

# ETHNIC DISCRIMINATION ON AN ONLINE MARKETPLACE OF VACATION RENTALS

While ethnic discrimination is a pervasive phenomenon in most markets and most countries, understanding which mechanisms are at work is necessary to design efficient policies. In their recent reviews, Charles and Guryan (2011) and Lang and Lehmann (2012) stress that uncovering discrimination mechanisms is crucial and that empirical attempts are rare and not conclusive. This project takes advantage of the features of a major online marketplace for short-term rentals to measure the share of statistical discrimination in the ethnic price gap which prevails on that market. The data used for this project is taken from an online marketplace of vacation rentals collected in 19 major cities in North America and Europe to measure discrimination against ethnic minority hosts.

## Discrimination and Social Inequalities Research group

Co-directors of the research group:

- Morgane LAOUENAN
- Anne REVILLARD
- Mirna SAFI

## Members of the project:

### Morgane LAOUÉNAN



Morgane Laouénan is a CNRS researcher at the Centre d'Economie de la Sorbonne. She is specialized in Labor Economics and Applied Microeconomics.

She was a junior researcher at LIEPP between December 2014 and December 2015 to manage a Research Group on Discriminations. Her research focuses on discrimination against African immigrants in France and against African-Americans in the US. In particular, she uses both individual-level data from surveys and from the Internet to study the impact of racial prejudice on labor market and housing outcomes of minorities. She has published in various articles such as *Journal of Labor Economics*, *Economie et Statistique*, *Revue Française d'Economie* and *ICFAI Journal of Applied Economics*.

### Roland RATHELOT



Roland Rathelot is an Assistant Professor at the University of Warwick since September 2014. He obtained his Phd in economics at Paris School of Economics in 2010.

His research interests focus on the Evaluation of Labor Market Policies, Unemployment Insurance, Ethnic Discrimination on the Labor Market and Residential Segregation. He is also an Affiliated Professor at the Centre for Research and Analysis of Migration (CReAM), and Research Affiliate at Centre for Economic Policy Research (CEPR). He has published in various journals such as *Quarterly Journal of Economics*, *Annals of Economics and Statistics* et *Regional Science and Urban Economics*.

## Two Sources of Discrimination

Some underlying theoretical backgrounds are crucial to understand the practice of discriminatory behaviors towards certain demographic groups. In one side, it is a taste-based discrimination which stems from the existence of racial preferences or an aversion towards cross-racial interaction (Becker, 1957). While in the other side, statistical discrimination is the result of imperfect information and ethnic differences in the mean or the variance of unobservable characteristics (Phelps, 1972; Arrow, 1973; Aigner and Cain, 1977). The most direct approach to distinguish statistical discrimination from other mechanisms is to measure how the ethnic gaps vary with the amount of information on the market (Farber and Gibbons, 1996; Altonji and Pierret, 2001).

## Identification Strategy

- Departing from Farber and Gibbon's (1996) learning model and Altonji and Pierret (2001), this studies try to distinguish the two sources of discrimination: (1). taste based and (2). statistical discrimination.
- This study relies on a simple conceptual framework where properties' quality is partly unobservable. When a property has no review, potential guests can only infer unobservable quality using hosts' ethnicity. When a property has reviews, potential guests aggregate the content of reviews and ethnicity to form the best possible guess about the property's observable quality.
- In case of statistical discrimination, the price gap should decrease with the number of reviews and tend to zero, conditional on observables and on the measure of quality provided by reviews. If the price gap is due to taste-based discrimination or to ethnic differentials in variables that are not observable to the econometrician but observable to potential guests, the price gap should remain stable with the number of reviews.

## Data

- It includes daily prices, hosts' and apartments' characteristics, as well as associated reviews.
- It contains 400,000 properties, corresponding to apartments to rent in 19 cities in North America and Europe.
- Two ethnic groups: African-Americans (in US/Canada) & Arabic/Sub-Saharan Africans
- 20 waves of data collected between June 2014 and July 2015 form an unbalanced panel of 3,500,000 observations.

