Does (lack of) reputation hinder entry? Study of statistical discrimination on a platform

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Carpooling: A very, very big mischief

Basic danger rule for kids:

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Never accept a lift in a car from a stranger!

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$\Rightarrow$ in other words carpooling leaves **a lot** of space for moral hazard.

- Alleviating moral hazard is key to success for many matching platforms (Blablacar, Airbnb, Uber, Couchsurfing, eBay...).
- A solution : reputation systems

Reputation systems mitigate MH issues

Blablacar/Arun Sundararajan: Digital trust is "a historical breakthrough"

- ▶ "Trust built in on-line communities is unlocking the world's sharing potential"
- ▶ "When provided with the right set of digital trust tools, users of on-line platforms are able to recreate a sense of trust almost comparable to the level of trust in friends"

BUT! Scientific evidence of persistence of discrimination

Discrimination:

- ▶ Edelman & Luca (2014) on AirBnB: non-black hosts are able to charge approximately 12% more compared to black hosts; black hosts receive a larger price penalty for having a poor location
- ▶ Laouénan and Rathelot (2017) on Airbnb: minority groups charge 3.2% less for comparable listings
- ▶ Farajallah et al (2017) on Blablacar: drivers with an Arabic name set prices €0.29 lower. €8.6 shortfall in revenue.

Entry to the market:

- ▶ Spagnolo (2012), Butler et al (2017) badly designed reputation systems hinder entry
- ▶ Kovbasyuk & Spagnolo (2017) repeated game with limited records maximizes amount of trade

Objectives of this study

Positive:

- ▶ Provide a model of dynamic moral hazard with a reputation system, that allows for studying entry decision and selection under statistical discrimination
- ▶ Validate theoretical findings using data from Blablacar

Normative:

- ▶ Optimal reputation design (platform vs. social planner)
- ▶ Simulate market outcome with an optimal reputation system

Literature

- **Moral Hazard**
  - Static : Baron and Myerson (1982), Laffont and Tirole (1986)
  - Dynamic : Garrett and Pavan (2012)
- **Reputation systems**
  - Roger and Vasconcelos (2014), Nosko and Tadelis (2015), Bar-Isaac and Tadelis (2008), li et al. (2016), Liu and Skrzypacz (2013), Livingston (2015),Jolivet et al (2016),Zervas et al (2015),Mayzlin et al (2014), Jullien and Park (2014)
- **Discrimination in collaborative economy**
  - Farajallah et al (2016), Edelman and Luca (2014), Edelman et al. (2016), Goddard et al. (2015), Ge et al. (2016),Laouénan and Rathelot (2017)
- **Entry with reputation system**
  - Spagnolo (2012), Butler et al. (2017), Kovbasyuk and Spagnolo (2017)
- Two-sided markets:
  - Rochet and Tirole (2003), Caillaud and Jullien (2003), Armstrong (2006), Hagiu (2006)

Matching on Blablacar.com

1.5 million travelers with Blablacar each month, annual growth rate of 200% since 2013.

1. drivers post rides at given time/date. They choose price (Blablacar makes suggestion)
2. riders see listings corresponding to their needs, send request to rider
3. driver accepts/rejects request
4. payment is made through Blablacar online system. Fee is ≈ 20% of price asked by driver.

Reputation system

A reputation system helps decision making. After each ride both drivers and riders are asked to send feedback:

1. Grade is 1 ("à éviter"),2,3,4,5 ("parfait")
2. Written comment
3. User is notified that grade was posted, but not the actual grade until she posts hers or time for feedback has elapsed

Empirics

note: preliminary!

Data collection (1)

A web crawler collected 100000+ observations. 1 observation is :

- **a ride**
  - Origin/Destination, price, date, # seats available, baggage/pet/smoking policy, +written description
  - rides selected randomly over 400 major French cities
- **a driver**
  - **Reputation:** average grade received, individual grades (with comment and identity of rider), # of published rides, seniority
  - **Characteristics:** name, age, gender, picture, car brand/type
  - **Checks:** ID, phone verified
- We also collect :
  - **origin of names**: French, Arabic, Spanish...(French gov., lefigaro, www.signification-prenom.net)
  - **city variables** crime in departure/arrival cities (French gov.), poverty rates, median revenue, population
  - **value of cars** (eBay, Germany)
  - **fuel consumption** (Ademe)
  - **duration of trip** by car / public transport (google.maps)

