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# ON THE ORIGIN OF EMISSION ALLOWANCE PRICE FLUCTUATION

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## OVERVIEW

According to conventional wisdom, this emission trading is the cost-efficient way to reduce greenhouse gas emissions. The idea of emission trading schemes is based on economic reasoning and implies establishing entirely new markets. With the introduction of emission trading schemes is that the right to emit a particular amount of CO2 now becomes a tradable commodity. This new market not only requires regulated emitters to run an adequate risk management, it also provides new business development opportunities for market intermediaries and service providers like brokers or marketeers. However, it is essential for carbon market players to learn about price dynamics in order to realize trading strategies, risk strategies and investment decisions.

With the end of the first trading period of the European Emission Trading Scheme (EU-ETS), empirically analyzing emission allowance prices receives growing attention in the literature. Issues under consideration in this empirical literature include the price behaviour of the allowances itself as well as the determinants of these price developments. [Paolella and Taschini, 2008; Benz and Trück, 2009, Gronwald and Ketterer, 2009]. While these papers employ univariate techniques and do not include exogenous variables, papers such as Alberola et al. (2009) and Hintermann (2010) focus on the price determinants. Usual suspects include gas and coal prices that reflect the preferred abatement opportunity fuel switching as well as weather conditions that affect electricity demand. In particular Hintermann's (2010) results, however, suggest that market fundamentals are an insufficient explanation for the observed EUA price behaviour in Phase I.

A recent offshoot of this literature deals with the relationship between carbon prices of different, but linked markets. The only existing link between carbon markets is that between the EU-ETS and the Clean Development Mechanism. Papers such as Mizrach (2010) and Nazifi (2009) epitomize these research efforts by investigating whether a cointegration relationship is present between EUA and CER prices. Alberola et al.'s (2009) try to explain the observed and, in a way, puzzling price spread between EUA and CER prices. Their approach is to investigate whether EUA and CER prices react differently to changes in a variety of market fundaments.

Therefore, this paper pursues a different strategy and investigates the origins of emission allowance price fluctuations. This paper applies the approach put forward by Kaufmann and Ullman (2009) to carbon markets. Their method allows investigating whether fluctuations originate in future markets and may therefore reflect some sort of speculative behaviour, while price innovations that emerge on spot markets can be attributed to fundamental behaviour.

## METHODS

This paper applies the approach put forward by Kaufmann and Ullman (2009) to carbon markets. Kaufmann and Ullman (2009) are concerned with the global market for crude oil and investigate whether Granger causal relationships are present between spot and future carbon

prices from different markets for crude oil. Their analysis allows one to conclude where changes in carbon prices originate and how they spread. Kaufmann and Ullman (2009) argue that fluctuations originating in future markets reflect some sort of speculative behaviour while price innovations that emerge on spot markets can be attributed to fundamental behaviour. This approach is intuitive, makes use of a widely accepted method and yields interesting economic insights. It is this combination that makes this approach particularly appealing.

## RESULTS

The results obtained from this exercise are important as they help to improve the understanding of currently existing emission trading schemes and existing links between these schemes. As asserted above, market fundamentals are not a sufficient explanation for the observed price movements; therefore pursuing additional modelling strategies is required.

## CONCLUSIONS

In a nutshell, this paper applies an appealing methodical approach in order to shed further light on the origins of emission allowance price fluctuations and the effects of linking existing emission trading schemes.

Having a sufficient understanding of the emission price developments is crucial for the design and regulation of trading schemes. It is of particular importance that emission trading schemes run smoothly. Inefficiencies in emission trading schemes possibly result in a loss of the cost-efficiency feature, which, in turn, makes alternative policy measures such as carbon taxes interesting. Finally, interesting conclusions regarding the effects of linking emission trading schemes can be derived from this study. This is relevant as prominent economists such as Hans-Werner Sinn and Ottmar Edenhofer argue that a global emission trading scheme rather than isolated regional schemes is required. It is, however, plausible to assume that linking existing schemes rather establishing a completely new one is the plausible policy scenario.

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