Digital Discrimination: The Case of Airbnb

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Online Marketplaces

• Transactions increasingly moving online

• Require:
  – Price mechanisms
  – Reputation mechanisms: facilitate trust
Online Marketplaces

• In many markets, transactions shifting from a small number of large producers to a large number of smaller producers
  – Airbnb
  – Relay Rides
  – CustomMade
Booking at the Marriott Courtyard

At Yale University in historic York Square, the Courtyard by Marriott at Yale is located at 30 Whalley Avenue, in the heart of downtown New Haven, Connecticut. Close to the Yale Bookstore, Payne Whitney Gym, Yale Bowl, Toad’s Place, and Chapel Street.

View Hotel Website

Key Amenities
- High-speed Internet
- Free high-speed Internet
- Fitness center
- Business center
- Restaurant on-site
- New Lobby
- Parking
- Meeting/event space

About Courtyard Hotels
Courtyard provides all of the essential services and amenities you need to be successful on your trip. And we are evolving our product every day to meet the changing needs of today’s travelers. From new lobby spaces, to enhanced food and beverage options, Courtyard wants you to make the most of your stay. (Amenities may vary by location.)

30 Whalley Ave
New Haven, CT 06511, USA
1 203-777-6221
Booking at Airbnb

$145

Check in: mm/dd/yyyy
Check out: mm/dd/yyyy
Guests: 1

CONTACT ME

SAVE TO WISH LIST

Saved 24 times

Living 1

Description

Located between downtown and the charming East Rock

Amenities

Matthew

More about the host
• Online marketplace for short-term rentals
• Started in 2008; currently valued at $2.5B
• 300,000 listings
  – Contrast: Marriott has 535,000 rooms
• 4 million guests to date (3 m in 2012 alone)
• Part of the “sharing” economy
• Hosts
  – Posts a room or apartment
  – Can rent out entire apartment or a room
  – Sets a price
  – Can accept or reject guests

• Guests
  – Search for room or apartment

• Airbnb
  – Allows hosts and guests to find each other
  – Allows hosts and guests to build reputation
  – Facilitates payment
Searching on Airbnb
3 Bedroom Apartment!!!
OVERALL GUEST SATISFACTION

<table>
<thead>
<tr>
<th>Category</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>★★★★☆☆</td>
</tr>
<tr>
<td>Cleanliness</td>
<td>★★★★☆☆</td>
</tr>
<tr>
<td>Check In</td>
<td>★★★★☆☆</td>
</tr>
<tr>
<td>Communication</td>
<td>★★★★★☆</td>
</tr>
<tr>
<td>Location</td>
<td>★★★★★☆</td>
</tr>
<tr>
<td>Value</td>
<td>★★★★★☆</td>
</tr>
</tbody>
</table>

- **Aaliyyah**
  Very close to the train and lots of room if you have more than two people!
  April 2013

- **Thomas**
  Spacious flat, but in a dilapidated state. However, the location is great (subway station nearby, no neighbors), and the price is right! Ideal for tight budgets.

- **Tomi**
  We were so thrilled to go to New York and this place was so good, close to the subway (3 blocks away). The owner was so kindly, The area was really great, the next time we are going to New York we will definitely book from Kwesi. Just perfect :)

- **Angela**
  Kwesi, thank you so much for your help.  
  I got the confirmation the same night I moved in. My reservation was cancelled by previous host because of Sand’s damage. I was really at a loss where to stay for the night when I heard the cancellation. And AT LAST I got help from Kwesi. It would be a very long story if I wrote all that happened the morning I got to NY city knowing nowhere to stay for the night.
Why does Airbnb work?

• To facilitate transactions, Airbnb must build *trust*.
  – Verify information.
  – Allow reviews.
  – Hosts (and guests) build profiles.

• Yet these same mechanisms have unintended consequences.
This paper

- Airbnb reputation system is a double-edged sword:
  - Reputation system works!
    - Prices influenced by characteristics of property, characteristics of host (ratings, certifications), etc
  - BUT: Price gap between black and white hosts
    - Not fully explained by characteristics of listings
    - Not fully explained by information about hosts
What determines prices on Airbnb?

