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Elasticity Memo

The Impact of New York City's (NYC) Ride-Hailing Cap on the Price of Uber

Introduction

On August 1, 2018, The New York City Council approved law number 2018/147, which will impose a cap on ride-hailing vehicles for a year (The New York City Council 2018). Ride-hailing companies include Uber, Lyft, Via and other companies that provide private ride services; this does not include yellow cabs or taxis (Schaller 2018). This cap will prevent ride-hailing companies from registering any new vehicles/employees in the already, estimated 100,000 vehicles currently in New York City (Wodinsky 2018). This bill seeks to reduced New York City's traffic congestion and is the first bill in American history to put a cap on ride-hailing vehicles (Noto 2018). The approved legislation will take effect in 2019, lasting one year. This will give New York City officials time to study, understand, and regulate the rapidly growing industry (The New York City Council 2018). This policy memo will analyze the effect that the cap will have on the price per mile for Uber, the largest ride-hailing company in New York City.

Policy Statement

Will New York City's cap on ride-hailing vehicles affect the price per mile of Uber rides?

Background

Uber is the largest ride-hailing company in New York City in terms of its growth, controlling most of the market, number of employees, and the most generated revenue thus far (Schaller 2018). Uber has grown exponentially over the years since its founding in 2009. The thriving business now faces a setback in one of its largest markets, New York City. New York City is the

first city in the U.S. to approve a law that places a cap on ride-hailing companies, preventing the companies from registering new vehicles into the network (Fitzsimmons 2018). This bill is one of five bills approved by the New York City Council whose goals are to cap the amount of ride-hailing vehicles for one year while New York Taxi and Limousine Commission conduct a study examining the impacts of ride-hailing vehicles on New York City, and establish a minimum wage for drivers (The New York City Council 2018). Proponents of the cap, such as Mayor Bill de Blasio, argue that New York City is dealing with a crisis where streets are too congested and "driving New Yorkers into poverty" (Siddiqui 2018). They anticipate that this cap will unclog the streets of New York City while the New York City Taxi and Limousine Commission assess the ride-hailing market. Ride-hailing companies like Uber disagree and argue that this cap will only limit job opportunities, burden consumers with higher ride prices and prevent trips in the outer boroughs, such as the Bronx or Queens, making it more challenging for consumers to access services (Goldman 2018). The following sections will examine, to what extent the cap on ride-hailing services would increase the price per mile for Uber and how the supply shift might affect New York City.

Methodology

To determine how the cap will affect the price of Uber rides, we need to calculate the following:

1. The price per mile for an Uber ride in NYC prior to the cap (P_{old})
2. The estimated average miles driven per week as a result of the cap (Q_{new})
3. The estimated average miles driven per week if there wasn't a cap (Q_{old})
4. The elasticity of demand for Uber rides

With these values we can calculate the new price per mile for an Uber ride in NYC based on the cap (P_{new})

Calculations

1. **The price per mile for an Uber ride in NYC prior to the cap (P_{old})**

The current price per mile for an Uber ride in New York City is $1.75 (Uber, 2018).

2. **The estimated average miles driven per week as a result of the cap (Q_{new})**

There are about 100,000 ride-hailing cars in NYC and about two-thirds of that number belong to Uber, totaling around 67,000 registered Uber vehicles (100,000*.67) (Marshall 2018). This is a significant increase from January 2015 where there were about 12,500 registered ride-hailing vehicles in NYC (Campbell 2018). Based on the assumption that Uber owns about two-thirds of the ride-hailing vehicles in NYC, there were 8,375 Uber associated vehicles in January 2015 (12,500*0.67). In the span of 44 months, Uber vehicles increased by 58,625 (67,00-8,375), averaging 1,332 registered vehicles a month (58,625/44). Ceteris paribus, for the year of 2018 Uber will have a total of 72,328 registered vehicles in NYC (average number of vehicles from August 2018 through December 2018 is 5,328 (1,332*4); then (5,328+67,000) to get the total number of registered Uber vehicles for the year of 2018 which is 72,328).

Uber drivers work about 17 hours per week, which is 1,020 minutes per week (LaMagna 2018). An expert in mobility services, Bruce Schaller, states that ride-hailing vehicles in urban areas, like New York, typically travel 4.9 miles per trip for 23 minutes (Schaller 2018). On average, Uber drivers make about 44 trips per week (1,020/23), driving about 215.6 miles per week (44*4.9). The total number of miles driven in NYC per week by registered Uber vehicles is 15,593,916.8 miles (215.6*72,328= 15,593,916.8).

$$\text{Miles} = \frac{\text{miles}}{\text{trips}} * \frac{\text{trips}}{\text{drivers}} * \text{drivers} = \frac{215.6}{44} * \frac{44}{72{,}328} * 72{,}328 = 215.6$$

The ride-hailing cap will halt the supply of Uber vehicles and ride-hailing companies alike in 2019. Uber will not be able to register any more vehicles, remaining at the same total amount of vehicles as 2018 and that is why 15,593,916.8 is designated as Q_{new}.

3. **The average miles driven per week if there wasn't a cap (Q_{old})**

All things being equal, if there wasn't a cap Uber would have registered about 88,312 vehicles in NYC by the end of 2019. This is 15,984 more vehicles than 2018 (average registered vehicles a month multiplied by 12 months in a year, 1,332*12=15,984; then add that total to the number of Uber vehicles in 2018, 15,984+72,328=88,312). Converting this into the total number of miles driven per week, its 19,040,067.2 miles (88,312*215.6). This is the estimated amount of miles per week that Uber vehicles would have driven if there was not a cap in place that ceased the registration of new vehicles, thus making 19,040,067.2 the Q_{old}.

