

# Urban amenities and tourism: evidence from the worst year in tourism history

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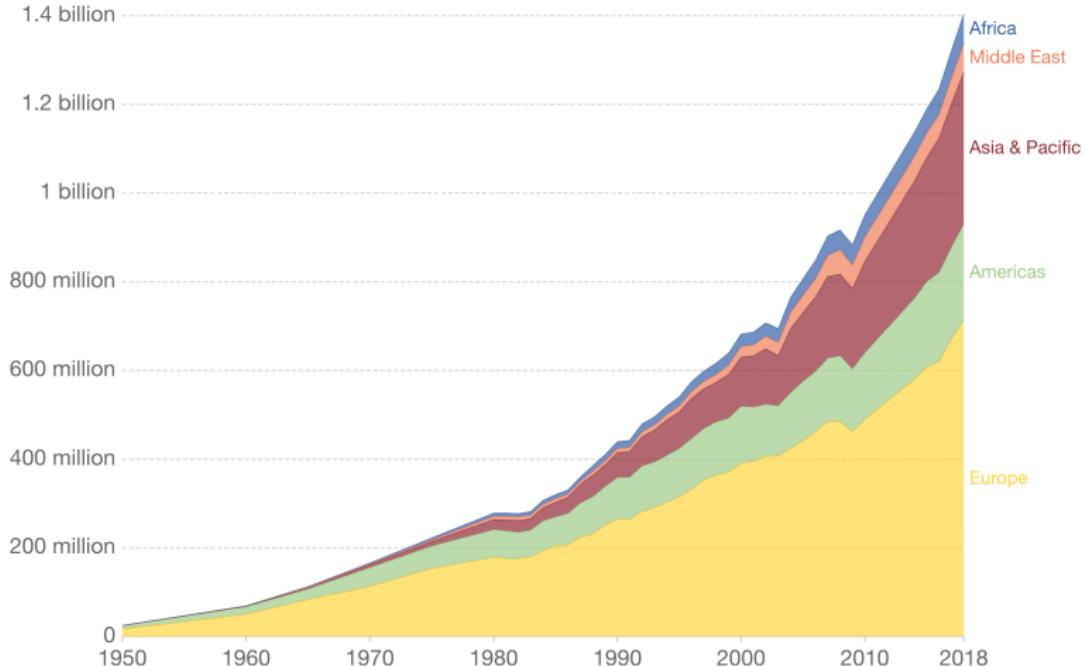
Sciences Po, CLS seminar

June 10, 2021

# Tourism Arrivals Double Every 15-20 years

International Tourist Arrivals by World Region

Our World  
in Data



Source: United Nations World Tourism Organization - World Tourism Barometer (2019)

[OurWorldInData.org/tourism/](http://OurWorldInData.org/tourism/) • CC BY

## Motivation

- ▶ Rapid growth of tourism and urbanization
- ▶ Tourism congestion is highly localised
- ▶ Residents and tourists compete for the space and infrastructure
- ▶ 'Overtourism' has become the subject of public discussion in recent years
- ▶ Spread of anti-tourism protests across Europe



## Research Question

- ▶ What is the within-city impact of tourism on urban amenities and residents' quality of life?
  - ▶ What are the main mechanisms through which tourism influence urban amenities?
- ⇒ We exploit COVID-19 pandemic as a source of exogenous decrease in tourism

## Related Literature

This paper is related to several strands of literature:

- ▶ Economics of tourism. The positive effects are more explored ([Faber and Gaubert, 2019](#); [Copeland, 1991](#); [Chao et al., 2006](#)). Literature on interaction between tourism and amenities ([Lanzara and Minerva, 2019](#); [Panzera et al., 2021](#); [Takahashi, 2019](#)).
- ▶ Literature on the economic role of urban amenities ([Rosen, 1979](#), [Roback, 1982](#); [Glaeser et al., 2001](#); [Carlino and Saiz, 2019](#); [Couture and Handbury, 2020](#); [Lee, 2010](#)). Product variety in the city ([Waldfogel, 2008](#); [Mazzolari and Neumark, 2012](#); [Schiff, 2015](#)). Restaurants rankings ([Kuang, 2017](#)).
- ▶ COVID-19 and the city ([Gupta et al., 2021](#); [Althoff et al., 2020](#); [De Fraja et al., 2020](#); [Miyauchi et al., 2021](#); [Couture et al., 2021](#); [Gupta et al., 2020](#); [Coven et al., 2020](#)).

