Influencing Factors of Environmental Information Disclosure of Commercial Banks: Case Study from China

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Abstract

Although commercial banks are the most important entities that dominate the flow of funds, there are few studies on the status of their environmental information disclosure. The business behavior of commercial banks plays a decisive role in the quality of the environment. Therefore, it is of great significance to study the influencing factors of environmental information disclosure of commercial banks to standardize the environmental information disclosure system and improve the environment. Based on the environmental information disclosure reports and social responsibility reports of 41 listed commercial banks, this work analyzes the current situation of environmental information disclosure of banks from the nature of property rights, bank types and disclosure forms, and analyzes the impact of environmental information disclosure of commercial banks in China. Results shows that there is little difference in the disclosure of qualitative indicators among different banks, and a large difference in the disclosure of quantitative indicators; from the perspective of environmental information disclosure of banks of different natures, the disclosure of large state-owned commercial banks, whether in disclosure The difference or the disclosure score of a single dimension is better than other commercial banks. Through regression analysis, it is found that the scale of commercial banks, profitability, financial leverage, equity concentration, proportion of independent directors and proportion of tradable shares have a significant positive impact on the level of environmental information disclosure, and the nature of equity also has a positive impact on the level of environmental information disclosure. However, it is not significant. Considering the influence of sample differences, there is a certain error. Based on the above research, we finally put forward opinions and suggestions on improving the level of environmental information disclosure of commercial banks in China.

Keywords

Commercial Banks; Environmental Information Disclosure; Influencing Factors; Chinese Cases.

1. Introduction

In the process of promoting the development of green finance, a sound environmental information disclosure system for commercial banks will help commercial banks demonstrate the effectiveness of green development, optimize capital allocation, and reduce operational risks, and it will also help the government guide, supervise, and restrain the behavior of commercial banks. The concept of environmental information disclosure was put forward earlier and has been widely practiced at home and abroad [1-3]. As early as 2003, Citigroup and other international banks jointly formulated the Equator Principles. The relevant systems stipulated in the Equator Principles require Equator Banks to publicly disclose and implement the process and experience of the Equator Principles, which have been widely recognized by the international community. Based on the development history and research status of environmental information disclosure, it can be seen that the current environmental

information disclosure is of great significance to the development of green finance [4-6]. At present, obvious results have been achieved, but there are problems in the disclosure rate and disclosure quality, which need to be further solved. At the same time, there are relatively few studies on environmental information disclosure in the banking industry in China, and they tend to focus on theory and policy [6-9]. Based on the existing practical experience and research results, this research will conduct an in-depth study on the level of environmental information disclosure in China's banking industry, and point out the main influencing factors that affect the level of environmental information disclosure, and comprehensively use research and regression analysis to explore the reasons behind it.

2. Sample and Model

2.1. Sample Selection and Data Sources

In view of the accuracy and convenience of data acquisition, this work selects the data of 41 listed banks as the sample data. The sample data comes from two parts: first, the listed banks' data on the corresponding sections of the flush platform. The second is the statistics of the website of the China Banking Regulatory Commission.

2.2. Assumptions of Factors Affecting Environmental Information Disclosure

Hypothesis 1: The larger the scale of a commercial bank, the higher the level of its environmental information disclosure.

Hypothesis 2: The more profitable a commercial bank is, the more fully it discloses environmental information.

Hypothesis 3: State-controlled commercial banks have higher levels of environmental information disclosure than non-state-controlled commercial banks.

Hypothesis 4: The greater the financial leverage of commercial banks, the higher the level of environmental information disclosure

Hypothesis 5: The higher the equity concentration of commercial banks, the higher the level of environmental information disclosure.

Hypothesis 6: The higher the proportion of independent directors of commercial banks, the higher the level of environmental information disclosure.

Hypothesis 7: The larger the proportion of tradable shares of commercial banks, the higher the level of environmental information disclosure.

2.3. Variable and Model

2.3.1. Explained Variables

This work selects the environmental information disclosure scores of 41 commercial banks as the explained variables, and takes the relevant influencing factors as the explanatory variables. The selection of each indicator in the environmental information disclosure scoring system in this work is based on the guidelines for environmental information disclosure of financial institutions issued by the Central Bank in 2021 and the convenience and objectivity of scoring. For an indicator, if it is disclosed, it will be counted as 1 point, and if it has not been disclosed, it will be counted as 0 point, and the full score is 17 points.

