Analysis of the impact of technological production and industrial structure on investment in environmental pollution control

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Abstract. From the concept of technology and production of industrial structure, this thesis discusses the specific impact of production technology and industrial structure on investment of environmental pollution control, through analyzing the concept and influencing factors of investment in it. On this basis, environmental pollution control investment affects the analysis and interpretation of factors mainly in order to provide the reference for further theoretical researches and practice of environmental pollution control investment. With the continuous expansion of our economy, and industrialization and urbanization of the city, there is more and more serious imbalance of economic development and environmental pollution, and the problem of environmental pollution has become one of China's current urgent economic problems [2]. As the result of the past economic growth and the basis of the future economic growth, the industrial structure is not only the important cause of the economic development, but also the primary factor of the environmental pollution problem. Therefore, it is important to improve the economic growth mode and optimize the industrial structure also improve the ecological environment [3]. The technological production brought by optimization and innovation of technological means has also become one of the key factors affecting investment in environmental pollution control.

1. Definitions of related concepts

1.1. Technical production
The production technology is the production of raw materials or semi-finished products for processing production, manufacturing and installation of products or services based on the final production which meets the relevant standards such as safety, quality, environmental protection of the nations and the enterprises. In the whole process of production, the integration of technology involved in the design, installation and manufacture of products or services has become the production technology [4]. Technological production is based on design, installation, manufacturing and processing technology.

Technology production is an important driving force to promote the progress of social productivity. It has developed all the way to the latest Internet technology for more than a century since the technology of steam as the representative of technology, and all of them are the important forces to promote social progress [5]. The environmental pollution is no exception, and it needs to invest a lot
of technology, especially the technology innovation is an important factor affecting the environmental pollution control investment.

1.2. The industrial structure
The industrial structure is a kind of scale variable that is very important. There is a very close relationship among the region of a routine, the industrial structure and regional development in the scale also the situation of environmental pollution control. Generally speaking, the industrial structure which can directly do is the proportions what are accounted for agriculture, industry and service industry in the national economy, and the industrial structure is relatively high to become "advanced" industrial structure of service industry accounted for conventional admiral. With the cycling of economic growth gradually, the proportion of the service industry is expanded, at the same time, injects more employment opportunities and economic vitality of the entire national economy.

2. Investment in environmental pollution control

2.1. Concept of investment in environmental pollution control
At present, the main object of environmental pollution control in China is industrial pollution, so the concept of its governance investment is also concentrated in the category of industrial pollution control. In short, the index of environmental pollution control is a comprehensive definition of all investments in the area, including capital and human input. Generally speaking, as industrial pollution is the main object, the "industrial pollution control completion investment" is often equated with capital investment, while "industrial pollution professional environmentalists" represent the investment of human resources.

![Figure 1. Category of Investment in Environmental Pollution Control](image)

According to the feedback of governance, it can be classified into gas waste, water waste and solid waste according to the different pollution categories. These three, also known as "three wastes", can generally cover the investment targets of environmental pollution control in a region.

2.2. Factors affecting the investment of environmental pollution control
At present, the research on environmental pollution control investment is mainly focused on the level of index selection. In fact, the so-called index is a quantitative and explicit expression of investment. Therefore, factors that affect investment targets of environmental pollution can be regarded as factors that affect investment in environmental pollution control.

Generally speaking, indicators that affect investment in environmental pollution are divided into explanatory and explained variable. The explanatory variables include index of technological innovation, factors of industrial structure and regional dummy variable, while the explained variables refer to the industrial pollution indicators in a region. There are some difficulties in quantifying the 2 types of pollution indicators because of noise pollution and ecological environmental pollution. Therefore, the efficiency of pollution control of "three wastes" is used as an explanatory variable.
As a result of the detailed explanation of technology survival and factors of industrial structure, this paper explains the influence factors of regional virtual variables. The reason for the introduction of this factor is because of the regional differences, and the investment in environmental pollution control may be greatly different. For example, the economy of the eastern region is relatively more developed, there is a gradual decline of the industry in industrial structure, so the environmental pollution control investment will also be decreased. In order to make the index more regional universality, it will be adjusted with area weighted coefficient, which reflects regional dummy variable factors.

