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RESEARCH ARTICLE

Environmental Regulation and Public Environmental Concerns in China: A New Insight from the Difference in Difference Approach

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Abstract: Facing severe air pollution, the Chinese government has introduced bottom-up public participation in environmental policy. The increase in public environmental attention can promote the participation of all people in environmental governance, which is a major guarantee for achieving the carbon peaking and carbon neutrality goals. In this paper, we use city-year panel data and the strategy of difference in difference (DID) to estimate the impact of environmental regulation of "The Blue Sky Defense War" on public environmental concerns (PEC). This environmental regulation reduces PEC for two reasons. First, the policy has greatly improved air quality in the Beijing-Tianjin-Hebei region and surrounding areas. When air quality improves, people pay less attention to environmental issues. Second, environmental regulations reduce household income. As incomes fall, people will focus more on economic development than on environmental issues.

Keywords: environmental regulation, concerns, DID

1. Introduction

The frequent occurrence of haze has brought many negative effects on people's work efficiency (Zivin & Neidell, 2018), physical and mental health (Kampa & Castanas, 2008; Zhang et al., 2023), which has aroused great public environmental concerns about air pollution Environmental problems not only seriously affect people's lives but also become an important factor hindering economic development (Zhang et al., 2014). Recently, China has paid increasing attention to environmental issues and has raised environmental protection to the policy level. In the face of tightening carbon emission constraints and achieving the carbon peaking and carbon neutrality goals, the importance of national participation in environmental governance is self-evident (Zhang et al., 2022).

Our government has introduced bottom-up public participation in environmental governance, as the Measures for Public Participation in Environmental Impact Assessment issued in 2019, aiming to build a diversified environmental system and effectively improve environmental quality.

Has the implementation of environmental policies increased the PEC? Our study finds that although the environmental policy has effectively improved air quality (Wang & Jia, 2021), it harms PEC. Studying the impact of environmental policies on PEC has important economic and policy implications. First, the increase in public environmental preference can improve the purchase of environment-friendly products and the stock investment of green enterprises (Gu et al., 2021), which can upgrade the industry structure into green and low-carbon paths (Pan & He, 2022). Second, public participation can play a supervisory role in the central and local governments, thus effectively promoting environmental governance (Wu et al., 2022).

Despite the importance of this impact, few studies show the influencing factors of PEC from the policy level. Most of the research focuses on psychology and personal cognition (Samdahl & Robertson, 1989), such as an individual's understanding of environmental issues, environmental attitude, and environmental sensitivity (Hungerford, 1992; Stern, 2000). Some studies believe that economic factors such as macroeconomic trends will also affect PEC. When the economy develops well and the income of residents increases, individuals will have higher requirements for environmental quality, thus increasing PEC (Li & Chen, 2018; Lo, 2016).

Our paper selects the "Three-year Action Plan for Winning the Blue Sky Defense War" (BSDW) issued in 2018 to study the impact of environmental regulation on PEC. The policy selects "2 + 26" cities in and around Beijing, Tianjin, and Hebei province (BTH), which are the transmission channels of air pollution in BTH cities aiming to improve the environmental quality of northern cities. This policy focuses on northern cities but not the national area. The general target is that the main emissions of atmospheric pollutants such as greenhouse gas emissions, particulate matter, and heavy pollution days should be reduced significantly after three years of efforts in "2 + 26" cities.

In addition, we select Baidu Environmental Pollution Search Index to represent PEC. We set the "2 + 26" cities as the

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treatment group and the other cities as the control group. We use DID to study the impact of the Blue Sky Defense War on PEC.

The results show that environmental regulation reduces PEC, and the robustness test also confirms this result. First of all, our research has passed the parallel trend test and the indexes in different cities have a similar time trend. Second, we have tested the concurrent events such as the epidemic in 2020 which does not affect our estimation results. In addition, we also find that the decline of PEC was driven by the improvement of environmental quality and the decline in employment.