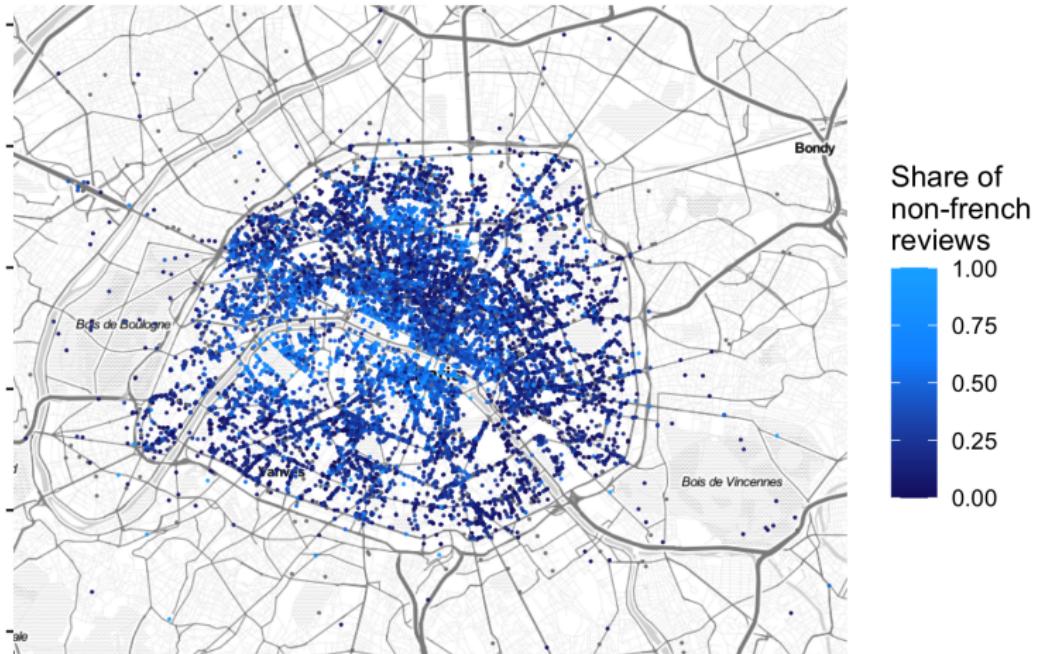
# Data

- ▶ **Tripadvisor:** We collect data on restaurants reviews from Tripadvisor. We construct unique and highly detailed panel that reflects city's restaurant consumption across space and time. The final sample consists of around 17,000 restaurants and 2 million reviews.
- ▶ **'Dans ma rue' - Mairie de Paris:** application that allows users to write and geolocate complaints in Paris, e.g.
  - ▶ Abandoned bulky objects
  - ▶ Waste & dirt
  - ▶ Inconvenient parking
  - ▶ Urine
  - ▶ Graffiti
  - ▶ Overflowing litter bin
  - ▶ Damaged road
  - ▶ Rats
- ▶ **Population and jobs** data from Insee

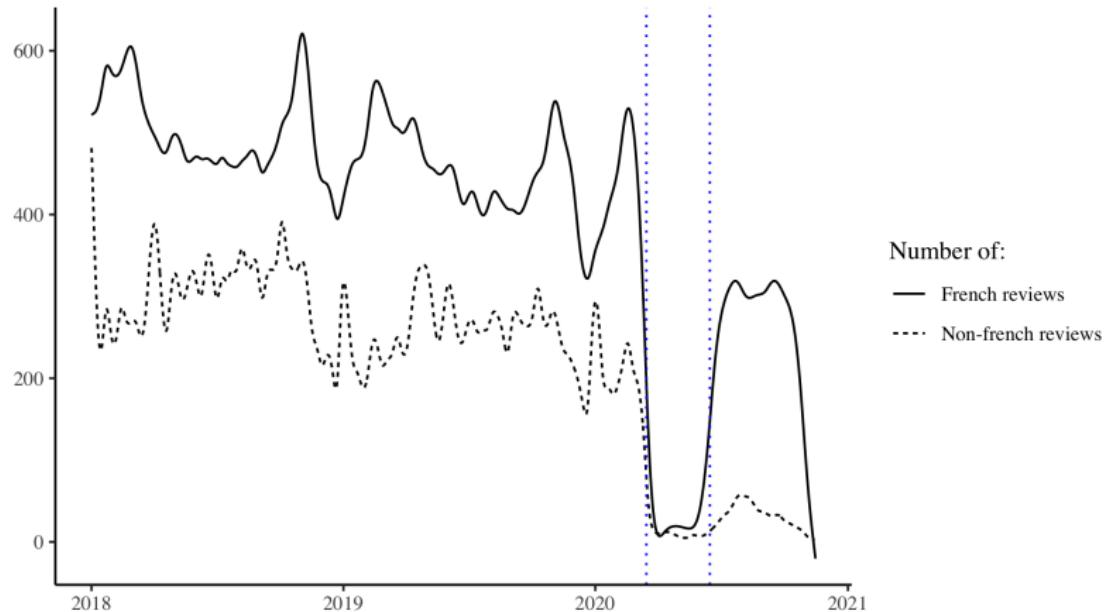
## Two proxies of tourism:

- ▶ Share of reviews written by users with 'location' not in Paris
  - ▶ 'Location' is defined for 64 % of users.
  - ▶ 12 % of them has 'Paris' as a location.
  - ▶ Proxy of international and domestic tourism
- ▶ Share of reviews not written in French
  - ▶ 28 languages
  - ▶ Proxy of international tourism
- ▶ Correlation of 0.53, results robust to using either definition

