Local Government, Polluting Enterprise and Environmental Pollution: Based on MATLAB Software

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Abstract—The important issues of China's environmental pollution and its internal reasons have been explored by means of the software MATLAB which has been widely applied to the economics fields due to its powerful mathematical and graphical functions. The impact of local government's behavior on environmental pollution has been evaluated and, an empirical analysis based on China's 30 provincial data from 1997 to 2009 has been given. The results show that, stimulated by decentralization reform, the local government tends to form close relationship with enterprise aiming at speeding up the economic growth as well as taking environmental protection as a secondary objective. While economic factors cannot be used to explain all the pollution problems completely, the behavior of local government plays important roles on environmental pollution. The investigation suggests that the reformation of the current political system and the adjustment of the distorted incentive mechanism are the two effective approaches of solving China's environmental pollution problems.

Index Terms—decentralization reform, local government, environmental pollution, enterprise, MATLAB

I. INTRODUCTION

In the current class of scientific computing software, MATLAB has been welcomed by more and more researchers due to its powerful mathematical and graphical functions. In the economics-related fields, MATLAB also has been wide used, such as financial modeling, quantitative analysis, image processing and so on. Here, we will use the MATLAB software to analyze China's environmental pollution and explore its real logic.

Since China adopted reform and opening-up policy in late 1978, the national economy has grown rapidly, and has produced an economic miracle. Yet the extensive economic growth has paid heavy environmental cost. In 2005~2009, there were 720 environmental pollution accidents, and the number of enterprise's illegal dredge activities accounts for 55.7 percent. A research report on China's green GDP accounting shows that, in 2008 the cost of degenerating ecology environment has reached

1274.57 billion yuan, and the cost caused by pollution has accounted for 70.2 percent of the total cost. Obviously, environmental pollution not only threatens seriously the health of human, but also restricts the socioeconomic sustainable development. Therefore, research on China's environmental problem is of realistic significance in building up a harmonious society between the man and nature.

A large number of existing literatures related to the environmental pollution generally analyze the problem from economic points of view, such as economic growth, industrial structure, FDI and international trade, which attempt to verify Environmental Kuznets Curve hypothesis, pollution Haven Hypothesis and so on [1] [2]. However, many scholars have criticized these methods which ignore the roles of the institutions. They believed that both tremendous success and social contradiction are closely associated with local government. Because local government has controlled a lot of resource, its decision-making has far-reaching impact on the country's economy and resource allocation [3] [4]. Blanchard and Shleifer [5] considered China's economic success can be attributed to the fiscal decentralization and political promotion, which force local government to carry out the central government's policies that focus on the economic construction. On one hand, central government delegates some fiscal/public resources to local authorities by means of fiscal decentralization and let local authorities share the fruits of economic growth. So, local governments have more financial power and more incentive in boosting regional economic development. On the other hand, central government promotes local government officials based on their political achievements, in which central government's target to boost economic growth would be further strengthened. Qian and Roland [6], Zhou [7], Li and Zhou [8] carried out the empirical analysis on the relationship between decentralization incentive and economic growth, and found that the reform of fiscal decentralization and political promotion stimulate local government and local governmental officials to develop the productive forces and improve people's living standards. However, decentralization incentive emphasizes GDP, and there is no regulation striking a proper balance between economic output and environmental quality, resulting in the fact that local