## Scientific Contributions

- Identifying the underlying mechanisms of ethnic price discrimination on a short term online vacation rentals.
- Provide an empirical test of Altonji and Pierret (2001) through the exploitation of price and reviews variations.
- Measure the precise source of ethnic discrimination on this specific market.

## Conceptual Framework

- The best possible prediction of the log-price based on what is observed by the econometrician is:

$$P = p_0 + \lambda\beta x + \lambda\beta \frac{K\bar{r}}{K+\rho} - \lambda\beta \frac{\rho\delta_v m}{K+\rho} - \lambda(\gamma + \beta\delta_\zeta + \beta\delta_u + \alpha\delta_w)m$$

Variables such as price  $p$ , number of reviews  $K$ , ethnic group  $m$ , characteristics  $x$  and a proxy for  $\bar{r}$  are available.

- The comparison within-listing will help identify the parameter related to statistical discrimination  $\delta_v$  but the parameters related to taste-based discrimination  $\gamma$  to the difference in  $\zeta\delta_\zeta$  and to difference in outside options  $\delta_w$  cannot be distinguished from each other.

## Primary Results:

- Hosts belonging to an ethnic minority charge 15.5% less than majority.
- Controlling for a rich set of characteristics reduces the ethnic price gap to 3.3%.
- The set of observable characteristics about the property (including its precise location) is rich and explains more than 67% of the variance of the prices.

## Ethnic price gap for Several Segments of the Number of Reviews

	Log daily rate				
	(1)	(2)	(3)	(4)	(5)
Minority	-0.038*** (0.007)	-0.031*** (0.006)	0.020*** (0.007)	-0.015 (0.010)	-0.004 (0.016)
Nb reviews	0	1-4	5-19	20-49	50+
Minority share	5.7%	5.7%	5.8%	5.8%	5.7%
Adj R <sup>2</sup>	0.635	0.708	0.749	0.761	0.759
N obs.	1,031,664	956,442	829,131	352,678	154,226

Notes: OLS regressions of the daily log-price on the minority dummy, controlling for neighborhood FE, property characteristics and ratings (for properties with at least one review). See the list of all property and host characteristics in Table 13. Robust standard errors clustered at the property level. \*\*\*  $p < 0.01$ .

## Fixed Effects Estimation

	log-price				
	(1)	(2)	(3)	(4)	(5)
3.5 stars $\times K/100$	0.034 (0.066)	-0.050 (0.069)	-0.109* (0.058)	-0.120** (0.054)	-0.184** (0.074)
4 stars $\times K/100$	0.082*** (0.030)	0.028 (0.029)	-0.033 (0.024)	-0.055*** (0.020)	-0.021 (0.027)
4.5 stars $\times K/100$	0.276*** (0.014)	0.188*** (0.013)	0.091*** (0.010)	0.032*** (0.007)	0.094*** (0.011)
5 stars $\times K/100$	0.383*** (0.014)	0.299*** (0.013)	0.202*** (0.009)	0.117*** (0.007)	0.206*** (0.014)
Minority $\times K/100$	0.147*** (0.043)	0.089** (0.037)	0.059 (0.036)	0.025 (0.025)	0.086** (0.036)
3.5 stars $\times K/100^2$					0.180 (0.116)
4 stars $\times K/100^2$					-0.034 (0.022)
4.5 stars $\times K/100^2$					-0.053*** (0.008)
5 stars $\times K/100^2$					-0.075*** (0.011)
Minority $\times (K/100)^2$					-0.059** (0.023)
Samples	Min(K)<5 Min Max	Min(K)<5 Full	Min(K)<21 Full	- Full	- Full
N obs.	597,061	2,507,078	3,033,699	3,324,141	3,324,141

Notes: OLS regressions with host fixed effects. Aside from those mentioned in the Table, controls include city\*wave FE, neighborhood FE and property characteristics (see Table 13). Robust standard errors clustered at the property level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .

- The table above shows that interaction term between the number of reviews and the minority dummy is positive : it means that more information on the listing (through reviews) decreases the ethnic price gap. These results show evidence of statistical discrimination against minority hosts.