2.3.2. Explanatory Variables

According to the previous research assumptions of this work, as well as through literature review and reference to the more significant factors in the literature research of previous scholars, this work proposes the following explanatory variables. The following data are all derived from the data of each listed bank in the corresponding sector in the flush.

The size of the company, the market value of each listed bank is selected in this work, and it is used as an explanatory variable to describe the size of the company.

Profitability, in layman's terms, is the ability of a company or enterprise to generate revenue within a certain period of time. In previous studies, most scholars choose ROE as an indicator to measure the profitability of a company, so this work also selects ROE as an explanatory variable to measure the profitability of commercial banks.

The nature of equity in this work represents the nature of banks. In this study of influencing factors, banks are divided into two categories. State-owned banks are represented by the number 0, and non-state-owned banks are represented by the number 1.

Financial leverage uses the asset-liability ratio as a reference indicator for the company's financial leverage, which represents the company's debt level and financial risk.

Ownership concentration can measure the degree of stock dispersion of a company. this work chooses the ratio of the number of shares held by the shareholder with the most shares in the listed bank to the total number of shares of the company as a reference index representing the concentration of ownership.

The ratio of independent directors is calculated in this work as the percentage of independent directors to the total number of directors of the company.

The ratio of tradable shares refers to the proportion of the company's tradable shares in the company's total number of shares.

2.3.3. Model Design

In order to test the above 7 research hypotheses and determine the main factors affecting the environmental information disclosure of Chinese commercial banks, since the explanatory variable of commercial bank size is too different from other explanatory variables, the logarithm is taken to make it different from other explanatory variables. The difference between them is reduced, and the data fluctuation trend remains unchanged.

The multiple linear regression model is established as follows:

$$E DI= r_0 + r_1 \ln SIZE_i + r_2 ROE_i + r_3 SH_i + r_4 L EV_i + r_5 OC_i + r_6 RIND_i + r_7 B LOC_i + \varepsilon \qquad (1)$$

Table 1. Variable Statistics

variable type	variable symbol	expected direction	variable name
Explained variable	EDI		Environmental disclosure information Index
Explanatory variables	S IZE	+	Company size
	ROE	+	Profitability
	S H	+	Stock rights
	LEV	+	Financial leverage
	O C	+	Ownership concentration
	R IND	+	Proportion of independent directors
	B LOC	+	Proportion of outstanding shares

In formula (1), the dependent variable is environmental disclosure information (EDI), i represents a listed commercial bank, i = 1, 2, 3,.. 41; r_0 is a constant term, which has no relationship with other factors; r_1 -r_7 is the regression coefficient, which mainly means that when the independent variable changes by one unit, the dependent variable changes according to the change of the independent variable; ε is the random change item. As shown in Table 1, there are 7 factors used to test the environmental information disclosure of Chinese

commercial banks, namely profitability (ROE), commercial bank size (SIZE), ratio of independent directors (R IND), financial leverage (L EV), stock rights (SH), ownership concentration (OC), ratio of outstanding shares (B LOC).

3. Results and Discussion

3.1. Descriptive Statistical Analysis of Explained Variables

3.1.1. The Overall Level of Environmental Information Disclosure of Commercial Banks
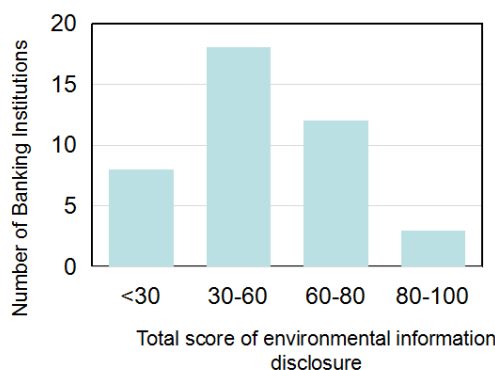