Beyond the above economic and policy of implications, this paper makes great contributions to the literature in other aspects. Most existing literature on Public Environmental Concern (PEC) analyzes the influencing factors from the perspectives of psychology and economic development level. However, there is a gap in studying the impact of policies on PEC, which is important for improving environmental policies and turning public attention into action. This paper aims to fill this gap by studying the impact of BSDW on PEC and supplementing the mechanism research to show how environmental regulations influence PEC by affecting environmental quality and income. While previous studies measured PEC using the number of environmental letters, petitions, and survey questionnaires, the use of the Baidu Search Index is more relevant today due to the widespread use of the internet and expansion of public participation channels. Baidu, as the largest Chinese search engine, has a broad reach and high data availability, and the Baidu haze index can effectively represent PEC given its direct correlation to the severity of haze.

The remainder of this paper is arranged as follows. Section 2 provides the literature review part. Section 3 provides the methodology. Section 4 shows the data. Section 5 is the results part, including the results of the main regression, parallel trend test, placebo test, and robustness test including the analysis of concurrent events. Section 6 is the mechanism analysis and its regression results. Section 7 is the summary and discussion.

2. Literature Review

The literature on the influencing factors of PEC mainly focuses on internal individual factors and external socioeconomic factors.

From the individual level, the research mainly focuses on psychology. Environmental behavior is a choice made under self-restraint, which depends on the individual's environmental knowledge, values, and other intrinsic factors. The influencing factors of PEC include personal awareness of environmental issues, personal environmental attitude, and environmental sensitivity which are proposed in the environmental literacy model. The environmental attitude is the key variable of environmental concern (Ramsey & Hungerford, 1989). But it only considers the individual's environmental knowledge, ignoring other aspects of the individual's perception of the environment. It added personal awareness level, values, and culture to expand the influencing factors of PEC (Peng, 2013). In addition, different individual characteristics also have different effects on PEC. Education has a positive impact on PEC, and there is no significant difference in environmental attitudes between gender (Fan & Hong, 2015). Rational individuals, after considering economic and environmental factors, choose to maximize individual utility, which will harm environmental behavior (Stern, 2000).

From a social perspective, PEC is mainly affected by economic growth. Specifically, while the economy develops well, the public will have more positive environmental behavior. When the economic level rises, the income of residents increases. After meeting the basic food and clothing needs, it will also increase environmental expenditure. The increased income will also put forward higher requirements for environmental quality, thereby increasing public environmental attention (Diekmann & Franzen, 1999). During recessions, people focus more on economic growth and less on the environment (Conroy & Emerson, 2014). This is because the environment is a luxury for low-income people, who think more about their material life and do not have time to care about environmental quality (Kahn & Kotchen, 2010). In addition, the disclosure of media and environmental information contributes to increasing public participation in environmental protection (Conroy & Emerson, 2004).

The internal and external influencing factors of PEC are discussed above, but environmental protection is the result of the combined effect of internal and external conditions. Environmental behavior will occur when favorable environmental attitudes are present. While external environments are neutral, attitudes tend to have a stronger effect (Guagnano et al., 1995). In addition, when environmental pollution becomes more serious, they will enhance their awareness of environmental pollution and pay attention to pollution (Wang & Han, 2016).

In summary, the influencing factors of PEC are from three aspects, including factors such as personal internal environmental knowledge, environmental attitudes, values, external socioeconomic conditions, and factors determined by both.

However, there is little literature that analyzes changes in PEC from an environmental policy perspective. Research on environmental policy mainly focuses on the effects of environmental regulations on pollution control (Pan & He, 2022), firm innovation (Greenstone, 2002), and personal income (Kahn & Mansur, 2013). The implementation of environmental policies has a series of ripple effects on public behavior. If the public's environmental behavior is not taken into account, it will be difficult to implement a low-carbon economic path. The public's environmental behavior depends on environmental awareness, therefore studying this impact helps achieve low-carbon green development faster.