# Map of Restaurants by Share of Non-French Reviews



# Daily Number of Reviews in Paris



Whole period

# Stylized Fact №1: More Touristic Restaurants Receive Lower Ratings

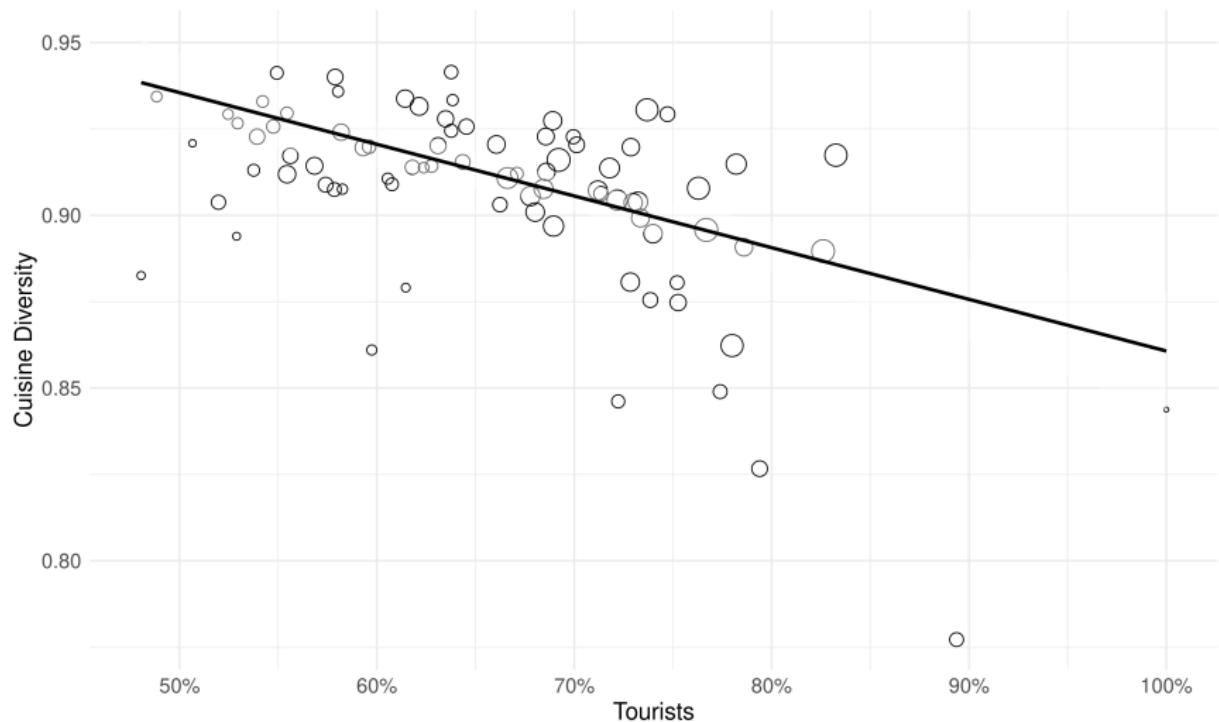
Dependent Variable:	Rating by Parisians		
Model:	(1)	(2)	(3)
<i>Variables</i>			
Share of non-Parisian reviews	-0.6482*** (0.0779)	-0.5463*** (0.0648)	-0.5417*** (0.0644)
log(Num of Reviews)	0.0661*** (0.0126)	0.0369*** (0.0101)	0.0425*** (0.0096)
<i>Fixed-Effects</i>			
User	No	Yes	Yes
Quartier	No	No	Yes
<i>Fit statistics</i>			
Observations	77,063	77,063	77,058
R <sup>2</sup>	0.00699	0.63536	0.63903
Within R <sup>2</sup>	—	0.00584	0.00553

One-way (Restaurant) standard-errors in parentheses.

Signif Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

## Stylized Fact №2:

*More touristic neighborhoods have less diverse cuisines*



## Empirical Strategy: Difference in Difference

$$Y_{jt} = \beta \times \text{Post-Lockdown}_t \times \text{Tourism}_j + \gamma_j + \delta_t + \epsilon_{jt} \quad (1)$$

- ▶  $Y_{jt}$  is an outcome of restaurant  $j$  in month  $t$
- ▶  $\text{Post-Lockdown}_t$  – a binary variable indicating whether month  $t$  belongs to the period from *June to October, 2020*
- ▶  $\text{Tourism}_j$  – to what extent restaurant  $j$  is frequented by tourists
- ▶  $\gamma_j$  – restaurant fixed effects
- ▶  $\delta_t$  – month fixed effect
- ▶ We cluster standard errors at the restaurant level

# Effect of Tourism on Rating by Parisians

Dependent Variable:	Avg. Rating by Parisian			
Model:	(1)	(2)	(3)	(4)
<i>Variables</i>				
Post-Lockdown x Share Non-Parisian	0.4237*** (0.1040)	0.3914*** (0.1133)		
Post-Lockdown x Top 25% Most Touristic			0.1499*** (0.0445)	0.1329*** (0.0480)
<i>Fixed-Effects</i>				
Restaurant	Yes	Yes	Yes	Yes
Month	Yes	No	Yes	No
Month x Quartier	No	Yes	No	Yes
<i>Fit statistics</i>				
Observations	65,248	65,248	65,248	65,248
R <sup>2</sup>	0.34349	0.37169	0.34343	0.37164
Within R <sup>2</sup>	0.00033	0.00022	0.00023	0.00015

One-way (Restaurant) standard-errors in parentheses.

