

# ***TOWARDS A LONG-TERM ECONOMIC WELFARE IN DEREGULATED ELECTRICITY MARKETS: TESTING CAPACITY MECHANISMS IN AN EXPERIMENTAL SETTING.***

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## **Overview**

One of the main concerns in the academic discussion about deregulated electricity markets is long-term economic welfare. A number of capacity mechanisms have been studied and implemented in many countries to address this issue; in this paper we focus on two of them, Procurement for long – term strategic reserve contracting and Centralized auctioning for capacity contracts. The first mechanism aims to stabilize the price behavior by including a market regulator that has generation capacity at its disposal and the second mechanism proposes an auctions system for capacity licenses to control the system capacity and hence, the electricity price. We hypothesize that both mechanisms will help to improve and stabilize market's economic welfare. To test our hypothesis, we propose an experiment composed by three treatments, in treatment 1 the subjects make investment decisions in a simplified model of an electricity market, in treatment 2, a regulator figure is included in the model to interact with the subjects and finally, in treatment 3 the subjects bid in an auction system for capacity generation licenses. Our results suggest that the second mechanism may improve and stabilize market's economic welfare, while the first may not contribute two either of two aspects.

## **Methods**

The paper uses a series of computerized laboratory experiments based on dynamic non-cooperative games. The experiment departs from simulations that serve as hypotheses for the experimental results.

## **Results**

First, laboratory experiments are used to replicate a deregulated electricity market as base treatment.

Second, we introduce two capacity mechanisms, namely Procurement for long – term strategic reserve contracting and Centralized auctioning for capacity contracts in the above mentioned base treatment to assess their potential to stabilize the market price.

Third, we found significant differences between each of the capacity mechanisms and the base treatment.

## **Conclusions**

Our results suggest that Centralized auctioning for capacity contracts can have positive results in electricity markets by improving its economic welfare in terms of both stability and expected economic surplus. Conversely, our results also suggest that Procurement for long strategic reserve planning can actually have detrimental effects in the market by reducing the expected economic surplus and increasing the surplus' instability.

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