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Research Article

Factors Influencing Public Concern about Environmental Protection: An Analysis from China

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This paper uses the Baidu Index to construct indicators for measuring the public's environmental concerns in 288 prefecture-level cities in China from 2011 to 2016 and validates the public's attention to the effectiveness of environmental indicators by using provincial panel data from public environmental reports. Through the analysis of urban heterogeneity, the impact on the development of informatisation on the public's concern for the environment is considered. Also studied is the cross-cutting effect of the level of informatisation and education, the government's environmental regulation power, economic development level, and environmental pollution level on the public's concern for the environment. The influence coefficients were 0.018, 0.147, 0.689, 0.620, 0.106, and 0.089, respectively. Through subsample heterogeneity analysis, we found that the level of informatisation will also indirectly promote public attention to the environment by strengthening the influence of the government's environmental regulation power on the public's attention to the environment.

1. Introduction

In recent years, China's economy has developed rapidly, and thousands of people have escaped from poverty. However, this rapid development has also led to increased pressure on the environment [1, 2]. The various types of environmental pollution in China include water and air pollution, soil erosion, land degradation, deforestation, grassland destruction, and salinisation [3]. Environmental problems have become a major crisis that plagues people's lives and affects their health. Rohde and Muller [4] estimated that approximately 1.6 M people die in China annually due to PM2.5 pollution. According to Yale's 2016 Environmental Performance Index, China ranks 109th out of 180 countries [5]. Many scholars have asserted that China's economic transformation requires the government to formulate and implement many policies to guide capital investment to be more environmentally friendly [6].

China's environmental management relies on the government to formulate environmental policies: administrative environmental policies, market-oriented environmental policies, and public participation environmental policies. Since the 2000s, some local governments have established an environmental protection performance evaluation (EPPE) system for their cadres [7]. The purpose of EPPE is to motivate local cadres to more proactively address environmental issues by measuring the progress of local environmental protection issues and then using the results as a factor to promote or downgrade [8].

Although China has made great progress in solving its environmental problems by relying on administrative environmental policies and top-down decision-making and management, the insufficient monitoring and evaluation of projects, insufficient coordination among government departments, and insufficient consideration of local interests, the current institutional approach is unlikely to generate future benefits. Local officials are usually more concerned with local economic growth [9] than environmental protection [10]. The government has gradually implemented some market-based environmental policy tools, such as pollution

discharge fees, or initiated in pilot areas such as pollutant emissions trading.

Increasing attention on environmental issues has put tremendous pressure on local officials and polluting companies. Environmental protection relies solely on government management and corporate self-discipline [11]. Public environmentalism is playing a more important role in China's environmental governance than in the past (Zheng, 2014). The need for public participation in environmental policies is evident. The experience of Western developed countries shows that the solution to environmental protection must rely on public participation, and the degree of public participation directly affects the environmental protection of a country or region.

An analysis found that the government's use of a single approach to environmental governance is not effective in rural environmental governance; thus, the analysis advocates that the government adopt comprehensive means to protect the rural ecological environment, including means to encourage rural residents to independently manage the rural environment [12]. The informal regulation influenced by public greatly complements the formal regulation promoted by the government in environmental governance [13]. Public participation in environmental policy plays a critical role in the public environment participation in the Philippines [14] and in European countries [15].

With the improvement of education and information (especially network information), people express their concerns and concerns about environmental issues through social software such as Weibo and WeChat. According to the "China Environmental Yearbook" data, from 1995 to 2014, the number of public environmental complaints and petitions expressed to local governments through letters, official hotlines, and the internet generally continued to increase. The environmental awareness of the Chinese public has gradually increased. Nearly 90% of the respondents in China are willing to pay to reduce air pollution, with an average annual willingness to pay 382.6 yuan per person.

In China, increasingly more people have begun to consciously and systematically express concerns about pollution and strong demands for environmental governance [16]. From 2003 to 2014, the frequency of environmental protests increased annually [17]. The newly revised Environmental Protection Law of the People's Republic of China, for the first time, presented a chapter on "Information Disclosure and Public Participation," aiming to promote public participation in environmental protection through information disclosure. The Chinese government has recognised this, and the government is trying to regulate government emissions to curb emissions.