government tends to neglect the environmental protection while to pursue economic growth [9][10][11]. With respect to these phenomena, Holmstrom and Milgrom [12] proposed a reasonable explanation according to the Principal-Agent theory. They considered that the principle under the condition of asymmetric information usually sets a single task that is easy to measure, and the rational agent usually puts all sorts of resources into the field which was chosen to be performance assessment criteria. In other words, the key target of central government's decentralization reform is to provide strong incentive for economic growth, so local government inevitably makes the growth of economy and tax revenue as primary tasks, and environmental protection becomes a secondary objective. The specific causes may be ascribed to: (A) Environmental protection and economic growth are incompatible in a short time. Stringent environmental protection will not only hinder the development of some enterprises, but also need to increase local government's capital investment that would reduce investment in constructive projects. (B) Investment in environmental protection has some special features, such as large-scale investment, long construction period and slow return. Generally speaking, the term of a local official is only 5-10 years; these officials do not have incentives to use scarce resource to do more help for successors. (C) Environmental protection has a positive externality. Political promotion is a "zero-sum game" between local officials. In other words, many officials compete for very limited positions, a person who get promoted means another loses opportunity for advancement. Therefore, all of these indicate local government at all levels lacks investment enthusiasm in environmental protection.

Based on this, the paper presents an environmental pollution hypothesis, which means the conspiracy between local government and polluting enterprises bring about pollution. Because of existing mutual interests between local government and enterprise, the latter is likely to capture local government by rent-seeking and tax contribution, making local authority to reduce the intensity of environmental regulation and tolerate the unlawful discharge behavior of enterprises. Here, we will use the MATLAB software to analyze China's environmental pollution and explore its real logic. It is shown that MATLAB has powerful mathematical and graphical functions and has been widely used in the economics-related fields (e.g. financial modeling, quantitative analysis, image processing). To verify China's pollution hypothesis, we set the measurement model, and give an empirical analysis based on Chinese 30 provincial data (excluding Tibet, due to incomplete data) from 1997 to 2009. Furthermore, we explain "government-enterprise conspiracy" in theory and experience. Finally, we give conclusions and propose the corresponding suggestions.

II. MODEL SPECIFICATION, VARIABLE SELECTION AND RESEARCH METHODS

A. Model Specification and Variable Selection

According to the above analysis, we draw the following econometric model:

$$Env_{i,t} = \alpha_i + \beta_i Corruption_{i,t} + \sum_j \gamma_j Control_{i,t} + \varepsilon_{i,t}$$

where $Env_{i,t}$ is environmental pollution, $Corruption_{i,t}$ means rent-seeking, $Control_{i,t}$ is control variables which would affect explanatory variable, $\varepsilon_{i,t}$ is random disturbance, i and t represent province and time.

Industrial pollution emission is the main indicator, which reflects enterprise's pollution. The paper selects three industrial pollution indicators as explanatory variables: (A) industrial effluent per capita; (B) industrial waste gas per capita; (C) industrial solid waste per capita. It is noted that the conspiracy between local government and polluting enterprises is not completely exposed; the official statistics can not distinguish moral and illegal pollution emissions. Therefore, the industrial wasters (including effluent, gas and solid waste) per capita are good approximation of indicators.

Corruption is an indicator reflecting the collusion between government and enterprises. In the existing literatures, there are two ways measuring corruption, including the subjective evaluation and the actual data, respectively. Subjective evaluation has the advantage of reflecting the degree of pollution in a broad and comprehensive sense, but the survey data would be quite different due to the lack of uniform standards and content among respondents. Although the actual data unifies statistical standards, it only reflects the "tip of the iceberg" in real corruption. Learning from Wu [13], Zhou and Tao [14], we use corruption and bribery case per million population to indicate corruption index.

In addition, we also select other variables, such as fiscal decentralization, deficit, per capita income and industrialization. (A) Fiscal decentralization. There are many ways to measure the fiscal decentralization. Zhang and Zou [15] selected the ratio of provincial expenditure per capita to the central expenditure per capita, the ratio of provincial budgetary expenditure per capita to the central budgetary expenditure per capita, and the ratio of provincial extra-budgetary expenditure per capita to the central extra-budgetary expenditure per capita, to measure the level of fiscal decentralization. Besides, Lin and Liu [16] used the marginal increment of local budget revenues to measure fiscal decentralization. In this paper, the ratio of provincial expenditure per capita to the central expenditure per capita will be used to measure fiscal decentralization. (B) Financial deficit. Financial deficit would reflect the situation of local government revenue and expenditure. In general, when local government's deficit becomes severe, they are likely to attract investment to reduce environmental barriers. We choose fiscal deficit per capita to measure the fiscal deficit. (C) Income per capita. Developed countries' empirical studies show that there are inverted U-shaped curves between various indicators of environmental degradation and income per capita. In the early stages of