3. Methodology

By combining the different impacts of policies on different cities and the changes before and after the implementation of policies, we can use the DID strategy to estimate the effect of environmental policy on PEC. In this paper, we combine two types of change. The first change is the time change, which is before and after the implementation of BSDW. The second is urban change, where the cities with blue sky policies and those without. These two variations provide us with evidence for the use of DID. Our estimate is the following regression (Liu et al., 2017).

$$ln(Y_{ct}) = \beta Treat_c * Post_t + Airpollution + \mu_c + \delta_t + \varepsilon_{ct} \quad (1)$$

We use the variations over city-year and analyze city and year levels. Y_{ct} is a vector including the total haze index of Baidu, the PC haze index of Baidu, and the mobile haze index of Baidu in city c and year t. We take the natural logarithm for Y_{ct}. $Treat_c$ is the target city c of "2 + 26" cities. $Post_t$ is a dummy variable that is equal to 0 for 2010–2007 and 1 for 2018–2020. The meaning of this coefficient is semi-elasticity, which indicates the impact on the PEC of BTH and surrounding cities after the implementation of the environmental policy in 2018. If the coefficient is positive, it implies the environmental policy has increased PEC. Otherwise, the policy has reduced the PEC.

We use average PM2.5 concentrations in cities from 2011 to 2015 as the control variable (Shi & Xu, 2018). The BTH region is located in the Bohai Rim Economic Circle, which greatly drives economic development in China. Nevertheless, the frequent occurrence of haze pollution has caused serious air pollution. According to the 2016 Global Urban Pollution Database, the BTH region accounted for six of China's top 10 cities with the concentration of air pollution in each city before the implementation of the policy. The "2 + 26" city was chosen to reduce air pollution in BTH and surrounding cities. Air pollution is the deciding factor in the implementation of the policy. Based on this, we select the predetermined variable of the average concentration of air pollution in each city before the implementation of the policy as the control variable.

We use DID strategy to study the effect of policy on PEC. The empirical model makes it feasible for the set of city-fixed effects μc and year-fixed effects δt. We can control all the cities' characteristics that do not change with time. All the standard errors cluster over the city. ϵ_{ct} is an error term with a mean equal to 0.

To further test the feasibility of the empirical model, we conduct a series of sensitivity tests and robustness tests. First, we test whether PEC change significantly before and after the BSDW was issued. Second, we examine whether the change is only affected by this environmental regulation and not by other factors. We also examined whether it would be affected by concurrent events, such as COVID-19, which occurred in late 2019. These robustness tests further confirm our conclusions.

4. Data

The costs of expressing environmental demands on the Internet are much lower compared with the previous channels such as telephone and petitions. More and more individuals pay attention to environmental information through search engines, so the search volume of network keywords can be used to measure public attention to the environment (Wu et al., 2022).

We obtained the data of Baidu search environmental pollution index from Baidu Index. We use the total environmental pollution index of Baidu including 320 cities and 10 years from 2011 to 2020 to represent the PEC and divide the total index into the PC index and mobile index.

The "2 + 26" cities are seen in Table 1. The specific goal of the BSDW is to reduce the total emissions of sulfur dioxide and nitrogen oxides in the target cities by more than 15 percent from 2015 levels by 2020. PM2.5 concentration will be reduced by more than 18 percent. Compared with 2015, 80 percent of the days in these cities will have good air quality, and the number of days with serious pollution will be reduced by more than 25 percent. In this paper, we use PM2.5 to represent air pollution for 2011–2020 in 320 cities collected by Environmental Monitoring of China. Besides, we use the mean PM2.5 from 2011 to 2015 as the control variable. We also use average annual employment for 2011–2019 in 320 cities from China Statistical Yearbook.

Table 2 shows the summary statistics for the variables used in the analysis. Panel A in Table 2 shows the ten-year average (2011–2020) of the total environmental index, the ten-year average (2011–2020) PC environmental index, and the eight-year average (2013–2020) mobile environmental index. These vary considerably with the mean of 1820, 1035, and 785 times and standard deviation of 23.55, 13.02, and 13.57, respectively. We use the data from 2011 to 2020, spanning seven years (2011–2017) before the policy and three years (2018–2020) after the policy. Panel B in Table 2 shows the data of PM2.5 from 2011 to 2020, and the mean is 39.30. Air pollution shows the data of PM2.5 from 2011 to 2015, and the mean is 41.78. Panel C in Table 2 shows the data on employment and the average annual number of employers about 3830 thousand.