The purpose of this paper is to explore public participation in the protection of the environment, and the public's requirements for improving national environmental security. The goal is to propose policy recommendations for the corresponding macro environmental management in China. Based on panel data from 288 prefecture-level cities in China from 2011 to 2016, we used the feasible generalised least squares method (FGLS) to study the factors affecting the public's concerns about the environment. The relationship between environmental concerns and environmental reporting was examined by using provincial panel data from April 2017 to July 2018.

The results show that the government's environmental regulation power, economic level, education level, information level, and environmental pollution level will significantly promote the public's attention to the environment. Through heterogeneity analysis, we found that the level of informatisation can positively promote the level of government environmental regulation power, education level, and environmental pollution level to the public's attention to the environment.

This article has the following innovations. First, we quantitatively analyse the influencing factors of public environmental concerns. Second, we use big network data from the Baidu Index to build indicators for measuring the public's environmental concerns in 288 prefecture-level cities in China from 2011 to 2016, and the provincial panel data public environmental report volume verifies the effectiveness of public attention to environmental indicators. Third, through the analysis of urban heterogeneity, the impact on the development of informatisation on the public's attention to the environment is considered, and the factors of informatisation and education, government's environmental regulation, economic development level, and environmental pollution level are studied. This article focuses on the cross-cutting effects of the environment.

The remainder of this paper is organised as follows. Section 2 provides a brief literature review. Section 3 presents the total amount and method and explains the sources of the variables, data, and choice of measurement methods. Section 4 discusses the empirical results and analysis. Section 5 presents the results and suggests policy recommendations.

2. Literature Review

Various studies have shown that the public is paying increasingly more attention to environmentally friendly production, including public perceptions of low-carbon cities in China [18]. However, literature on the impact on public participation regarding the protection for the environment has been rare, and fewer studies have investigated the impact on public appeals on protection for the environment. In investigations of the public's need for the environment, people with higher education and families with children often demand higher environmental quality than those with lower education levels or without children [19]. Companies that have received a higher level of public attention have better environmental performance, especially state-owned enterprises [20].

In addition, most of the research data have been from developed countries, and few data have been based on developing countries. Compared with the relatively rich research in developed countries, environmental performance assessment studies in developing countries are not as rich [21]. The Google search function was used to construct public environmental concerns, and an observation was that public environmental concerns helped local governments pay attention to environmental governance issues [22].

In developed countries, people can vote for the government to increase public spending to improve environmental quality. China has a top-down national political system. Therefore, the government is willing to listen to the public's appeal and set environmental regulations to maintain social stability. By using data from 2000 to 2009, urban environmental improvement investment may increase if environmental quality is clearly linked to cadre promotion opportunities or land price increases [23]. By using the empirical data of China's A-share heavy polluting industry list of companies from 2008 to 2013, an empirical analysis was conducted on the relationship between media supervision, environmental regulation, and corporate green investment. Strict government environmental regulation plays an active role in promoting corporate green investment behaviour, and media supervision can significantly promote the exertion of environmental regulation [24].

The panel data of 86 cities in China from 2004 to 2009 were used to analyse the promotion mechanism of public appeals to urban environmental governance. The empirical results show that public environmental attention can effectively promote local governments to increase their attention to environmental governance issues, improve environmental pollution in cities through environmental governance investment, and improve industrial structure [25].

Some people's thirst for wealth is much stronger than their demand for a clean environment. However, when environmental pollution affects livelihoods, people take action to solve the problem [26]. A study demonstrated that if the media reports to the public about environmental protection, the government increases its attention and promotes environmental protection [27]. By using a provincial panel data collection, a study explored the potential behind the public's need for population size, income levels, urbanisation, and education to improve national environmental security [28]. By using the panel datasets of 30 provinces from 1998 to 2014, the determinants of China's green investment from the perspective of public appeals show that public appeals often have a positive impact on increasing China's green investment [29].