3. The impact of technological production and industrial structure on investment in environmental pollution control

3.1. The influence of technology production on the investment of environmental pollution control
It is generally believed that the core of technological innovation lies in the Research & Exploitation of Technology, doing environmental pollution control for the research and exploitation of related technologies, so the cost of it becomes the cost of technology and development (RDE for short), also the cost represents the technology to some extent. The impact of the operation on the environmental pollution control investment is also reflected from the side of the area, which reflects the value of science and technology and environmental protection, technical ability and the level of R & D in the region [12]. The calculation method of RDE is used for reference by relevant scholars. It is simply expressed as 55% of consumptional index in local area and 45% of local fixed asset price, which represents local price index, and the price index is the basic data of local RDE calculation. It is worth mentioning that due to regional differences, it is necessary to invoke the characteristics of regional differences to determine the corresponding weighted proportion.

In short, technology production has brought great technological promotion and innovation ability for environmental pollution control. At the same time, technology production will bring about the investment of innovation cost of human and capital, which should be included in the area of local environmental pollution control investment. However, because of the acceleration of environmental pollution control effectiveness which brought about by technological production, technological survival has the ability to reduce investment in environmental pollution control.

3.2. The influence of industrial structure on the investment of environmental pollution control
In the academic world, GDP is often used as a control variable directly in the region, because GDP can clearly reflect the industrial scale and concentration in the local area, and show the changes in the direct indicators brought by the scale effects in the process of economic development. Secondly, as industrial development what needs to be used as a cost of environmental consumption, the scale of industrial development is consistent with the index of the scale of the environment and energy consumption. Finally, using the local gross industrial product in local GDP, it can effectively express
the status of the industrial scale in the local area, to a certain extent, represents the process of adjusting the variables of the local industrial structure [13].

In short, the proportion of the secondary industry in the industrial structure will directly determine the level of investment in the local environmental pollution control. Generally speaking, if the secondary industry is relatively high, then the local environmental pollution control investment will bring bigger investment on technology, which is due to the large consumption of industry to the environment. On the other hand, if the service industry is high and belongs to the state of industrial structure, the local environmental pollution control investment will be relatively small, because the pressure of the service industry to the environment is the smallest in the three industries, and some service industry can even bring bigger saving on investment cost for the environmental pollution.

Therefore, by adjusting the structure system of industry, the target of reducing the investment of local environmental pollution control can be cut down directly and intuitively by reducing the proportion of the secondary industry in the industrial structure. While the service industry accounting for a relatively high industrial structure, investment in manpower and capital for environmental pollution control will be significantly reduced. Industrial restructuring is an important factor to promote environmental pollution control and cost savings. For example, when the industrial structure of the second industry is relatively high in a certain area, the pollution of water waste, gas waste and rubbish waste is relatively high. Therefore, the government and enterprises need to invest higher environmental governance capital and human resources to control the "three wastes" pollution, which directly brings the significant investment upgrade.

4. Conclusion

The innovation ability brought by technology production and the decrease of industrial proportion brought by the adjustment of industrial structure will bring the direct reduction of human and capital on the investment of environmental pollution control. Although this study has not yet been more scientific and specific indicators for specific quantitative trade-offs, there is still certain short of academic, in the whole, the efficiency of environmental pollution control can be improved by improving the abilities of technological innovation and the power of technology to achieve the goal of saving the cost. And through the adjustment of the industrial structure, the release of the environment friendly energy brought by the service industry can save a lot of environmental pollution control costs, even through the super high proportion of the service industry, and let the local direct transform into the environment friendly area, and the investment of environmental pollution control is limited to 0. The above 2 directions to reduce investment in environmental pollution control have been more clear.

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