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# The impact of environmental regulation, shadow economy, and corruption on environmental quality: Theory and empirical evidence from China

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**Abstract:** Mounting environmental pressures led China to focus on the effectiveness of the environmental regulation to control pollution. Since the shadow economy, or underground economic activities that are not included in official statistics, accounts for an increasing fraction of China's economy, its impacts on environmental quality should be carefully evaluated. In this study, the main research questions are as follows: 1) What is the extent of the effect of environmental regulation on environmental quality? and 2) What are the factors that influence the impact of environmental regulation on environmental pollution? A theoretical model is developed to explain the relationship among the environmental regulation, shadow economy, and environmental quality in China. An empirical analysis is conducted to test the three propositions of the model, thereby examining the explanatory power of the theoretical model. Concretely, using panel data from 30 provinces for the period of 1998-2012, the generalized method of moments (GMM) method is employed to control for potential endogeneity and introduce dynamic effects. The estimation results indicate that stringent environmental regulation and the level of the shadow economy are both positively related to China's environmental pollution; however, the results also indicate that tighter environmental control would help reduce pollution at a given level of the shadow economy. Moreover, an increase in the proportion of corrupt officials may weaken the environmental regulation, which would consequently lead to the increase in illegal production and total pollutant emissions. Besides, many economic and social factors may also affect the environmental quality. For instance, the development of secondary industry contributes toward an increase in pollutant emissions; however, increased research and development (R&D) spending on eco-friendly industrial operations can help to reduce pollution.

**Keywords:** Environmental regulation; Shadow economy; Corruption; Environmental pollution

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