• To answer this question:
  • Collected data on all listings in Manhattan
    – Price
    – Listing characteristics (number of bedrooms, bathrooms, location, reviews, etc)
    – Host characteristics (host reviews, pictures)
  • For a randomly selected half of pictures: coded picture for race and gender
  • Final sample of roughly 3500 listings
Prices on Airbnb

Average Price = $140
### Determinants of Prices

<table>
<thead>
<tr>
<th></th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td># BR</td>
<td>-3.08 **</td>
</tr>
<tr>
<td># BR X Whole Apartment</td>
<td>45.88 ***</td>
</tr>
<tr>
<td>Accommodates</td>
<td>2.99 ***</td>
</tr>
<tr>
<td>Accommodates X Whole Apartment</td>
<td>8.73 ***</td>
</tr>
<tr>
<td>Whole Apartment</td>
<td>-5.60</td>
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</tbody>
</table>
## Determinants of Prices

<table>
<thead>
<tr>
<th>Apartment Characteristics</th>
<th># BR</th>
<th># BR X Whole Apartment</th>
<th>Whole Apartment</th>
<th>Accomodates</th>
<th>Accomodates X Whole</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-5.72***</td>
<td>49.69 ***</td>
<td>-19.76 **</td>
<td>5.38 ***</td>
<td>7.75***</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Reviews</th>
<th>Location</th>
<th>Check In</th>
<th>Communication</th>
<th>Cleanliness</th>
<th>Accuracy</th>
<th>Satisfaction</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>27.70 ***</td>
<td>0.43</td>
<td>0.88</td>
<td>5.16 ***</td>
<td>4.72 **</td>
<td>-3.00</td>
<td>-14.75 ***</td>
</tr>
</tbody>
</table>
Recap

• Size matters: Prices (sensibly) respond to listing characteristics
• Location, location, location: Reviews are important – especially location ratings.
• Certifications ineffective
A thought exercise:
Which host would you stay with?
How many adults are clearly visible in the picture?
- No Adults
- Single Male
- Single Female
- 1 Male & 1 Female
- Multiple Males
- Multiple Females
- Mixed Gender Group
- Unclear/Uncertain

Are there any children (<18 yrs old) clearly visible in the picture?
- Yes
- No
- Unclear/Uncertain
Picture Coding

What do you perceive to be the race of the person/people in the picture? *Note: include both adults and children.*

- White
- Black
- Hispanic
- Asian
- Unclear but Non-white
- Multiple Races
- Not Applicable (no people in picture)
- Unclear/Uncertain
Who hosts on Airbnb?

- Male: 32%
- Female: 40%
- One Male, One Female: 10%
- Two Females: 2%
- Two Males: 1%
- Other: 15%
Race and Prices

White Hosts

Black Hosts

mean of Price

Graphs by isblack
Distribution of Prices

White Hosts

Black Hosts
What explains this gap?

• Black hosts receive lower location ratings...

<table>
<thead>
<tr>
<th></th>
<th>favorable</th>
<th>location</th>
<th>accuracy</th>
<th>cleanliness</th>
<th>value</th>
<th>communication</th>
<th>check in</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>1.00</td>
<td>9.32</td>
<td>9.39</td>
<td>9.08</td>
<td>9.29</td>
<td>9.70</td>
<td>9.62</td>
</tr>
<tr>
<td>Black</td>
<td>1.00</td>
<td>8.47</td>
<td>9.19</td>
<td>9.03</td>
<td>8.99</td>
<td>9.57</td>
<td>9.57</td>
</tr>
<tr>
<td>Overall</td>
<td>1.00</td>
<td>9.26</td>
<td>9.38</td>
<td>9.08</td>
<td>9.27</td>
<td>9.69</td>
<td>9.62</td>
</tr>
</tbody>
</table>

• ... but this does not fully explain the gap
Recap

• Airbnb’s reputation system facilitates trust, but also facilitates discrimination.
• White hosts receive significantly more for a similar listing relative to black hosts.
  – Not fully explained by location, listing characteristics, information about hosts, etc.
• Controlling for all characteristics, black hosts receive roughly 15% less for comparable listings.
On the Internet, nobody knows you're a dog.
The internet in 2013

“On Facebook, 273 people know I’m a dog. The rest can only see my limited profile.”
Conclusion & Next Steps

• Online marketplaces are changing the world...
• ... but *market design* challenges abound.
• Seemingly innocuous design choices may have unintended consequences.
• Policy: Behind the technology.
• Goal: Maximize value of reputation system while minimizing unintended consequences.
• What if orchestras could be blinded?
Thank you!