A study on the relationship of environmental regulations and economic performances

NISHA Jia1,2, and CHEN Shen2

1 International Business School, Shaanxi Normal University, Xi’an 710119, China
2 China (Xi’an) Institute for Silk Road Research, Xi’an 710100, China
3 College of Economics and Management, Zhejiang SCI-Tech University, Hangzhou 310018, China
jianisha@snnu.edu.cn, littleangle6@sina.com

Abstract: This paper analyzes the mechanism transmission of environmental regulation affecting on economic performance from a new perspective. It shows that environmental regulations affect country’s economic performance through direct transmission and indirect transmission. Direct transmission means that environmental regulations affect economic performance from influencing corporation’s cost and revenue, and indirect transmission is that environmental regulations affect economic performance through leading to the increased effort of corporations in improving the quality of environment and building the image of fulfilling environmental responsibility.

1. Introduction
The economic development processes of many countries, especially some developed countries, seem to prove that economic growth mode is at the expense of environment. Due to environment resources’ nature of public goods, environment problem’s negative externality, and opportunism of microeconomic units, environment problem is hard to be solved with market mechanism, so environment regulation is deemed as an important tool for correcting market failure. Can current environmental regulation make economic growth and environmental protection achieve a kind of balance?

According to existing literature, there are four views on the relationship between environment regulation strength and economic development level: (1) “the former has a negative impact on the latter”. This view’s theoretical base is “compliance cost theory”. Represented by Gollop and Roberts(1983), Barbera and McConnell(1990), Walley and Whitehead(1994), the scholars holding this view think environment regulation causes new cost factors to enterprises, which are called “compliance cost”. The costs will bring about “extra” burden to enterprises’, affect output and profit level, and weaken enterprises”’ competitiveness. Besides, corporate pollution control expenditure may occupy other production investment. When resources are limited, environment regulation will indirectly increase enterprises’ opportunity costs. (2) “the former has a positive impact on the latter”. Its theoretical base is “Porter Hypothesis” (Porter and Van der Linde, 1995; Porter, 1996). The scholars advocating this view think choosing proper environmental regulation can drive enterprises to innovate, induce the “innovation offset” effect between production process and products (namely technological innovation offset and product innovation offset), and thus reduce enterprises’ costs, further bring about technology diffusion effect, improve enterprises’ productivity, achieve the optimization and upgrading of enterprises”’ own structure and industrial structure, and finally improve
their market competitiveness. However, “Porter Hypothesis” has two preconditions: the first is that resources configuration, technology, consumption demand and other conditions are variable dynamic model; the second is that environment regulation tool must be “properly designed”. (3) Uncertain “mixed view”. Those holding the “mixed view” think the results of mixed effects are uncertain or the results are inconsistent for different market subjects. (4) Environmental regulation’s influence on economic growth has inflection point. Some domestic scholars make empirical test on the relationship between environment regulation and economic development respectively from the levels of state, region, industry and enterprise, and find the relationship between the two shows a U-shaped curve (Fu Jingyan and Li Lisha 2010; Xiong Yan, 2012).

Scholars have analyzed the relationship between environmental regulation and economic growth from different points of view, providing reference for the research of this paper. However, there is little literature considering the direct transmission mechanism and indirect transmission mechanism. This paper attempts to systemic analyze the mechanism transmission environmental regulation affecting on economic performance.

2. Analysis on Theoretical Mechanism
According to existing theories, environmental regulation directly affects corporate performance. The sum of net effect of emission controlling enterprises form the net efforts on department economy and finally form the net influence on regional and national economic performance. The action channels of environmental regulation’s influence on enterprises have both direct and indirect transmission mechanisms (as shown in figure 1).

![Figure 1. The Mechanism of Effect of Environmental Regulation](image)

2.1. Direct Transmission Mechanism
Direct effect has both positive and negative sides. Positive effects include: (1) stimulate corporate technical innovation, and establish competitive advantages. As environment regulation improves, government’s preferential policies for the related industries will bring about opportunities for innovation for enterprises, and drive the development of new environment protection materials and equipments and optimization of production technologies. This product (innovation) compensation effect can increase products’ value or reduce production costs. Environment regulation will also drive enterprises to develop pollution control technologies to optimize its production process or waste management and improve resources’ productivity. This effect is called as process (compensation effect). Product compensation and process compensation effect work together to promote enterprises to establish and keep competitive advantages through innovation. (2) Improve market access “threshold” and prevent new competitors from entering. After the implementation of environment regulation policies, existing enterprises enjoy greater cost advantages because of mature pollution treatment technologies and scale economy. The mechanism that obstructs new enterprises from entering and reduces industrial competition is called access barrier effect. Enterprises may be driven to invest on emission reduction by environment constraint and thus be subject to the decline of performance: (1) demand declines as enterprises’ production and transaction costs are increased. Environment regulation raises the direct production costs such as pollutant emission tax/charge, pollutant emission license and prices of inputs and transaction costs such as pollution measuring and monitoring and negotiation with government and supplier, which is unfavorable for simple and expanded reproduction and the subsequently increasing sales price may also reduce the demand on products. (2) Occupy scarce resources and squeeze production investment. New emission reduction
equipments and R&D and use of production technology require a lot of early-stage investment and personnel training. Transition to new equipments also needs certain conversion and scrap costs. At the same time, enterprises’ scarce resources, such as high-quality talents are used to improve environment quality, so production investment is occupying and resources utilization efficiency is also limited.

