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GREEN TOTAL FACTOR PRODUCTIVITY MEASUREMENT AND GREEN TECHNOLOGY CAPABILITY SPILLOVER IN WESTERN REGION OF CHINA

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Abstract

In the current situation of increasingly urgent environmental problems, how to improve the capacity of green technology through spillover means based on the existing green knowledge and technology stock in the western region of China, so that the economy of the western region can move towards a low-carbon, coordinated and sustainable direction in a short period of time is worthy of our deep discussion. This study measured the carbon dioxide emissions and calculated the green total factor productivity (TFP), green technology progress and technology efficiency in Western region of China. The results are as follows: first, the highest CO_2 emissions in western region of China is Inner Mongolia, the CO_2 emissions of Shanxi, Xinjiang, Sichuan and Guizhou province are in a downward trend, the CO_2 emissions of Ningxia, Guangxi, Chongqing, Yunnan, Gansu and Qinghai province are relatively stable. Second, the results of TFP without considering the non-expected input and output are higher than the results of green TFP, while the efficiency change calculated by Malmquist productivity index is significantly different from that calculated by SBM, and the efficiency calculated by Malmquist productivity index is basically 0.2-0.3 higher than that calculated by SBM. Third, the level of green technology efficiency scored differently in west region of China, ranking high to low was Qinghai, Ningxia, Xinjiang, Inner Mongolia, Shaanxi, Guizhou, Chongqing, Guangxi, Sichuan, Gansu and Yunnan province.

Keywords: green technology capability, green TFP, Malmquist productivity index, SBM model, western region of China

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