Table 1
"2 + 26" cities

Provinces	Cities
Beijing	Beijing
Tianjin	Tianjin
Hebei	Shijiazhuang, Tangshan, Langfang, Baoding, Cangzhou, Hengshui, Xingtai, and Handan
Shanxi	Taiyuan, Yangquan, Changzhi and Jincheng
Shandong	Jinan, Zibo, Jining, Dezhou, Liaocheng, Binzhou, and Heze
Henan	Zhengzhou, Kaifeng, Anyang, Hebi, Xinxiang, Jiaozuo, and Puyang

Table 2
Summary statistics

	Mean	S.D.	obs
Panel A. City-year level			
Total index (100 times)	18.20	23.55	2989
PC index (100 times)	10.35	13.02	2939
Mobile index (100 times)	7.85	13.57	2,358
Panel B. City-year level			
PM2.5 (ug/m^3)	39.30	16.58	3,330
Air pollution (ug/m^3)	41.78	15.50	2970
Panel C. City-year level	41.78	15.50	2970
Employment (1000)	3830	65.57	2,403

5. Results

5.1. Baseline results

Tables 3, 4, and 5 present the impact of BSDW on the total index, PC index, and mobile index, respectively, with all regressions utilizing city-year panel data and mean PM2.5 concentrations from 2011 to 2015 as the control variable. The regression coefficient represents the effect of BSDW on PEC, with positive coefficients indicating improvement and negative coefficients indicating reduction. In Table 3, we present the OLS estimates of equation (1) as the baseline regression, with column 2 showing a statistically significant coefficient of −0.111 for the total environmental pollution index of Baidu. Columns 2 in

Table 3
Impact of environmental regulations on public environmental concerns

	Total index	Air pollution
DID	−0.111*	0.019***
	(0.0597)	(0.00600)
City-FE	yes	yes
Year-FE	yes	yes
Observations	3,370	3,301
Number of cities	320	320

Notes. ***, **, and * present the significance levels at 1%, 5%, and 10%, respectively, and the same applies to other tables. Table 3 uses the total index.

Table 4
Impact of environmental regulations on public environmental concerns

	PC index	Air pollution
DID	−0.0948*	0.004
	(0.0597)	(0.00600)
City-FE	yes	yes
Year-FE	yes	yes
Observations	3,301	2643
Number of cities	320	320

Note. Table 4 uses the PC index.

Table 5
Impact of environmental regulations on public environmental concerns

	Mobile index	Air pollution
DID	−0.216***	0.0229**
	(0.0575)	(0.00961)
City-FE	yes	yes
Year-FE	yes	yes
Observations	3,301	2,643
Number of cities	318	318

Notes. Table 5 uses a mobile index.

Tables 4 and 5 show significant coefficients for the PC and mobile environmental pollution indices, respectively, at 10% and 1% levels of significance.

The three tables presented in our study illustrate a clear decline in PEC following the implementation of the policy. This negative effect is likely attributable to the effectiveness of BSDW in enhancing environmental quality, reducing the sensitivity of pollution health response function. Additionally, Figures 1 and 2 depict the shift in PM2.5 levels in "2 + 26" cities before and after the policy's implementation, displaying a significant improvement in air quality.

Figure 1
Average change of PM2.5 concentration from 2011 to 2017. Notes: Figure 4 shows the average change in PM2.5 concentration from 2011 to 2017, and we can see that the PM2.5 concentration of most "2 + 26" cities is from 70 ug/m^3 to 92 ug/m^3

