

Examining the Impact and Influencing Channels of Emission Trading Pilot Markets in China

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ABSTRACT

The global warming has become a serious issue in the world since the 1980s. The targets for the first commitment period of the Kyoto Protocol cover emissions of the six main greenhouse gasses (GHGs). China is the world's largest CO₂ emitter and coal consumer and was responsible for 27.3 percent of the global total CO₂ emission and 50.6 percent of the global total coal consumption in 2016 (BP, 2017). As China plays an important role in the global climate change, China has set goals to improve its environmental efficiency and performance. In 2011, the Chinese government for the first time announced an intent to establish carbon emission trading market in China. Eight regional emission trading schemes have been operating since 2013 (seven pilot markets during the 12th Five Year Plan period and one pilot market during the 13th Five Year Plan period) including provinces of Guangdong, Hubei, and Fujian, and cities of Beijing, Tianjin, Shanghai, Shenzhen, and Chongqing. The goal of these regional emission trading pilot markets is to help the government establish an efficient carbon emission trading scheme at national level. Some researchers have been focused on examining the impact of emission trading schemes in China using CGE model by constructing different scenarios and ex-ante analysis using data prior to emission trading pilot markets implementation. While this paper tries to conduct an ex-post analysis with data of 2005-2017 to evaluate the impact of emission trading pilot markets in China at provincial level using difference-in-difference (DID) model. By including both CO₂ and SO₂ as undesirable outputs to calculate Malmquist-Luenberger (ML) Index to measure green total factor productivity, this paper plans to evaluate the impact of carbon emission trading pilot markets in China via emission reduction, regional green development, synergy effect and influencing channels. This paper tries to answer the following research questions: (1) Do emission trading pilot markets reduce CO₂ emission and increase regional green total factor productivity? (2) Is there any synergy effect from emission trading pilot markets? (3) What are the influencing channels of emission trading pilot markets?

Keywords: Emission trading, CO₂ emissions, Different-in-difference