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Digital Discrimination: The Case of Airbnb

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joint with Benjamin Edelman (HBS)



Online Marketplaces

- Transactions increasingly moving online



- Require:
 - Price mechanisms
 - Reputation mechanisms: facilitate trust

The internet in 1993

(New Yorker)



"On the Internet, nobody knows you're a dog."

The internet in 2013

(Cunningham)

**"On Facebook, 273 people know I'm a dog.
The rest can only see my limited profile."**



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
- Much of this pertains to the *sharing economy*.

Booking at the Marriott Courtyard

Marriott

Use this?

Spec

Advanc

Find

Narro

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Am

High

Free (44

Free

Fitn

Bus

Res

Poo

Kitc

Plug

Pet

Ro

New

Hot

Tra

Eve

Act

Hot

Courtyard New Haven at Yale

Like 0 Share 0 Tweet 0

COURTYARD Marriott

OVERVIEW PHOTOS AMENITIES ROOM TYPES

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.)

From **139** (USD) per night

[View Rates](#)

[Return to search results](#)

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

1

2

3

4

5

Booking at Airbnb



Airbnb.com

\$145

Check in Check out Guests

CONTACT ME

 **SAVE TO WISH LIST**

Saved 24 times



Matthew

[More about the host](#)

Description Amenities

Located between downtown and the charming East Rock



- Online marketplace for short-term rentals
- Started in 2008; currently valued at \$10B
- 600,000+ listings
 - Contrast: Marriott has 535,000 rooms
- 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

airbnb New York, NY

SIGN UP LOG IN HELP LIST YOUR SPACE

12/18/2013 → 12/19/2013 1 Guest

Entire Place Private Room Shared Room

Min Price: \$10 Max Price: \$1000

More Filters 1000+ Rentals · New York

Listing Title	Price	Location
Loft 1 Bedroom / Sleep 4 / Chelsea	\$245	Flatiron District, New York
Instant Book Apple TV/iPad Apt E. Village	\$185	East Village, New York
AWESOME 2BR UPPER WEST SIDE HOME!!!	\$280	Upper West Side, New York
MY HOME 3 & TIME'S SQUARE	\$219	Hell's Kitchen, New York

Language and Currency


Entire Place


Private Room


Shared Room



Min Price: **\$10** Max Price: **\$1000**

Bedrooms ▾

Bathrooms ▾

Beds ▾

Manhattan

Brooklyn

Midtown



Wireless Internet

TV

Kitchen



Apartment

House

Bed & Breakfast



English

Español

Français



ocean side, transit, relaxing...

[Tweet](#) [Pin it](#) [+1](#)

Loft 1 Bedroom/ Sleep 4 / Chelsea

Apartment - Entire home/apt · Avenue of the Americas, New York, NY 10010, United States

[Photos](#) [Maps](#) [Calendar](#)

[Description](#) [Amenities](#) [House Rules](#)

Located in the Center of the city, West 24th Street and SIXTH AVE, 1 minutes walking distance from the Subway (A, C, E, 6, F, M, R, N, W, 4, 5) Train, and 5 minutes away from Central Park, Guggenheim Museum. In the neighborhood you can find designers stores, cinemas, Great restaurants and coffee shops. The apartment is a Loft one Bedroom Apt it has, two rooms, Bedroom and Living room ,Full bathroom with a and full kitchen equipped with: dining area, table, chairs, cabinets and more (microwave & oven, fridge / freezer and gas burners). Bathroom includes a sink,Bathtub and restroom.

You will get clean and Fresh linens and towels !!!

The bedroom is furnished with Queen Size Bed

In the living room there is a sofa that can be converted into a queen size bed, Dinning Area with four Chairs, flat LCD TV 42"and 3 closets

There is a FREE high speed internet and complimentary unlimited local phone calls.

You may feel free to contact me with any questions 24/7 before, during and after the stay.

★Amenities★

- High-speed Internet
- Towels
- FRESH Bedsheets, bed linens are provided.
- Cooking ware, plates, cups
- Kitchen table
- Queen size bed
- Sofa Bed (Queen size sleeper)
- Hair dryer
- Iron & Ironing Board
- maps
- Air Conditioning
- Stove
- Refrigerator

Fees: ONLY!!! \$70 cleaning fee.