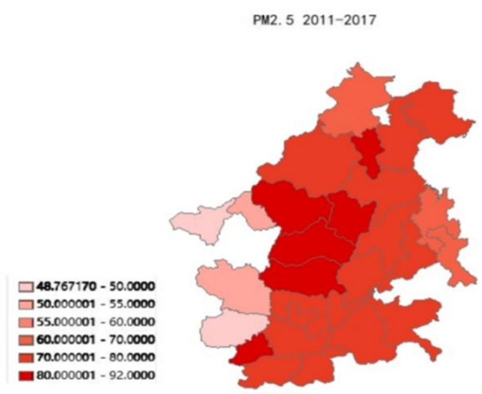
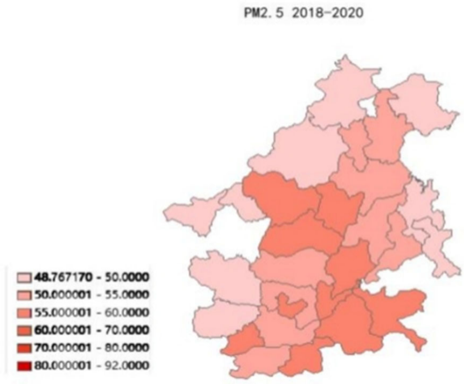


Figure 2
Average change of PM2.5 concentration from 2018 to 2020. Notes: Figure 5 shows the average change of PM2.5 concentration from 2018 to 2020, and we can see that the PM2.5 concentration of most "2 + 26" cities reduces largely with the range from 48 ug/m^3 to 55 ug/m^3



Consequently, individuals may become less sensitive to environmental concerns, detracting from their perceived importance.

Upon comparing Tables 4 and 5, it becomes evident that the effects of BSDW differ across various Baidu haze indexes. Specifically, we observe that the coefficient in the first column of Table 5 surpasses that in the first column of Table 4, suggesting that the mobile terminal index is more greatly impacted by BSDW. This could be due to the fact that it is comparatively easier to search using a mobile phone than a computer.

5.2. Examination of parallel trends

The assumption of parallel trends is the premise for the use of DID in empirical papers. DID can be used only when the target variables of the treatment group and the control group have similar change trends before the environmental policy. In this paper, we do a parallel trend test to test whether the empirical results reflect the effects of the BSDW on PEC. After the occurrence of the policy, the changing trend of PEC in the "2 + 26" cities will have significant difference from that in other cities.

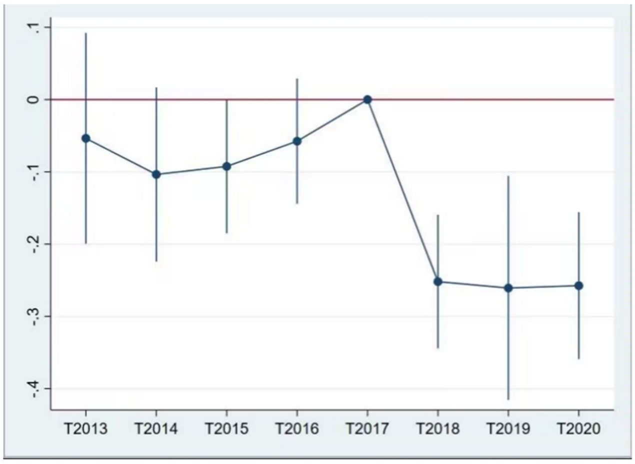
Figure 3 shows the results of the parallel trend test. We chose 2017 as the base period. As can be seen from Figure 3, there is no significant difference between the two groups before the BSDW occurred. In 2018, the year that this policy was implemented, PEC dropped significantly. After the implementation of the policy, there began to be significant differences between the two groups of cities.

Our results show that the parallel trend test passes. This suggests that without the policy, the treatment city and the control city would have similar developing trends. It also further confirmed the feasibility of our empirical strategy of using DID.