Figure 1. Statistics of the total score of environmental information disclosure

Table 2. Statisticalon the disclosure of environmental information disclosure indicators of each bank

sub-indicator name	comment content	Number of disclosed banks (houses)
Green remediation	Concept and development orientation of green finance	41
	Green Finance Goals and Planning	26
	Construction of green financial organizations	19
	Green finance standards respond to international	23
Environmental Risk Management	Environmental Risk Identification	24
	Environmental Risk Assessment	13
	Environmental Risk Quantification	1
	Environmental Risk Response Measures	18
Green achievement	Green investment and financing performance	38
	Quantification of Green Investment and Financing Performance	38
	Green Investment and Financing Effectiveness	15
	Quantifying the effectiveness of green investment and financing	15
	Disclosure of green investment and financing cases or quantification of benefits	33
	Investment and financing business innovation	24
Green operation	System construction related to green operation	33
	Is there any action to publicly advocate the concept of green operation?	37
	Green operation performance measurement	36

Figure 1 lists the basic statistical characteristics of environmental information disclosure of the sample banks selected in this work. This article is read and scored through the environmental information disclosure reports, social responsibility reports and ESG reports published on the official websites of each bank. As shown in Figure 1, among the 41 selected listed banks, all banks have disclosed environmental information, but the overall situation is very different. There are 8 banks with a score of less than 30, and a score of more than 30 and less than 60. There are 18 banks with a score of more than 60 points and less than 80 points, and 3 banks with a score of more than 80 points. The total score of environmental information disclosure of most banks is less than 80 points, and the banks with more than 80 points are in the minority.

In Table 2, the number of bankers who disclose green finance concepts and development orientation is the largest, that is, all banks have disclosures, with 41 banks; while the number of bankers who disclose environmental risk quantification is the least, only one, this one the bank is the Agricultural Bank of China. And the disclosure of quantitative indicators is relatively small, especially the disclosure of environmental risk quantification and environmental risk assessment is very small.

In Table 3, it is obvious that the environmental information disclosure scores of all banks are less than full marks, with a maximum score of 85.42 points, which indicates that the environmental information disclosure of Chinese commercial banks is not comprehensive. The average value is 48.90, which shows that the overall quality of environmental information disclosure of commercial banks in China is relatively low.

Table 3. Total score of environmental information disclosure

variable name	Number	Mean	Max	Min	SD
EDI	41	48.90	85.42	9.404	29.90

3.1.2. The Overall Situation of Environmental Information Disclosure with Different Property Rights

Table 4 summarizes the environmental information disclosure of banks according to the nature of property rights. Among the sample data, there are 6 state-owned banks and 35 non-state-owned banks. It is very obvious that the environmental information disclosure of state-owned banks is better than that of non-state-owned banks. The maximum comprehensive score of environmental information disclosure of state-owned banks is 8.542. The maximum environmental information disclosure of non-state-owned banks is 8.386. The minimum value is 33.89, the minimum value of environmental information disclosure of non-state-owned banks is 9.40; the average value of environmental information disclosure of state-owned banks is 65.53, and the average value of non -state-owned banks is 46.05; this shows that the environmental information of state-owned banks The disclosure is better than that of non-state-owned banks, indicating that state-owned banks are more willing to disclose more environmental-related information. The standard deviation of environmental information disclosure score of state-owned banks is 16.32, while that of non-state-owned banks is 20.27. From the standard deviation point of view, the difference of environmental information disclosure of state-owned banks is smaller than that of non-state-owned banks, and state-owned banks are more stable. The emergence of this situation may have a lot to do with state-owned banks being more strictly supervised by the government, paying more attention from all walks of life, and improving various systems. Therefore, it is very necessary to raise the social attention to non-state banks, strengthen the government's supervision of non-state banks, and regulate the policies and systems of non-state banks.

Table 4. Environmental information disclosure of banks with different property rights

Property rights	Number	Mean	Max	Min	SD
State-owned large commercial bank	6	85.42	33.89	65.5 3	16.32
non-state bank	35	83.86	9.40	46.0 5	20.2 7

3.2. Descriptive Statistical Analysis of Explanatory Variables

As shown in Table 5, first looking at the indicator of standard deviation, the standard deviation of company size is the highest, which is 4 086.34. This result shows that the market value of the sample banks is very different. The standard deviation of the debt ratio is the smallest at 0.00768, which shows that the leverage ratios of the sample banks are almost the same. The standard deviation of ROE is 0.02208, which shows that among the selected sample banks, there is a certain difference in their profitability. Regarding the proportion of tradable shares, four banks lacked the data of tradable shares at the end of 2020, so the number of samples became 37, and the maximum proportion of tradable shares was 1, indicating that public investors have control over the bank's equity. The capacity is very large, and the supervision of the bank will also increase accordingly.