Room type:	Entire home/apt
Bed type:	Real Bed
Accommodates:	4
Bedrooms:	1
Bathrooms:	1
Extra people:	No Charge
Monthly Price:	\$6500 /month
Cleaning Fee:	\$70
Country:	United States
City:	New York
Neighborhood:	Flatiron District
Size:	800 ft² (74 m²)
Cancellation:	Strict

53

Reviews

From **\$220** Per Night

Check in Check out Guests

Subtotal **\$220**

[Book It](#)

Includes \$70 cleaning fee
Excludes Airbnb service fee (\$26)

[Save to Wish List](#)

Saved 986 times



Inga

[More about the host](#)

Response Rate **100%**
Response Time **within a few hours**
Calendar Updated **today**

[Contact Me](#)

How does Airbnb promote safety?

- Educate yourself about safety
- Protected by the Airbnb Host Guarantee
- 24/7 phone support
- Rich user profiles and reviews

Are you or your friends connected with this host?

Over 600 million social connections have been

availability, so it is not necessary to send an inquiry about availability. Simply click "book it" if you are ready to book!

We look forward to hosting you!

Reviews (53) Other Property Reviews (475) Friends (9)

Overall Guest Satisfaction ★★★★★
Accuracy ★★★★★
Cleanliness ★★★★★
Check In ★★★★★
Communication ★★★★★
Location ★★★★★
Value ★★★★★



Vladimir

The apartment was very spacious, and comfortable, but a bit hot - we had to open the windows to let some cold air in. Everything else was perfect: well organized and well-thought out. There was tea and coffee and everything else one needs land in NYC and get going. We were met by Inga's friend who was very friendly and accommodating.

December 2013



Matthias

Thank you very much for the nice stay! And thanks to Nancy. She had a really warm welcome for us. The apartment was very comfy and it really makes you feel like a New Yorker :)

November 2013

Similar Listings

0.6mi away
\$184 per night

1.0mi away
\$375 per night

1.1mi away
\$270 per night

1.3mi away
\$219 per night

2.3mi away

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 Project

- The share economy makes personal information about buyers and sellers more salient.
- Lack of regulation/enforcement.
- Goal: test for discrimination both against hosts and guests.

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
- The project, more generally:
 - What drives the sharing economy?
 - What are the implications of this?

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



	(1)	(2)	(3)	(4)	(5)	(6)
Number	9.605***	11.492***	11.647***	10.903***	10.824***	10.808***
Accommodated	(1.30)	(1.32)	(1.32)	(1.31)	(1.30)	(1.30)
Whole Apartment	64.025***	52.292***	51.651***	50.222***	50.788***	50.945***
	(1.97)	(2.10)	(2.12)	(2.15)	(2.13)	(2.13)
2 Bedrooms	2.314	-5.657*	-5.272	-5.915*	-5.106	-4.671
	(3.30)	(3.27)	(3.27)	(3.38)	(3.35)	(3.33)
3 Bedrooms	-18.315***	-22.424***	-22.053***	-15.038***	-15.258***	-14.507***
	(6.83)	(6.99)	(7.06)	(5.13)	(5.04)	(5.19)
4+ Bedrooms	-22.865***	-28.349***	-28.332***	-28.941***	-27.796***	-27.050***
	(5.21)	(4.63)	(4.58)	(4.69)	(4.61)	(4.60)
Location Rating		22.497***	-63.213***	-74.325***	-72.798***	-71.155***
		(1.31)	(16.21)	(16.16)	(16.28)	(16.30)
Location Rating ^2			4.904***	5.475***	5.397***	5.303***
			(0.94)	(0.93)	(0.94)	(0.94)
Check-In Rating		-1.866	-1.239	-0.140	-0.211	-0.292
		(2.43)	(2.34)	(2.42)	(2.41)	(2.39)
Communication Rating		-2.199	-2.100	-1.531	-1.606	-1.537
		(2.52)	(2.51)	(2.54)	(2.53)	(2.53)
Cleanliness Rating		1.141	1.114	-0.737	-0.542	-0.559
		(1.40)	(1.40)	(1.42)	(1.42)	(1.42)
Accuracy Rating		2.118	2.544	1.440	1.341	1.166
		(1.76)	(1.75)	(1.75)	(1.73)	(1.72)
Has LinkedIn		10.193***	8.929***	8.664***	8.455***	8.404***
		(3.28)	(3.29)	(3.26)	(3.25)	(3.24)
Has Facebook		0.006**	0.006**	0.006**	0.005*	0.006**
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Has Phone Number		12.282***	12.990***	13.583***	12.543***	12.338***
		(4.52)	(4.48)	(4.64)	(4.61)	(4.64)
Has Twitter		0.001	0.001	0.001	0.001	0.002
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Picture Quality				11.909***	-8.066	
				(1.04)	(4.98)	
Picture Quality ^2					2.415***	
					(0.65)	
Picture Rating Indicators						Yes
Apartment Size - Whole Apartment Interactions	Yes	Yes	Yes	Yes	Yes	Yes

Recap

- Size matters: Prices (sensibly) respond to listing characteristics
- Location, location, location: Reviews are important – especially location ratings.