5.3. Placebo test

The purpose of the placebo test is to establish whether the observed effect is a result of any extraneous, random factors. Multiple experimental groups can be randomly selected from the cities, and the coefficient or placebo result value can be extracted and plotted on a graph to better understand the actual policy effects. Primarily used to validate the efficacy of a policy, the

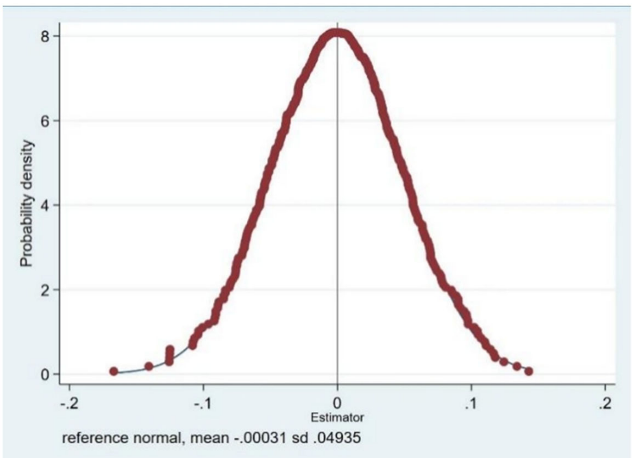
Figure 3
Parallel trend test. Notes: (1) The changing trend of PEC from 2013 to 2020. (2) We choose 2017 as the base period



placebo test involves analyzing the control group's outcomes, which receives a false policy implementation or treatment. If the policy's effect remains significant even after the use of a placebo, it suggests that the results of the main regression analysis may not be entirely trustworthy and could be influenced by unobservable factors, unrelated to the policy.

To test whether the coefficients differ significantly from the main regression estimates, we conducted 500 random processes on the interaction terms and regressions. As depicted in Figure 4, the placebo test results showed that the coefficient was not significant, following a normal distribution with a mean value of zero. This suggests that the coefficients of the 500 random experiments were approximately zero. We compared the placebo test results with those of the baseline regression and noted significant differences between the two. The insignificant coefficient of the placebo test indicates that the substantial reduction in PEC was attributed to the policy intervention rather than other factors. Consequently, our baseline results are reliable and robust.

Figure 4
Placebo test. Notes: (1) We take 500 random samples of 366 cities. (2) The average estimator is about 0



5.4. Concurrent events

If any other events are affecting PEC in various cities during the period of BSDW, our estimates may be biased. There is one thing we cannot ignore. The epidemic of COVID-19 broke out in late 2019. During the outbreak, people's concern about the epidemic has increased dramatically, and people are paying more attention to the changes in the epidemic situation and the government's epidemic prevention policy. To eliminate the impact of the pandemic on the estimated results, we removed the 2020 indexes from the sample. Table 6 shows the verification of concurrent events. We can see from Table 4 that the coefficients are −0.13, −0.128, and −0.226 and are significant at the 5% level, which has a similar outcome to our baseline results. These negative coefficients prove the validity of our empirical results.

Table 6
Testing for concurrent events

	Total index	PC index	Mobile index
DID	−0.130**	−0.128*	−0.226***
	(0.0643)	(0.0651)	(0.0622)
City-FE	yes	yes	yes
Year-FE	yes	yes	yes
Observations	3,010	2,944	2,292
Number of cities	320	320	318

Note. Table 6 uses the total index, PC index, and mobile index from 2011 to 2019 to exclude the impact of the epidemic in 2020.

If BSDW affected different industries across cities, our results can be biased. One such event stands out, the epidemic of Corona Virus Disease 2019 (COVID-19) that broke out in December 2019. During the epidemic, concerns about the epidemic increased dramatically. So we drop the index in 2020 from the sample, and the result is shown in Table 6. We can see that the coefficient is negative and significant at the 5% level, which is similar to our main estimate.

6. Mechanism Check

We investigate the channels through which environmental regulation reduced PEC. To be specific, we estimate whether this policy reduced air pollution and employment, thus declining PEC. We obtain a panel of the data of PM2.5 to represent air pollution and annual employment. In the baseline regression, we divide cities by the city-year level and use DID to estimate the effect of BSDW on air pollution and employment. We can see the regression results shown in Tables 7 and 8.

Table 7
Impact of environmental regulations on PM2.5

	PM2.5	BTH	non-BTH
DID	−0.058***	−0.136***	−0.0162
	(0.014)	(0.0135)	(0.0106)
City-FE	yes	yes	yes
Year-FE	yes	yes	yes
Observations	3,570	3,390	3,470
Number of cities	320	320	318

Note. Table 7 divides the cities in the disposal group into BTH cities and non-BTH cities. The effects of the BSDW on air pollution in the two groups of cities are examined separately.