In China, as urban residents pay more attention to the quality of life and the transparency of environmental information, especially the development of modern media, more and more people are beginning to consciously and systematically express their concern about pollution and a strong demand for environmental governance. However, due to the availability of data, the data used in these documents were at the provincial level, or limited to some cities. Thus, to fully and effectively reflect the influencing factors affecting public participation in protecting the environment is difficult.

Discovering environmental information is easier through internet-based social media, such as Weibo and WeChat [30]. A study discovered that negative media legitimacy can prompt companies to publish environmental information [31]. The study found that many people expressed their complaints about PM2.5 pollution and environmental requirements on social media, causing a direct impact on China's air pollution policy. Online environmental protests were also observed [32].

Through a review of the literature on public participatory environmental governance, we found the following three research gaps. First, most of the articles on public participation in environmental governance have investigated the impact of public appeal on environmental governance. Few examples in the literature have analysed the factors affecting public environmental concerns. Second, the development of informatisation promotes the development of environmental governance systems. However, when studying public concerns about environmental impact factors, no article has considered the impact of informatisation development. Third, the coordination of administrative, market-based, and public-participating environmental policies is the development direction of the future environmental governance system. According to our review of the literature, there have been no studies on the impact of government environmental regulation forces on public environmental concerns. We attempt to fill these research gaps in this article.

3. Models, Data, and Methods

3.1. Models and Variables. Based on combining and theoretical analysis of the literature, we constructed a theoretical analysis framework. The specific formula is as follows:

$$\ln \text{Public Part}_{it} = \theta_0 + \theta_x \ln X_{it} + u_{it}, \quad (1)$$

$$u_{it} = v_i + e_t + \varepsilon_{it},\ i = 1, 2, \ldots, N,\ t = 1, 2, T.$$

X indicates the impact of factors, including economic development level, industrial structure, government environmental regulation power, informatisation level, financialisation level, opening level and industrial, pollution level on public participation in protecting the environment.

In addition to using 288 cities from 2011 to 2016 as a total sample for econometric analysis, we divided 288 cities into subsamples with higher levels of informatisation and lower levels of informatisation according to the level of informatisation of cities. The subsample regression is used to study the informatisation heterogeneity of cities.

3.2. Indicator Construction and Data Sources. We use 288 prefecture-level cities in China as a total sample from 2011 to 2016.

(1) Public Attention. In the 21st century, with the popularity of the internet, communication tools continue to improve. The public is increasingly learning about social information through online tools and expressing their opinions [33]. In recent years, scholars at home and abroad have begun to use the index of Google's search engine to measure the public's demand and attention to social and economic activities [34–36]. Since Google withdrew from the Chinese market in 2009, Baidu became the most widely used search engine in China [37]. Therefore, this paper draws on the latest methods [34, 35] and uses the Baidu Index to build a measure of public concern about environmental issues.

The specific construction steps: first, select the keyword "environmental pollution." Second, use the Baidu search

engine, which comes with the function to obtain the Baidu Index of every day in China's 288 cities from 1 January 2011 to 31 December 2016. Third, calculate the annual Baidu Index for each city by using the cumulative method, that is, to obtain the indicators for each city each year.

(2) Government Environmental Regulation Power. The vast majority of the literature on the number of environmental protection personnel, environmental pollution control R&D investment, pollution tax rate, or pollution control cost to measure government environmental governance has one problem: these indicators tend to focus on one aspect of government environmental governance; thus, measuring local government environmental governance and obtaining an overall picture of the policy are difficult [38, 39]. The Chinese government has many environmental governance methods, including economic instruments such as increasing environmental R&D investment, adjusting pollution tax rates, enacting environmental protection regulations, and directly promulgating administrative orders for energy conservation and emissions reduction. The proxy variables of the government's environmental regulation power used in the literature are largely endogenous to the quality of economic development, which leads to estimated endogenous problems that result in biased estimation results [40].

This paper refers to Chen et al [41] and selects the frequency and proportion of environmental-related vocabulary in the provincial government work report as the agent of the prefecture-level municipal government's environmental regulation power. Variable: government work reports are administrative, according to law, and the outline of the executive authority's decision and resolution is a programmatic document guiding the government's work. Therefore, the frequency and proportion of the environmental-related vocabulary of government work reports can more fully reflect the intensity of government environmental governance and reflect the overall picture of government environmental governance policies.