Signif Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

# Effect of Tourism on Demand by Parisians

Dependent Variable:	At least one review by Parisian users			
Model:	(1)	(2)	(3)	(4)
<i>Variables</i>				
Post-Lockdown x Share Non-Parisian	0.0087 (0.0059)	0.0220*** (0.0062)		
Post-Lockdown x Top 25% Most Touristic			0.0439*** (0.0035)	0.0509*** (0.0035)
<i>Fixed-Effects</i>				
Restaurant	Yes	Yes	Yes	Yes
Month	Yes	No	Yes	No
Month x Quartier	No	Yes	No	Yes
<i>Fit statistics</i>				
Observations	360,288	360,288	360,288	360,288
R <sup>2</sup>	0.28936	0.29589	0.28973	0.29632
Within R <sup>2</sup>	1e-05	3e-05	0.00052	0.00064

One-way (Restaurant) standard-errors in parentheses.

Signif Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

## User-Level Approach

User-level regressions allow us to assess whether the same users evaluated initially more touristic restaurant differently when borders were closed

$$Y_{ijt} = \beta \times \text{Post-Lockdown}_t \times \text{Tourism}_j + \gamma_j + \delta_t + \mu_i + \epsilon_{ijt} \quad (2)$$

- ▶  $Y_{ijt}$  is a rating by user  $i$  for restaurant  $j$  in month  $t$
- ▶  $\text{Post-Lockdown}_t$  – a binary variable indicating whether month  $t$  belongs to the period from *June to October, 2020*
- ▶  $\text{Tourism}_j$  – to what extent restaurant  $j$  is frequented by tourists
- ▶ Restaurant and month fixed effects ( $\gamma_j, \delta_t$ )
- ▶ **User fixed effects  $\mu_i$**
- ▶ We cluster standard errors at the restaurant level

# User-Level Approach: Effect on Rating

Dependent Variable:	Rating					
Model:	(1)	(2)	(3)	(4)	(5)	(6)
<i>Variables</i>						
Post-Lockdown x Share	0.3130 *** (0.1140)	0.3243 ** (0.1447)	0.3385 ** (0.1546)			
Non-Parisian				0.1327 *** (0.0455)	0.1209 ** (0.0595)	0.1316 ** (0.0619)
Post-Lockdown x Top 25%						
Most Touristic						
<i>Fixed-Effects</i>						
Restaurant	Yes	Yes	Yes	Yes	Yes	Yes
Month	Yes	Yes	Yes	Yes	Yes	Yes
User	No	Yes	Yes	No	Yes	Yes
Post-Lockdown x Quartier	No	No	Yes	No	No	Yes
<i>Fit statistics</i>						
Observations	84,428	84,428	84,428	84,428	84,428	84,428
R <sup>2</sup>	0.28117	0.75296	0.75356	0.28118	0.75295	0.75355
Within R <sup>2</sup>	0.00012	0.00018	0.00016	0.00013	0.00014	0.00014

One-way (Restaurant) standard-errors in parentheses.

Signif Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

## Magnitudes

We find a robust negative and significant relationship between exposure to tourists and demand and restaurants ratings by Parisians.

The effect is meaningful in size: after pandemic a restaurant among the top 25% most touristic

- ▶ increases its rank by around 400 places among resident's reviewers (inferred from estimating TripAdvisor's ranking algorithm)
- ▶ is five percentage points (or around 25%) more likely to receive a review by a resident

⇒ What could be driving this?

# Effect on Other Amenities

$$\#\text{Complaints}_{qt} = \exp[\beta \times \text{Post-Lockdown}_t \times \text{Tourism}_q + \delta_q + \delta_t] \times \epsilon_{qt}$$

$q$  = quartier,  $t$  = month, Poisson model

Dependent Variables: Model:	Litter (1)	Overflowing Litter Bin (2)	Abandoned Objects (3)	Disturbance by Commercial Activity (4)
<i>Variables</i>				
Tourism $\times$ Post-Lockdown	-0.6036* (0.3444)	-2.178** (0.8666)	-0.6363*** (0.2157)	-1.254* (0.6774)
<i>Fixed-effects</i>				
Month	Yes	Yes	Yes	Yes
Quartier	Yes	Yes	Yes	Yes
<i>Fit statistics</i>				
Observations	1,600	1,600	1,600	1,600
Squared Correlation	0.86458	0.73490	0.93506	0.77626
Pseudo R <sup>2</sup>	0.77431	0.62731	0.93172	0.59250
BIC	17,559.0	9,671.7	29,474.6	9,079.8

One-way (Quartier) standard-errors in parentheses.

Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

# Robustness: Language Based Definition of Tourism

	(1)	(2)	(3)
Dependent: Average ranking by french users			
Share of non-french users	-0.4905*** (0.015)		-0.5039*** (0.016)
Post lockdown × Share of non-french users		0.3060*** (0.058)	0.0979** (0.046)
Post lockdown (first wave)			0.0880*** (0.016)
Restaurants FE	No	Yes	No
Months FE	Yes	Yes	No
Observations	156,226	154,802	156,226
R-squared	0.009	0.341	0.008

Notes: Each observation is on the month-restaurant level.

