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INFORMATION FEEDBACK EFFECTS IN RETAIL ELECTRICITY MARKETS

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Overview

The paper studies alternative paths of introduction and implementation of demand-side management (DSM) programs designed to increase the efficiency of retail electricity markets and improve the management of cyclical electricity demand. Consumers have shown aversion to these new programs and a lack of understanding about possible efficiency gains. To further explore the most effective path of DSM implementation, we investigate how differences in information feedback affect consumer behavior during and after the transition phase to a real-time pricing program. In a laboratory setting, we compare the effects of direct and indirect feedback on market efficiency. Human subjects participate in a series of simulated retail electricity exchanges that are transitioned from flat rate to real-time pricing programs while different experimental treatments vary the type of information feedback on wholesale electricity prices during the transition phase.

Method

Laboratory market experiments.

Results

Results indicate that direct feedback does increase market efficiency and lessens aversion to implementation of real-time pricing contracts. Subjects are significantly more averse to real-time pricing prior to participation in the program than after participation, which suggests a need for better communication in order to ease transition for consumers and minimize customer complaints.

Conclusions

This experiment is the first laboratory study on the effect of feedback in retail electricity markets transitioning from flat-rate pricing to real-time pricing. The observed participants' preferences do provide useful information about how consumers might respond to implementation of real-time pricing programs and changes in feedback. Though currently we are observing an aversion to the installation of smart meters and the associated demand-side management programs, the information collected here suggests that timely feedback on prices could assist in consumer acceptance of new programs. In addition, as the efficiency rises after the implementation of a dynamic contract with direct feedback, consumer aversion towards the new contract seems to melt significantly.

Findings from this laboratory experiment in addition to those from numerous field experiments suggest that real-time pricing programs do lead to greater efficiency gains. However, if consumers are averse to these programs and opt out of participation, then these efficiency gains cannot be realized. Although indirect feedback did not prove to be greatly influential in increasing efficiency of participant consumption, direct feedback did have an impact on consumer preferences and did lead to higher market efficiency. Thus, direct feedback could be beneficial as the grid transitions through deregulation to encompass real-time pricing programs.

References

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