The reasons why the government environmental regulation power used in this paper can better meet the exogenous assumptions of instrumental variables are as follows. First, local government work reports generally occur at the beginning of the year, whereas economic activities run through the year; thus, they can effectively avoid the antiendogenous problem caused by causality. Second, the government environmental regulation variables are provincial-level variables, and other related variables are prefecture-level market-level variables, which help to alleviate the endogenous problems caused by reverse causality. The reason the problems are alleviated is that in the context of the Chinese system, subordinate government behaviour is generally difficult to directly affect the decision of the higher level government.

The specific steps of the government's environmental governance indicators are as follows. First, manually collect 31 provincial government work reports from 2011 to 2016; second, classify the government work report texts; and third, count the frequency of statistics and environment-related vocabulary, and calculate it in a manner that accounts for the proportion of the full text of the government report. Environmental-related vocabulary includes, for example, environmental protection, pollution, energy consumption, emission reduction, sewage, ecology, green, low carbon, air, chemical oxygen demand, sulphur dioxide, carbon dioxide, PM10, PM2.5, environmental management, and forest coverage and carbon emissions.

(3) Education Level. According to China's education system, we can divide Chinese education into four stages: ordinary primary schools, general secondary schools, secondary vocational education schools, and ordinary higher education institutions (China City Statistical Yearbook). We measure the level of education based on the education of students in each city in each year. The specific steps are as follows. First, the number of students in ordinary primary schools, general secondary schools, secondary vocational education schools, and ordinary higher education institutions in each city and total number of students at the end of each year are counted. Next, we use the following formula to calculate the education level of each city in each year.

$$\text{Education level} = \frac{(\textit{the number of ordinary primary school students} * 1 + \textit{ordinary middle school students} * 2 + \textit{secondary vocational education school students} * 3 + \textit{ordinary high school students} * 4)}{\textit{total number of people at the end of the year}}. \quad (2)$$

The data comes from the 2012–2017 China City Statistical Yearbook.

Ordinary institutions of higher learning refer to full-time universities that pass the national general higher education enrolment examinations, recruit high-level secondary school graduates, and implement higher education, that is, independent colleges, public colleges, vocational schools, and other institutions.

Secondary vocational education schools refer to schools approved by the national standards and approval procedures. These schools recruit junior high school (or part of the middle school) graduates or equivalent, implement secondary vocational and technical education, and train secondary vocational and technical personnel. For junior high school graduates, the duration of their studies is usually three to four years; for high school graduates, the duration of their studies is generally two to three years. These schools include secondary professional schools, technical schools, and vocational middle schools.

Ordinary secondary schools refer to the number of schools approved by the county and above-level education departments to recruit primary school graduates to implement secondary school teaching plans, including junior high schools and full secondary schools.

Ordinary primary schools refer to schools that have been approved by the education departments at or above the county level to recruit primary school-age children and implement primary school teaching plans.

(4) Other Control Variable Descriptions. The level of financial development is measured by the loan balance of per capita financial institutions; it is open to the outside world and measured by per capita foreign direct investment. The level of informatisation is measured by the ratio of the number of internet users to the total number of people at the end of the year. For industrial structure, we use per capita GDP to measure the level of economic development. We also use the average income of employees to measure the income level of residents and the industrial wastewater discharge and industrial sulphur dioxide emissions to measure the level of environmental pollution. The data sources are the 2012–2017 China City Statistical Yearbook.

3.3. Methods and Tests. In this paper, the panel data regression analysis model is used to better control the OLS estimation bias caused by unobservable economic variables, which helps to achieve more reasonable model setting and increases accuracy better than the cross-sectional data model. The sample estimates the model parameters. In addition, compared with the time series model, the panel data model can expand the sample information, reduce the collinearity between economic variables, and improve the effectiveness of the estimation. In addition, the panel data model can identify and measure effects not detectable by time series and cross-sectional models [42]. The FGLS method can effectively eliminate false regression between the unit root sequence and stationary autocorrelation sequence [43].