Data collection (2)
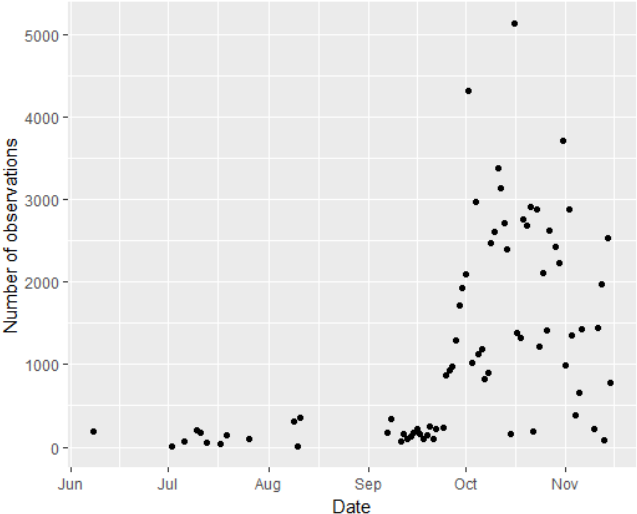
Descriptive statistics (1)

Statistic	N	Mean	St. Dev.	Min	Max
price	103,910	27.99	15.10	2	77
price delta	101,817	3.29	3.56	−7.52	17.38
minority	83,137	0.092	0.290	0	1
male	83,137	0.695	0.460	0	1
bio (# words)	103,927	15.5	18.2	0	199
facebook	26,124	396	527	2	5,000
driver's age	103,913	37.4	13.1	18	101
experience	87,578	3.15	1.06	1	4
reputation	90,425	4.58	0.27	3.70	5.00
last grade	91,077	4.62	0.60	2	5
listings made	100,394	66.9	130.1	2	2,773
response rate	55,141	86.0	21.9	0	100
driver's skill	65,526	2.97	0.07	2.00	3.00

Descriptive statistics (2)

Statistic	N	Mean	St. Dev.	Min	Max
available seats	103,927	2.37	0.88	0	4
sold seats	103,927	0.32	0.63	0	4
n. views	103,927	22.5	34.1	0	993
crime	77,847	5.7	1.8	1.8	31.2
competition	99,232	30.5	28.7	2	143
public transport	74,830	3.58	2.04	1.30	15.23
minutes	103,927	3.71	1.69	0.0	8.68
km	103,927	378.5	197.2	0.0	944.6
car price	82,449	6.231	5.018	2.178	24.403
fuel efficiency	91,001	4.98	0.73	3.65	7.48

Driver price delta

Blablacar gives a recommended and max price:

- ▶ recommended:
  distance in km *0.065eur

- ▶ maximal:
  distance in km *0.082eur
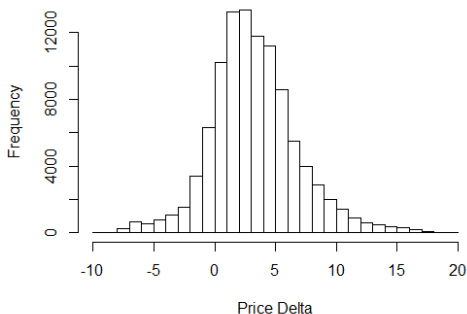
We focus on devations from recommended price

Figure: Deviations from recommended price

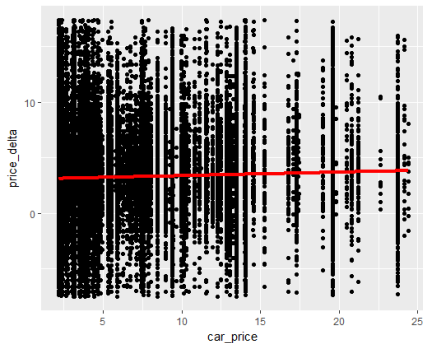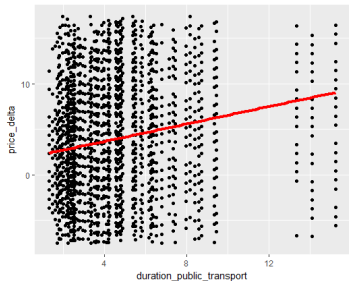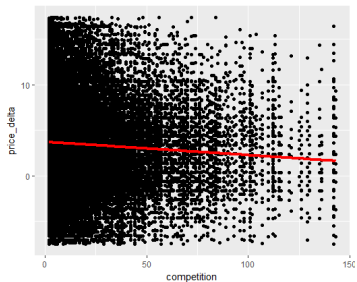# What explains price delta: costs and competition

Figure: Price delta and price of car, competition, public transport

Minorities: who are them?
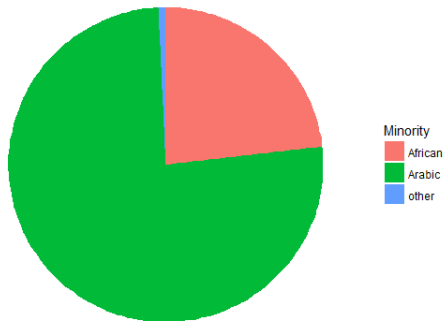
Figure: Shares of different minorities, total number 7681