economic growth delegation and pollution increase, but the trend reverses beyond some level of income per capita, so that at high-income levels economic growth leads to environmental improvement. In order to verify the existence of "environmental Kuznets curve" in China, we choose GDP per capita to measure the income. (D) Industrialization. Generally speaking, large proportion of industrialization would deteriorate environmental quality. The ratio of industrial output to GDP is chosen to measure industrialization.

The data come from China's 30 provincial panel data from 1997 to 2009. Due to the incomplete data, Tibet autonomous region is excluded. The data mainly come from "China Statistical Yearbook", "China Environmental Yearbook", and "Sixty Years of China Statistical information". Descriptive statistics of Specific variables is outlined in Table I.

TABLE I
DESCRIPTIVE STATISTICS OF VARIABLES

Variables	Mean	Std.	Min	Max
industrial effluent per capita	1.967	1.470	0.408	9.321
industrial waste gas per capita	16.849	9.661	3.084	66.262
industrial solid waste per capita	.0002694	.0002113	.0000245	.0013538
corruption	30.780	9.096	13.749	70.319
fiscal decentralization	3.34516	2.61109	.512494	24.4980
deficit	832.876	940	106.253	12988.8
per capita income	119.731	89.168	21.991	623.709

B. Research Methods

As the spatial effect of environmental pollution among provinces exists objectively, the absolute and relative spatial locations determine the degree and patterns of spatial autocorrelation. Therefore, the space measurement and spatial econometric models are introduced below, which are Spatial Auto Regressive Model (SAR) and Spatial Error Model (SEM).

Spatial Auto Regressive Model：

$$y = \rho \left(I_T \otimes W_N \right) y + X^{'} \beta + \varepsilon$$

Spatial Error Model：

$$y = X^{'} \beta + \mu$$

where μ is equal to $\lambda \left(I_T \otimes W_N \right) \mu + \varepsilon$, y means explained variable, X is explaining variable (including constant term), β is variable coefficient, ρ and λ are coefficient of spatial autoregressive and spatial autocorrelation respectively, ε is error term. In the one-dimensional error decomposition model, $\varepsilon = \eta_i + \upsilon_{it}$ and $\varepsilon = \delta_t + \upsilon_{it}$; In the two-dimensional error decomposition model, $\varepsilon = \eta_i + \delta_t + \upsilon_{it}$, $\eta_i \sim IID\left(0, \omega_i^2\right)$, $\delta_t \sim IID\left(0, \xi_t^2\right)$, and $v_{i,t} \sim IID\left(0, \sigma_{i,t}^2\right)$. i, t are the cross-section dimension and time dimension, respectively. I_T is the T-dimensional time matrix, W_N is

the $n \times n$ spatial weight matrix (n is the number of regions).

According to the difference of error component decomposition, there are fixed effect and random effect. We will use the spatially fixed effect model, because random effect model assumes that the individual effects and explaining variables are not related, which does not conform to the actual economic situation. Therefore, fixed effect model is a better choice [17].

In the spatial econometric analysis, spatial correlation test is an important element. Despite the fact that Warld Test, Lagrange Multiplier Test (LM Test) and Likelihood Ratio Test (LR Test) are equivalent in the large sample case, Ward Test and Likelihood Ratio Test make the process of setting up statistics more complex, because of requiring calculation under non-binding conditions. We use Lagrange Multiplier Test to access the model for the purpose of avoiding complicated operations. In order to test the reasonableness and necessity of the model with spatial variable, we combine four types of statistical tests, which contain Lagrange Multiplier Test of spatial autoregressive effects (LM Test (spatial lag)), Lagrange Multiplier Test of spatial error effects (LM Test (spatial error)), Lagrange Multiplier Test of robust spatial autoregressive effects (robust LM Test (spatial lag)) and Lagrange Multiplier Test of robust spatial error effects (robust LM Test (spatial error)), with the model fitting results [18].