The feasible generalised least squares method is based on generalised least squares (FGLS). There are two steps to take when implementing the method.

First, transform the ordinary least squares regression.

$$\Phi Y = \Phi X\beta + \Phi V \tag{3}$$

where $\Phi V \triangleq v$ satisfies the requirements of the error method of the ordinary least squares method.

Second, a general least squares estimate is given to equation (3). The estimated value is as follows:

$$\widehat{\beta} = \left(X^T\Phi^T\Phi X\right)^{-1} X^T\Phi^T\Phi Y \tag{4}$$

Thereby $\widehat{\beta} - \beta = (X^T\Phi^T\Phi X)^{-1}X^T\Phi^T\Phi V = (X^T\Phi^T\Phi X\rangle^{-1}X^T\Phi^T v$.

If $E(X^T v) = EX^T Ev = X^T Ev$ holds, the estimated value $\widehat{\beta}$ obeys the normal distribution, and its expectation and variance are as follows:

$$E\widehat{\beta} = \beta \tag{5}$$

$$\operatorname{var}\widehat{\beta} = \widehat{\sigma}_v^2\left(X^T\Phi^T\Phi X\right\rangle^{-1} \tag{6}$$

$$\begin{aligned}\widehat{\sigma}_v^2 = S^2 &= \frac{1}{(n-2\rangle}\left(\Phi Y - \Phi X\widehat{\beta}\right)^T\left(\Phi Y - \Phi X\widehat{\beta}\right\rangle \\ &= \frac{1}{(n-2)}\Big[Y^T\Phi^T\Phi Y \\ &\quad + Y^T\Phi^T\Phi X\left(X^T\Phi^T\Phi X\right)^{-1}X^T\Phi^T\Phi Y\Big]\end{aligned} \tag{7}$$

In the FGLS method, the transformation matrix Φ is unknown, and it is necessary to estimate $\widehat{\Phi}$ first and then obtain the estimated value of β from (3).

3.4. Model Inspection. Empirically, to test for heteroscedasticity, the likelihood ratio test is employed by specifying hetero in the command xtgls in STATA [44], which uses iterated GLS to estimate the model with heteroscedasticity [45, 46]. Regarding a test for autocorrelation, Wooldridge [47] presented a simple test in panel data models, which was later advanced by Drukker [48], in his simulation study. Drukker [48] found that the test has good size and power properties in reasonably sized samples. His written programme is used in this paper to test for autocorrelation.

3.5. Preevidence Test. If there is either an exact correlation or a high degree of correlation between the explanatory variables in the linear regression model, the model estimation is either distorted or difficult to estimate accurately. This paper uses the variance inflation factor (VIF) to perform the collinearity test. VIF is equal to the ratio of variance in the existence of multicollinearity and variance in the absence of multicollinearity. The greater the VIF, the more severe the collinearity between the variables. The empirical judgment method shows that there is no multicollinearity when 0 <VIF< 10; when 10≤VIF< 100, there is strong multicollinearity; and when VIF≥100, there is severe multicollinearity.

4. Empirical Results and Analysis

4.1. Empirical Results. The regression results are shown in Table 1. The first column indicates the names of the variables. The second column is the total sample regression results, and the third column to the tenth column, respectively, indicate that the government has higher environmental regulation power, lower government environmental regulation power, higher informatisation level, lower informatisation level, higher economic level, and economy. Eight subsample regression results are presented, such as lower levels, higher levels of education, and lower levels of education. Lines 2–10 represent regression coefficients for each variable, and column 11 is the intercept. Lines 12–15 represent the number of samples, the number of cities, the test results for heteroscedasticity, the results of autocorrelation tests, and the results of the multiple collinearity tests.

According to the results of the heteroscedasticity test and autocorrelation test, we observe obvious heteroscedasticity and autocorrelation problems in the regression of nine subsamples of panel data. We use the variance expansion factor (vif) method [49] to test the multicollinearity problem of the variables. We observe that the average vif of the nine

Table 1: Regression results.

