Farronato & Fradkin (2022, AER)

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The Welfare Effects of Peer Entry: The Case of Airbnb and the Accommodation Industry†

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We study the welfare effects of enabling peer supply through Airbnb in the accommodation industry. We present a model of competition between flexible and dedicated sellers (peer hosts and hotels) who provide differentiated products. We estimate this model using data from major US cities and quantify the welfare effects of Airbnb on travelers, hosts, and hotels. The welfare gains are concentrated in specific locations (New York) and times (New Year's Eve) when hotel capacity is constrained. This occurs because peer hosts are responsive to market conditions, expand supply as hotels fill up, and keep hotel prices down as a result. (*JEL* L11, L83, L86, L88, Z31)

Brief Summary

- Welfare effects of peer production in the market for short-term accommodations
- Farronato & Fradkin (2022) find that in 2014, Airbnb generated
  - $305 million in consumer surplus, or about $70 per Airbnb room-night booked;[1] and
  - $112 million in peer host surplus, or about $26 per room-night,
  - at the expense of hotels, who experienced a 1.6 percent decrease in revenues and a decrease in variable profits of up to 2.8 percent.[2]

[1] The $70 in consumer surplus per Airbnb room-night is almost equally split between the benefits from increased consumer choice and those from lower prices paid by hotel guests.

[2] These effects were concentrated in particular locations (e.g., New York) and times (e.g., New Year's Eve) when hotel capacity was constrained.

Section 1 (Stylized Facts on Heterogeneity in Airbnb Supply)

- Geographic heterogeneity
  - Larger share in cities where hotel prices are higher
  - Larger share in cities where residents tend to be single and have no children
- Temporal heterogeneity
  - High and low demand due to seasonality, festivals, or sporting events
  - Larger share in cities with high demand volatility
  - Larger share, perhaps more intuitively, in cities where demand is trending upward
- Three times higher supply elasticity for peer hosts than for hotels
  - Peer suppliers: host travelers when prices are high and devote their accommodations to private use when prices are low
  - Hotels (a fixed number of dedicated rooms): choose to transact even when demand is relatively low and cannot expand capacity during demand peaks
- Reduced-form regressions of hotel performance on Airbnb supply
  - Active Airbnb listings: IV for available listings & Ctrl for aggregate demand shocks
  - Negative effect of Airbnb on hotel revenues in cities with constrained hotel capacity

Section 2 (Rationalization of the Stylized Facts)

- A model of short-run competition between hotels and peer hosts
  - Rooms can be provided by dedicated or flexible sellers.
  - Products are differentiated.
  - Define the short-run horizon as one day in one city.[3]
  - Travelers choose an option among differentiated hotel and Airbnb rooms.
  - Hotels choose quantities to maximize profits subject to their capacity constraints.
  - Peer hosts act as a competitive fringe taking prices as given.
- Data: between 2013 and 2015 from the ten largest cities, which have also experienced the largest entry of Airbnb

[3] During this short-run horizon, the capacity of flexible and dedicated sellers is fixed, and aggregate demand is realized.

- Estimation strategy (3 steps)
  1. Estimate a random coefficient multinomial logit demand model (BLP, 1995) $\longrightarrow$ Augment the estimation with survey data regarding the preferred second choices of Airbnb travelers $\longrightarrow$ Identify substitution between Airbnb and hotel options
  2. Estimate hotels' cost functions assuming Cournot competition between hotels of the same tier $\longrightarrow$ Following Ryan (2012), rationalize the fact that prices steeply increase when occupancy approaches 100 percent[4]
  3. Estimate the cost distribution of peer hosts assuming that they are price takers
- These estimates allow us to measure consumer and peer producer surplus, as well as to quantify how surplus would change in the absence of peer supply, or if peer supply were subject to regulations such as lodging taxes or quotas.

[4] These price changes with marginal costs begin to increase when hotels are close to their capacity constraint.

Section 3 (Estimation Results)

- Consumers' mean utility for Airbnb is lower than for hotels, but that preferences for Airbnb increase between 2013 and 2015.
  - By the end of the sample period, the mean utility from top-quality Airbnb listings is closer to the mean utility of economy and midscale hotels.
- Peer hosts often have higher marginal costs than hotels in the corresponding quality tier, and the distribution of peer costs makes peer supply highly elastic.
- Counterfactual (in the absense of Airbnb)
  - Hotels would benefit from less competition: reporting the effects for 2014, hotels in the top ten US cities would increase profits by $165 million.
  - Total welfare would be lower and peer producers and travelers would be worse off: peer host surplus would go from $112 million to zero, and consumer surplus would decrease by $305 million.