III. EMPIRICAL ANALYSIS

A. Spatial Correlation Analysis

Setting spatial weight matrix is the key factor in spatial econometric models. At present, there are there rules to quantify spatial proximity: (A) Rook Rule means that sharing a common border could be considered as contiguous; (B) Bishop Rule means that sharing a common point could be considered as contiguous; (C) Queen Rule means that sharing a common border or point could be considered as contiguous.

Empirically, the spatial correlation of environmental pollution occurs mainly in geographically adjacent areas, thereby Rook rules are more reasonable. Specific sets of matrix W are as follows: the main diagonal elements are equal to zero, W_{ij} equals to one if region i and region j are geographically adjacent, and W_{ij} equals to zero if region i and region j are not geographically adjacent. China's 30 provinces and its geographical information are summarized in Table II.

Using LM Test (spatial error), robust LM Test (spatial lag), robust LM Test (spatial error) and LM Test (spatial lag), we test the spatial variables index of industrial wastes. The results are shown in Table III. According to Probability value, it can be seen that all spatial variables in equations are statistically significant and contrary to the original hypotheses. This shows that the industrial waste water, industrial waste gas and industrial solid

waste have significantly spatial dependence, which supports the spatial panel model analysis.

TABLE II
CHINA'S 30 PROVINCES AND THEIR GEOGRAPHICAL INFORMATION

1	Beijing 2, 3	16	Henan 3, 4, 12, 15, 17, 26
2	Tianjin 1, 3, 15	17	Hubei 12, 14, 16, 18, 22, 26
3	Hebei 1, 2, 4, 5, 6, 15, 16	18	Hunan 14, 17, 19, 20, 22, 24
4	Shanxi 3, 5, 16, 25	19	Guangdong 13, 14, 18, 20
5	Neimenggu 3, 4, 6, 7, 8, 26, 27, 29	20	Guangxi 18, 19, 24, 25
6	Liaoning 3, 5, 7	21	Hainan 19
7	Jilin 5, 6, 8	22	Chongqing 17, 18, 23, 24, 26
8	Heilongjiang 5, 7	23	Sichuan 22, 24, 25, 26, 27, 28
9	Shanghai 10, 11	24	Guizhou 18, 20, 22, 23
10	Jiangsu 9, 11, 12, 15	25	Yunnan 20, 23, 24
11	Zhejiang 9, 10, 12, 13, 14	26	Shan'xi 4, 5, 16, 17, 22, 23 27
12	Anhui 10, 11, 14, 15, 16, 17	27	Gansu 5, 23, 26, 28, 29, 30
13	Fujian 11, 14, 19	28	Qinghai 23, 27, 30
14	Jiangxi 11, 12, 13, 17, 18, 19	29	Ningxia 5, 26, 27
15	Shandong 2, 3, 10, 12, 16	30	Xinjiang 27, 28

TABLE III
LAGRANGE MULTIPLIER TEST FOR SPATIAL VARIABLES

	Gas	Effluent	Solid
LM Test (spatial lag)	20.6135 (0.000)	0.0179 (0.003)	36.6950 (0.000)
robust LM Test (spatial lag)	20.6940 (0.000)	28.7499 (0.000)	19.4480 (0.000)
LM Test (spatial error)	5.2410 (0.022)	4.8429 (0.028)	18.7856 (0.000)
robust LM Test (spatial error)	5.3216 (0.021)	33.5749 (0.000)	11.5387 (0.015)

B. Empirical Analysis

Based on the analysis, we can consider that there is spatial correlation in environmental pollution. As the individual effects correlated with explaining variables, we should adopt a fixed effects model. Otherwise, the estimated coefficients would be biased. Thus, we use Matlab 7.10 software fitting Spatial Auto Regressive Model and Spatial Error Model. The specific results are outlined in Table IV.

