

# Counterpart choice in emission markets

## Beyond pollution abatement motives

Author: María Eugenia Sanin

The need to link CO<sub>2</sub> markets to create a global price for GHG emissions has been supported by many well-known economists (see Golier and Tirole, 2015). As the debate on how to implement such a link between regional markets remains open (see, *e.g.*, Jaffe *et al.* 2009), it is important to understand that the determinants for buying or selling a certain amount of allowances in an emission trading market does not solely depend on the possibility of abating pollution at a lower marginal abatement cost. There are market conditions determining counterpart characteristics at different points in time, that have a direct influence on the utility derived from each specific transaction undertaken. Understanding the choice over types of counterparts as a function of market, individual and counterpart characteristics allows us to assess the fragmented structure of these markets and the important role of professional traders in linking local markets, reducing trading costs, risks and, in general, increasing the information available.

In this paper we study the determinants of agents' counterpart choice in the U.S. Acid Rain Market, namely: *(i)* how the structure of the underlying electricity market influences agents' trading behavior in the permit market; *(ii)* how the rules imposed by environmental regulation impact the number (and type) of agents entering the market at each point in time<sup>1</sup> and, consequently, market evolution; and *(iii)* what the role of professional traders is as the market evolves and whether their presence has an impact on efficiency. With this purpose, we obtained a database that collects all transactions registered for the U.S. Acid Rain Market in the Environmental Protection Agency's (EPA) Allowance Tracking System (ATS) between January 1995 and December 2005. We cross-referenced this information with data on local electric market conditions to account for the link with the electricity market.

Each time an electricity generator enters the Acid Rain Market he must choose between three alternative trading counterparts: market maker, broker or another electricity generator also entering the market in order to comply with environmental regulations. Our results regarding preferences over counterparts are in line with well-known results in the market microstructure literature. Hendel *et al.* (2009) claim that it might be socially efficient to have multiple platforms (in our case alternatives), offering different service levels, catering to different types of houses and sellers (in our case, transactions and agents). Our findings are in line with this result. Barclay *et al.* (2003) study competition between Electronic Communication Networks and NASDAQ, whereas Bessminder and Kaufman (1997) study competition between the National Association of Security Dealers and the NYSE. Both find, as we do, that agents seeking to trade large quantities usually prefer the centralized market.

In addition to the results just mentioned, our estimations show evidence to support the hypothesis that the SO<sub>2</sub> market inherits the regional dimension from the electricity market and that this determines how agents choose their trading counterparts. This finding has a

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<sup>1</sup>Measuring the number of agents active in a certain market is a way of building a measure of liquidity and therefore a measure of market efficiency (Cohen-Cole *et al.*, 2014).

direct regulatory implication: the reason for creating a tradable permit market is to give the possibility of abating emissions at the lowest marginal cost nationwide (Montgomery, 1972). If most private trading of permits is done within regions, then the main objective in creating this market, as formulated above, is not achieved. Our results show that, on average, generators prefer to trade within their own region with other generators or brokers, but when there is a shock in the local electricity market that could make SO<sub>2</sub> allowances locally scarce, generators are more likely to buy allowances from market makers, which operate nationwide serving as a link between local markets (thereby increasing the efficiency of the environmental regulation).

Regarding the market conditions imposed by environmental regulation, we investigate what influences counterpart choice with respect, first, to the need for immediacy and the increase in the number of private participants when the allowance surrender date is approaching and, second, to the change in market configuration when moving from Phase I to Phase II. We find that, during Phase II, agents are more likely to prefer professional traders, probably due to the increase in counterpart identification costs.

Finally, we account for changes in preferences across alternatives as the market develops. We find that trade with private counterparts increases over time (as more firms are covered by the regulation) but that trade with market makers increases to an even greater extent during the last two years considered (since more liquid markets entail higher counterpart risks).

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