Standard errors in parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

# Robustness: Bataclan Attacks

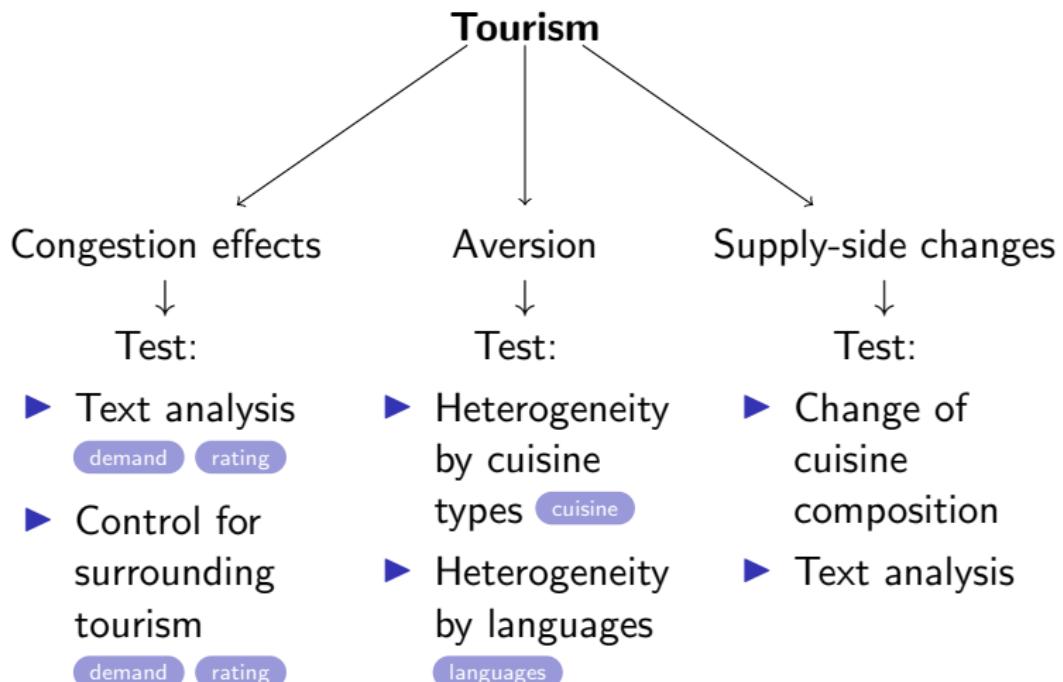
- ▶ Another major shock to tourism were terrorist attacks in November 2015 (Sample period Jan 2015-May 2016)
- ▶ Smaller decline in tourism inflows than during Covid
- ▶ Allows estimating effects on remaining tourists

Dependent Variables: Model:	Rating by Parisians (1)	Rating by Parisians (2)	Rating by Non-Parisians (3)	Rating by Non-Parisians (4)
<i>Variables</i>				
Post-Bataclan × Tourism	0.0974** (0.0454)	0.1221** (0.0519)	0.0144 (0.0264)	0.0240 (0.0315)
<i>Fixed-effects</i>				
Restaurant	Yes	Yes	Yes	Yes
Month	Yes		Yes	
Month × Quartier		Yes		Yes
<i>Fit statistics</i>				
Observations	46,698	46,698	68,019	68,019
R <sup>2</sup>	0.35429	0.37666	0.31448	0.33064
Within R <sup>2</sup>	0.00014	0.00017	$5.61 \times 10^{-6}$	$1.18 \times 10^{-5}$

One-way (Restaurant) standard-errors in parentheses

Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

# Potential Mechanisms (Non-Mutually Exclusive)



# Text Analysis: Demand

Dependent Variable:	At least one review by Parisian users			
Model:	(1)	(2)	(3)	(4)
<i>Variables</i>				
Post-Lockdown x Top 25% Most Touristic	0.0454*** (0.0037)	0.0437*** (0.0037)	0.0420*** (0.0038)	0.0455*** (0.0037)
Post-Lockdown x Top 25% Most Touristic x Noisy		0.0217*** (0.0047)		
Post-Lockdown x Noisy		-0.0316*** (0.0031)		
Post-Lockdown x Top 25% Most Touristic x Long Wait			0.0098*** (0.0033)	
Post-Lockdown x Long Wait			-0.0243*** (0.0023)	
Post-Lockdown x Top 25% Most Touristic x Price				-0.0029 (0.0024)
Post-Lockdown x Price				0.0027 (0.0017)
<i>Fixed-Effects</i>				
Restaurant	Yes	Yes	Yes	Yes
Month x Quartier	Yes	Yes	Yes	Yes
<i>Fit statistics</i>				
Observations	354,080	354,080	354,080	354,080
R <sup>2</sup>	0.29411	0.29469	0.29448	0.29412
Within R <sup>2</sup>	0.00049	0.00131	0.001	0.00049

One-way (Restaurant) standard-errors in parentheses.

Signif Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

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# Surrounding Tourism Controls 1

Dependent Variable:	At least one review by Parisian users			
Model:	(1)	(2)	(3)	(4)
<i>Variables</i>				
Post-Lockdown x Top 25% Most Touristic	0.0439*** (0.0035)	0.0453*** (0.0037)	0.0509*** (0.0035)	0.0494*** (0.0037)
Post-Lockdown x Touristic Area (100m)		-0.0076 (0.0053)		-0.0040 (0.0055)
Post-Lockdown x Touristic Area (100m-300m)		-0.0059 (0.0063)		0.0049 (0.0073)
Post-Lockdown x Touristic Area (300m-500m)		0.0013 (0.0067)		0.0183** (0.0078)
Post-Lockdown x Touristic Area (500m-1000m)		-0.0229** (0.0101)		0.0114 (0.0126)
<i>Fixed-Effects</i>				
Restaurant	Yes	Yes	Yes	Yes
Month	Yes	Yes	No	No
Month x Quartier	No	No	Yes	Yes
<i>Fit statistics</i>				
Observations	360,288	347,552	360,288	347,552
R <sup>2</sup>	0.28973	0.2887	0.29632	0.2954
Within R <sup>2</sup>	0.00052	0.00053	0.00064	0.00063

One-way (Restaurant) standard-errors in parentheses.

