

Does civil environmental protection force the growth of China's industrial green productivity? Evidence from the perspective of rent-seeking



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ABSTRACT

Based on the decision analysis of heterogeneous enterprise between green technology innovation and rent-seeking, this paper formulates the Hybrid-Luenberger index considering undesirable outputs and studies difference in the response of regional industrial green productivity to civil environmental protection. Empirical study on China's regional industrial data from 1997 to 2011 shows that: (1) Compared with the intensity of environmental pollution and other passive environmental protection incentives, the public are more sensitive to per capita income level, education quality, health concern and other rational environmental protection incentives. (2) The increase in the civil environmental protection effect promotes the industrial green technology innovation, while the rent-seeking activities have a significant negative effect on green productivity. (3) The civil environmental protection of the eastern coastal area has more significant effect on the industrial green productivity compared with that of the central and western inland area. (4) As the quantile of the industrial green productivity increases from the low point to high level, the positive effects of the civil environmental protection on the industrial green productivity turn to be more significant, and the rational environmental protection have positive and negative effects on high and low quantile of the industrial green productivity, respectively, which proves that the "Potter Hypothesis" can only be established on the condition that producers are approaching to the technology frontier.

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1. Introduction

Statistics show that the level of pollution intensity of industrial waste water, waste gas and solid waste in China as a whole has decreased by 90%, 21% and 33% respectively from 1997 to 2011, and the industrial pollution intensity in most provinces also shows a trend of sharp drop which forms a stark contrast as the number of environmental complaint letters from the public keeps growing, the average growth rate in eastern area even reaches up to 18% (see Fig. 1a and b), the number of environmental complaint letters from the Chinese public amounted to 3.35 million during the whole period of "11th Five-Year Plan", and the environmental petitioner has become a new member of the large petitioner group. These seemingly abnormal phenomena show that people care less about the changes of economic benefit behind the regional environmental pollution, but more about pollution hazard. Previous study

shows environmental pollution may affect people's health utility and be easy to cause serious diseases (Ebenstein, 2012). About 21% of diseases suffered by Chinese residents are caused by environmental pollution factors, 8% higher than those in the United States (WHO, 2009). In fact, China's local governments are in a dilemma: on one hand, the importance of industrial development as the power source of regional economic growth cannot be overemphasized, but it will inevitably result in "the three wastes" and other environmental problems. On the other hand, if the environmental threats (even potential ones) generated from regional industries damage the environmental utility of the local public and cause their concern about health problems, the pressure from the public environmental demands will urge local governments to take a more stringent environmental regulation on industrial enterprises. Something noteworthy is that, since the administrative accountability system was written in the *Working Rules of the State Council* in 2003 for the first time, liability will be pursued in accordance with the law by the central government for any behaviors seriously damaging national interests, public interests and people's rights, such as serious environmental pollution accident and production

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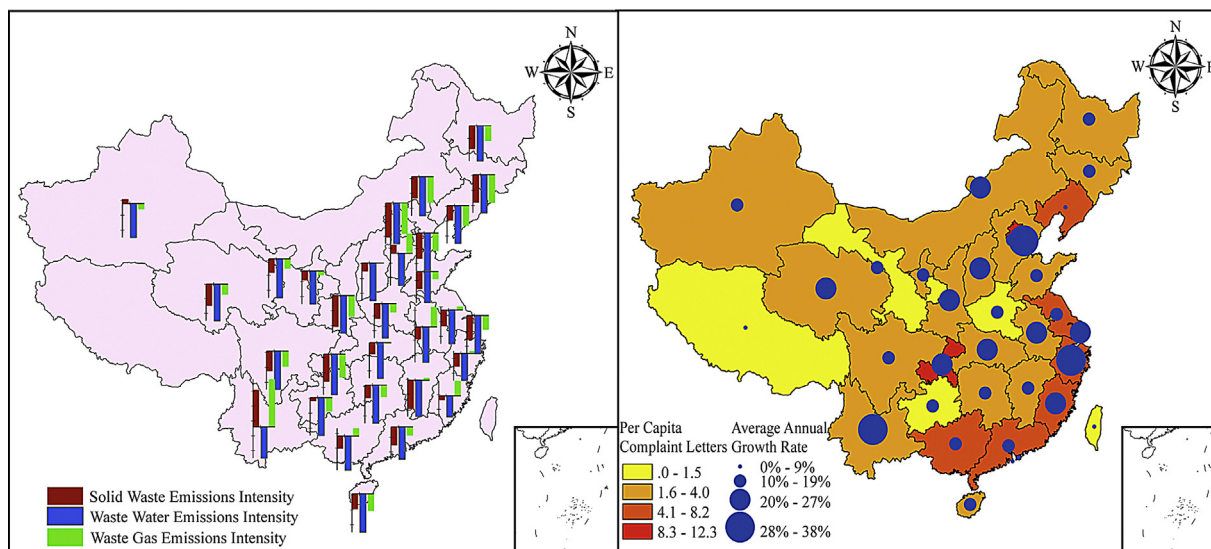


