

# MARKETING COLLOQUIA

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**Date:** Thursday, October 13, 2022

**Where:** 741 JMHH

**When:** 12:00 PM to 1:20 PM

## WHO SHOULD BE SUBSIDIZED FOR ELECTRIC VEHICLES?

### DEMAND ESTIMATION AND POLICY DESIGN UNDER NETWORK EFFECTS

#### ABSTRACT:

I quantify the heterogeneous network effects and price elasticities in consumers' Electric Vehicles (EV) purchases. I consider both direct network effects from social influences and indirect effects from charging stations. Given the estimated effects, I design targeted pricing policies for the firms. To examine the equilibrium effects of counterfactual policies under social influences, I model consumers' decisions jointly as equilibrium outcomes. Multiple equilibria might arise, posing challenges to estimation and identification. I show that if the average social influence effect is within my derived bounds, then unique equilibrium is guaranteed even under counterfactual policies. I investigate whether the data patterns suggest unique equilibrium; if so, estimation requires searching for parameters within the derived bounds. Another challenge comes from the endogenous charging stations and prices. I construct instruments for the endogenous variables and show identification of each effect. Using zip code level vehicles and charging stations data in Texas over six years, I find positive heterogeneous social influence effects; moreover, ignoring social influence effects under-estimates the mean price elasticities by 11%. The socio-economically disadvantaged group is less affected by social influences and more sensitive to prices. I design a profit-maximizing targeted pricing policy which charges this group \$15k less than the others on average. Under the recommended policy, the average firm's annual sales increase by 35.7% and annual profits increase by 2.7%. The recommended policy improves not only firms' profits but also distributional equity among consumers.