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Application to NBER Digitization Tutorial 2019

Contact information:
Juan Camilo Castillo
Economics Department
Stanford University
jccast@stanford.edu

Current Year: 5th
Main Fields: Industrial Organization and Microeconomic Theory
Other Interests: Market Design and Economics of Technology

Coursework:
Industrial Organization
Industrial Organization 1-3
Energy and Resource Economics

Microeconomic Theory – Market Design
Social and Economic Networks
Matching and Market Design
Contracts, Information, and Incentives
Theory of Auction Market Design

Other Courses:
Behavioral and Experimental Economics I
Machine Learning for Causal Inference
Institutions and Organizations

My research interests are related both to empirical industrial organization and microeconomic theory, with a strong component of market design. I am mostly interested in concrete applications of economic theory with direct implications to real world markets, and in applying cutting edge empirical techniques, such as machine learning, to acquire a better understanding of markets.

The digital economy is a particularly good subject to fulfill these goals. On one hand, the fact that digital markets change at a fast pace means that there is little experience about how they work, so theoretical models are necessary to understand how agents will behave in them. On the other hand, the data they produce is so detailed that it allows very precise estimation to test theory. I also find the digital economy very interesting in itself, with its huge potential to transform society for good. Because of these reasons I am particularly interested in focusing my research on digital and online markets.

"Who Benefits from Surge Pricing?", which will be my job market paper next year, is an example of this. I have been working on this project for the last year under the supervision of Matthew Gentzkow, Liran Einav, and Susan Athey. Economists typically think that dynamic pricing, as in ride-hailing platforms like Uber and Lyft, is definitely beneficial for society. However, the public perception about it is mostly negative, to the extent that companies have decided not to do surge pricing—for instance,

DiDi, the Chinese company that bought Uber's operations in China now uses a queuing mechanism—and cities have banned surge pricing—Manila, Shanghai, and Delhi, to name a few examples. A more nuanced analysis reveals that, although total welfare and a platform's revenue most likely increase with surge pricing, riders or drivers might be hurt under certain assumptions on the elasticity of demand and supply.

My paper is an empirical analysis of surge pricing. I estimate supply and demand for Uber using data from San Francisco. Then I build a model of spatial equilibrium, which I use in order to simulate the behavior of the market under counterfactuals without surge pricing. I then compute the welfare effects of surge pricing on drivers, riders, and on the platform. This analysis is exactly what is necessary to judge whether companies should do surge pricing, whether cities should ban surge pricing, and whether taxis should start moving towards dynamic pricing. I am still putting together all the pieces in my model, but I should have results by the end of the year.

Another example is my work with Susan Athey and Bharat Chandar, "Service Quality in the Gig Economy: Empirical Evidence about Driver Safety at Uber". Traditional industries rely on ex ante screening of employees to ensure high quality. The new business model of the gig economy needs to give flexibility to workers, so it cannot follow the traditional model. Instead, it relies on technology, using ratings and real time monitoring in order to incentivize workers to provide high quality. It is an open question whether the shift to new quality assurance methods leads to an increase in quality. We focus on the case of Uber, using telematics data on accelerations, breaks, and speed to measure quality objectively, and we find that UberX trips perform substantially better than UberTaxi trips, which do not follow the normal ratings system but have to pass city licensing processes. We find that a portion of this difference can be attributed to the ratings system and to behavioral nudges such as reports on drivers' past behavior relative to other drivers.

Another paper I have been working on, "Surge Pricing Solves the Wild Goose Chase" (joint with Dan Knoefle from Uber and Glen Weyl from Microsoft Research), has a more theoretical flavor to it, but it shares many themes with both papers I have mentioned. Ride hailing apps are a more efficient technology than traditional taxis, which means they should give rise to important welfare gains. However, we show that the ride hailing equilibrium is fragile. At times of high demand, the market is depleted of idle drivers, which forces the platform to send cars to pick up distant customers. This occupies time that drivers could instead have spent taking passengers to their destination, thus reducing the capacity of the market. The market collapses and welfare declines drastically. A simple solution to this problem is to increase prices. Surge pricing is thus a fundamental tool for Uber, since it uses it to set low prices at most times, but increase prices at times at which the market would otherwise collapse. We build a model that explains how the market collapses under certain circumstances, and then use simple empirical evidence to support our model and to show that Uber uses surge pricing as a tool to manage this market failure.

Given my interests, I would be able to profit greatly from attending the NBER Digitization Tutorial. It would be very useful to hear about the newest research on these topics by the best economists, and I would be glad to meet the people working on them.