# Online Travel Agencies and beyond: The role of sales channels for hotels and consumers

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Economics of the DMA Workshop - Brussels, 22 September 2025

# The rising importance and regulation of digital platforms

- Growing importance of digital platforms in travel and accommodation
- Increasing regulatory scrutiny of Online Travel Agencies (OTAs)
  - August 2015: France bans PPCs for platforms of the lodging sector
  - May 2024: Booking.com designated as gatekeeper under DMA
  - Beyond DMA: price controls

# The rising importance and regulation of digital platforms

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  - August 2015: France bans PPCs for platforms of the lodging sector
  - May 2024: Booking.com designated as gatekeeper under DMA
  - Beyond DMA: price controls
- Impact of different policies
  1. role of OTA in hotel multi-channel strategy: cannibalisation vs. demand expansion
  2. new equilibrium, players react

# This paper

**Data**

- 3 major hotel chains, 2014-2017, 8 EU countries: hotel-channel

**Approach**

- Structural model: inter-channel substitution and costs for each channels
- Counterfactual policies

**Preliminary results**

- OTAs expand demand with little cannibalisation and price competition
- Fee cap benefits hotels and consumers, but hurts outside competitors (independents)
- Anti-steering boosts sales but hurts profits

# Literature

OTAs and demand

- Low cross-channel substitution, preference for OTA (*Cazaubiel et al. 2020*)

PPCs and their removal

- Impact on OTA and direct channel, more so if non visible (*Mantovani et al. 2021; Ma et al. 2024; Ennis et al. 2023*)
- Platform reaction (*Hunold et al. 2020; Peitz 2022; Scott Morton 2023*)

Fee regulation

- Alternative to PPC ban, effective but other prices react and platform responds (*Gomes and Mantovani 2025, Sullivan 2024, Li and Wang 2024*)

# The context

Online Travel Agencies (OTAs)

- EU 2023: 678.6 mln nights in the EU booked via top 4 OTAs (+33% vs. pre-pandemic)
- 44% independent hotel sales
- Fee (%) for any room sold on platform, but price set by hotel

# The context

Online Travel Agencies (OTAs)

- EU 2023: 678.6 mln nights in the EU booked via top 4 OTAs (+33% vs. pre-pandemic)
- 44% independent hotel sales
- Fee (%) for any room sold on platform, but price set by hotel

High regulatory scrutiny

- DMA: Booking.com designated as gatekeeper May 2024
  - Ban of MFN tout court, i.e. price parity clauses, art. 5(3)
  - Anti-steering, art. 5(4) - potential for showrooming →
- Fee caps: recently proposed in Switzerland, US food delivery

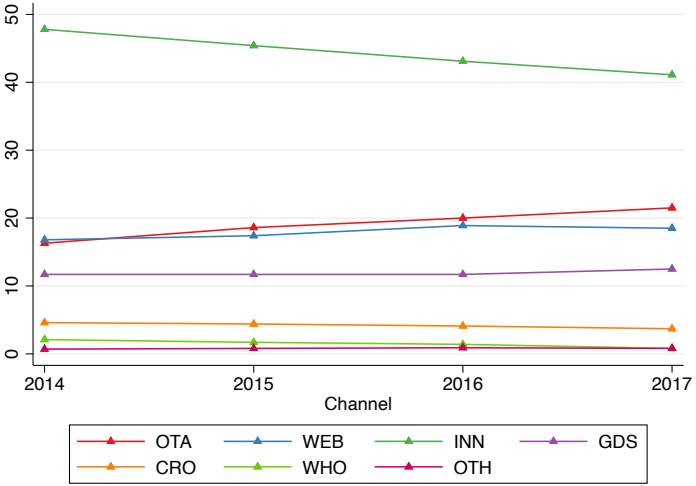
# Data sources

- 3 major international hotel chains
- 213 hotels in 8 EU countries, 22 brands
- January 2014-June 2017: sales and revenues
- Unit of observation: hotel-quarter-booking channel
- Hotel characteristics and amenities from various sources
  - Segment (economy, midscale, luxury,...), number of rooms, review score, bar, spa, restaurant, location info

