Project: The Impact of Uber on Taxi Fare

Class: Quantitative Analysis

Class term: Spring 2017

Keywords: Econometrics, Disruptive Competition, Uber, Ride-sharing

Project Summary:

Since its founding in 2009, Uber has continued to see rapid growth and now serves hundreds of cities worldwide. Although Uber itself does not own any vehicles, the app and its service provide a transportation network which connects riders and drivers in place of taxis (MarketLine, 2014). Today, Uber is only one of the many companies within the ride-sharing industry. The technology company has powerful advantages over the taxi industry, including the ability to avoid costs, e.g., taxes, associated with transportation services and governmental regulations placed on taxis. Uber faces increasing legal battles from state governments and the taxi industry; many cities in the U.S. have implemented Uber bans (Edelman & Geradin, 2016).

This econometric study explores the impact of Uber, a ride-sharing platform, on the average taxi fare in various markets. Taxi fares were collected for hundreds of markets across the U.S. Controlling for regional differences and population, I estimate the difference in fare between taxi markets where Uber is present and those where Uber is not present. Empirical results suggest that the availability of the Uber platform reduces the average 10-mile ride by $2.35. This study also examines the policy implications of allowing Uber and the consumer surplus that occurs.

The Impact of Uber on Taxi Fare

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The Sharing Economy

The sharing economy connects buyers with sellers at a level that was previously impossible. Using an app or other online platforms, suppliers who have an asset can quickly connect with consumers who are demanding that asset and have a willingness to pay for it.

There are several economic benefits of ride- sharing platforms:

- decreased transaction costs
- improved information distribution
- pricing efficiencies

The taxicab industry has directly been affected, with the rapid growth of ride-sharing providers, This research study is designed to examine whether the presence of a ride-sharing platform has a dollar impact on taxi fare.

(Edelman & Geradin, 2015).

Analysis

In order to obtain the impact of the presence of Uber on taxi fare, analysis was performed on the following components of taxi fare:

- The distance of the ride
  - 1 mile, 5 mile, and 10 mile rides were used as a constant
- Time duration of the ride:
  - Data collected from the 2010 U.S. census on population, density and square miles were used as a proxy
- Location of the ride (city/zip code)
- Location of the ride in terms of regions

Using the taxi fare data, a multiple linear regression was performed to estimate the impact of Uber on the average taxi fare. After running the model using the 1 mile, 5 mile, and 10 mile average fares, the 10 mile fare was selected for the final analysis.

Application

We can apply this model to the city of Menomonie to capture the estimated fare impact if Uber entered the marketplace

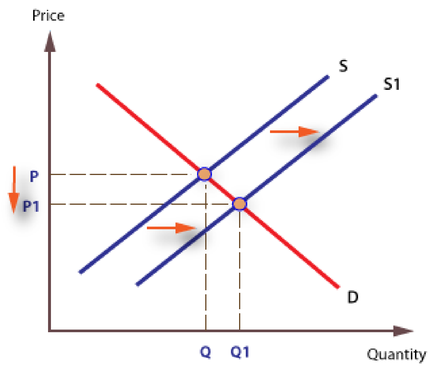
The estimated taxi fare for a ten mile fare in Menomonie, WI:

Menomonie, WI:

- 2010 population: 16,264 residents
- MW=1
- Uber= 0

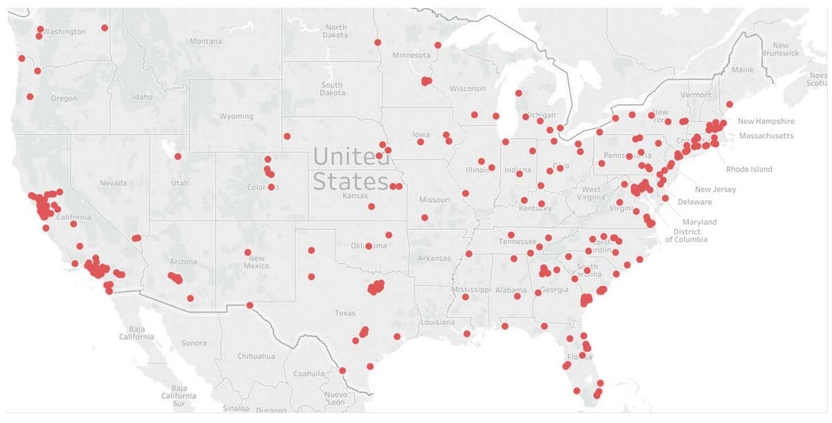
The net benefit of Uber entering Menomonie, WI is a $2.35 decrease in the average 10- mile taxi fare.

Economic Theory



According to economic theory, when additional supply enters a market place, the price of the good or service will decrease. In the case of Uber, the increase in supply should cause taxi fares to decrease.

Data Collection



The average taxi fare was collected for 265 cities across the United States. The taxi fare data collection included: the initial charge, per mile charge and the average fare for 1 mile, 5 mile and 10 mile rides.

Results

$$Yi = \beta o + \beta 1*(Uberi) + \beta 2*(2010\ Pop.i) + \beta 3*(NEi) + \beta 4*(Southi) + \beta 4*(MWi) + \mu$$

	Coefficients	*t-Stat*
Intercept	**38.54*** **	39.25
Uber	0.00001	0.97
2010 Population	**-2.35*** **	-3.09
NE	**-6.87*** **	-8.73
South	**-6.62*** **	-11.04
Midwest	**-6.91*** **	-8.19

* = 90% significance, ** = 95% significance, *** = 99% significance

The results of the multiple regression display the estimated impact of Uber's presence (1) is associated with a $2.35 decrease in the average fare for a 10-mile ride. This coefficient is significant at the 99% level.

As expected, the results also show that the region of country affects the average 10-mile fare. The coefficient for the West can be interpreted as, a 10-mile taxi ride in the West is associated with an estimate of a $6.91 increase in fare, compared to the Midwest fare.

Note: The Midwest variable was removed to avoid the dummy variable trap, which produces perfect multicollinearity in the regression equation, and thus, OLS estimates cannot be computed.

Regression Statistics	
Multiple R	0.6337
R Square	0.4016
Adjusted R Square	0.3900
Standard Error	3.9302
Observations	265

Should we allow Uber?

The results of this study demonstrate that there are financial benefits for consumers due to the growth of the presence of Uber. Examination of the consequences to government infrastructure should be considered, due to lost revenues by taxi companies.

The U.S. taxi medallion industry is facing increased volatility in long-term profitability as the ride-sharing model continues to expand. Government regulations pose high barriers to entry for the taxi industry. Several studies propose deregulation in order to level the playing field against Uber and other ride-sharing platforms (Gevero; Alves; Durante, 2016).

Future Research

The expansion of the "sharing economy" has been the main culprit of disrupting several industries and if a company does not respond to their presence, they will be wiped out entirely. (Edelman & Geradin, 2015).

The response of the taxi industry was delayed in several markets, which imposes a potential lag in the average taxi fare data that was collected. Traditionally Uber enters a marketplace with bare minimum fares in order to gain market share. A time series analysis could be performed on:

- If there is an immediate impact on fare when Uber enters
- Or if there is a distinct delay in the impact on fare after a long term presence of Uber

This would indicate whether the taxi industry is now following a more *proactive* or *reactive* approach as a response to the growing presence of ride-shares in the marketplace.