

Dynamics in forward and spot electricity markets

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Abstract— This paper provides new results that cast doubt on the conventional assumption that introducing voluntary forward markets will mitigate the market power of electricity generating companies by encouraging them to contract forward. We provide complementary insights by developing an agent-based simulation model of an actual system. This facilitates understanding the strategy selection of heterogeneous companies through computational learning. We use a detailed model of the Spanish system, where companies trade through a uniform price, pool-based spot market. We model market power in this pool through agents offering to generate with conjectured price responses estimated from supply function equilibrium assumptions. We envisage the introduction of a forward market, with price formation following the conventional financial perspective of expected spot plus a risk premium. We find, in general, that larger companies prefer to exercise market power in the spot market, while smaller companies prefer to contract forward, but strategy selection itself can be quite a delicate, situation specific process.

Index Terms— Electricity markets, forward contracts, market power, trading

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