Table 5. Descriptive statistics for each variable

	Number	Mean	Max	Min	SD
Company size (SIZE)	41	16573	83.19	2449.25170	4086.34
Profitability (ROE)	41	15.94%	6.81%	11.25%	0.02208
Debt ratio (DEBT)	41	94.07%	90.84%	92.18%	0.00768
Independent Director Proportion (INDEP)	41	0.46666666	0.285714	0.37731640	0.04318
Ownership concentration	41	0.6537	0.0431	0.223066	0.16618
Proportion of outstanding shares	37	1	0.100038	0.776197	0.255838

3.3. Correlation Analysis

Table 6 show that the environmental information disclosure index has a very significant positive correlation with the company's market value, and its correlation coefficient is 0.421; the environmental information disclosure index is significantly positively correlated with the nature of equity, and the correlation coefficient is 0.329; The environmental information disclosure index has a significant positive correlation with the equity concentration, and its correlation coefficient is 0.3 14; the environmental information disclosure index has a significant positive correlation with the proportion of tradable shares, and the correlation coefficient is 0.330; the explained variable environmental information disclosure index and The correlation between profitability and the proportion of independent directors is weak, and the correlation coefficients are 0.024 and 0.094 respectively. In order to further study the relationship between variables, the environmental information disclosure score of Chinese commercial banks is used as the explained variable, and the remaining seven are explanatory variables to carry out multiple regression analysis.

The test results show that seven independent variables are positively correlated with the environmental information disclosure index, and four independent variables are significantly positively correlated with the environmental information disclosure index. Among the independent variables, it can be found from the test results that there is a certain correlation between the variables. Therefore, in order to exclude the influence of the multicollinearity between the independent variables on the results, the method of tolerance value is used to accurately test.

Table 6. Pearson correlation analysis results

	EDI	S IZE	ROE	S H	LEV	O C	R IND	B LOC
EDI	1							
S IZE	0.421 **	1						
ROE	0.024	0.178	1					
S H	0.329 *	0.654 **	0.023	1				
LEV	0.246	0.109	0.313 *	0.159	1			
O C	0.314 *	0.691 **	0.057	0.628 **	0.024	1		
R IND	0.094	0.013	0.101	0.018	0.124	0.112	1	
B LOC	0.330 *	0.503 **	0.044	0.225	0.387 *	0.243	0.013	1
*. At the 0.05 level (two-tailed), the correlation is significant; **. At the 0.01 level (two-tailed), the correlation is significant.							

3.4. Multiple Regression Analysis

3.4.1. Results of Multicollinearity Test Results

Preliminary test results show that there is a certain degree of multicollinearity in this model, so in order to make the test results more accurate, further tests are being carried out. The test results are shown in Table 7. The tolerance value of the independent variable selected in this work is the smallest, its value is 0.294, and the maximum value of VIF is 3.396. According to previous theoretical experience, when the tolerance value is lower than 0.1 and the VIF value is greater than 10, the model has multicollinearity. The results show that all VIF values are not greater than 10, so it can be concluded that there is no multicollinearity problem., in theory, the following regression analysis can be carried out.

Table 7. Multicollinearity Test Results

Model	Tolerance	VIF
S IZE	0.294	3.396
ROE	0.763	1.31
S H	0.478	2.092
LEV	0.683	1.463
O C	0.393	2.544
R IND	0.945	1.058
B LOC	0.598	1.673

3.4.2. Results of Multiple Regression

First, the results in Table 8 show that the values of R^2 in the model and the adjusted R^2 are 0.244 and 0.184, respectively, which means that the explanatory variables explain 24.4 % of the explained variables, respectively. and 1 8.4%. According to previous theoretical experience, when R^2 is greater than 0.1, there is no multicollinearity. From the regression coefficient table in Table 4.9, it can be seen that each regression coefficient is a positive number, which means that these independent variables can play a positive role in the environmental information disclosure index. Among them, equity concentration, company size, financial leverage, profitability, the proportion of independent directors and the proportion of tradable shares are all significantly less than 0.05, indicating that these independent variables have a significant impact on the dependent variable, and the significance of the nature of equity is greater than 0.05, indicating that the impact on the dependent variable is not significant. The β value of each variable is the influence of the independent variable on the explained variable. From the test results, among the explanatory variables, profitability has the greatest impact on the level of environmental information disclosure. Financial leverage, equity concentration, proportion of

independent directors, nature of equity, proportion of tradable shares. The excluded variable is the nature of equity.