From the above results, we can find that the coefficients of "W*dep.var" in SAR are very small, in which they are 0.064975, 0.002988 and 0.076996, respectively. They can not reject the null hypothesis, and are not statistically significant. Therefore, we infer that the spatial lag of environmental pollution is not significant, and there may are spatial error correlation. According to the results of SEM, most of the parameters are statistically significant in 1% and 5% level. Meanwhile, three adjusted R-squared values reach 0.8467, 0.8190 and 0.8625, respectively, indicating that the results of regression models are quite good. According to "spat.aut" value, three models entirely reject the null

TABLE IV
FITTING RESULTS OF SPATIAL AUTO REGRESSIVE MODEL AND SPATIAL ERROR MODEL

SAR	Gas	Effluent	Solid
Corruption	0.01160** (2.16895)	0.06776* (1.74591)	0.00184 (0.73558)
Fiscal	0.5078*** (2.89791)	3.1320** (2.45339)	0.25605*** (3.13529)
Deficit	0.0001*** (2.737211)	-0.000614** (-2.0896)	0.000044** (2.32379)
Income	0.0196*** (9.042473)	0.079555*** (6.47237)	0.007391*** (7.79807)
Income^2	-0.000017*** (-5.38412)	-0.000180** (-8.476846)	-0.000008*** (-5.582627)
Industry	0.0859*** (7.396785)	0.34963*** (1.8500)	0.04303*** (7.94869)
W*dep.var	0.064975 (1.071530)	0.002988 (0.041879)	0.076996 (1.239691)
R^2	0.8467	0.8122	0.8579
log-likelihood	-284.40881	-974.70434	-18.839033
SEM	Gas	Effluent	Solid
Corruption	0.01183** (2.13884)	0.10211*** (2.55976)	0.00167* (0.64572)
Fiscal	0.38196** (2.13924)	3.32581*** (2.59220)	0.18279** (2.20789)
Deficit	0.000110*** (2.69885)	-0.000347 (-1.191076)	0.000039** (2.065800)
Income	0.020665*** (11.84347)	0.087447*** (6.86979)	0.00707*** (8.467046)
Income^2	-0.000018*** (-6.052464)	-0.000197*** (-9.345571)	-0.000007*** (-5.28170)
Industry	0.08399*** (7.326421)	0.36280*** (4.457359)	0.04416*** (8.496655)
spat.aut	0.176996*** (2.639537)	0.236998*** (3.654417)	0.286998*** (4.569028)
R^2	0.8467	0.8190	0.8625
log-likelihood	-285.95517	-971.08607	-16.678491

Note: (1) The significance level of 1%, 5%, and 10% are noted by ***, ** and *; (2) the first line indicates explained variables, the first column contains explaining variable, others are the estimated coefficients and t statistics; (3) "W*dep.var" and "spat.aut" are explaining variables' spatial lag term and spatial error term respectively; (4) "R^2" is the adjusted R-squared value, and "log-likelihood" indicates the maximum likelihood function value.

hypothesis in the significance level of 1%, which show the existence of "spatial error correlation" in environmental pollution. In other words, the relevance of environmental pollution is caused by some factors with spillover effects.

Firstly, the increase in rent-seeking, per capita pollution will become more serious. When the number of corruption and bribery cases per million population increases by 1%, industrial waste gas per capita increases 0.01183 billion cubic meters, industrial effluent per capita increase 0.10211 tons and industrial solid waste per capita increase 0.00167 tons. In addition, the coefficients of variables in three equations are significant by statistical test. The environmental pollution is positively correlated with corruption, indicating that the alignment of interests built by local governments and enterprises would increase environmental pollution. This indirectly confirms the viewpoints of Chen, Hillman and Gu [19] that the reform of decentralization encourages local government to grab wealth and resources from market. In other words, when local government is captured by local enterprise, government and enterprise will form the alignment of interests. In that case, local government not

only has little incentive to increase investment in environmental public goods, but also ignores environmental pollution and lessens environmental regulation.