▶ Mean price delta is 3.296, while minority drivers set 3,215

Minorities: is there a selection?
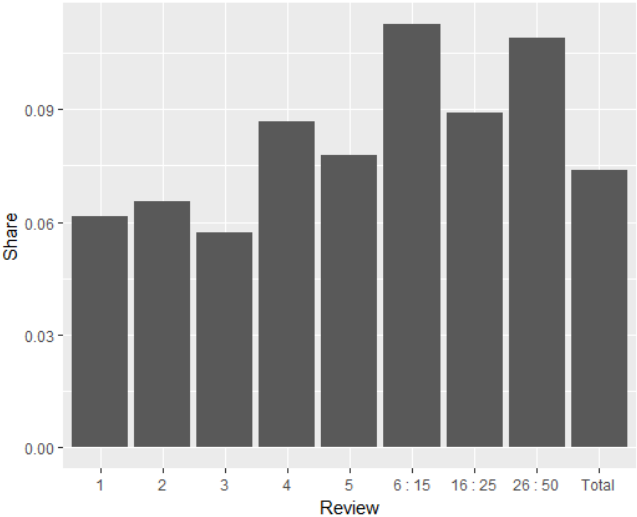
Figure: Shares of minority drivers as a function of time

Results overview – cross-section

We verify that users with minority names face discrimination (see Farajallah et al (2016), Edelman and Luca (2014), Ge et al. (2016), Laouénan and Rathelot (2017)...).

Cross-section analysis:

- ▶ Minority drivers post lower price than non-minority counterparts at the beginning of their career
- ▶ This difference vanishes when drivers have built reputation
- ⇒ there is discrimination (= previous literature)
- ⇒ however, not taste-based: statistical discrimination ($\neq$ previous literature)

Minority gap as experience increases

Table: Incremental price regressed over driver and ride characteristics

	Dependent variable:
	price_delta
	full sample
male	−0.131*** (0.050)
minority	0.296*** (0.079)
seniority (months)	−0.005*** (0.001)
picture	−0.005 (0.069)
# listings	0.0001 (0.0002)
driver age	0.009*** (0.002)
response rate	0.001 (0.001)
car price	0.017*** (0.003)
consumption	0.074*** (0.027)
total seats	−0.122*** (0.031)
luggage	−0.148*** (0.053)
detour	−0.067 (0.048)
pets allowed	−0.157** (0.069)
smoking allowed	−0.056 (0.050)
ride (#words)	−0.003*** (0.0004)
public transport	0.001 (0.001)
competition	0.0004 (0.001)
crime	−0.004 (0.017)
automatic acceptance	−0.605*** (0.045)
population 2014	−0.00000*** (0.00000)
median income	−0.0001 (0.00004)
Observations	21,375
R^2	0.218
Adjusted R^2	0.217
Residual Std. Error	3.164 (df = 21345)
F Statistic	204.782*** (df = 29; 21345)
Note:	$^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Minority gap as experience increases

Table: Incremental price regressed over driver and ride characteristics

	Dependent variable:	
	price_delta	
	1-5 reviews	50+reviews
male	−0.151 (0.212)	−0.313*** (0.077)
minority	−0.908** (0.396)	0.523*** (0.104)
seniority (months)	0.004 (0.004)	−0.005*** (0.001)
picture	−0.036 (0.291)	−0.100 (0.099)
# listings	−0.005 (0.005)	0.0005** (0.0002)
driver age	−0.005 (0.008)	0.016*** (0.003)
response rate	0.008** (0.004)	0.001 (0.002)
car price	0.024* (0.014)	0.018*** (0.004)
consumption	0.002 (0.117)	0.078** (0.037)
total seats	−0.224* (0.127)	0.002 (0.046)
luggage	0.289 (0.256)	−0.222*** (0.072)
detour	0.018 (0.226)	−0.018 (0.066)
pets allowed	0.160 (0.299)	−0.122 (0.102)
smoking allowed	−0.491** (0.208)	0.016 (0.074)
ride(# words)	−0.013*** (0.003)	−0.002*** (0.001)
public transport	0.003 (0.004)	0.003** (0.001)
competition	−0.003 (0.005)	−0.0003 (0.001)
crime	−0.100 (0.079)	−0.071*** (0.024)
automatic acceptance	−0.749*** (0.202)	−0.629*** (0.068)
population 2014	0.00000 (0.00000)	−0.00000*** (0.00000)
median income	−0.0003* (0.0002)	−0.0001** (0.0001)
Observations	1,348	9,211
R^2	0.278	0.184
Adjusted R^2	0.262	0.182
Residual Std. Error	3.513 (df = 1318)	2.930 (df = 9181)
F Statistic	17.504*** (df = 29; 1318)	71.567*** (df = 29; 9181)