- Two ways to think about these magnitudes
  1. Peer production in the baseline scenario is responsible for just 3 percent of rooms sold in 2014. $\longrightarrow$ The consumer surplus loss is small relative to the revenues in the market.[5]
  2. The benefit to individual consumers and hosts is large. The consumer surplus benefit of Airbnb is \$70 per Airbnb room night and the peer surplus is \$26 per room night.
- Travelers' type and prices
  - Airbnb travelers (about one-half of the consumer) enjoy an additional \$34 per room-night in consumer surplus (about 16 percent of the average room price).
  - Hotel travelers (the other half) further benefit from lower prices because peer competition reduces the prices they pay by about \$1 per room-night.

[5] In particular, hotel and peer host revenues in 2014 were a combined \$27.32 billion, meaning that the lost consumer surplus amounts to around 1.1 percent of total revenues.

- Because of the elasticity of peer supply...
  - Actual Airbnb bookings (and thus surplus gains) disproportionately occur when hotel capacity constraints are more likely to be binding, either in busy cities or during major holidays.
  - Indeed, 40 percent of the consumer surplus loss is concentrated in 19.6 percent of nights with high demand for accommodations.
- In the absence of peer supply, travelers in those markets would be unable to easily find a substitute hotel room because hotels are frequently fully booked.
  - A large share of Airbnb bookings, especially during nights with high traveler demand, are market-expanding.
  - In particular, 62 percent of Airbnb guests would not have switched to a hotel if no Airbnb was available.
  - During periods of high traveler demand 87 percent of Airbnb customers would not have switched to hotels in the absence of Airbnb.

- Airbnb bookings are concentrated in cities and periods of peak demand. $\longrightarrow$ It is suggested that, in the absence of Airbnb,
  - Hotels were already operating at or close to full capacity.
  - Hotels would be limited in their ability to increase the number of booked rooms.
  - Hotels would instead be able to increase prices.
  - Indeed, without Airbnb, hotel revenues and profits increase by a higher percentage than hotel rooms sold.
  - In particular, during periods of high demand when hotels cannot increase their available rooms, hotels would be able to increase their revenues by 1.4 percent and profits by 2.4 percent.

- During the time period of the sample, cities typically did not collect lodging taxes on peer hosts.
- However, over time, Airbnb has negotiated agreements to collect lodging taxes on behalf of local jurisdictions.
- Two counterfactual policy proposals:

1. Peer hosts to be faced the same tax rate as hotels in each of our cities:
    - The taxes would reduce the consumer and peer surplus by $95 million (which is 23 percent of the loss that would have occurred if Airbnb had been completely banned)
    - The taxes would increase lodging tax revenues by $72 million, a 1.8 percent increase over the baseline scenario.
2. To cap the number of days for which peer hosts could accept bookings:
    - A quota limiting Airbnb sales to the 90 days with the largest number of travelers in a city would decrease consumer and peer surplus by $229 million (which is 55 percent of the loss that would have occurred if Airbnb had been banned).

- A counterfactual with twice as many Airbnb listings as in 2014:
  - Consumer surplus and peer surplus would increase by $168 million, which is 39 percent of the loss that would have occurred if Airbnb did not exist.
  - Hotel profits would decrease by $64 million, or by 1.1 percent compared to the baseline profit.

Literature

- Online peer-to-peer platforms
  - Einav, Farronato, and Levin (2016); Zervas, Proserpio, and Byers (2017); Kroft and Pope (2014); Seamans and Zhu (2014); Aguiar and Waldfogel (2018); Cohen et al. (2019); Castillo (2020); Lam and Liu (2019); Almagro and Dominguez-Iino (2021); Calder-Wang (2021)
- The role of peer- to-peer markets in enabling rental markets for durable goods
  - Filippas, Horton, and Zeckhauser (2020); Fraiberger and Sundararajan (2019)
- The market design aspects of reputation systems; search; pricing
  - Bolton, Greiner, and Ockenfels (2013); Fradkin, Grewal, and Holtz (2021); Nosko and Tadelis (2019); Horton (2014); Fradkin (2019); Einav et al. (2018); Hall, Kendrick, and Nosko (2019); Lewis and Zervas (2021)
- Analyses on suppliers, technology adoption and diffusion
  - Cullen and Farronato (2021); Chen (2016); Hall, Kendrick, and Nosko (2019); Griliches (1957); Bass (1969)