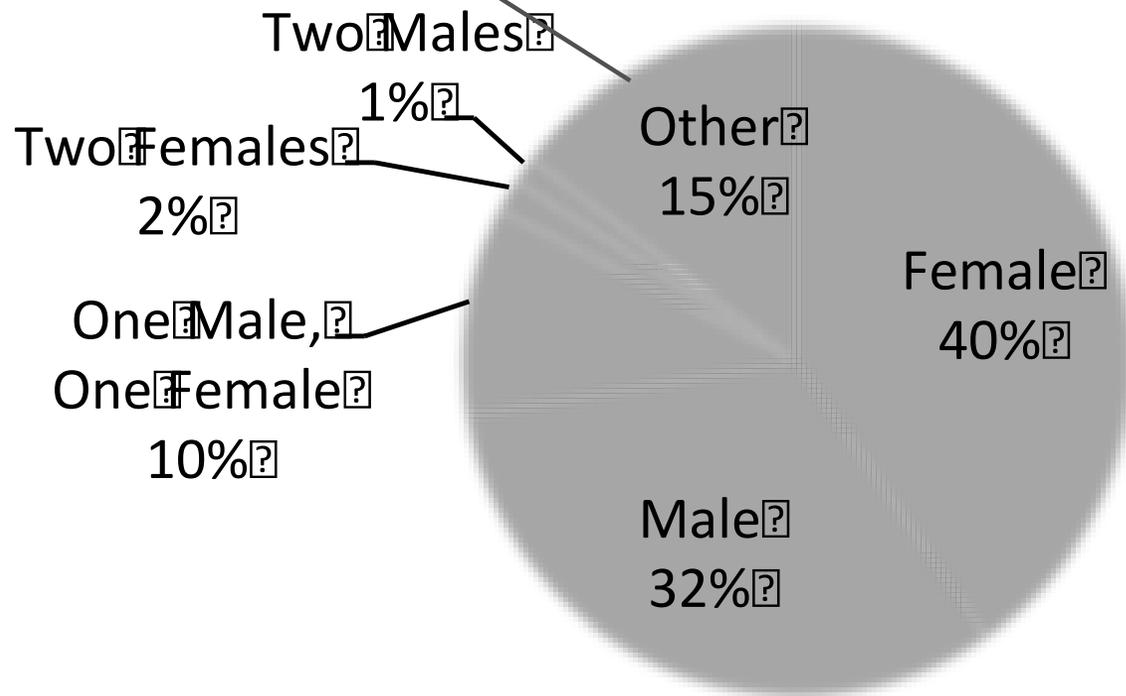
A thought exercise:
Which host would you stay with?