Table 8
Impact of environmental regulations on employment

	Employment	BTH	non-BTH
DID	−0.0823***	−0.0743***	−0.0950***
	(0.0178)	(0.0243)	(0.0144)
City-FE	yes	yes	yes
Year-FE	yes	yes	yes
Observations	2,574	2,475	2,484
Number of cities	286	275	276

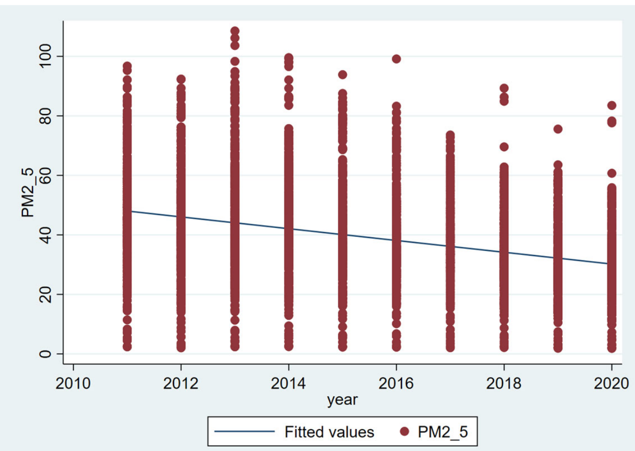
Note. We divided the cities in the disposal group into BTH cities and non-BTH cities. The effects of the policy on employment in these two groups of cities were examined separately.

For air pollution, the environmental policy obliges enterprises in key cities to reduce emissions of pollutants. As a result, air pollution in key cities will decrease significantly (Yu et al., 2023). When air quality is improved, people will be less sensitive to air pollution and will no longer pay attention to environmental quality. That is to say, when environmental policies are implemented, PEC decreases with the improvement of air quality.

Table 7 examines the above mechanism. Table 7 shows that environmental regulations significantly reduce air pollution. Column 2 in Table 7 applies to air pollution in "2 + 26" cities and the coefficient is −0.058 and significant at a 1% level. The negative coefficient shows that environmental regulation decreased air pollution. Figure 5 also shows the overall decreasing trend of PM2.5 in each city from 2011 to 2020. But this mechanism only applies to BTH cities, as we can see from columns 3–4 in Table 7 which apply to air pollution in BTH cities and non-BTH cities, respectively. The coefficients are −0.136 which is significant at the 1% level and −0.0162 which is not significant. The air pollution in BTH is more serious than that in other cities. Residents in BTH will increasingly focus on environmental quality. The implementation of environmental regulations has significantly reduced air pollution in the BTH region, which could explain why environmental regulations have hurt PEC.

In terms of employment, Maslow's hierarchy of needs believes that individuals' minimum needs are based on material needs. The

Figure 5
The changing trend of PM2.5 from 2011 to 2020. Notes: Figure 5 depicts the changing trend of PM2.5 from 2011 to 2020



need for higher environmental quality is part of the spiritual need. Higher income people are already adequately satisfied with material needs compared to lower income people and will therefore show more concern for the environment (Liere & Dunlap, 1980). As people get richer, the demand for higher environmental quality should increase. Overall, this can contribute to a positive relationship between wealth and environmental problems (Diekmann & Franzen, 1999). But when the economic situation is bad and unemployment increases, people have to face the double pressure of material and spiritual unemployment. At this time, people will focus on material life and income sources, and the demand for the environment will be reduced. The implementation of the policy has forced companies to reduce pollution emissions and develop new technologies, which have increased their costs (Greenstone, 2002). When companies are less profitable, they hire fewer workers, leading to an increase in unemployment (Kahn & Mansur, 2013). Faced with a bad employment environment, people will focus on economics and reduce their attention to the environment.

