

Supply Chain and Operations Management Seminar

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**Electricity Pricing with Limited Consumer
Response**

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Abstract

Matching demand with supply has been a long-standing challenge in operating residential electricity markets. The utility firms often face stochastic demand functions that are affected by the unpredictable exogenous random shocks (e.g., outdoor weather condition). Although various Demand Response programs are in place to regulate electricity consumption, the effectiveness of these programs has been undermined, largely because the consumers have demonstrated limited capability in adjusting their household appliances' settings. In this paper, we construct a demand model to describe how consumers make consumption decisions in response to random external factors representing their ambient environment at a given price. To that end, we adopt the notion of "rational inattention" to capture the consumers' inertia in readjusting their decisions over time. Subsequently, we investigate an electricity firm's pricing decision as well as its impact on social welfare and system reliability. Our findings highlight the nuanced implications of rationally inattentive consumers, and lead to guidelines for better regulating retail electricity markets.

Bio

Saed Alizamir is an associate professor of Operations Management at Yale School of Management. His research interests lie in the areas of social responsibility and sustainability as well as healthcare operations. He mainly focuses on public policy-related problems in these settings that involve dynamic decision-making and learning. The goal of his research is to provide normative recommendations that can inform better policy decisions, especially in areas where not enough data exists to run full-fledged empirical studies. He has worked on government subsidy instruments in renewable energy industry and agriculture as well as optimal control of diagnostic systems such as nurse triage.