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Sectoral Crediting Mechanism: How to Work in China

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Abstract

Using the method of conjoint analysis, this paper assesses corporate preferences for the policy alternatives of the sectoral crediting mechanism (SCM) aiming at supporting the discussions and development of this instrument. Data was collected in all 11 prefecture-level cities of Shanxi province, China. Modeling analysis confirms that companies are most concerned about the following three policy attributes, domestic policy instruments, the relationship with the clean developing mechanism (CDM) and the principle of Common but Differentiated Responsibilities (CBDR). Companies prefer a policy alternative that has a domestic policy instrument in which installations with voluntary targets receive tradable units, can co-exist with the CDM, and can get financial and technical assistance from developed countries. Meanwhile, the coverage of the SCM has the potential to expand to small companies that are the most inefficient under the premise of controlling transaction costs.

1. Introduction

The 17th Conference of the Parties to the United Nations Framework Convention on Climate Change decided to define a new market mechanism (NMM), which is to scale up mitigation activities across broad segments of the economy and to achieve a net decrease of greenhouse gas emissions (UNFCCC, 2012). The term "broad segments" is commonly understood to mean that the NMM needs to cover mitigation activities at sectoral, sub-sectoral or cross-sectoral level (IGES, 2014). Usually, the power, iron

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and steel, transport and building sectors are targeted by the NMM. Implementing the NMM at these sectors could lower the cost of achieving emission reductions and catalyse investment from the private sector in low carbon technologies and practices. It can therefore play an important role in the diverse policy toolkit needed to address the global issue of climate change and achieve low carbon transition.

Amongst different proposals of the NMM, the SCM has always been regarded as one of the most important options (e.g. Ecorys, 2012; Cai et al., 2012). The SCM is based on an agreed 'no-lose' emission target set for a certain sector in the host country. To a large extent, the achievement of this target depends upon the mitigation actions of companies in the sector. Moreover, as a typical carbon pricing approach, the acceptance level of companies is vital in determining its actual success (Liu et al., 2015). Current research has explored the theoretical design of SCM for several years, but few studies have been conducted to clarify the opinions of companies.

Aiming to close the existing research gap, this study uses conjoint analysis to assess corporate preferences over the selected attributes of the SCM. The companies from Shanxi are targeted. The specific objectives of this study are to: (i) assess the relative importance of different attributes in conditioning corporate preferences; (ii) evaluate corporate preferences towards policy alternatives of the SCM; (iii) draw policy implications in designing the SCM.

2. Model used in the conjoint analysis

Individual company's preference for each policy alternative is the dependent variable in the conjoint models. Companies were asked to rate their preferences for each policy alternative on a five-Likert scale (1-completely non-support, 2-hardly support, 3-moderate support, 4-relatively support, 5-fully support). Two conjoint models are used: a traditional conjoint model and an ordinal logit model.

2.1. Traditional conjoint model

The ordinary least squares method is the major statistical method used in traditional conjoint analysis, which has a strong assumption that the rating scale needs to satisfy the numerical property associated with interval scales. Relevant methods are widely used in the conjoint analysis (e.g. Balana et al., 2011; Cattin and Wittink, 1982).

2.2. Ordinal logit model

Given that the assumptions of the traditional conjoint model are strong, an ordinal logit model is also used. In addition to the policy attributes, companies' characteristics are added into the independent variables in the ordinal logit model. Thus, eight characteristics are identified through institutional theory and literature reviews (Table 1).

Table 1. Description of the companies' characteristics

Abbreviation	Description	Valuation
Export	Export rate of the product	A five-point scale
Enprice	Perception of domestic energy price level	A five-Likert scale
Potential	Energy saving potential of the company	A four-point scale
AwareETS	Company's awareness on the trading mechanism of national and international emission trading system (ETS)	A five-Likert scale