Note: $^*p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Minority gap as experience increases

Table: Incremental price regressed over driver and ride characteristics

|	Dependent variable:	
	Number of views	
	1-5 reviews	50+reviews
male	−0.907 (0.915)	−0.949 (0.619)
minority	−5.011*** (1.694)	−0.466 (0.832)
seniority (months)	0.051*** (0.016)	0.002 (0.010)
picture	3.362*** (1.251)	2.102*** (0.791)
# listings	0.032 (0.023)	−0.013*** (0.002)
driver age	−0.080** (0.035)	0.038* (0.021)
responce rate	0.097*** (0.018)	0.105*** (0.014)
car price	−0.005 (0.060)	0.023 (0.035)
consumption	0.071 (0.503)	0.016 (0.299)
total seats	2.016*** (0.572)	2.829*** (0.370)
luggage	−1.470 (1.089)	0.166 (0.572)
detour	4.232*** (0.987)	0.595 (0.530)
pets allowed	1.899 (1.302)	1.819** (0.816)
smoking allowed	−1.223 (0.902)	−1.119* (0.594)
ride (# words)	0.057*** (0.011)	0.036*** (0.004)
public transport	−0.036** (0.017)	0.008 (0.009)
competition	−0.040* (0.021)	0.072*** (0.011)
crime	0.037 (0.342)	−0.127 (0.189)
automatic acceptance	−1.724** (0.868)	−5.205*** (0.540)
population 2014	0.00000 (0.00001)	−0.00000 (0.00000)
median income	0.002** (0.001)	0.0003 (0.0004)
Observations	3,297	9,448
R^2	0.073	0.095
Adjusted R^2	0.065	0.092
Residual Std. Error	23.498 (df = 3268)	23.203 (df = 9419)
F Statistic	9.192*** (df = 28; 3268)	35.378*** (df = 28; 9419)
Note:		*p<0.1; **p<0.05; ***p<0.01

Minority gap as experience increases
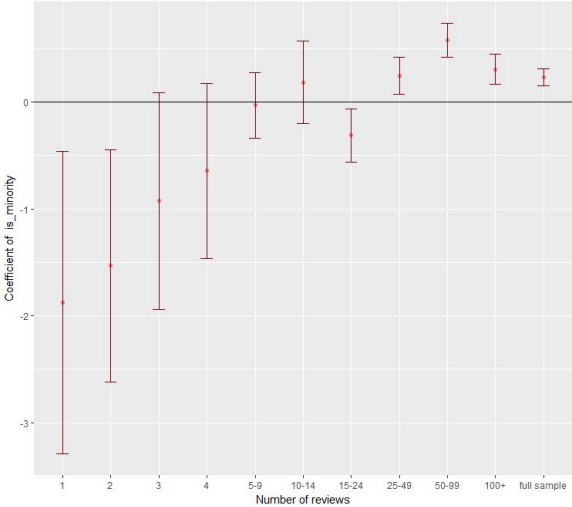
Figure: Impact of minority status on price delta, subset by number of reviews

Drivers are strategic players
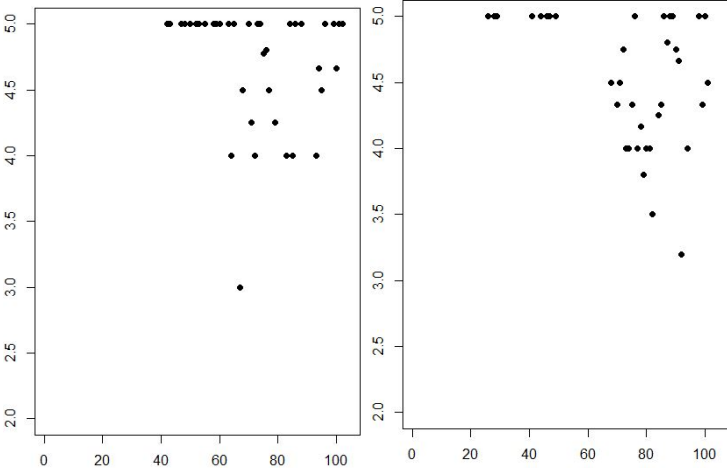
Figure: Two rating records over time

Ratings change in time

	Rating
(Intercept)	4.63^{***}
	(0.00)
number_avis	0.00
	(0.00)
number_avis2	-0.00^{*}
	(0.00)
R^2	0.00
Adj. R^2	0.00
Num. obs.	91077
RMSE	0.60

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$
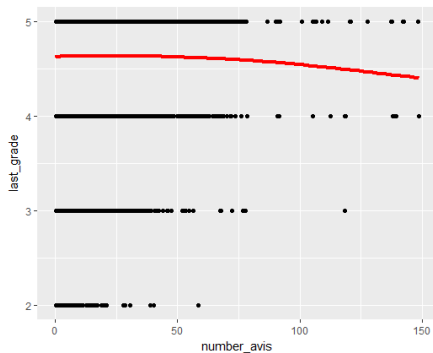

Figure: Last rating and number of avis; red line all drivers

Intuition: Drivers need to exert high efforts initially, esp. if from a low-perception population.