Secondly, Industrial waste per capita and fiscal decentralization show positive correlation significantly. When the level of fiscal decentralization increase by 1%, industrial waste gas per capita, industrial effluent per capita and industrial solid waste per capita respectively increase 0.38196 billion cubic meters, 3.32581 tons and 0.18279 tons. Evidently, fiscal decentralization make local government have right to share the fruits of economic growth, thus it has a strong incentive to develop economy and produce a wide range of new tax sources. When local enterprise makes a great contribution to local economic growth and tax revenue discharge illegally, local government usually tolerates the illegal action in order to attract investment and protects local economy.

Thirdly, financial deficit will increase the industrial waste per capita. When the level of financial deficit increase by 1%, industrial waste gas per capita and industrial solid waste per capita increase will increase 0.000110 billion cubic meters and 0.000039 tone. In the model of industrial effluent per capita, although the variable coefficient is negative, it is also not significant by statistical test. In general, the financial deficit and industrial wastes per capita are positively correlated.

Finally, there are inverted U-shaped curves between income per capita and environmental pollution. The coefficient of income per capita is positive, and the coefficient of its square is negative, which verify the "environmental Kuznets curve" in China. In addition, the regional industrial structure and industrial waste per capita show a positive relation. As the proportion of secondary industry increased by 1%, industrial waste gas per capita increase 0.08399 billion cubic meters; industrial effluent per capita increases 0.36280 tons; industrial solid waste per capita increases 0.04416 tons.

IV. THEORY ANALYSIS AND EMPIRICAL VERIFICATION TOWARDS "GOVERNMENT-ENTERPRISE CONSPIRACY"

Obviously, quantitative analysis demonstrates that the cooperation between local government and enterprise will lead to environmental degradation. Next, we will use the distorted incentives of fiscal decentralization and regulation theory to analyze the relation between local government and enterprise, and the cause of pollution. In addition, we also introduce the incident of Fujian zijin mining pollution to empirically verify the cause of pollution, thereby proving the collusion can not be ignored.

The nation enacted "Environmental Protection Law" in 1989, which said that local government should be responsible for the quality of environment in the area and take measures to improve environmental quality. However, the law is quite simple, and do not contains detailed stipulation on the standards, supervision and punishment. As the law does not effectively restrict the behavior of local government, the government regulation may be inefficient. Specifically, there are two reasons for local government's regulation inefficiently, which are as follows. Firstly, Fiscal decentralization motivates local government to pursue economic growth, making it reluctant to implement a strict environmental policy. Initially by dividing tax revenue between central government and local government, the purpose of fiscal decentralization reform is to harden local government's fiscal constraint and inspire them to widen the base of the tax. But, the environmental protection objectives in the short term are often in conflict with economic growth. If local government implements strict environmental protection policy, many companies will inevitably be excluded from local market. Thus, such result is a "lose-lose" situation. Since environmental protection is not included in performance evaluation, local government and polluting enterprise tend to form "alignment of interests", taking environmental protection as a secondary objective. In other words, as long as local economy keeps growing, local government and local officials will be able to get tax revenue, political promotion and implicit rent. Thus, the local government's optimal choice is to maintain understanding and cooperation with local enterprise. Secondly, central government can not effectively control the local regulatory authority. Due to the asymmetry of information and the high cost of access to information, central government supervises inefficiently local environmental regulatory authorities (such as local Environmental Protection Agency). The main reason is that local government has right to decide personnel appointment and removal of local regulatory authority, therefore, local regulatory authority's behavior is more vulnerable to the impact of local government. If local environmental regulatory authorities strengthen environmental supervision and punishment, it harms the interests of polluting enterprise and local government. Therefore, in the case of central government regulation inefficiently, local environmental regulatory authority is natural to obey the will of the local government, shutting its eyes to pollution.

