



Does order flow in the European Carbon Futures Market reveal information? ☆

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Abstract

This paper identifies the classes of agents at play in the European Carbon Futures Market and analyzes their trading behaviour during the market's early development period. A number of hypotheses related to microstructure are tested using enhanced ACD models. Evidence is presented that the market is characterized by three different groups of traders: informed, fundamental, and uninformed. OTC trades are distinct to regular trades and are used strategically by the informed. Fundamental traders react faster in Phase II and the informed counteract by increasing their trade size and speed. The results indicate enhanced market transparency and increased market maturity. © 2012 Elsevier B.V. All rights reserved.

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1. Introduction

Several studies have analysed the microstructure of the European Carbon Futures Market that developed with the implementation of the European Union Emission Trading Scheme (EU ETS). Benz and Hengelbrock (2008) is the first study on price leadership and discovery; Paoletta and Taschini (2008), Benz and Trück (2009), and Conrad, Rittler, and Rotfuss (2012) investigate the relation between price formation and volatility; Mizraeh and Otsubo (2011) analyse price discovery across spot and futures markets and the predictive content of order imbalances; Frino, Kruk, and Lepone (2010) examine the relation between liquidity, trading costs and volatility, and Ibikunle, Gregoriou, and Pandit (2011) study liquidity variations around the new rules of the Kyoto commitment period (2008–2012). Other contributions are largely along these lines. Zhang and Wei (2010) provide a survey of the literature on the market's operating mechanism and economic effect. In particular, apart from Bredin, Hyde, and Muckley (2011), who focus on the volume–volatility relationship, little has been done on the identification of trading behaviour, especially through non-price related order flow variations and, specifically, through the modelling of the time between trades (duration).

The typical market microstructure model assumes two classes of agents: informed traders who possess private information about future values and uninformed traders who are primarily liquidity motivated (c.f., Madhavan, 2000). Admati and Pfleiderer (1988) further dissect the uninformed class into discretionary traders who time their trades and non-discretionary traders who arrive randomly. They show that the strategic play between the informed and the discretionary traders generates bouts of trading reflected in clusters of high trading activity. An appropriate time series analysis of trade characteristics, such as trade sign, size, frequency, and timing, should then reveal the presence, type, and magnitude of impact of the various agents at play. Diamond and Verrecchia (1987) and Easley and O'Hara (1992), for example, show that the time between trades (duration) is related to information. Specifically, longer durations can be associated with either a specific type of news or the absence of news. Dufour and Engle (2000) explicitly incorporate this time dimension into the pricing model of Hasbrouck (1991) using the Autocorrelated Duration (ACD) model of Engle and Russell (1998). They provide evidence that trade duration is informative and high trading frequency reflected in short duration is associated with a high price impact, faster price adjustment to new information, and stronger autocorrelation of trades. Beside the important implications this has on prices, it is evidence that non-price characteristics of trades carry information that may enable the identification of the various agent classes at play during trading. As a transaction on its own does not reveal the class of agent that initiated it, its characteristics relative to those of adjacent others might. Methodologically, if trading behaviour is revealed in trade characteristics, such as duration, then it is reasonable to expect these characteristics to cluster in regimes each having a different distribution. Accordingly, that specific trade characteristic would be described by a mixture of distributions. Hujer and Vuletic (2007) suggest the introduction to the ACD framework of an underlying 'unobservable' mixing variable that "culls the presence of unobservable information regimes and the mixing parameters pose as fractions of different information regimes...". Through this theoretical hinge they are able to link the hazard rate of duration (instantaneous transaction rate) to classes of agents.

This paper identifies the classes of agents at play in the European Carbon Futures Market and analyzes their trading behaviour during the market's early development

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