1st step : for each driver, regress grades received over time. Collect trend.
2nd step: Use trend as dependent variables

We observe that minorities have a more declining trend in grades received
  $\Rightarrow$ high efforts at early stages to build reputation?

trend in grades received

Table: Regression Results – trend in grades received

	Dependent variable:			
	`grade_trend *100`			
	(1)	(2)	(3)	(4)
male	−0.158***	−0.160***	−0.116**	−0.119**
	(0.045)	(0.044)	(0.048)	(0.047)
minority	−0.075	−0.073	−0.163**	−0.144*
	(0.071)	(0.070)	(0.077)	(0.076)
driver age	0.0003	0.001	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)
picture	0.201***	0.215***	0.268***	0.277***
	(0.067)	(0.067)	(0.071)	(0.070)
car price	−0.0002	−0.0001	0.0002	0.0002
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
bio (# words)	−0.003***	−0.002***	−0.002***	−0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
response rate			0.004***	0.004***
			(0.001)	(0.001)
Constant	−0.218	0.191**	−0.498	−0.308***
	(0.451)	(0.089)	(0.439)	(0.097)
Trip FE	yes	no	yes	no
Observations	23,203	23,203	17,526	17,526
R^2	0.014	0.002	0.021	0.004
Adjusted R^2	0.001	0.001	0.005	0.004
Note:				*p<0.1; **p<0.05; ***p<0.01

Some theory

Theory

Repeated **moral hazard model**

- ▶ Laffont and Tirole (1986), Garret and Pavan (2012)
- ▶ Repeated interaction between principal and agent in an environment with moral hazard

Model set-up

Players:

- Principal enjoys per period benefit: $\pi = \beta_i + e_i - s_i$, where β_i is type of agent, e_i effort, only π is observed
- Two agents: incumbent and entrant, if trades with principal get $u_i = s_i - \psi(e_i)$, 0 otherwise; private type β_i, public type ϵ_i –drawn from distribution of populations

Principal has an imperfect recall of previous disclosures, she believes agent to be of type:

$$\tilde{\beta}_{i,n+1} = (1 - \alpha^n)\beta_i + \alpha^n \nu_{\epsilon_i}$$

ν_{ϵ_i} randomly drawn from the distribution of types in population ϵ_i; $\alpha \in [0, 1]$ quality of reputation system, 0 perfect system

Timing:

- Step 1: Platform sets α
- Step 2: Principal, having established her prior on current driver is matched with a new driver randomly and she chooses whether to retain her agent, or take the new one
- Step 3: Agent accepts/rejects to participate and reports her type $\hat{\beta}$
- Step 4: Pricing mechanism prescribes a menu of payments. Agent exerts effort e accordingly
- Step 5: Agent/Principal agree on bad outcome if observed benefits do not equal $\pi(\hat{\beta})$

Trade-off in setting α

Firm needs to trade-off between:

- α **small:** good screening of participants with same level of experience. i.e. no discrimination.
  - driver of experience n replaced iff

  $$\beta_1 > \beta_2 + \frac{\alpha^n}{1-\alpha^n}(\epsilon_2 - \epsilon_1) = \beta^{opt} + bias(\alpha, n)$$

  - $sign(bias(\alpha, n)) = sign(\epsilon_1 - \epsilon_2)$. Magnitude $\nearrow$ in α
- α **large :** market expansion
  - new driver is hired iff

  $$\epsilon_{new} > \beta_{old} - \frac{1}{6} - \alpha^n(\beta_{old} - \epsilon_{old}) + \frac{\alpha^{2n}}{6} = \epsilon^{opt} + IR(\alpha, n)$$

  - $\mathbb{E}\left[IR(\alpha, n)\right] > 0$, $\searrow$ in α
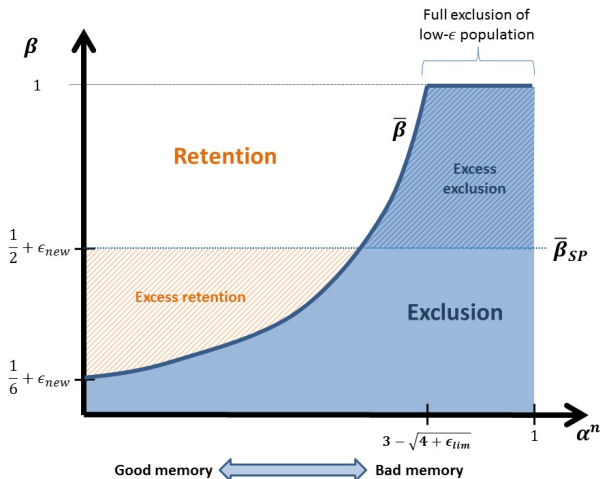
Retention policy

