Global Environmental Change 39 (2016) 244–257

Contents lists available at ScienceDirect

Global Environmental Change

journal homepage: www.elsevier.com/locate/gloenvcha

Different extent of environmental information disclosure across chinese cities: Contributing factors and correlation with local pollution

Xian-Liang Tian*, Qi-Guang Guo, Chao Han, Najid Ahmad

Center for Industrial and Business Organization, Dongbei University of Finance and Economics, No. 217 Jianshan Street, Shahekou District, Dalian, Liaoning Province, 116025, PR China

ARTICLE INFO

Article history:
Received 3 December 2015
Received in revised form 24 May 2016
Accepted 31 May 2016
Available online xxx

JEL classification:
Q50
Q53
Q58
Q59

Keywords:
PITI
Environmental disclosure
Pollution reduction
China

ABSTRACT

This paper uses the dataset of Pollution Information Transparency Index covering 113 Chinese cities and the period of 2008–2011 to find out what contributes to different levels of environmental information disclosure across Chinese cities and the correlation between cities' Pollution Information Transparency Indexes and local pollution. We find that cities whose mayors have longer tenures and PhD degrees are likely to release more environmental information. In addition, the higher the number of internet users and income per capita, the closer a city is to Hong Kong, and the lower a city's unemployment rate, the greater the level of environmental disclosure is. An efficient local legal system is also found to facilitate information disclosure.

We also find that in most cases, high Pollution Information Transparency Indexes are associated with lower pollutant levels and more pollution-control investment, suggesting the effectiveness of China's environmental disclosure in pollution control. Community pressure for a better environment is shown to reinforce the role of environmental disclosure in pollution reduction. We find no evidence that environmental disclosure improves the efficacy of traditional environmental regulation in pollution control. Nevertheless, different aspects of environmental disclosure vary a lot in their effectiveness in pollution reduction and the results here indicate that inducing cities to respond to public information requests is perhaps the most effective method of pollution control in China.

1. Introduction

As China has achieved outstanding economic growth over the past 30 years, it has also been accompanied with severe pollution and related environmental problems. Ferris (2015) indicates that 80 percent of Chinese population are exposed to pollution levels far exceeding the safety standards of the U.S. environmental protection bureau. They also estimate that roughly 4000 people are killed each day by air pollution, accounting for 17 percent of deaths in China. Another official report from China states that over 300 million Chinese people are using polluted water; one third of the water system across the nation is below the safety standard, and one fifth of the farmland is contaminated by heavy metals (the Ministry of Environmental Protection of China and Chinese Academy of Engineering, 2011). It is calculated that, during 2004–2010, the cost of environmental degrading in China had been tripled, and the ratio of the cost to GDP had increased from 3% to 3.5% (Chinese Academy for Environmental Planning, 2012). In addition, existing or potential pollution has aroused wide-spread protests, threatening the stability of Chinese society.

Some researchers, such as Dasgupta et al. (2002), Dinda (2004) and Selden and Song (1995) interpret China's current environmental challenge in terms of the inverted-U-shaped environmental Kuznets curve, which states that in the early stage of industrial development, the environment degrades and pollution increases as income per capita goes up, whereas later on, environment is improving as economy relies more on "cleaner" goods while richer people have higher preference for environmental quality. Another strand of thought (Chen et al., 2005; Li and Zhou, 2005; Wu et al., 2014) attributes China's pollution difficulties to its specific institutional arrangements. Until recently, the central government of China evaluates local officials by regional GDP growth. Thus, local officials have few incentives to preserve the environment.

In order to prevent further productivity loss caused by pollution-related health damage, restore people's support for the government and reserve social stability, several years ago, the central government of China began to give more priority to environmental concerns in its policy making (Boyd, 2012; Zheng

* Corresponding author.
E-mail address: xianliangtian@gmail.com (X.-L. Tian).

http://dx.doi.org/10.1016/j.gloenvcha.2016.05.014
0959-3780/

et al., 2013a,b; Wang, 2013). For instance, in the eleventh "Five-year Plan" (2006–2010), the Chinese central government planned to decrease the emission of COD and SO_2 by 10 percent per year. During the same 5-year period, the ratio of energy consumption to the GDP was targeted to decline by 20 percent. At the 2009 Copenhagen climate summit, China also promised to cut its carbon intensity by 40–45 percent in next 10 years (NDRC, 2010).

To meet this goal, China uses a "target responsibility system" – a top-down pressure transfer arrangement where the central government specifies sub-targets of energy and environment conservation for local governments and monitors/evaluates the performance of the latter (Zheng et al., 2013a,b). As a legal backup for state's pollution-reduction endeavors, the revised Environmental Protection Law took effect at the beginning of 2015, which is considered as the strictest environmental law in the legal history of China.