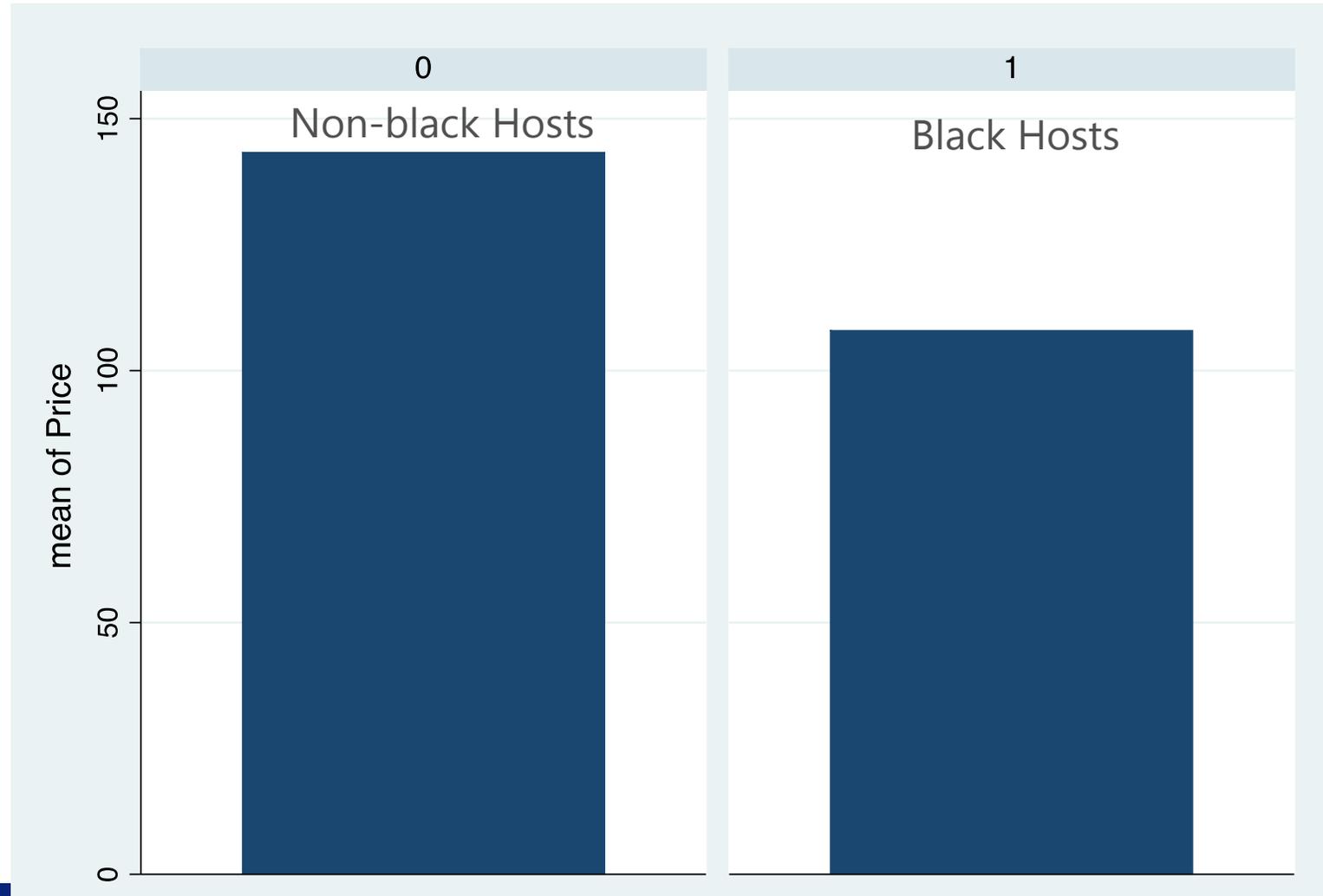
Picture Coding



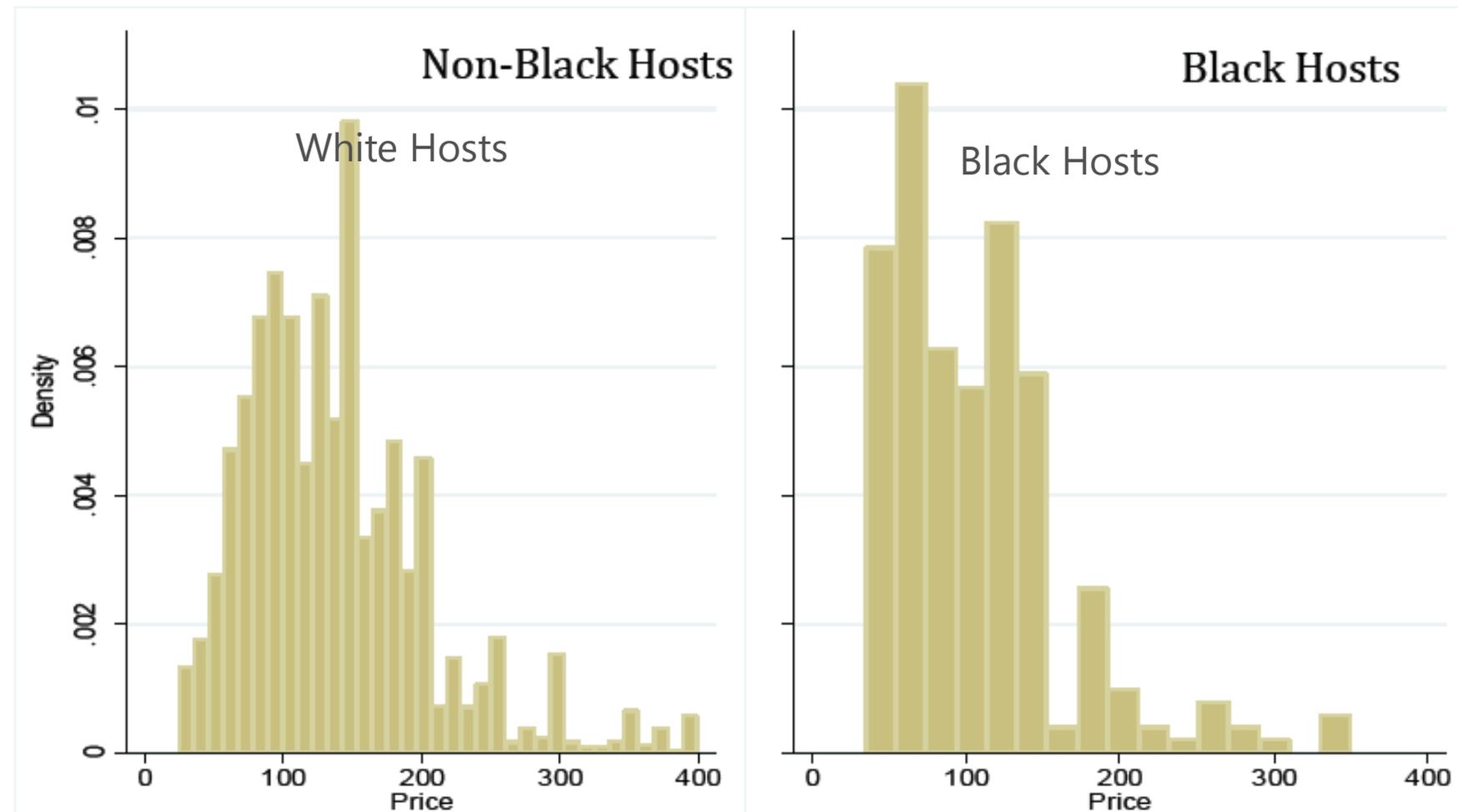
Who hosts on Airbnb?



