The Sharing Economy and Housing Affordability: Evidence from Airbnb

Davide Proserpio
University of Southern California

January 22, 2019
Brussels, Belgium

joint work with Kyle Barron (MIT & NBER), Edward Kung (UCLA)
What is the paper about?

Do home-sharing platforms such as Airbnb affect house prices and rental rates?
Important remarks

It is not a trivial question to answer
  • The housing market is affected by many factors
    • Local economy conditions
    • Gentrification
    • ...
  • Measuring Airbnb is not easy
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The answer is not obvious...it could be NO if:
  • The short-term rental market is very small compared to the long-term market
  • The market for short-term rentals is dominated by housing units that would have remained vacant in the absence of home-sharing
Roadmap of the paper

1. We develop a model of rental rates and house prices where landlords can substitute between long-term and short-term rental markets.

2. We test the predictions of the model using a comprehensive dataset of Airbnb listings in the US over a six years period (2011-2016).
Roadmap of the paper

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Model predictions

A home-sharing platform reduces the cost for landlords to participate in the short-term market.
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Model predictions

A home-sharing platform reduces the cost for landlords to participate in the short-term market

1. Home-sharing increases the rental rate in the long-term market
2. Home-sharing increases house prices, but by a greater proportion than rental rates
3. The effect of home-sharing is larger when the share of owner-occupiers is lower
Roadmap of the paper

1. We develop a model of rental rates and house prices where landlords can substitute between long-term and short-term rental markets.

2. We test the predictions of the model using a comprehensive dataset of Airbnb listings, housing prices and rental rates (Zillow) in the US over a six years period (2011-2016).
Data: Airbnb

Snapshot of all Airbnb listings in the US (2011-2016)

• >1 million properties from 700,000 hosts
  • Including consumer-facing information such as location and creation date
• 18 million reviews
Data: Zillow

ZIP code – month house prices
  • Zillow Home Value Index (ZHVI): median transaction price for homes

ZIP code – month rental rates
  • Zillow Rent Index (ZRI): median monthly rental rate for homes
Data: Auxiliary data sources

- **Google trends** for the term “Airbnb”

- **Touristiness**
  - # of establishments in the food services and accommodation industry (NAICS code 72) at the ZIP code level

- **Local economy controls**
  - Median household income, population, share of 25-60 year olds with bachelors’ degrees or higher, employment rate, and owner-occupancy rate

- **Housing vacancy rates** at the Core Based Statistical Area (CBSA) level
Empirical strategy

We would like to estimate the following regression:

\[ Y_{zct} = \beta \log \text{Airbnb}_{zct} + \gamma \log \text{Airbnb}_{zct} \times oorate_{zc} + \text{Controls} \]
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- **Airbnb supply**
- Interaction Airbnb supply & owner-occupancy rate
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where:
- \( Y_{zct} \) represents the dependent variable.
- \( \beta \) and \( \gamma \) are coefficients to be estimated.
- \( \log \text{Airbnb}_{zct} \) represents the logarithm of Airbnb supply in location \( zct \).
- \( \log \text{Airbnb}_{zct} \times \text{oorate}_{zc} \) represents the interaction term between Airbnb supply and owner-occupancy rate.
- Controls include log House prices, rental rates, or ratio price/rent.
“Randomizing” Airbnb entry

We use a technique known as instrumental variables to isolate the part of housing costs that is driven only by Airbnb.

In simple terms, we argue that:

• If a ZIP code is “touristy” (a lot of restaurants and bars) and if awareness for Airbnb increases...

• Then any change in Airbnb supply in that ZIP code is likely driven by an increase in demand for short-term rentals through Airbnb, rather than local economic conditions.
Results and economic significance

We find that Airbnb increases both rental rates and house prices.
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Magnitude of the effect (TOP-100 CBSAs)

• 0.59% annual increase in US rental rates
• 0.82% annual increase in US house prices

Not trivial when compared with average housing market growth:

• 3.18% annual US rent growth
• 5.70% annual US house price growth
Mechanism: Reallocation of the housing stock

We show that the effect is partially driven by landlords switching from the long- to short-term market.

Airbnb supply is

- **Positively** correlated with “seasonal homes” (short-term market housing units are generally classified in this way)
- **Negatively** correlated with “vacant homes” (long-term market housing units are generally classified in this way)
Discussion & conclusions

Airbnb is affecting the housing market by increasing

• Rental rates by reducing long-term supply

• House prices by increasing the value of owning through two channels:
  1. Higher rental rates
  2. Extra income from the short-term rental market

Part of this effect can be explained by landlords switching from the long- to the short-term rental market
Discussion & conclusions

Cities
• Policy to limit the reallocation from long- to short-term market
• Occupancy tax on home sharers who rent the entire home for an extended period of time

Renters and home owners
• Not everyone is happy

Platforms
• More collaboration with cities
Thank you
Overview of the model

Housing market segmented into long-term market (which serves local residents) and short-term market (which serves visitors)

Landlords are either absentee landlords or owner-occupiers

- Absentee landlords choose to allocate housing to short-term or long-term rental market
- Owner-occupiers can still benefit from short-term market by renting unused capacity (i.e., extra rooms, while away on vacation, etc.)
Overview of the model

Rental rate in the **short-term** market determined by exogenous hotel sector

Rental rate in the **long-term** market determined by inverse demand curve of local residents

**House price** is the net present value of owning
Modeling Airbnb supply

Difficult to measure active supply because of stale vacancies (Fradkin et al. 2017)

- Main measure: Listing enters when it is created and never exit – cumulative supply (Zervas et al. 2017)
- Robustness check using alternative measures
  - Exploit reviews and create a Time To Live (TTL) for every listing
Modeling Airbnb supply

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- Main measure: Listing enters when it is created and never exit – cumulative supply (Zervas et al. 2017)
- Robustness check using “active listings”

Note: This figure plots the number of Airbnb listings over time, using each of the 3 methods described in Table 1.
### Results: The effect of Airbnb on rental rates and house prices

<table>
<thead>
<tr>
<th></th>
<th>Rental rates</th>
<th>House Prices</th>
<th>Price/Rent</th>
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<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
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<td>ln Airbnb Listings</td>
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**Significance levels:** * p<0.1, ** p<0.05, *** p<0.01
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