Signif Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

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## To do list

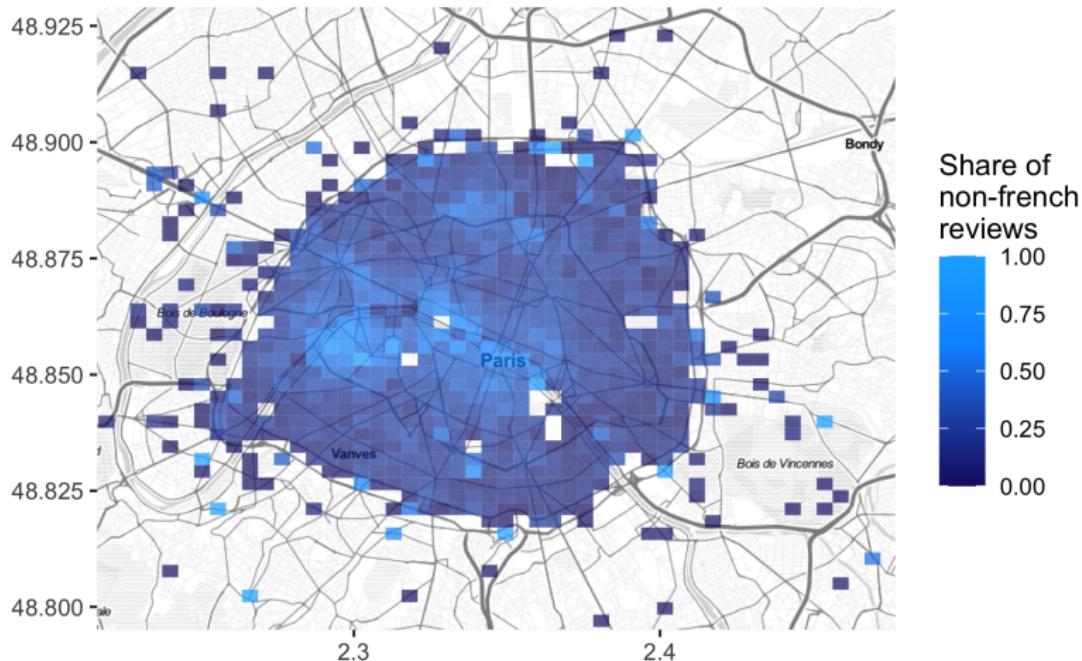
- ▶ Do analysis of changes in cuisine compositions by neighborhoods
- ▶ Do demand analysis at user level
- ▶ Do more advanced text analysis
- ▶ Do robustness checks to account for post-covid changes, such as streets closed for cars
- ▶ Estimate the contribution of the considered amenities to housing prices
- ▶ Use the 'dans ma rue' data at a more disaggregated level

# Conclusion

- ▶ **What is the within-city impact of tourism on urban amenities and resident's quality of life?**
  - ▶ We provide evidence that exposure to tourism decrease residents satisfaction with restaurants and urban infrastructure, decrease their demand of restaurants associated with tourists
- ▶ **What are the main mechanisms through which tourism influence urban amenities?**
  - ▶ We argue for congestion effects both on restaurant and *quartier* levels
  - ▶ Supply side channel requires further investigation

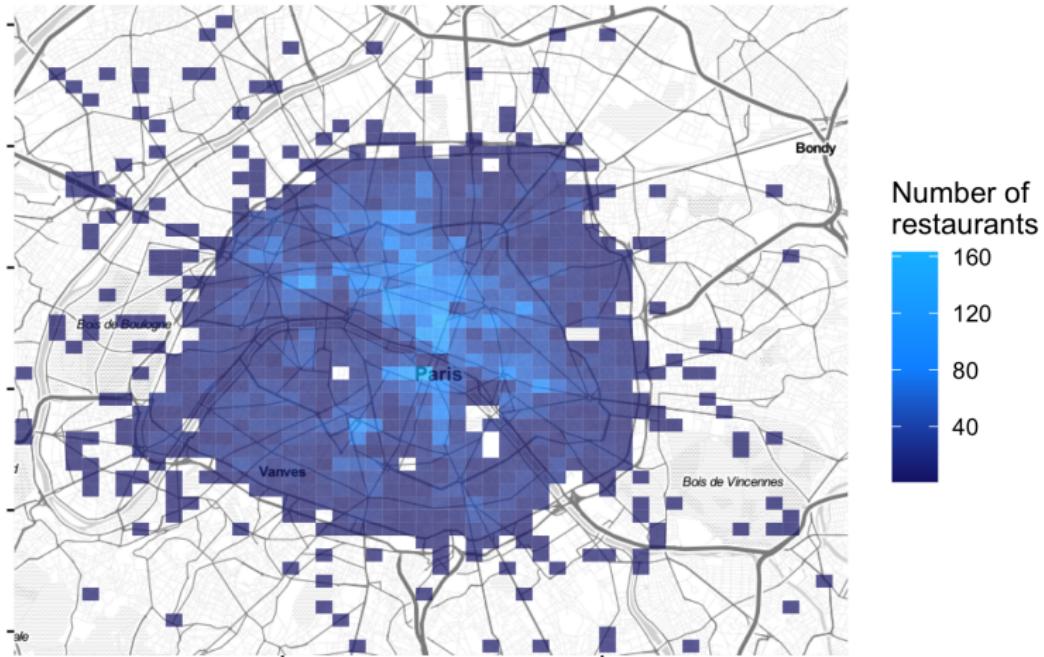
Thank you!