Race and Prices



Distribution of Prices



What explains this gap?

	Dependent Variable: Price					
	(1)	(2)	(3)	(4)	(5)	(6)
Black Host	-36.611*** (3.88)	-30.521*** (3.72)	-16.108*** (3.46)	-16.578*** (3.47)	-16.291*** (3.48)	-16.532*** (3.48)
Number Accommodated		9.656*** (1.28)	11.439*** (1.31)	10.691*** (1.30)	10.615*** (1.29)	10.608*** (1.29)
Whole Apartment		61.726*** (2.01)	51.631*** (2.11)	50.274*** (2.14)	50.844*** (2.12)	50.991*** (2.12)
2 Bedrooms		-0.289 (3.33)	-6.749** (3.27)	-7.576** (3.38)	-6.735** (3.34)	-6.320* (3.32)
3 Bedrooms		-18.398*** (7.02)	-22.043*** (7.10)	-14.175*** (5.16)	-14.411*** (5.06)	-13.381** (5.22)
4+ Bedrooms		-25.743*** (5.20)	-29.711*** (4.63)	-30.664*** (4.75)	-29.483*** (4.66)	-28.802*** (4.64)
Location Rating			21.448*** (1.33)	20.246*** (1.34)	20.425*** (1.35)	20.429*** (1.34)
Check-In Rating			-1.584 (2.42)	-0.656 (2.52)	-0.720 (2.51)	-0.780 (2.49)
Communication Rating			-2.384 (2.51)	-1.751 (2.55)	-1.823 (2.54)	-1.766 (2.54)
Cleanliness Rating			1.352 (1.40)	-0.426 (1.43)	-0.234 (1.42)	-0.254 (1.43)
Accuracy Rating			1.902 (1.76)	0.688 (1.75)	0.601 (1.73)	0.420 (1.72)
Has LinkedIn			11.022*** (3.30)	11.029*** (3.27)	10.781*** (3.25)	10.706*** (3.25)
Has Facebook			0.006** (0.00)	0.006** (0.00)	0.005** (0.00)	0.006** (0.00)
Has Phone Number			12.662*** (4.49)	12.956*** (4.66)	11.918** (4.64)	11.687** (4.67)
Has Twitter			0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)
Picture Quality				11.685*** (1.03)	-8.389* (4.93)	
Picture Quality ^2					2.428*** (0.65)	
Picture Rating Indicators Constant	143.878*** (1.468)	66.388*** (2.89)	68.600*** (3.99)	27.489*** (5.26)	65.631*** (9.35)	Yes 50.083*** (6.90)
Apartment Size - Whole Apartment Interactions		Yes	Yes	Yes	Yes	Yes
Observations	3752	3746	3746	3565	3565	3565

Note: P-values are reported in parentheses. *** P<0.01, ** P<0.05, * P<0.10.

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 12% less for comparable listings.
- Next steps...

Conclusion

- 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.
- Orchestras have put up screens; should the sharing economy?

Thank you!



Save the planet and return
your name badge before you
leave (on Tuesday)

