

# Application of Environmental Kuznets Curve in Evaluating Environment

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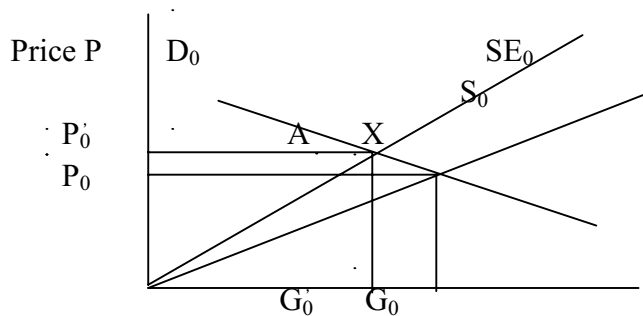
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## 1. The Impact of Environment on the Development of Economy

In terms of economics, the impact of environment on the development of economy incurs the change of total output. Figure 1 demonstrates this correlatively. In figure 1  $X$  denotes equilibrium point when demand equals supply, while  $G_0$  and  $P_0$  represent the equilibrium total output and equilibrium price respectively. Given environmental cost is taken into account and borne by enterprises engaged in production, the rise of price would bring the decrease of supply. Let  $G_1$  and  $P_1$  represent output and price at new equilibrium point  $A$ , and we can find that environment cost leads to the decrease of output value.

Figure 1



In fact environmental pollution has been threatening human beings. According to statistics, in 1997 the pH value of yearly precipitation in China ranged from 3.74 to 7.79. And 44 cities were with pH value lower than 5.6, accounting for 47.8 percent of the total number under survey. Severe air pollution has made it difficult for more than 500 cities to reach primary standards stipulated by the state. In China the emission of waste materials can not be disposed appropriately, causing one third of cities were surrounded by wastes. At same time noise pollution are becoming severe. The economy is growing at the cost of environmental destruction, which is going against original intention of human being to create ample material products with civilization and progress. Therefore, how to harmonize development of economy with environmental protection is one of important things to maintain sustainable development in large cities since as the center of economy they are playing an important role.

## 2. Environmental Kuznets Curve

Environmental Kuznets curve assumes without appropriate environmental polices, a nation's environmental quality and degree of pollution would deteriorate with the increase of national income in its initial stages of development of economy. When national economy reaches a higher level, environmental quality and degree of pollution would tend to be steady going. While national economy continues to prosper, environmental quality and degree of pollution would keep to be improved. That is to say before national economy reaches the turning point, with 1 percent increase of economic income, there would be more than 1 percent increase of some pollutant. After this turning point the degree of decrease of some pollutant would surpass that of increase of income. In general there exists an inverse U relation

between the level of development of economy and degree of pollution.

### 3. Application of Environmental Kuznets Curve in Evaluating Environment

We use Environmental Kuznets curve model and related data of Nanjing to analyze the relation between the development of economy and environmental pollution. The total amount of emitted air pollutant and SO<sub>2</sub> is the solution to the following equation:  $Y_T = \beta_0 + \beta_1 x_t + \beta_2 x_t^2 + \epsilon_t$ , where  $x_t$  denotes per capita GDP. Table 1 shows the result of analysis with SPSS software.

**Table1**

pollutant	constant term	per capitaGDP	(per capitaGDP) <sup>2</sup>	R <sup>2</sup>	F hypothesis
air pollutant	960.537	0.0198	1.7E-6	0.862	12.46
so <sub>2</sub>	19.4219	8.1E-5	2.1E-8	0.856	11.88
solid pollutant	500.842	0.0307	-7E-7	0.965	54.55

We get the following equations:  $Y(\text{air pollutant}) = 960.537 + 0.0198X + (1.7E-7)X^2$

$$Y_{\text{SO}_2} = 19.4219 + (8.1E-5)X + (2.1E-8)X^2$$

$$Y(\text{solid pollutant}) = 500.842 + 0.0307X + (-7E-7) X^2$$

From the equations mentioned above, we get  $Y'(\text{air pollutant}) = 3.4E-7 > 0$ . It is an increasing convex function without an inflecting point. From  $Y'_{\text{SO}_2} = 4.2E-8 > 0$ , we know it is also an increasing convex function without an inflecting point, while  $Y'(\text{solid pollutant}) = -14E-7 < 0$  shows that it is an decreasing concave function with an inflecting point. According to analysis, we get conclusions: in recent ten years, environmental pollution in Nanjing will deteriorate since we can not find an inflecting point. The major reasons is that the development of economy in Nanjing has not reached a higher level and still in the initial stage of industrialization. Unlike some western countries, it is characterized with industry concentrating in urban areas, which causes heavier environmental pollution. On the other hand, industrial structure tends to be unchangeable in short term.

#### REFERENCES:

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