

Designing Nonlinear Electricity Pricing with Misperceptions: Evidence from Free Electricity Policy*

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Abstract

This paper assesses the welfare effects of nonlinear electricity pricing in the presence of consumer misperceptions regarding the pricing schedule. Our analysis focuses on a unique electricity subsidy program in Bhutan, wherein electricity is provided free of charge up to a consumption of 100 kWh per month in rural regions. Utilizing administrative billing data from the entire population of retail customers, we observe a notable bunching of electricity consumption at 100 kWh following the introduction of the program. In order to explain this observation and deduce the welfare implications of the policy, we develop and estimate a model of electricity demand that accounts for the heterogeneous (mis)perceptions of consumers regarding the pricing schedule. By leveraging the differential behavior at the threshold and variation of the tariff schedule, we identify and estimate the types of perceived pricing schedules and underlying electricity demand. We conduct a simulation analysis to evaluate the free electricity policy, which demonstrates that the current subsidy scheme primarily benefits households with higher electricity consumption. We explore the optimal tariff schedule and its welfare and distributional implications.

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