Figure: Retention policy per type β , as a function of reputation system memory α^n. $\psi(e) = \frac{e^2}{2}$, $F_\epsilon(.) = \text{unif}[\epsilon, 1 + \epsilon]$

A relationship between price and statistical bias (prelim.)

The expected surplus of a rider, interacting with a driver of type β_i, from population ϵ_{pop} :

$$\mathbb{E}_{pop}(\Pi) = (1 - \alpha^n)\beta_i + \alpha^n \epsilon_{pop} + \frac{1}{2} + \frac{\alpha^{2n}}{6}$$

For two drivers of same type/experience but different population to have the same probability to be retained we need that low population offers a discount:

$$\mathbb{E}_l(\Pi) + price_l = \mathbb{E}_h(\Pi) + price_h$$
$$\Leftrightarrow price_l - price_h = \alpha^n(\epsilon_h - \epsilon_l)$$

Hence we estimate the non-linear relation:

$$price_i = bias * \alpha^{\#reviews_i} minority_i + \gamma X_i + \xi_i$$

Non-linear least square yields $bias = -2€$, $\alpha = 0.65$. *(for now, illustrative!)*

Next steps:

Empirics:
- collect more data
- analysis of time series

Theory:
- make the model dynamic (strategic drivers)
- platform effects

Preliminary conclusions

- Much of the observed statistical bias against minorities is related to statistical discrimination, rather than taste-based.
- Reputation system is instrumental in counteracting this bias, esp. at early stages.
- Should reviews be deepened at first interactions, relaxed afterwards?

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Thank you!
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Appendix

Trip

Départ   ○ Saint-Rémy-lès-Chevreuse, France
Arrivée   ○ St - Agne, 31400 Toulouse, France
Date de départ   Aujourd'hui à 14:00
Options   2 max. à l'arrière

Yann S
Le conducteur n'a pas donné plus de détails sur son trajet.

Contactez le conducteur

Itinéraire et remplissage du véhicule

Saint-Rémy-lès-Chevreuse				
14:00	Yann S 25 ans	Christian.. 36 ans		
Toulouse				
~ 20:50 (Horaires d'arrivée estimé)				

Prix par place   **47,50 €**

Passagers sur ce trajet

2 places restantes

Votre réservation sera automatiquement confirmée

1 place

J'accepte les Conditions Générales et la Politique de Confidentialité.

Réserver

Arrivée à destination garantie

Conducteur

Yann S
25 ans

★ 4,6/5 - 23 avis
Conduite : bonne — 3 / 3

⊘ Téléphone vérifié
⊘ E-mail vérifié

Véhicule
Citroen C3

Listings

Driver profiles

Service fees of Blablacar
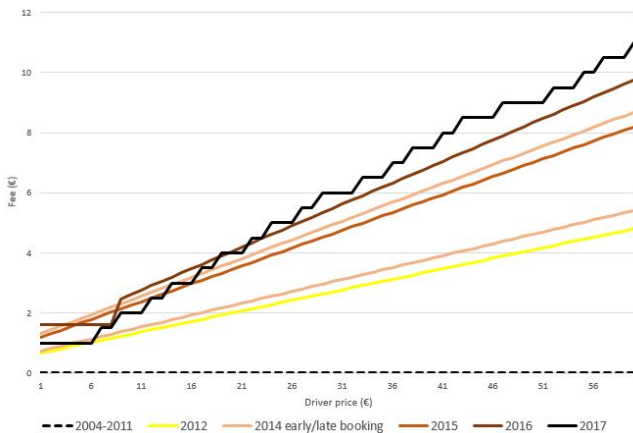
Observed ratings skewed to the right

Figure: Reputation of drivers

As experience grows, rating dispersion decreases

Minority gap as experience increases

Table: Incremental price, price, log(price) regressed over driver and ride characteristics

