Dynamics of CO_2 price drivers

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ABSTRACT

From the moment a limit and a price are attributed to a production waste, known as carbon, it gains importance for emitters, either companies or national econo-mies. Knowledge of variations in that price becomes essential to production deci-sions. Currently, most studies look only to univariate causality of carbon prices. They fail to reflect intertemporal relations between what should be considered endogenous variables. Here, using data from Phase II of the European Union Emission Trading Scheme, we aim to characterize CO2 prices interrelation with energy prices (gas, electricity and coal), carbon allowances substitute prices and economy index prices. To do this we develop a vector autoregressive model, considering all variables endogenously, but temperatures, included as the only exogenous variable. We show responses of CO2 prices to impulses in other variables through impulse-response functions, and observe duration, direction and magnitude of the impact. Main findings include significant positive impact of returns of CO2, peak electricity, gas, coal and economy index, in CO2 returns. The impact is visible during ten days in case of an electricity innovation, and during one day in case of gas and coal. A shock in economy index prices has impacts in 2 days, and finally certified emission reductions do not have a significant impact.

KEYWORDS: carbon price, energy price, emission allowance, emissions trading, VAR model