Emissions trading in China: a partial transmission and indirect emissions input-output analysis

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To achieve a 40â€“45% goal for reduction of carbon intensity, China cannot continue to rely only on costly administrative measures, it must also increasingly turn to market-based methods. In 2013, China established seven pilot markets for carbon-emissions trading under the 12th Five-year Plan (12th FYP, 2011â€“2015) to find a way toward a unified national carbon-trading market. The reduction targets at the provincial level over the period 2010 to 2015 ranged from 17 to 21%. Because carbon markets have been advocated as the most promising, efficient and effective policy instrument to avoid serious climate change, scholars from various countries have been studying the methods and likely results of carbon trading. There have been several studies that analyzed carbon emissions markets at the macro level. Some of these have provided overviews of the market coalition and the accounting method used in emissions trading, while others investigated the economic impact of emissions trading, especially in terms of cost-effectiveness and permit pricing (Zhou et al, 2013; Cui et al.2014; Wu et al.,2015; Fan et al,2016; Zhang et al, 2014; Jotzo and LÃ¶schel,2014). These studies can also be divided into those that have focused on estimating the impacts of emissions trading at the national or regional level (especially for the pilot markets), and those that have focused at the industrial sector level(electricity, building, transportation, etc.).
One hand, emissions embodied in trade are therefore important for defining the regional CO2 emissions reduction and its exogenous ceiling. Production-based accounting (PBA) can represent all emissions generated by the production activities of a country or other entity. Consumption-based accounting (CBA) allocates all emissions created along the chains of production and distribution. On the other hand, emissions embodied in production chains are also important for defining the industrial CO2 emissions reduction. Greenhouse gas emissions are categorised into three scopes by the most widely-used international accounting tool, the GHG Protocol. While scope 1 and 2 cover direct emissions source (are emissions from sources that are owned or controlled by the reporting entity), scope 3 emissions cover all indirect emissions (are emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity) due to the activities of an organization.
Despite the number of studies focused on emissions accounting methods, it is still unclear how different accounting methods have contributed to the stickiness of China's price pass-through. In particular, how and to what extent does China's price control policy affect its price index and economic development under national emissions trading market? To address these questions, we will develop a partial transmission input output model that captures the uniqueness of the Chinese carbon trading market. In traditional input output model, the price turbulence in upstream industries can be completely and instantaneously transmitted to downstream. However, price control policy on certain commodities are still implemented in China today, suggesting the need to modify the traditional IO model to better reflect the real economy and derive the realistic results. We will incorporate the stickiness in China's price transmission mechanism into the traditional IO model, thus better simulate the price pass-through. We will apply an interregional input-output model to derive cost curves for regional marginal abatement and estimate interregional embodied emissions and indirect emissions. It then proposed an emissions trading model for exploring the impacts of emissions accounting methods on trading markets in the context of China achieving its 12th FYP intensity reduction target. The estimation of carbon emissions is one of the key determinants of the total cost due to emissions trading and permits price, which affect the design of the national carbon trading scheme.