	Total sample	3.1: Cities with higher levels of informatisation	3.2: Cities with low levels of informatisation
Government environmental regulation power (keyword/total words)	0.018 (0.025)	0.086∗(0.033)	0.043(0.038)
The proportion of the secondary industry to GDP	-0.023 (0.048)	-0.597∗ ∗ ∗(0.071)	-0.42(0.102)
Per capita GDP (RMB10,000)	0.147∗ ∗ ∗ (0.031)	-0.153∗ ∗ ∗(0.048)	0.444∗ ∗ ∗(0.072)
Internet (10,000 people)	0.620∗ ∗ ∗ (0.017)		
Average wage of employees (Yuan)	-0.408∗ ∗ ∗ (0.050	0.455∗ ∗ ∗(0.067)	-0.171∗∗(0.073)
Financial level (per capita loan level of 10,000 yuan/person)	0.088∗ ∗ ∗ (0.021)	0.171∗ ∗ ∗(0.028)	-0.072(0.054)
Per capita foreign investment (US$/person)	-0.024∗ ∗ ∗ (0.007)	0.006(0.037)	-0.004(0.013)
Education level	0.689∗ ∗ ∗ (0.029)	0.883∗ ∗ ∗(0.037)	0.704∗ ∗ ∗(0.088)
Industrial wastewater discharge (10,000 tonnes)	0.106∗ ∗ ∗ (0.012)	0.401∗ ∗ ∗(0.015)	0.215∗ ∗ ∗(0.023)
Industrial sulphur dioxide emissions (tonnes)	0.089∗ ∗ ∗ (0.009)	0.113∗ ∗ ∗(0.856)	0.067∗ ∗ ∗(0.019)
cons	9.627∗ ∗ ∗(0.628)	20147∗ ∗ ∗(0.856)	8.699∗ ∗ ∗(0.979)
Number of samples	1630	831	797
Number of cities	280	142	136
chi2()	13065.15∗ ∗ ∗	21912.16∗ ∗ ∗	10459.95∗ ∗ ∗
Autocorrelation test	89.891∗ ∗ ∗	51.077∗ ∗ ∗	46.184∗ ∗ ∗
Multicollinearity test (mean vif)	2.73	2.49	1.77

subsamples is significantly less than ten. Therefore, we believe that the variables of the regression of these nine subsamples do not have multiple collinearity problems.

The total sample regression results showed that the coefficients of factors such as per capita GDP, network accession, financialisation level, education level, industrial wastewater discharge, and industrial sulphur dioxide emissions were significantly positive, respectively, 0.147, 0.620, 0.088, 0.689, 0.106, and 0.089. The variable coefficients of wage income and external investment factors were significantly negative, -0.408 and -0.024, respectively. The coefficient of government environmental regulation power is 0.018, but it is not significant.

According to the regression results of subsamples 3.1 and 3.2, in the areas with a high informatisation level, the coefficients of government environmental regulation power, financial level, education level, industrial wastewater discharge, and industrial sulphur dioxide emissions are significantly positive; respectively, the values are 0.086, 0.175, 0.883, 0.401, and 0.113, which are greater than the corresponding regression coefficients for the total sample and subsample 3.2.

4.2. Discussion of Results. Through the previous analysis of the regression results, we obtained the following five points.

First, increasing economic and education levels increases public awareness of the environment. According to the total sample regression results, when the per capital GDP level increased by 1%, the public's concern for the environment increased by 0.147% ($p < 0.01$). When the level of education increased by 1%, public attention to the environment increased by 0.689% ($p < 0.01$). This view is consistent with the study by Wen [28], which demonstrated that education levels increased by 1% and public demand for environmental improvements increased by 0.51%. People with higher levels of education may be more aware of the dangers of environmental pollution and willing to learn more about the environment; thus, the higher the level of education, the higher the public's concern for the environment [19]. Poston [50], Cheng and Liu [20], and Wen [28] have indicated that an increase in regional economic development promotes public attention to the environment. Fouquet [51] asserted that as the level of economic development increases, the public's requirements for environmental quality continues to increase. Among them [25], the results show that the per capital GDP level has increased by 1%, and the public's concern for the environment has increased by 0.073%, slightly less than the research results in this paper. We believe that this result is biased because the sample city changed. Zheng [25] selected 86 cities in China from 2004 to 2009 as a sample, and this paper selected 288 cities in China from 2011 to 2016. Factors such as the level of informatisation about the city and the level of government concern for the environment

have changed greatly. Factors such as economic level and education level have changed the public's influence on the environment, which is also one of the research results of this paper. See the fifth point for details.