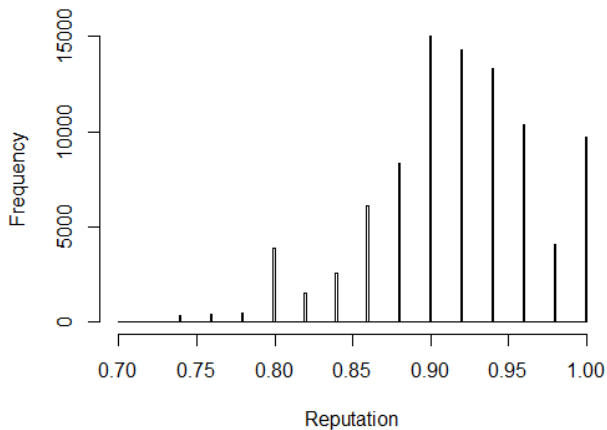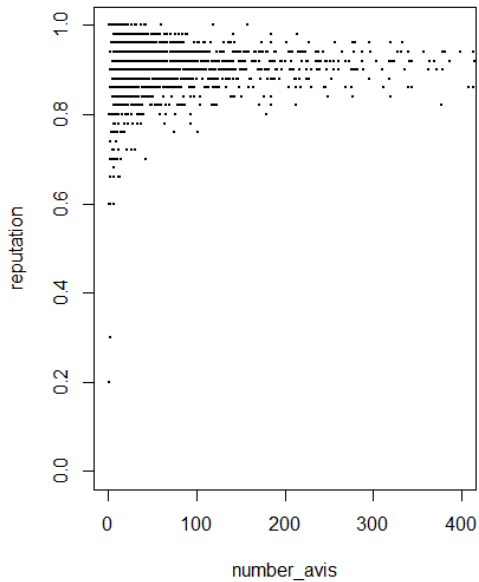|	Dependent variable:					
	price_delta		price		logprice	
	(1)	(2)	(3)	(4)	(5)	(6)
male	−0.195 (0.183)	−0.211*** (0.044)	−0.168 (0.191)	−0.186*** (0.046)	0.013 (0.012)	0.001 (0.003)
is_minority	−0.772** (0.343)	0.107 (0.070)	−0.810** (0.359)	−0.035 (0.073)	−0.067*** (0.023)	−0.013** (0.005)
reputation	−0.275 (1.191)	−1.050** (0.443)	0.130 (1.246)	−1.841** (0.461)	0.039 (0.081)	−0.227*** (0.031)
seniority_months	0.001 (0.003)	−0.0004*** (0.001)	0.0002 (0.003)	0.0004*** (0.001)	0.0004* (0.0002)	0.0001*** (0.0001)
picture	−0.070 (0.252)	0.052 (0.061)	0.030 (0.263)	0.145** (0.064)	−0.022 (0.017)	−0.002 (0.004)
last_over_average	0.298 (0.192)	−0.018 (0.034)	0.252 (0.201)	−0.034 (0.035)	0.026** (0.013)	0.0003 (0.002)
driver_cluster_agree	−0.046 (0.184)	−0.057 (0.041)	0.039 (0.193)	−0.042 (0.043)	0.019 (0.013)	−0.001 (0.003)
announces_problem	0.0002 (0.003)	−0.0001 (0.0002)	0.0003 (0.003)	−0.0005** (0.0002)	−0.003*** (0.0002)	−0.0004*** (0.0001)
driver_age	−0.004 (0.007)	0.011*** (0.002)	−0.003 (0.007)	0.011*** (0.002)	0.0003*** (0.0005)	0.0002* (0.0001)
taxi_response	0.004 (0.004)	0.001 (0.001)	0.003 (0.004)	0.001 (0.001)	0.0004 (0.0002)	0.0002*** (0.0001)
car_price	0.065*** (0.023)	0.034*** (0.005)	0.064*** (0.024)	0.037*** (0.006)	0.003** (0.002)	0.001** (0.0004)
consumption	0.069 (0.102)	0.091*** (0.024)	0.076 (0.106)	0.105*** (0.025)	0.002 (0.007)	0.005** (0.002)
total_seats	−0.165 (0.111)	−0.170*** (0.027)	−0.241** (0.116)	−0.209*** (0.028)	−0.026*** (0.008)	−0.007*** (0.002)
baggies	0.302 (0.221)	−0.143*** (0.046)	0.267 (0.232)	−0.122** (0.048)	0.007 (0.015)	−0.022*** (0.003)
detour	0.206 (0.197)	−0.034 (0.042)	0.183 (0.206)	0.004 (0.044)	0.003 (0.013)	−0.007*** (0.003)
driver_pet1	0.029 (0.258)	−0.105* (0.062)	0.120 (0.270)	−0.148** (0.064)	−0.022 (0.018)	−0.012*** (0.004)
driver_smoke1	−0.395** (0.178)	−0.044 (0.044)	−0.370** (0.186)	−0.028 (0.045)	−0.018 (0.012)	0.005* (0.003)
driver_blabla	0.039 (0.177)	−0.073* (0.041)	0.007 (0.185)	−0.101** (0.042)	0.003 (0.012)	−0.005* (0.003)
number_of_views	−0.014*** (0.003)	−0.002** (0.001)	−0.013*** (0.003)	−0.001** (0.001)	−0.0004* (0.0002)	−0.00003 (0.0004)
town_fill_ride	−0.001 (0.001)	0.001*** (0.001)	0.0004 (0.001)	0.001*** (0.0002)	0.0001 (0.0004)	0.0001*** (0.0001)
length_bio	−0.004 (0.006)	−0.003*** (0.0004)	−0.005 (0.006)	−0.003*** (0.0004)	−0.0004** (0.0002)	−0.0003 (0.0001)
length_ride	−0.009*** (0.002)	−0.003*** (0.0004)	−0.008*** (0.002)	−0.002*** (0.0004)	−0.0003** (0.0002)	−0.0003 (0.0003)
minutes	0.004 (0.012)	0.014*** (0.003)	0.141*** (0.013)	0.139*** (0.002)	0.005*** (0.001)	0.006*** (0.0002)
direction_public_transport	0.010 (0.006)	0.004*** (0.001)	0.004 (0.007)	0.0002 (0.001)	−0.0005 (0.0004)	−0.001*** (0.0001)
comp	−0.010** (0.004)	−0.001*** (0.001)	−0.004 (0.004)	−0.001* (0.001)	0.001*** (0.0003)	0.0004*** (0.0001)
acceptation_automatique	−0.813*** (0.174)	−0.636*** (0.040)	−0.860*** (0.182)	−0.659*** (0.042)	−0.017 (0.012)	−0.012*** (0.003)
suggested_price	−0.115 (0.106)	−0.081*** (0.024)				
Observations	1,866	28,920	1,866	28,920	1,866	28,920
R²	0.231	0.168	0.942	0.940	0.848	0.849
Adjusted R²	0.218	0.167	0.941	0.940	0.846	0.848
Residual Std. Error	3.553 (df = 1834)	3.241 (df = 28888)	3.721 (df = 1837)	3.377 (df = 28891)	0.242 (df = 1837)	0.227 (df = 28891)
F Statistic	17.734*** (df = 31; 1834)	180.378*** (df = 31; 28888)	1,070.985*** (df = 28; 1837)	16,151.950*** (df = 28; 28891)	367.206*** (df = 28; 1837)	5,783.697*** (df = 28; 28891)

