



Zooming into Airbnb listings: Lessons learned from investigating the sector's competitiveness and demand modeling

Dr. Bozana Zekan
Modul University Vienna

Impact of Airbnb listings on the tourism industry

- Positive and negative impacts
- Disruptive innovation? Unequal playground for the entire accommodation industry?
- Reality – Airbnb listings are already spread around the world, are very popular among young travelers in particular, and as such are negatively influencing the demand for hotels and, in turn, their revenues
- The impact of Airbnb listings on destinations and the role they may play in the overall destination competitiveness cannot be ignored

Pre-COVID-19. Post-COVID-19 too?

Theme 1:

Assessing competitiveness of the Airbnb sector across European cities

Zekan, B., Önder, I., & Gunter, U. (2019). Benchmarking of Airbnb listings: How competitive is the sharing economy sector of European cities? *Tourism Economics*, 25(7), 1029-1046.

Theme 2:

Including uncontrollable input variables into modeling of the sector's competitiveness

Zekan, B., & Gunter, U. – in progress.

Theme 3:

Modeling Airbnb demand

Gunter, U., Önder, I., & Zekan, B. (2020). Modeling Airbnb demand to New York City while employing spatial panel data at the listing level. *Tourism Management*, 77.

Let's take a sneak peek at our first study!

Variables

- Eleven variables across ten different models (interactive DEA modeling)
- Data source: AirDNA (<https://www.airdna.co/>)
- Period: July 2015 – June 2016
- Only active Airbnb listings were considered (i.e., those that had a non-zero number of bookings)
- All variables are averages of all active Airbnb listings per city (except number of properties) → the most plausible approach to performance analysis of the overall sector of various European cities

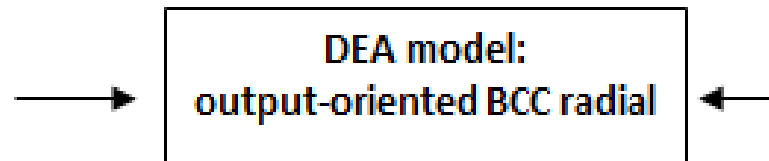
... and DMUs (name of the city = proxy for its listings)

Amsterdam	Barcelona	Berlin
Brussels	Budapest	Cologne
Copenhagen	Dublin	Edinburgh
Florence	Geneva	Genoa
Hamburg	Helsinki	Istanbul
Lisbon	London	Madrid
Munich	Oslo	Paris
Prague	Reykjavik	Rome
Salzburg	Seville	Stockholm
Tallinn	Vienna	

Proposed DEA model – the base model

Inputs:

- Number of properties
- Maximum number of guests
- Minimum number of nights
- Number of photos



Outputs:

- Annual revenue
- Occupancy rate
- Number of bookings
- Overall rating

- Efficient + inefficient DMUs
- Sample: 29 DMUs
- Benchmarking partners and weights
- Virtual benchmark

+ interactivity note (nine alterations)

			<i>Output-oriented BCC Radial DEA Model</i>			
	City = Airbnb Listings of the City	Score	Benchmarks & Weights			
Inefficient DMUs						
2	Barcelona	106.50%	1 (0.10)	13 (0.05)	23 (0.60)	27 (0.25)
15	Istanbul	104.88%	20 (0.38)	28 (0.62)		
21	Paris	103.35%	1 (0.21)	13 (0.08)	23 (0.11)	27 (0.60)
17	London	102.82%	1 (0.43)	8 (0.07)	9 (0.18)	11 (0.20) 23 (0.13)
18	Madrid	102.51%	8 (0.33)	9 (0.18)	13 (0.16)	23 (0.32)
16	Lisbon	102.28%	8 (0.20)	10 (0.32)	22 (0.04)	23 (0.43)
29	Vienna	101.44%	13 (0.29)	23 (0.40)	27 (0.30)	

		<i>Output-oriented BCC Radial DEA Model</i>	
	City = Airbnb Listings of the City	Score	Benchmark Appearance
Efficient DMUs			
5	Budapest	99.65%	0
7	Copenhagen	99.32%	0
3	Berlin	99.10%	0
20	Oslo	98.99%	1
9	Edinburgh	98.56%	2
27	Stockholm	98.07%	3
24	Rome	96.31%	0
26	Seville	95.44%	0
4	Brussels	94.74%	0
10	Florence	91.57%	1
1	Amsterdam	91.26%	3
22	Prague	89.58%	1
23	Reykjavik	75.90%	6
8	Dublin	71.62%	3
6	Cologne	big	0
11	Geneva	big	1
12	Genoa	big	0
13	Hamburg	big	4
14	Helsinki	big	0
19	Munich	big	0
25	Salzburg	big	0
28	Tallinn	big	1

Lessons learned

- Six to eights DMUs are categorized as inefficient across different models
- Listings of five cities (Barcelona, Istanbul, Lisbon, Madrid, and Vienna) inefficient irrespective of the model
- Listings of four cities (London, Paris, Rome, and Hamburg) – shifting between inefficient and efficient groups
- Being efficient does not necessarily translate into being a best practice example for other DMUs
- No such thing as the universal best practice – listings of Reykjavik come as close as possible to being identified as such