4. **The elasticity of demand for Uber rides**

Demand for Uber is rather inelastic (Freakonomics 2016). According to Cohen, Hahn, Hall, Levitt, and Metcalfe, who produced an article entitled "Using Big Data to Estimate Consumer Surplus: The Case of Uber" the elasticity of demand for Uber is between -0.6 and -.04 (Cohen, Hahn, Hall, Levitt, Metcalfe 2016). This means that for a given 1 percent increase in price, the quantity of Uber rides demanded decreased by .60 percent or .40 percent. To calculate the effect that the imposed cap has on the price per mile for Uber rides, I used the two elasticities provided: 1. (-0.6) and 2. (-0.4). The following equation will be used to find the new price per mile for an Uber ride in NYC.

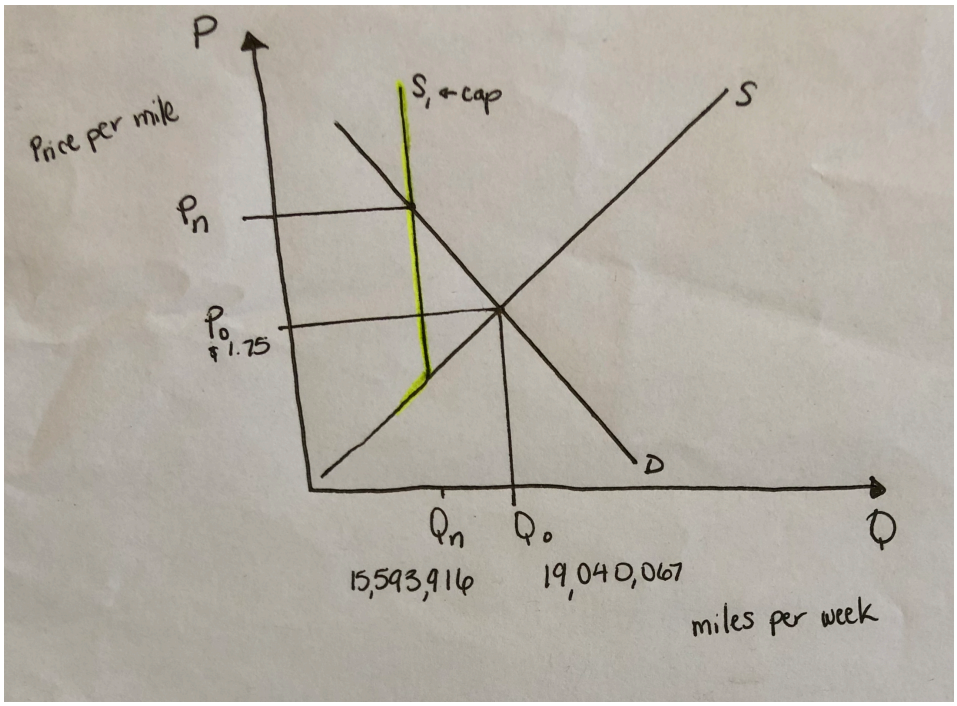
$$ED = \frac{\%\Delta Q}{\%\ \Delta P} = \frac{\frac{Q_{new}-Q_{old}}{Q_{old}}}{\frac{P_{new}-P_{old}}{P_{old}}} \qquad \%\Delta Q = \frac{15.6-19}{19} = -0.18 \qquad \%\Delta P = \frac{P_{new}-1.75}{1.75}$$

$$P_{new} = (\%\Delta Q)/ (ED_1) (P_{old}) + P_{old}$$

	Elasticity Estimate 1	Elasticity Estimate 2
Calculations	P_{new}= (%ΔQ)/ (ED_1) (P_{old}) + P_{old} = (-0.18/-0.6) (1.75) + (1.75) = (0.3) (1.75) + (1.75) = 2.28 P_{new} for Elasticity Estimate 1 is $2.28	P_{new}= (%ΔQ)/ (ED_1) (P_{old}) + P_{old} = (-0.18/-0.4) (1.75) + (1.75) = (.45) (1.75) + (1.75) = 2.54 P_{new} for Elasticity Estimate 2 is $2.54

Conclusion

Based on the elasticities used in the calculations above, we can see that the price per mile for Uber rides will increase due to the New York City Council's legislation that will impose a cap on ride-hailing companies. The decrease in supply of Uber will result in an increase in price between $2.28 per mile and $2.54 per mile. The New York City Council passed this bill with the intentions of ceasing the influx and reducing the number of vehicles that contribute to New York City's street congestion while analyzing the market. The demand for Uber and other ride-sharing companies are inelastic (Freakonomics 2016). Due to the inelasticity of demand for Uber, we can assume that people aren't so sensitive to price changes (Investopedia 2018). The demand for Uber would decrease between a mere .60 percent and .40 percent as a result of this policy. Despite the increase in prices, this cap will not deter consumers, however Uber will not be able to increase its supply in 2019. Nonetheless, this legislation will have the intended affect policymakers were hoping for. Therefore, New York City Council law number 2018/147 would accomplish its goal of reducing the congestion of New York City roads.


P
Price per mile
S_1 = cap
S
P_n
P_0
$1.75
D
Q_n
Q_0
Q
15,593,916
19,040,067
miles per week

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