Note: *p<0.1; **p<0.05; ***p<0.01

All controls

Table: Incremental price regressed over driver and ride characteristics

	Dependent variable:	
	price_delta	
	1-5 reviews	50+reviews
male	−0.151 (0.212)	−0.313*** (0.077)
minority	−0.908*** (0.396)	0.523*** (0.104)
seniority (months)	0.004 (0.004)	−0.005*** (0.001)
picture	−0.036 (0.291)	−0.100 (0.099)
last grade	0.220 (0.222)	0.036 (0.053)
charter signed	0.108 (0.216)	−0.016 (0.065)
# listings	−0.005 (0.005)	0.0005** (0.0002)
driver age	−0.005 (0.008)	0.016*** (0.003)
response rate	0.008** (0.004)	0.001 (0.002)
car price	0.024* (0.014)	0.018*** (0.004)
consumption	0.002 (0.117)	0.078** (0.037)
total seats	−0.224* (0.127)	0.002 (0.046)
luggage	0.289 (0.256)	−0.222*** (0.072)
detour	0.018 (0.226)	−0.018 (0.066)
pets allowed	0.160 (0.299)	−0.122 (0.102)
smoking allowed	−0.491** (0.208)	0.016 (0.074)
chatty	0.064 (0.206)	0.044 (0.062)
hours till ride	0.00001 (0.0003)	0.001*** (0.0001)
bio (#words)	−0.007 (0.007)	0.002 (0.002)
ride (#words)	−0.013*** (0.003)	−0.002*** (0.001)
minutes	−0.001 (0.013)	0.022*** (0.004)
public transport	0.003 (0.004)	0.003** (0.001)
competition	−0.003 (0.005)	−0.0003 (0.001)
crime	−0.100 (0.079)	−0.071*** (0.024)
automatic acceptance	−0.749*** (0.202)	−0.629*** (0.068)
km	0.009 (0.007)	−0.005** (0.002)
population 2014	0.00000 (0.00000)	−0.00000*** (0.00000)
median income	−0.0003* (0.0002)	−0.0001** (0.0001)
poverty rate	−0.133** (0.059)	−0.095*** (0.018)
Observations	1,348	9,211
R²	0.278	0.184
Adjusted R²	0.262	0.182
Residual Std. Error	3.513 (df = 1318)	2.930 (df = 9181)
F Statistic	17.504*** (df = 29; 1318)	71567*** (df = 29; 9181)
Note:		*p<0.1; **p<0.05; ***p<0.01