# Grid Map of Restaurants by Share of Non-French Reviews



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# Grid Map of Restaurants Density

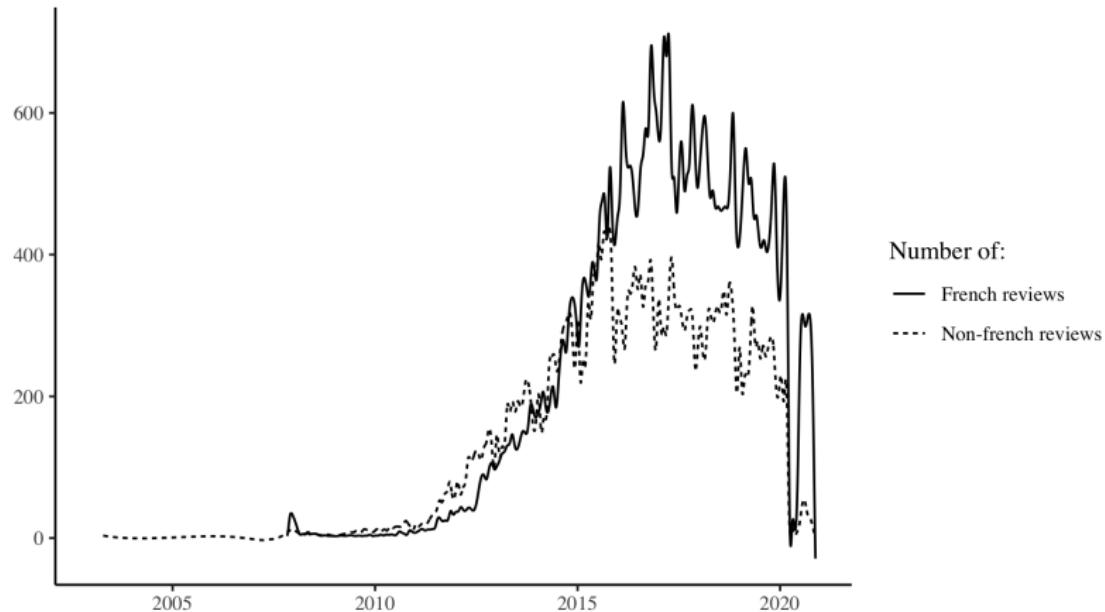


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# Quartier Map of Restaurants by Share of Non-French Reviews



# Historical Trend of Numbers of Reviews in Paris



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# Extension des terrasses : les rues concernées à Paris

Rues qui pourront  
fermer à la circulation



- 1 Rue des Jeuneurs (II<sup>e</sup>)
- 2 Quartier Sainte-Anne (II<sup>e</sup>)
- 3 Quartier du Carreau-du-Temple (III<sup>e</sup>)
- 4 Quartier du Marais\* (IV<sup>e</sup>)
- 5 Place des Vosges et rue de Birague (IV<sup>e</sup>)
- 6 Sortie du métro Le Pelletier (IX<sup>e</sup>)
- 7 Quartier du canal Saint-Martin (IX<sup>e</sup>-X<sup>e</sup>)
- 8 Quartier du Faubourg-St-Denis (X<sup>e</sup>)
- 9 Quartier Sainte-Marthe (X<sup>e</sup>)
- 10 Bd de Belleville (XI<sup>e</sup>), en partie
- 11 Bd Richard-Lenoir (XI<sup>e</sup>), en partie
- 12 Rue de Charonne et rue de la Roquette\*\* (XI<sup>e</sup>)
- 13 Place de la Nation (XI<sup>e</sup>-XII<sup>e</sup>)
- 14 Rue du Chevaleret (XIII<sup>e</sup>)
- 15 Quartier Butte-aux-Cailles (XIII<sup>e</sup>)
- 16 Rue Daguerre (XIV<sup>e</sup>)
- 17 Rue du Château (XIV<sup>e</sup>)
- 18 Rue du Commerce\*\* (XV<sup>e</sup>)
- 19 Rue Lepic (XVIII<sup>e</sup>)
- 20 Rue des Abbesses (XVIII<sup>e</sup>)
- 21 Quartier du marché de l'Olive (XVIII<sup>e</sup>)
- 22 Canal de l'Ourcq (XIX<sup>e</sup>)
- 23 Rue Jourdain\*\* (XX<sup>e</sup>)

\* Rue Vieille-du-Temple, rue des Rosiers, rue Ste-Croix-de-la-Brettonnerie.

\*\* Secteur Paris respire uniquement.