China has also adopted a bottom-up strategy – information disclosure to combat its pollution and other environmental challenges. Inspired by Indonesia and Philippines' environmental information disclosure programs, in late 1998, China began to implement "GreenWatch", a firm-level pollution disclosure program in two cities – Zhenjiang and Hohhot (Wang et al., 2004). In April 2007, the State Environmental Protection Administration of China passed *the Measures on Open Environmental Information (for Trial Implementation) (called the Measures for short below)*, which explicitly clarifies governments' responsibility of disclosing environmental information. It also specifies the scope of disclosure, procedures, responsibilities and supervision, etc.

As for the enforcement of the law, however, different regions in China exhibit different extent of environmental disclosure (IPE and NRDC, 2008). Thus this paper asks what determines the difference of disclosure across cities. The paper then examines the correlation between cities' extent of environmental disclosure and local pollution levels, to infer the impact of environmental information disclosure on China's pollution reduction at city levels.

For these purposes, this paper makes use of a dataset of Pollution Information Transparency Index (PITI), covering 113 Chinese cities and the period of 2008–2011. The PITI is compiled by the Institute of Public and Environmental Affairs in China and the Natural Resources Defense Council in order to assess the enforcement of *the Measures* by local governments.

We find that cities whose mayors have longer tenures and PhD degrees are likely to release more environmental information. In addition, the higher the number of internet users and income per capita, the closer a city is to Hong Kong, and the lower a city's unemployment rate, the greater the level of environmental disclosure is. An effective local legal system is also found to facilitate information disclosure.

We also find that in most cases, high PITI scores are associated with lower pollutant levels and more pollution-control investment, suggesting the effectiveness of China's environmental disclosure in pollution control. Community pressure for better environment is shown to reinforce the role of environmental disclosure in pollution reduction. We find no evidence that environmental disclosure improves the efficacy of traditional environmental regulation in pollution control. Nevertheless, different aspects of environmental disclosure vary a lot in their effectiveness in pollution reduction and the results here indicate that inducing cities to respond to public information requests is perhaps the most effective method of pollution control in China.

The rest of the paper is organized as follows: Section 2 examines the relevant institutions in China and conducts a review of the relevant literature. Section 3 introduces the background of the PITI index, as well as other data sources used in the analysis. Section 4 specifies the empirical strategy and Section 5 presents the results. The paper's conclusions are contained in Section 6.

2. Related literature review

2.1. Political incentives and constraints affecting environmental outcomes in China

China's serious environmental problems to a large extent stem from its local official evaluation standards and central-local government relationship. China's political structure involves a big central government and hundreds of local governments which compete with each other. Local officials are directly appointed by the central government instead of elected by the people, and the latter uses "promotion" carrot to induce local officials to pursue national interest, when there are central-local interest conflicts or information asymmetry between them (Zheng and Kahn, 2013; Wu and Ma, 2009). Until several years ago, China's central government had mainly evaluated local officials' performance by local GDP or its growth. And studies show that Chinese officials' odds of promotion are positively correlated with the economic growth of their administrative areas (Chen et al., 2005; Li and Zhou, 2005).

Consequently, local governments are reluctant to take into account the environmental costs in decision-making as it does not help for local officials' political ladder. Local officials also have private information that central governments do not have, and the typical principle-agent problem prevents the latter from effectively monitoring and regulating local governments' environmental performance (Zheng and Kahn, 2013). In addition, some officials have direct stakes in private firms or personal relationship with their owners (Allen et al., 2005). Thus they have even less incentive to combat pollution at the expense of their monetary benefits.

Nevertheless, the political constraints on environmental outcomes differ across cities with different characteristics. Officials from rich cities would care more about the environment since they are faced with less pressure to push the economy forward. Tourist cities should also be active in environment protection because better environmental quality attracts more tourists and directly contributes to higher GDP growth. As Chinese cities heavily rely on land sale to collect fiscal revenues, some cities would be more interested in environmental conservation in order to increase the land value (Arnott, 2008). Besides, better environment quality can attract intellectuals or prevent brain drain, which provides additional incentive of environmental protection for cities counting more on skilled workforce.

Recently, the central government of China has proposed the concept of "Scientific Outlook on Development", which stresses the importance of energy conservation and environment protection during economic development (Chow, 2010). And the motivations behind the proposition include meeting people's demand for cleaner environment, coping with the increasing energy shortage, and grabbing the nascent low-carbon international market, among others (Zheng and Kahn, 2013; Boyd, 2012). Accordingly, local officials' promotion criteria have been adjusted to include energy and environment conservation. In 2011, the State Council explicitly declared that environmental performance is an important consideration for officials' promotion (Zheng and Kahn, 2013).

With the change in performance evaluation criteria, local officials now have more incentive to care about environmental protection. In an empirical study using panel data of 86 Chinese cities from 2004 to 2009, Zheng et al. (2013a) find that cities' energy consumption per unit of GDP and ambient air pollution have already been associated with officials' odds of promotion. In addition to the top-down pressure from the central government of environmental protection, local governments are also faced with bottom-up pressures from citizens and communities. Along with the increase of Internet users, people find it easier to acquire accurate pollutant information in a timely manner. Concerns on