

Presentation only, **Wang Manman** will be attending the conference and make a presentation.

EMPIRICAL RESEARCH ON GREEN INNOVATION ABILITY EVALUATION OF CHINA'S MANUFACTURING ENTERPRISES BASED ON PRINCIPAL COMPONENT ANALYSIS

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Abstract: With the rapid development of economy in our country. The waste of resources, environmental pollution and ecological destruction and other issues are becoming more and more obvious. Manufacturing industry is a strategic industry which provides technical equipment for the national economy and is the important guarantee of industrial upgrading of all industry and the technological progress. The establishment of a strong manufacturing industry is to improve Chinese comprehensive national strength and guarantee to achieve industrialization. But Chinese manufacturing industry is still in the middle stage of development from lower level to higher level at present. The annual energy consumption of the manufacturing industry is about 57% of the total energy consumption in China. 60% of the water pollution, 40% of the SO₂, 75% of harmless waste and 90% of hazardous waste are produced by the manufacturing industry. The extensive mode of economic development has seriously restricted the sustainable development of Chinese economy. Chinese economy is in a period of rapid growth, the contradiction between man and nature has never been so urgent as today, we have not enough resources to support high consumption, high pollution economic growth. With the enhancement of people's consciousness of environmental protection. Green innovation is the inevitable choice for the future technological innovation. Green innovation is a professional innovation activity which is developed on the basis of technological innovation. Facing the double pressure of resources and environment, Chinese government first proposed five development ideas about innovation, coordination, green, open, sharing in 13th Five-Year Plan, in which one of the five development of the concept of "green development" is of concern. At the same time, how to evaluate the enterprise's green innovation ability has become a hot topic in the academic circles.

The evaluation method selected in this paper has the following advantages. PCA can transform multiple indicators into a small number of unrelated indicators. And PCA is a multivariate statistical method that can maximize the response of the original indicator information. The advantage of PCA is that it will reduce the dimension of the variables and simplified data structure to bring convenience to the analysis and research. And the calculated principal components are independent of each other and reduce the cross of information. It is feasible to carry out an empirical analysis on the evaluation of the green innovation ability of Chinese manufacturing industry.

Firstly, this paper constructs the evaluation system of green innovation capability of Chinese manufacturing industry from 4 aspects, and it selects twelve indexes related with green innovation ability of Chinese manufacturing enterprises. It employs PCA

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method to comprehensively evaluate and rank the Chinese green innovation ability of twenty-five manufacturing industry in 2016. Research shows: The transportation equipment manufacturing industry and electrical machinery and equipment manufacturing industry belong to the high green innovation capability of the industry as the first category; chemical fiber manufacturing, general equipment manufacturing industry, ferrous metal smelting and rolling processing industry, equipment manufacturing, non-ferrous metal smelting and rolling processing industry and the agricultural food processing industry belong to middle green innovation capability of the industry as the second categories; the rest of the industry belong to the low green innovation capability of the industry as the third categories.

Key word: Green innovation ability; PCA; manufacturing industry