# Language Measure: Effect on Number of Reviews

	(1)	(2)	(3)
	Monthly Number of French Reviews ( $\log (+1)$ )		
Share of non-french users	0.0040 (0.004)		0.0178*** (0.005)
Post lockdown $\times$ Share of non-french users		0.0335** (0.013)	-0.0361*** (0.010)
Post lockdown (first wave)			-0.2488*** [0.004]
Restaurants FE	No	Yes	No
Months FE	Yes	Yes	No
Observations	426,391	426,318	426,391
R-squared	0.043	0.572	0.029

Notes: Each observation is on the month-restaurant level.

Standard errors in parentheses.

Back \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

# Text Analysis: Rating

Dependent Variable:	Avg. Rating by Parisian			
Model:	(1)	(2)	(3)	(4)
<i>Variables</i>				
Post-Lockdown x Top 25% Most Touristic	0.1328*** (0.0480)	0.1308*** (0.0498)	0.1211** (0.0507)	0.1323*** (0.0483)
Post-Lockdown x Top 25% Most Touristic x Noisy		-0.0281 (0.0696)		
Post-Lockdown x Noisy		-0.0622** (0.0265)		
Post-Lockdown x Top 25% Most Touristic x Long Wait			-0.0606 (0.0951)	
Post-Lockdown x Long Wait			-0.0901** (0.0381)	
Post-Lockdown x Top 25% Most Touristic x Price				-0.1107 (0.1100)
Post-Lockdown x Price				0.0441 (0.0440)
<i>Fixed-Effects</i>				
Restaurant	Yes	Yes	Yes	Yes
Month x Quartier	Yes	Yes	Yes	Yes
<i>Fit statistics</i>				
Observations	65,233	65,233	65,233	65,233
R <sup>2</sup>	0.37135	0.37145	0.37146	0.37137
Within R <sup>2</sup>	0.00015	0.00031	0.00033	0.00019

One-way (Restaurant) standard-errors in parentheses.

Signif Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

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# Surrounding Tourism Controls 2

Dependent Variable:	(1)	Avg. Rating by Parisian		
Model:	(1)	(2)	(3)	(4)
<i>Variables</i>				
Post-Lockdown x Top 25% Most Touristic	0.1460*** (0.0450)	0.1421*** (0.0481)	0.1226** (0.0485)	0.1155** (0.0494)
Post-Lockdown x Touristic Area (100m)		-0.0088 (0.0549)		0.0293 (0.0568)
Post-Lockdown x Touristic Area (100m-300m)		-0.0502 (0.0652)		-0.0097 (0.0797)
Post-Lockdown x Touristic Area (300m-500m)		0.1474** (0.0717)		0.1375 (0.0868)
Post-Lockdown x Touristic Area (500m-1000m)		-0.0296 (0.0926)		-0.0419 (0.1133)
<i>Fixed-Effects</i>				
Restaurant	Yes	Yes	Yes	Yes
Month	Yes	Yes	No	No
Month x Quartier	No	No	Yes	Yes
<i>Fit statistics</i>				
Observations	63,115	63,115	63,115	63,115
R <sup>2</sup>	0.3435	0.34357	0.37253	0.37258
Within R <sup>2</sup>	0.00022	0.00033	0.00013	0.00021

One-way (Restaurant) standard-errors in parentheses.

Signif Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

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# Cuisine Heterogeneity

Dependent Variable:	At least one review by Parisian users			
Model:	(1)	(2)	(3)	(4)
<i>Variables</i>				
Post-Lockdown x Top 25% Most Touristic	0.0697*** (0.0036)	0.0500*** (0.0036)	0.0507*** (0.0038)	0.0496*** (0.0038)
Post-Lockdown x Top 25% Most Touristic x French	-0.0329*** (0.0067)			
French x Post-Lockdown	-0.0433*** (0.0039)			
Post-Lockdown x Top 25% Most Touristic x Chinese		0.0270* (0.0138)		
Chinese x Post-Lockdown		0.0066 (0.0079)		
Post-Lockdown x Top 25% Most Touristic x Asian			0.0228*** (0.0084)	
Asian x Post-Lockdown			0.0171*** (0.0045)	
Post-Lockdown x Top 25% Most Touristic x European				0.0113 (0.0097)
European x Post-Lockdown				-0.0068 (0.0060)
<i>Fixed-effects</i>				
Restaurant	Yes	Yes	Yes	Yes
Month x Quartier	Yes	Yes	Yes	Yes
<i>Fit statistics</i>				
Observations	360,288	360,288	360,288	360,288
R <sup>2</sup>	0.29703	0.29633	0.29638	0.29632
Within R <sup>2</sup>	0.00165	0.00066	0.00074	0.00065

One-way (Restaurant) standard-errors in parentheses

Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

# Effects of Different Languages

Dependent Variable:	Avg. Ranking by French users					
	(1)	(2)	(3)	(4)	(5)	(6)
Post x Share English reviews	0.3041*** (0.082)					
Post x Share Spanish reviews		1.3435*** (0.434)				
Post x Share Portugal reviews			1.2456** (0.546)			
Post x Share German reviews				0.0718 (0.727)		
Post x Share Russian reviews					1.9865* (1.064)	
Post x Share Japanese reviews						-0.6129 (0.572)
<i>Fixed-effects</i>						
Restaurant	Yes	Yes	Yes	Yes	Yes	Yes
Month	Yes	Yes	Yes	Yes	Yes	Yes
Observations	411,528	411,528	411,528	411,528	411,528	411,528
R-squared	0.438	0.438	0.438	0.438	0.438	0.438

Robust standard errors in brackets

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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