Second, the increase in environmental pollution levels will increase public awareness of the environment.

The discharge of industrial pollutants will lead to a deterioration in the quality of the public living environment, which will cause public concern about the environment. The public has different sensing abilities for water quality and air quality in the environment. Additionally, industrial wastewater and industrial sulphur dioxide have different environmental pollution efficiencies. Therefore, the impact of different industrial pollutant emissions on public environmental concerns is different. The total sample results showed that when industrial wastewater discharge increased by 1%, public concern for the environment increased by 0.106% ($p < 0.01$), industrial sulphur dioxide emissions increased by 1%, and public concern for the environment increased by 0.089% ($p < 0.01$). In this paper, only two types of pollutants, industrial wastewater and industrial sulphur dioxide, are selected to represent the environmental pollution level. In addition to these two pollutants, common air pollutants include PM2.5, PM10, ozone, and nitrogen monoxide. Therefore, we expect that the impact of real environmental pollution levels on public environmental concerns is greater than 0.195%.

Third, the government's environmental regulations will promote public attention to the environment, and the level of informatisation will strengthen the impact of government environmental regulation on public attention.

By comparing the regression results in the total sample, subsample 3.1, and subsample, we found that the influence coefficient of government environmental regulation power of subsamples with higher information level reached 0.086 ($P< 0.1$) and was greater than the total sample and information level. When the government's regulatory power over the environment increases, it is often accompanied by a series of measures, such as environmental protection policies, environmental protection education, environmental protection publicity, and corporate pollution information disclosure. Most of these measures are promoted through the network. Therefore, in areas with high levels of informatisation, the government's environmental awareness will increase by 1%, and the public's attention to the environment will increase by 0.086%.

Fourth, the level of informatisation can directly promote public attention to the environment.

In areas with high levels of informatisation, the public's access to environmental protection information and the transmission of environmental protection information is lower, and the public can participate in environmental protection more conveniently. The total sample results showed that the influence coefficient of the number of people entering the network was 0.620 ($P< 0.01$). Therefore, when the level of informatisation increases by 1%, the public's attention to the environment will increase directly by 0.620%.

At present, China is in the period of rapid development of information technology and is entering the era of big data [52]. The Chinese government has announced the "internet +" national strategy to encourage the development of the internet industry and its innovative performance [53]. The rapid development of the level of informatisation will lead to a rapid increase in the attention and appeal to the Chinese public regarding the environment. The growing gap between public demand and actual environmental safety levels is a substantial challenge for China's environmental control and management systems.

Fifth, the level of informatisation will also indirectly promote public attention to the environment by strengthening the government's environmental regulation power, education level, industrial wastewater discharge, industrial sulphur dioxide emissions, and other factors.

By comparing subsamples 3.1 and 3.2, we found that in areas with high levels of informatisation, the influence factors of government environmental regulation power, education level, industrial wastewater discharge, and industrial sulphur dioxide emissions on public concern environment are significantly larger than the total sample and subsample 3.2.

4.3. Robustness Test. We perform an additional robustness test on the previous empirical process. We test the effectiveness of previously built public concern regarding environmental indicators. At present, the Chinese public participates in environmental management mainly through environmental reporting [54]. We quantify the number of environmental reports and the public's concern for the environment to test whether the public concern environmental indicators we construct can represent the Chinese public in environmental governance. The inspection steps are as follows.