Table 8 confirms our mechanism. The implementation of the policy reduces employment, which leads to the reduction of PEC. Column 2 in Table 8 applies to employment and the coefficient is −0.0823 and significant at a 1% level. The coefficient shows a negative impact of the policy on employment. This mechanism applies not only to BTH cities but also to non-BTH cities. Columns 3–4 in Table 8 apply to employment in BTH cities and non-BTH cities, respectively. The coefficients are −0.0743 and −0.0950 both of which are significant at a 1% level.

7. Conclusion and Discussion

PEC is a critical determinant of environmental behavior, making it a significant parameter to boost environmental policy. Our article investigates the impact of environmental regulation on PEC from a fresh policy perspective. The primary goal of our research is to establish whether the implementation of environmental regulation results in an increase in public environmental concerns. Taking the environmental policy of BSDW as our focus, we select the "2 + 26" cities affected by this policy as the treatment group and employ the DID method, inclusive of city-fixed effects and year-fixed effects. Our study reveals that policy shocks have a considerably negative impact on PEC, as well as on the total index, PC index, and mobile index. Further analysis shows that the BSDW has the most significant impact on the mobile index, likely as a result of the convenience of mobile phones.

To ensure the accuracy of our study, we conducted several robustness tests. First, our model underwent the parallel trend test, which revealed that both the experimental and control groups had the same time trend before the policy implementation. Moreover, after the implementation of BSDW, the two groups showed significant differences. Second, our model passed the placebo test, which reinforced the reliability of the baseline regression model. Finally, to eliminate the impact of other time-varying factors, we considered the concurrent event of COVID-19. Remarkably, the regression results remained significantly negative, indicating the significant role played by BSDW in reducing the PEC.

Our article also includes mechanism testing to investigate the factors underlying the negative impact. Our study reveals that the low PEC was due to the improved environmental quality and reduced employment. BSDW has effectively enhanced the air quality of BTH by shutting down heavily polluting enterprises. However, this policy did not have a significant impact on the air pollution of non-BTH. When air quality improves, people typically pay less attention to air pollution as they become less susceptible to its health hazards.

Another factor that contributes to the low PEC is the reduction in employment brought about by BSDW. Strict environmental regulations encourage companies to reassign workers from polluting industries to other sectors because the cost of complying with these regulations may lead to job losses. As a result, people may prioritize their basic material needs instead of environmental concerns when their income is lowered due to job cuts. Only when their material needs are met, they are able to shift their focus toward environmental aspects.

While environmental policies are effective in reducing air pollution, they can also have negative consequences. Typically, people are only concerned about the negative effects of air pollution, such as cardiovascular and cerebrovascular diseases, obesity, mental illness, and low work efficiency, when air pollution becomes severe. When air quality improves, people are no longer sensitive to the harmful effects, which reduces the PEC. Hence, it is crucial to enhance public knowledge and understanding of the impact of environmental pollution on health, economic development, and the environment. This would increase the public's sensitivity to the health response function of air pollution and inhibit PEC reduction. As such, environmental awareness campaigns should focus on educating the public about the dangers of environmental pollution and the benefits of environmental protection to overcome the issue of declining PEC.

Individuals tend to prioritize their material needs before considering other requirements. With the BSDW increasing unemployment rates, individuals may experience both material and spiritual unemployment, causing environmental protection to be deemed a luxury. To encourage individuals to adopt environmentally friendly attitudes and behaviors, the benefits of such actions must outweigh the costs. It is, therefore, vital to reduce the relative cost of environmental protection. This can be achieved through both environmental and economic measures. The government can establish a comprehensive information monitoring system to monitor and evaluate people's environmentally protective or harmful behavior. To incentivize environmental protection, rewards and subsidies can be provided for individuals who display protective conduct.

In our study, we have analyzed the relationship between air quality, employment, and PEC reduction. However, other factors may also contribute to this effect. To further our research, we plan to undertake the following approaches. First, we will evaluate environmental policies' impact on employment in various industries by segmenting them. Second, we will investigate the impact of different environmental policies on PEC reduction. Through these steps, we aim to broaden our understanding of the mechanisms underlying the PEC reduction phenomenon.

Conflicts of Interest

The author declares that she has no conflicts of interest to this work.

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