is no reasonable and effective incentive and punishment mechanism for financial institutions and enterprises, it will not be fully adjusted. Mobilizing its enthusiasm to participate in green finance practice makes it impossible to make substantial progress in green finance reform. The adjustment of central bank's monetary policy leads to the change of money supply and interest rate, which will inevitably affect the liquidity of commercial banks, the adjustment of green credit scale and the financing cost of green enterprises. The adjustment of the government's financing policy for green enterprises will also increase the risk of green investment. Frequent adjustment of regional industrial policy will accompany the transfer of funds among different industries. The change of policy environment will reduce the return on investment of green projects and increase the investment risk of green projects. Secondly, compared with the green transformation of traditional industries, direct investment in green industries can achieve more immediate results, which increases the land use. In view of their achievements, the local government adopted extreme preferential policies, which resulted in the imbalance of supply and demand in the traditional industrial transformation, green industrial development funds and product market. In addition, Huzhou and Quzhou cities, relying on their unique industrial resources and geographical location advantages, have formed several characteristic industrial agglomeration areas, and industries in the agglomeration areas. On the one hand, it is conducive to the optimal allocation of resources and the improvement of production efficiency, on the other hand, it also provides fertile ground for the spread of green financial risks within and between industries.

3.3. Compensation mechanism

Fine source analysis of PM_{2.5} organized by EPA shows that regional transmission accounts for one third of the main sources of PM_{2.5} in the whole year, and regional transmission accounts for 55%~75% of heavy pollution days, as shown in Figure 2. In addition, China has entered the post-industrialization stage, but many regions are still in the mid-stage of industrialization, and the cost of emission reduction in different regions is dozens of times different. This requires the formation of a certain ecological supplementary approach. But in fact, except for a small amount of financial compensation, there is no normalized ecological compensation mechanism. It is suggested that a new mechanism of ecological compensation for sustainable development be established in the following aspects in close connection with the green financial model.

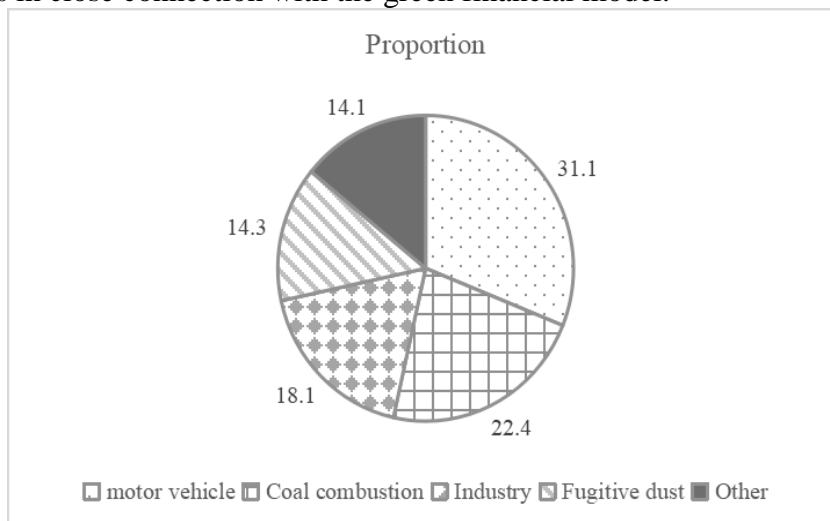


Fig.2. PM_{2.5} source

Firstly, the compensation standard of ecological value should be established. It is suggested that relevant standards be formulated to accurately measure the value of ecological environment. Economic incentives shall be given to economic entities who operate in accordance with the law and save resources, and ecological compensation fees and fines shall be levied on enterprises that waste resources and destroy the environment. Financial institutions provide preferential loans to law-abiding enterprises, and at the same time raise the financing threshold of illegal enterprises, so as to promote enterprises to take a green development path.

Secondly, the property right nature of ecological environment resources should be established. To clarify the property right nature of ecological environment resources is an important legal basis for carrying out the financing of ecological environment rights and interests pledge and carrying out the transaction of ecological environment rights and interests. The transaction of ecological environment rights and interests is the most direct and effective mechanism design to stimulate the power of market participants to reduce emissions. It is also an important means to implement the “hematopoietic” compensation model and is conducive to the sustainable development of ecological compensation mechanism.

Establish stricter green finance Beijing standards and information disclosure mechanism. At present, China's domestic green financial standards are not uniform. The construction field of green financial support is mainly based on the “Green Bond Support Project Catalogue” issued by the People's Bank of China, the “Energy Efficiency Credit Guidelines” issued by the former CBRC and the “Green Bond Issuance Guidelines” issued by the National Development and Reform Commission. It is suggested that a stricter and more systematic standard should be established on the basis of these three standards. Combining with the Green Building Evaluation Standard (GB/T 50378-2014), it is mandatory to require all new buildings to undergo green certification by third parties. The certified public buildings should disclose energy consumption information in real time and reduce the access risk of financial institutions.

Stimulate the vitality of more participants such as enterprises, social organizations and individuals. In order to encourage financial institutions to actively enter the green construction industry when they do not know enough about it in the initial stage, it is suggested that the government set up a risk compensation fund and encourage insurance companies to introduce insurance mechanism to share green risks. In order to encourage individuals to purchase or lease green buildings, it is suggested that new green building details should be added under the legal and stable residence index of Beijing Integral Settlement Policy, and certain points should be awarded to individuals who purchase or lease green buildings. Design green financing scheme matching green building cycle. Green construction projects often have large one-time investment, long payback period, high investment risk, and obvious term mismatch. In order to solve the problem of term mismatch and broaden the financing channels of green construction, it is necessary to cooperate green credit with a variety of green financing tools and explore the financing of pledge of environmental rights and interests, such as franchise right, project income right and emission right.

4. Conclusion

Green finance is an important capital driving force to promote economic transformation on the road of sustainable development. At present, the financial industry is facing a series of institutional obstacles to green development. Among them, the lack of ecological value compensation mechanism is the key institutional obstacle to restrict the development of green finance, and the low level of scientific government decision-making has become an important institutional defect to restrict the modernization of national governance. Under the conditions of modern market economy, we must constantly improve the level of modernization of state governance, make full use of economic leverage, reduce government decision-making errors and interference, create a fair and reasonable market competition environment, and fully develop the green financial industry, which can effectively promote industrial layout optimization and social and economic transformation.

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