Using SPSS software carried out regression analysis to find the influencing factors of the environmental information disclosure level of Chinese commercial banks under a certain significant level. First, select the most significant control variables according to the judgment basis, and add new variables in turn to ensure that each new Before adding variables, only significant variables are included. Repeat the above operation, and the analysis and learning results obtained are as follows:

Table 9 into the linear regression model to obtain the regression equation:

$$EDI = 9.382 \ln SIZE + 11.748\ ROE + 7.419\ DEBT + 5.179\ OC + 4.039\ RIND + 2.156\ BLOC + 52.47\ 9 \qquad (2)$$

Table 8. Regression equation fitting table

R	R2	Adjusted R^2	Error in Standard Estimation	Durbin Watson
0.494	0.244	0.184	20.260553	1.89

Table 9. Regression coefficient table

Model	Unstandardized coefficient B	Error	Coefficient	t	Signification	Tolerance	VIF
constant	52.479	79.126		0.932	0.006		
S IZE	9.382	8.832	0.246	0.882	0.001	0.294	3.396
ROE	11.748	16.039	0.012	0.072	0.000	0.763	1.31
S H	3.204	12.949	0.054	0.147	0.086	0.478	2.092
LEV	7.419	18.635	0.189	0.031	0.001	0.683	1.463
O C	5.179	8.370	0.105	0.134	0.000	0.393	2.544
R IND	4.039	5.713	0.217	0.114	0.001	0.945	1.058
B LOC	2.156	3.125	0.313	0.127	0.003	0.598	1.673
a dependent variable: y							

3.5. Discussion and Suggestion

There is a significant positive correlation between company size and the level of environmental information disclosure of commercial banks. The regression results on firm size explain Hypothesis 1. The larger the scale of a listed commercial bank, the greater the difficulty and cost of its governance, and information disclosure is the main way to solve this problem. In addition, the larger the scale of a listed commercial bank, the more emphasis on its external image, the more inclined it is to in terms of disclosing environmental information, it has won the trust of investors and the public, and the larger its scale, the more financial and financial strength it has to support the development of environmental information disclosure.

Profitability is significantly positively correlated with the level of environmental information disclosure of commercial banks. The regression results on profitability explain Hypothesis 2. That is to say, the better the profitability of a listed commercial bank, the less financial risk it has, and the more financial strength it has to support its disclosure work.

The nature of equity has no significant impact on the level of environmental information disclosure of commercial banks, but it also promotes the level of environmental information disclosure. The regression results cannot support Hypothesis 3. The reason may be that in the sample data, there are only 6 units with the nature of state-owned equity, and the sample is not sufficient, so there will be a certain error. On the other hand, the investment units representing the state sector do not pay much attention to this field, and the awareness of environmental responsibility is not particularly strong, indicating that the environmental information disclosure mechanism of my country's listed banks needs to be improved.

Financial leverage is the debt ratio, which has a significant positive impact on the level of environmental information disclosure of commercial banks. The regression results on financial leverage prove hypothesis 4. Companies with high financial leverage and large demand for capital require the support of external stakeholders and the general public, so they will pay special attention to their social image and increase the trust and recognition of the public, so they are more inclined to disclose more Information related to the environment to maintain its social image.

There is a significant positive correlation between equity concentration and the level of environmental information disclosure of commercial banks. The regression results on equity concentration prove Hypothesis 5. The first aspect is that most small and medium-sized investors are seeking to obtain speculative gains, regardless of long-term interests, and will prevent information disclosure that is unfavorable to the company. For controlling shareholders, they mainly focus on long-term interests and safeguard the unit's interests. External image; another aspect is that the game cost between shareholders will also be reduced due to the higher equity concentration, and it has more financial strength in environmental information disclosure.

The proportion of independent non-executive directors has a significant positive correlation with the level of environmental information disclosure of commercial banks. So this result confirms Hypothesis 6. Because the more independent directors, the wider their professional scope, the more adequate supervision, and the higher the quality of their disclosures.