2.2. Indirect Transmission Mechanism
The external pressure imposed by environment regulation will drive enterprises to improve environment quality, deliver “responsibility investment” and “green investment” information to the society, and thus bring about feedback effects of different stakeholders to enterprises. The indirect transmission mechanism of environment regulation’s influence on corporate economic performance works as follows: (1) promote product characterization and create new demands. As consumers attach more importance onto environment protection, green industries and the enterprises better performing their environment protection responsibilities are increasingly preferred by market. Environment regulation will drive enterprises to change the passive emission reduction to active environment treatment investment, establish distinct product characteristics, stand out from competition and thus improve products’ sales and added value. (2) Improve enterprises’ brand and fame and develop intangible assets. Stakeholder theory and the theory on enterprise’s social responsibility reveal the importance of intangible assets such as corporate culture and fame. Improving environment quality can help enterprises build brand and fame, expand social recognition and influential power, and the appreciation of intangible assets can also improve enterprises’ performance in capital market. (3) Improve stakeholders’ loyalty, and reduce risk and operational costs. Enterprises’ efforts on reducing environment pollution help improve the loyalty of stakeholders including consumer, suppliers and employees, reduce enterprises’ risk and operational costs, for example reduce high-quality employee turnover, reduce financing difficulty and costs, and lower the price and insurance fee of raw materials etc. A good relationship with government can also reduce enterprises’ compliance costs, such as tax, licensing costs, penalty and lawsuit costs etc.

3. Conclusion
In this paper, the theory analysis show that environmental regulation directly and indirectly effects the economic performance, and environment regulation’s influence on corporate economic performance is quite uncertain (as shown in figure 2). Its net effect depends on the relative degree of direct and}

**Figure 2. Direct and Indirect Transmission Mechanism**

3. Conclusion
In this paper, the theory analysis show that environmental regulation directly and indirectly effects the economic performance, and environment regulation’s influence on corporate economic performance is quite uncertain (as shown in figure 2). Its net effect depends on the relative degree of direct and
indirect transmission mechanism influenced by multiple factors such as enterprises’ characteristics, specific environment problem, policy tool, industrial structure and location characteristics and the interaction of the mechanisms.

4. Policy Suggestion

Based on the conclusions from analysis above, we draw the following policy recommendations:

First, Leaders should strengthen the legal consciousness, and make sure administration according to law strictly. We should improve the situation of legal system that “there shall be laws to abide by, everyone should abide by the law, the law must be enforced strictly, and those who violate the law must be dealt with”. Advancing the reform of environmental management system and implementing the vertical administration system to make sure that the environmental protection department has an independent monitoring and administration. Defining the legal situation of the status of environmental monitoring and institutions, the governor should gradually increase level of environmental monitoring agencies and the authority of environmental enforcement team based on the actual situation.

Second, it should reduce the degree of association of the economic performance and officials promotion, and add the regional environmental benefits, the consumption of resources and energy into the evaluation system, and enhance the incentives and constraints of public welfare in the region in the establishment and implementation of a wide range of local government performance evaluation system. In the pursuit of economic performance, establishing the public service-oriented "service type" local government, so as to promote the coordinated development of regional economic and ecological.

Third, improvement of ecological environmental quality as a result of environmental regulation constraining enterprise pollution behavior can promote the improvement of corporate performance. Thus, the local government should encourage enterprises to strengthen environmental responsibility, increase investment in environmental governance and fulfill corporate social responsibility. This is conducive for us to improve both environmental quality and economy growth.

References
[1] Gollop R 1983 Environmental regulations and productivity growth: the case of fossil-fueled electric power generation The Journal of Political Economy. 91 654-674.
[2] Barbera AJ and McConnell VD 1990 The impact of environmental regulations on industry productivity: direct and indirect effects Journal of Environmental Economics and Management. 18 50-65.
[3] Walley N and Whitehead B 1994 It's not easy being green Harvard Business Review. 36-44.
[4] Porter M and Linde Van 1995 Toward a new conception of the environment competitiveness relationship The Journal of Economic Perspectives.9 97-118.
[5] Porter M 1996 America's green strategy Business and the Environment (London: Earthscan) p 33.
[6] Fu Jingyan and Li Lisha 2010 The empirical study of environmental regulation, factor endowments and industrial international competitiveness: based on panel data of China's manufacturing industry Management Word. 10 87-98.
[7] Xiong Yan 2012 Environmental regulation on economic growth Dongbei University of Finance and Economics (Dalian).