Fig. 1. (a) The percentage of industrial pollution intensity changes in various provinces (1997–2011). (b) The mean value and average growth rate of per capita environmental complaint letters in various provinces (1997–2011).

safety accidents. Besides, more transparency in public decision-making, increase of public consciousness of rights safeguarding and timely follow-up of the media superintendence all lead to a rising pressure of public environmental protection, which usually force local governments to punish the environmental violations enterprises and the involved government officials, postpone or cancel the relevant industrial project development plan. It shows that China's civil environmental protection has been affecting the production and polluting behavior of enterprises in recent years, and local governments should pay more attention to the public demands and re-examine the relationship between economic development and environmental protection.

Actually, the environmental problem in China is not only caused by the enterprises' production activities, but also closely related to the performance evaluation mechanism for local officials. Such a mechanism, centering around economic growth since the 1980s, makes local governments prefer to pursue high GDP growth and even take the initiative to participate in the "race to the environment bottom" to attract foreign investment and other liquidity factors (Dua and Esty, 1997), and less motivation is observed in them to regulate enterprise environmental pollution behavior since such achievements as the pollution control, carbon dioxide emissions reduction are relatively more "imperceptible". What's worse, some officials even choose conspiring with the enterprises out of private economic benefits, providing shelters for enterprises' polluting behavior by setting industry entry barriers, softening environmental regulation standard, distorting environmental policies and other methods. Many studies have also confirmed that the rent-seeking activities are closely associated with the regional environmental quality (Welsch, 2004; Cole, 2007). The abuse of these administrative interventions can cause some problems. On one hand, it may encourage enterprises to choose rent-seeking rather than green technology innovation to maintain market competitive advantage. As a result, the change of the green productivity level can be affected; on the other hand, people's environmental welfare in that area will suffer a loss due to the negative externality produced by pollution of enterprises lagging behind, and triggering civil environmental protection pressure which will influence the rent-seeking and collusion between local governments and enterprises involving in the environmental problems.

This paper makes contributions by studying the following several interesting issues. In recent years, what factors led to the significant rise of civil environmental protection demands in

various regions of China? Whether civil environmental protection and rent-seeking activities affect the motivation for green technology innovation and then result in changes in the industrial green productivity? What are the differences between the eastern coastal developed area and the central and western inland region when their industrial green productivity is influenced by civil environmental protection? Considering the technology heterogeneity of regional industries, will there be a difference in the influence of civil environmental protection on the regional industry green productivity of different technical levels? When civil environmental demands are further subdivided into passive environmental demand caused by deterioration of environmental quality and rational environmental demand by the enhancement of people's environmental protection consciousness, whether the latter also has an impact on the regional industry green productivity of different technical level?

2. Literature review

Since the 1960s, environmental problems have become new sharp social problems in developed countries. Early studies consider that the environmental quality change is the main reason of affecting the public environmental demands. However, based on the rational choice theory, these demands are believed by some scholars to increase with the rising income level (Franzen and Meyer, 2010), and people's environmental awareness is closely related to economic prosperity (Van Liere and Dunlap, 1980). Another study shows that health threat caused by environmental pollution is another important factor for people's concern about environment (Ebenstein, 2012). Moreover, the public education level and the population structure are also the reasons for civil environmental demands (Torgler and Garcia-Valiñas, 2007; Givens and Jorgenson, 2011). For a long time, due to the strict household registration system constraints in China, people couldn't migrate freely under the poor environmental public goods provided by local government, so the "vote with their feet" mechanism (Tiebout, 1956) for environmental problems is difficult to come into effect in China. In spite of this, civil environmental demands could still have an impact through two ways: First, influencing the enterprise production behavior through consumers' green consumption decisions. For example, the raising of environmental awareness makes people consume environment-friendly products, and

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