AN ESTIMATION OF CARBON-EMISSION PRICE OF KOREA USING THE COMPARATIVE ANALOGY: A KOREAN CASE

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Overview

The Paris Agreement was signed in December 2015 which aims to strengthen the international efforts against the climate change threats. Therefore, 195 countries participating in the Paris Agreement are considering introducing the Carbon Emissions Trading System(ETS), which is evaluated as the most effective method among various methods. In this context, it is meaningfull to analyzing Korean carbon market. Korea is the latest country to introduce ETS and it is the first country to carry out ETS nationwide in Asia. But Korea's carbon trading system, which has been in effect since 2015, has not yet been fully activated in the early year of implementation, only 0.8% of total quantity is traded. Among various reasons experts pointed out, the claim that the standard price set by the government would not be an appropriate level have been frequently raised. The purpose of this study is to estimate an appropriate level of Korean carbon price using the comparative analogy with European carbon market's data which is considered as the most stable market.

The procedure of the present study is as follows: First, we constructed the set of factors affecting the price of carbon credits based on the relevant literature, and then developed alternative models for the estimation of European carbon price based on the selected variables. Second, the best model is selected through the statistical analysis using the empirical data of European carbon market. Third, the appropriate level of Korean carbon price was estimated by substituting Korean market data into the selected model. Finally, we performed sensitivity analysis to examine how the estimated price would vary with respect to the changes of explanatory variables.

Methods

Regression Analysis, Sesitivity Analysis

Results

Fisrst, It is more important to consider the EU-ETS Third Phase Data rather than considering time lag in analysis. Also we checked again that coal and oil are the most influential factor for carbon price through sensitivity analysis. It is same result with relavant literature.

Second, As a result, the average price of Korean carbon credits for 2015-2016 is estimated to be 22,049.87 KRW for the General Data Set Model without time lag and 20,458.66 KRW for the General Data Set Model with time lag, which suggest that the current standard price set by Korean government would be lower level compared to an appropriate one.

Third, Our empirical result implies that the actual Korean carbon price is approaching the estimated price level. In particular, from March to June 2016, the actual price was very similar to the estimated price. However, due to the intervention of the Korean government, the impact of the surge in coal prices since June 2016 has not been reflected on the actual price.

Fourth, Compared with the international market, the average price of EU-ETS carbon credits in the same period was 8,926.7 KRW, while the average price of carbon credits in the US was 6,298.7 KRW. This difference is orginated in difference of raw material prices.

Conclusions

This study analyzed EU-ETS data, which is the most stable carbon market, and tried to estimate the appropriate Korean carbon price level based on EU-ETS. To this end, the major factors affecting the carbon price were selected by literature survey, and the EU-ETS data was analyzed by regression with and without time. In addition, we found that the general data set are more predictive than the second data set through the forecasting test,

This study is meaningful in that it is the first trial to estimate the appropriate price level of carbon credits in Korea. Estimated carbon credits price is expected to be used to reset the current standard prices set by government. In addition, the framework and methodology of this study can be used in emerging countries that introduce carbon trading schemes such as China.

However, this study has a limitation that we assumed that the Korea shared the same factors affecting carbon emission price with EU market without reflecting the characteristics of each market. Therefore, in future research, it is necessary to improve the model considering the characteristics of each market.