(1) Build Environmental Reporting Indicators. Beginning in April 2017, the Ministry of Ecology and Environment of the People's Republic of China (http://www.mee.gov.cn/gkml/) announced the "12369" for each province in China every month (12369 is the hotline for reporting environmental violations, according to China's Ministry of Environmental Protection of the People's Republic of China "Economic Reporting Hotline Work Management Measures" established). The reporting method is divided into WeChat reports, telephone reports, and online platform reports. By manually collecting monthly environmental report data, we collected the reports on the three reporting methods and obtained the number of environmental reports from April 2017 to July 2018. Data are missing for August, September, and October 2017.

(2) Construction of the Baidu Index. We reorganised the Baidu Index data mentioned. The Baidu Index of the provincial level from April 2017 to July 2018 was calculated by using the Baidu Index of 288 prefecture-level cities from April 2017 to July 2018. The specific calculation formula is as follows:

$$\text{Baidu IndexIm} = \sum_{i=1}^{n} D_i \tag{8}$$

Among them, D_i is the Baidu Index of the i-th prefecture-level city every day, N is the number of days in the sample month, and the result of adding the Baidu Index of the N daily prefecture-level cities is the provincial monthly Baidu Index.

Table 2: Test results.

Impact of public attention on environmental reporting volume	ols	Panel ols (re)	Panel ols (fe)	fgls (Resolving heteroscedasticity)
Public concern (lnx)	0.973∗∗∗ (0.054)	0.311∗∗∗ (0.057)	0.207∗∗∗ (0.058)	0.812∗∗∗ (0.044)
cons	-1.612∗∗∗ (0.468)	4.054∗∗∗ (0.520)	5.004∗∗∗ (0.501)	-0.156 (0.398)
Sample number (number of obs)	368	368	368	368
Group number (number of groups)		31	31	31
R∗R (within)	0.472	0.037	0.037	
R∗R (between)		0.638	0.638	
R∗R (overall)		0.472	0.472	
F ()	327.42∗∗∗		12.79∗∗∗	
wald chi2 ()		29.8∗∗∗		344.81∗∗∗

(3) Regression of Indicators. We use the ols, random panel ols, fixed panel ols, and FGLS methods to regress the two indicators to test the relationship between the two.

The estimated value is as follows:

$$\begin{aligned} &\ln(\text{Environmental reporting}) \\ &\quad = a * \ln(\text{Public concern about the environment}) \\ &\qquad + b \end{aligned} \tag{9}$$

The empirical results are shown in Table 2. We observe that the public concern regarding the environment and the amount of environmental reporting we build are highly correlated. In particular, the ols regression results show that the public's concern for environmental factors is 0.973, which is significant at a confidence level of 1%. This result means that when the public is concerned about a 1% change in the environmental level, the environmental report volume changes by 0.973%. Therefore, our empirical results are robust.

5. Conclusion

In this study, based on panel data from 288 prefecture-level cities in China from 2011 to 2016, we used FGLS to study the public's environmental impact factors. The relationship between environmental concerns and environmental reporting was examined by using provincial panel data from April 2017 to July 2018. The results show that the government's environmental regulation power, economic level, education level, information level, and environmental pollution level will significantly promote the public's attention to the environment. Through heterogeneity analysis, we found that the level of informatisation can promote the government's environmental regulation power, education level, and environmental pollution level to the public's attention to the environment.

We conclude that with the continual development of factors such as economic development level and education level, especially the continual development of information technology, the public's demand for improving environmental safety will continue to increase now and in the near future. The growing gap between public demand and actual environmental safety levels is a substantial challenge for China's environmental control and management systems.

On the basis of our results, we suggest the following. First, China should comprehensively use environmental management policies such as administrative, market, and public participation to establish a complete policy system. Second, the impact on factors such as information transfers should be fully considered when constructing an environmental policy system. Third, the use of the big data in the information age should be a means to establish an effective environmental risk communication system. Fourth, a correct and timely guide for public participation in environmental management is necessary to improve environmental safety. Finally, to reduce environmental management costs, the public's demands for the environment should be adjusted to avoid environmental incidents.

Nomenclature

Acronyms

EPPE: Environmental protection performance evaluation
FGLS: Feasible generalised least squares method
VIF: Variance expansion factor method

Symbols

Public part: Public participation
GDP: Gross domestic product.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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