

## Chapter 6

# Empirical Study on the Correlations of Environmental Pollution, Human Capital, and Economic Growth: Based on the 1990–2007 Data in Guangdong China

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### ABSTRACT

*Based on 1990-2007 data in Guangdong China, this chapter studies the correlation of environmental pollution, human capital, and economic growth. The results show that Guangdong's economic growth deteriorates the environmental quality. Highly skilled human capital is one of the main engines of the economic growth and the growth promotes the human capital's accumulation. Upgrading the human capital helps controlling pollutant emission and environmental pollution depresses the human capital accumulation. Furthermore, the authors hope that understanding the individual relationships between environmental pollution and human capital or economic growth will help the environmental protection authority or governments in China to make more effective and efficient regulations or policies to coordinate the country's sustainable development.*

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## INTRODUCTION

The correlations of environmental pollution, human capital and economic growth have been the hot issue in the academic sector. What is the contribution of human capital to the economic growth? Does the economic growth have to deteriorate the environmental pollution or improve the environmental quality? Are there any effects of human capital accumulation on environmental protection, and is there the necessary association between human capital and environmental pollution? There are a number of researchers who studied the correlations of environmental pollution, human capital and economic growth in the world. Furthermore, the current literatures focus more on the relations between environmental pollution and economics growth, and between human capital and economic growth.

Vellinga & Withagen(2001)found that human capital is the main propeller of economic growth. Environmental pollution would influence the human capital accumulation by deteriorating human's health and weakening the people's learning ability. Jha & Murthy(2003)studied the relationship between environmental pollution and economic growth through the data from 174 countries and regions. They thought the EKC proposition is not appropriately explaining the relationship between environmental pollution and economic growth. The authors studied the relation by principal component method and showed there is an inverse N curve relation for the whole global scope. Their results also showed the certain different effects of economic growths on environment in the countries with different human capital stock, and high level of human capital stock was good for environmental protection. Puatrel(2008) considered that environmental pollution hindered the long-run economic growth, explained the affecting mechanism of environmental pollution on economic growth in the long-run by human capital accumulation and inter-temporal overlapping model. Environmental pollution shortened

the expected life length, and affected human's learning ability, then further human capital accumulation. Valeria & Salvatore (2008) explained the reasons of resource curse and environmental Kuznet curve in the long term economic growth. They identified that institution design and human capital size were the main influencing factors. Improving institution system and increasing the investment on human capital is the important path to ensure sustainable economic growth.

There were few studies about the underlying correlations. Cao & Wang (2006), Zhang & Zhang (2006), Guo, Fang & Wu et al (2007), Xu & He (2007) studied the relation between economic growth and environmental pollution from different angles. The results showed that there exist the phenomena of environmental Kuznet curve in China or part of its regions, and in the preliminary stage the environmental pollution was worsened by economic growth but was alleviated gradually when the economy had developed to some extent. According to the empirical studies, the relation between the economic growth and environmental pollution is still on the left hand side of the EKC. That is, both economic growth and environmental pollution are rising up. Yang & Pan (2003) explored the relation between human capital and economic growth, by classifying knowledge as elemental science and applied techniques. They showed the positive relation between the long run growth rates of economy and elemental science knowledge, which depends on the human capital stock inside the economy. The non-exclusivity of elemental science knowledge determined the big role for the government to play in. Dai & Bie (2006) applied a two country internal growth model to analyze the industry selection of FDI from developed countries, economic growth and technique progress problems. They proved whether FDI can bring in technical progress and economic growth to developing countries depends on the human capital accumulation inside the developing countries. Increasing human capital is the core policy of developing countries for

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