In order to attract investment, local government inspired by the distortion of fiscal decentralization usually removes environmental barriers to the project and reduces environmental assessment. Fujian zijin mining pollution accident is a typical case that is helpful to explain "government-enterprise cooperation" and the origin of China's pollution. In July 2010, Fujian Zijin Mining Group Co., Ltd. located in Shanghang County, Fujian Province, has occurred leakage of acidic solution containing copper, causing serious pollution and major economic losses of up to 31.8771 million yuan. Ministry of environmental protection, Longyan city government and Longyan environmental protection department do a joint investigation, believing that the contamination is the direct cause of sudden rainstorm, impermeable membrane ruptured, and spillway opened illegally. However, the alignment of interests built by local governments and enterprises lead to poor supervision and weak enforcement and inadequate protection, which is the key to explain the accident. Specially, we look at two ways,

which are as follows. First, Zijin Mining Group has been the largest taxpayers in Shanghang country and creates huge revenue. With the rapid development of Zijin Mining Group, Shanghang Country has become the second economically developed area in Longyan city since 2002. In 2006, the tax paid by Zijin Mining Group was nearly 70% in the total tax revenue of Shanghang Country. Therefore, for the purpose of increasing GDP and protecting tax revenue, local government usually ignore pollution and condone discharge behavior of Zijin Mining Group. Second, enterprise capture local government in the way of bribery, shares and so on. In 2009, the largest shareholder was the Minxi Xinghang state-owned assets Investment Management Co., Ltd. that is on behalf of Shanghang's State-owned Assets Committee, holding 28.96% of the share. Furthermore, the survey also found that, although many people were still local government officials, they had worked in Zijin Mining Group or had Zijin Mining's shares through various channels. Due to alignment of interests, local government officials do not want to strengthen the supervision of Zijin Mining Group's pollution illegally.

It can be found that externalities, economic growth, technological progress and other economic factors can fully explain China's environmental pollution problems. There is an inherent logic in China's pollution: inspired by fiscal decentralization and political promotion, local government often tend to associate with polluting enterprise and form "alignment of interests", in order to create GDP, increased rental income. Thus, the result distorts the allocation of environmental resources, deteriorate environmental pollution.

V. CONCLUSIONS

MATLAB has been widely applied to the economics-related fields, because of its powerful mathematical functions. Using MATLAB software, we analyze the relationship between China's environmental pollution and local government's behavior, thereby exploring the internal reasons of China's environment pollution.

In this paper, the relationship between China's environmental pollution and local government's behavior was analyzed, and the internal reasons of China's environment pollution were explored using the MATLAB software. The results show that environmental pollution has been worsening, and triggering widespread attention. Importantly, economic factors can not completely explain all pollution problems though many literatures mainly focus on economic factors play an important role on environmental pollution but treats institution as a neutral factor. The analyses of the impact of local government's behavior on the environmental pollution show that fiscal decentralization and financial deficit, environmental pollution becomes serious with the increase in degree of rent-seeking. Because inspired by fiscal decentralization and political promotion, local government usually has a close relationship with polluting enterprise and forms "alignment of interests", in order to create GDP and increase rental income. Thus, the result distorts the allocation of environmental resources, deteriorate

environmental pollution. China's pollution contains distorted incentives called "alignment of interests" between local government and local enterprise, and it can be completely explained by economic factors. Therefore, solving China's environmental pollution problems needs to reform the current political system, and to adjust the distorted incentive mechanism. The solution is to reduce the resources controlled by the government, to draw the boundaries of market and thus strengthen supervision of collusion between local government and enterprise.

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