



CPA Speaker Series (BA)

Alberta School of Business
Department of Accounting and Business Analytics

Presents:

Nasser Barjesteh

University of Toronto

Topic:

Spatial Pricing: An Empirical Analysis of Taxi Rides in New York City

Friday, November 6, 2020

9:00am – 10:00am

Zoom details in the calendar invite.

If you are not a member of ABA, please contact Karmeni Govender (karmeni@ualberta.ca) for the Zoom meeting details.

ABSTRACT

This paper studies how spatial pricing and search friction can impact the taxi market in New York City. We use a mean field model, in which the taxi drivers strategically search for customers in different neighborhoods across the city, taking into account the spatial and temporal distribution of the supply and demand as well as the prices across the city. Our model captures the interplay between spatial pricing, where prices depend on either the origin of the ride alone or both its origin and destination, and search friction, due to empty taxis and customers within the same neighborhood failing to pair efficiently. Spatial pricing can incentivize relocation of empty taxis to a neighborhood while the use of mobile applications can alleviate search friction within that neighborhood. We fit our model to a dataset of New York City taxi rides over four years and conduct a series of counterfactual studies to explore how spatial pricing impacts demand for and supply of rides, consumer welfare, and drivers' profit. Our analysis reveals that spatial prices that only use origin information can increase consumer surplus by 7.0% of the average fare and serve 2.6% more customers without hurting the drivers' profit. Moreover, we find that eliminating the (local) search inefficiency alone

can increase consumer surplus by 13.9% of the average fare and serve 4.3% more customers while simultaneously increasing drivers' profit by 2.5% of the average fare. We also observe that improving search efficiency primarily impacts under-served neighborhoods such as upper Manhattan, Brooklyn and Queens, while pricing primarily impacts well-served neighborhoods, for example, the airports, midtown, and downtown Manhattan. This underscores the value of a hybrid mechanism. We propose a mechanism in which (local) search is eliminated in all neighborhoods while spatial pricing is only used in well-served neighborhoods. This mechanism increases consumer surplus by 21.5% of the average fare and serves 8.7% more customers, while avoiding price discrimination in less affluent neighborhoods of the city. The proposed mechanism achieves 96.3% of the benefits of a citywide spatial pricing and friction removal mechanism.