The proportion of tradable shares has a significant positive correlation with the level of environmental information disclosure of commercial banks. The regression results on the proportion of tradable shares prove Hypothesis 7. This shows that the larger the proportion of tradable shares in all stocks, the stronger the supervision of commercial banks by minority shareholders, and the commercial banks will take the initiative to improve the quality of disclosure in order to maintain their own image.

Combined with the research in this work, the following development suggestions can be put forward for the industry:

1) Improve the environmental information disclosure laws and regulations system. A complete set of laws and regulations for environmental information disclosure should be established and improved, and the relevant content, rules and implementation rules of environmental information disclosure should be improved. The central bank should organize local banks to conduct environmental information disclosure investigations, investigate the difficulties in their work, solve problems in a targeted manner, and formulate an environmental information disclosure system that is more suitable for the development of each bank.

2) Introduce a third-party audit platform and implement a reward and punishment mechanism. The quality of the environmental information disclosure reports issued by the banking industry should be verified by an independent third-party platform for correctness and authenticity, and regular on-site investigations of the environmental information disclosure reports of the banking industry should be conducted to ensure the quality of the environmental information disclosure reports of the banking industry. The progress of environmental information disclosure can be included in the annual assessment report of each bank. By learning from foreign experience in rewards and punishments, it is possible to impose fines or civil compensation on commercial banks that do not disclose environmental information, and give relevant honorary titles to banks that actively disclose environmental information. Ethics agreements can also be used to encourage banks to actively disclose environmental information.

3) Establish systematic environmental information disclosure indicators. To improve the status of environmental information disclosure, the most critical part is to establish systematic and authoritative environmental information disclosure indicators. When disclosing environmental

information, the disclosing subject should know what to disclose, how to disclose it, and increase the number of environmental information disclosure reports. Comparability and readability. In this regard, we can learn from the experience of Western countries, and the government, industry associations and the general public will jointly supervise the development of environmental information disclosure. A systematic environmental information disclosure indicator system or disclosure indicator list is established by the expert resources of relevant industry associations. Stakeholders make suggestions on their environmental disclosure reports to improve the disclosure indicator system. The stock exchange issues relevant regulations and penalties to supervise disclosure. Whether the entity actively and comprehensively discloses environmental information.

4) Enhance the environmental protection awareness of relevant responsible personnel of commercial banks. Carry out environmental education for relevant persons in charge of commercial banks to improve their awareness of environmental protection and social responsibility. It can be seen from the above research that with the increase of equity concentration, the level of environmental information disclosure will also become higher and higher, which shows that the environmental protection awareness of the controlling shareholders of commercial banks is very important to improve the level of environmental information disclosure. First of all, we should start with the environmental responsibility attitude of the relevant responsible personnel, and enhance their environmental protection awareness and social responsibility awareness through environmental protection courses, so as to fundamentally strengthen the supervision of the superiors over the subordinate departments. Secondly, when compiling relevant environmental information disclosure reports, it is necessary to enhance the professional knowledge and environmental responsibility awareness of actual operators, and to increase the operability of environmental information disclosure.

5) Strengthen the research and development of relevant indicator accounting tools. Through the research, it is found that most banks disclose more qualitative indicators and less quantitative indicators, especially the disclosure of environmental risk assessment and measurement indicators. Therefore, it is necessary for the banking industry to develop environmental risk measurement tools in terms of technical support, improve the data measurement capability of the banking industry, and improve the availability and quality of data. In addition, establish a data sharing platform for environmental information disclosure in the banking industry, and unify the disclosure principles, contents, platforms, etc., which can increase the operability of environmental information disclosure work, reduce the cost of the banking industry, and improve the credibility of the banking industry.

4. Conclusion

In this work, the investigation empirically tests the factors that affect the environmental information disclosure of China's commercial banking industry. The results show that not all the indicators set in this work pass the test. The indicators passed mainly include company size, financial leverage ratio, profitability, proportion of independent directors, stock concentration and ratio of outstanding shares. The nature of equity has not passed the significance test. Learn from the advantages of foreign countries in environmental information disclosure and learn from their experience. To improve the environmental information disclosure system of China's banking industry, actively guide commercial banks to actively disclose environmental information, and use commercial banks and other financial institutions as intermediaries to guide investment funds to flow to environmentally friendly industries, so as to improve the environment and promote the development of green finance and green economy realizes the transformation and development of the economy.

Acknowledgments

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