Outlook → our Theme 2

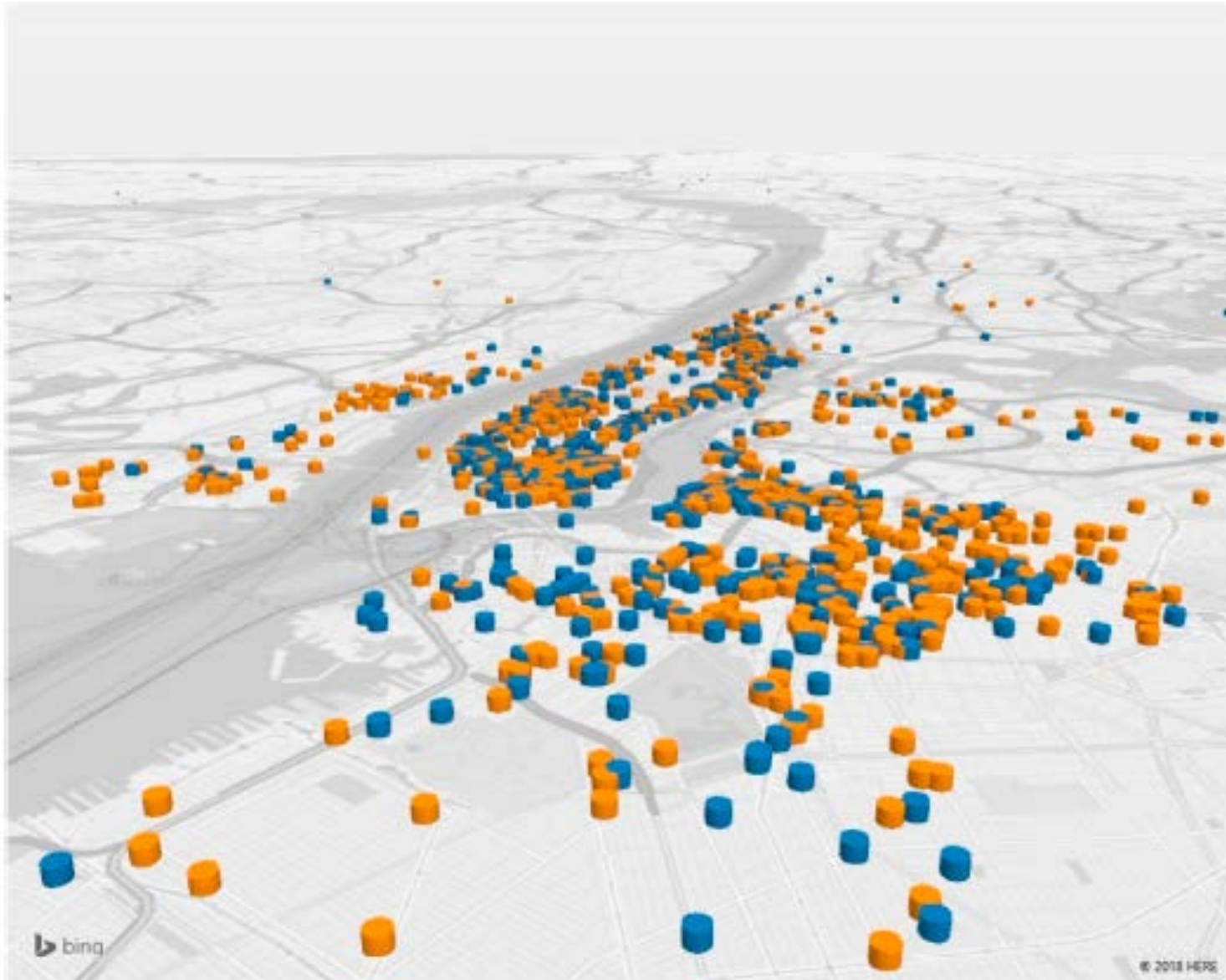
Outlook → our current research on Theme 2

- Inclusion of uncontrollable input variables that relate to traditional forms of accommodation establishments (e.g., number of hotel rooms per city, ADR of hotel rooms per city) in order to:
 - further account for heterogeneity and
 - inspect their impact on the efficiency scores of Airbnb listings
- Separation of private and commercial listings
- AirDNA and STR as data sources

And lastly...

A few highlights from our study on modeling Airbnb demand (Theme 3)

- This is the first study modeling Airbnb demand to New York City employing spatial panel data at the listing level
- It investigates if the traditional accommodation industry is a substitute or a complement for Airbnb in this city
- It is also the first study to quantify income elasticities of Airbnb demand
- Demand is price-inelastic for Airbnb accommodation in New York City, which is a luxury good
- The city's traditional accommodation industry and neighboring Airbnb listings are substitutes



Thank you 😊

Bozana Zekan
bozana.zekan@modul.ac.at