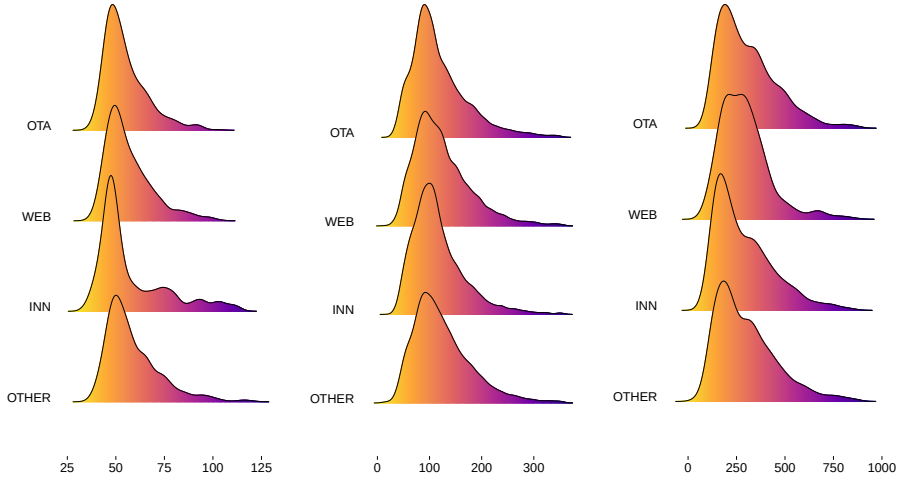
# The data

| | Average Price | Monthly Sales | Star Rating | Hotel Capacity | Review Score | City Centre | In-House Diner |
|---|---|---|---|---|---|---|---|
| Austria | 112 | 3305 | 3.8 | 183 | 8.1 | 0.3 | 0.8 |
| Belgium | 109 | 2608 | 3.3 | 145 | 8.1 | 0.1 | 0.8 |
| France | 168 | 2750 | 3.8 | 156 | 8.2 | 0.2 | 0.8 |
| Germany | 131 | 5390 | 3.6 | 253 | 8.1 | 0.2 | 0.7 |
| Italy | 132 | 3363 | 4.0 | 185 | 8.3 | 0.0 | 1.0 |
| Netherlands | 157 | 3599 | 3.8 | 176 | 8.4 | 0.3 | 1.0 |
| Portugal | 103 | 2856 | 3.7 | 149 | 8.4 | 0.3 | 1.0 |
| Spain | 100 | 2829 | 3.4 | 153 | 8.2 | 0.1 | 0.7 |
| Overall | 138 | 3746 | 3.7 | 188 | 8.2 | 0.2 | 0.9 |

# Channel shares



# Channels: price distribution by segment



# The approach

**Demand** →

- random utility model, BLP → inter-channel substitution

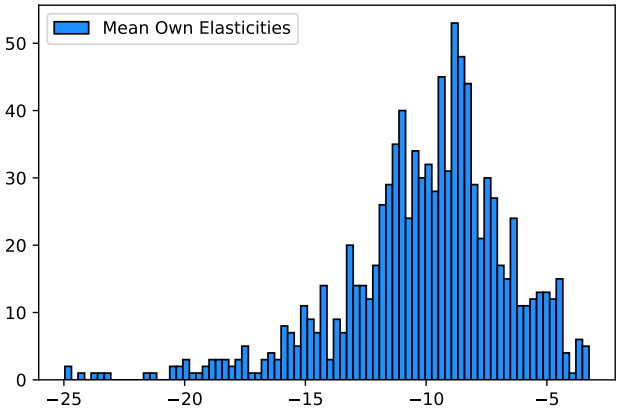
**Supply** →

- multi-product Bertrand-Nash → costs of different channels

**Counterfactuals**

- impact of OTA on market: cannibalisation vs. demand expansion, prices, Π, CS
- fee cap for all hotels in sample: impact across channels
- ability to steer users from OTA to hotel website: price promotion for return customers

# Demand is elastic →

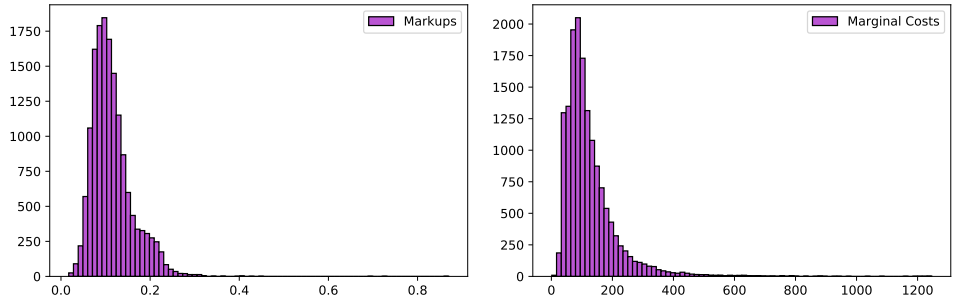


# Little cross-channel substitution

| | CRO | GDS | INN | OTA | OTH | WEB | WHO |
|---|---|---|---|---|---|---|---|
| CRO | -10.4 | 0.05 | 0.17 | 0.08 | 0.02 | 0.07 | 0.03 |
| GDS | 0.02 | -10.3 | 0.15 | 0.07 | 0.03 | 0.06 | 0.03 |
| INN | 0.02 | 0.04 | -9.7 | 0.07 | 0.02 | 0.06 | 0.03 |
| OTA | 0.02 | 0.04 | 0.15 | -9.8 | 0.02 | 0.06 | 0.03 |
| OTHER | 0.04 | 0.07 | 0.27 | 0.13 | -12.3 | 0.13 | 0.05 |
| WEB | 0.02 | 0.04 | 0.16 | 0.07 | 0.02 | -10.1 | 0.03 |
| WHOLESALE | 0.01 | 0.03 | 0.12 | 0.05 | 0.01 | 0.05 | -9.9 |

- Little substitutability, some variation
- OTA: substitution to less visible direct channel (*Ma et al. 2024*)

# Markups and marginal costs




- Lower price and mc on OTA (pre fee), WEB more costly than INN
- Markups comparable across channels

# OTAs expand demand

- Sales: demand expansion vs. channel cannibalisation
- Remove OTA from choice set and simulate new price equilibrium

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| | $\Delta p$ | $\Delta s$ | $\Delta \Pi$ |
|---|---|---|---|
| CRO | -0.03% | 6.5% | 6.7% |
| GDS | -0.02% | 4.3% | 4.9% |
| INN | -0.03% | 4.5% | 4.3% |
| OTHER | -0.04% | 7.8% | 7.3% |
| WEB | -0.04% | 5.2% | 3.9% |
| WHOLESALE | -0.01% | 5.8% | 3.1% |

- Average hotel loses 733 roomnights/quarter
- Profits drop 15% or EUR 9k per hotel-quarter
- CS↓ on avg by EUR 30k per city-quarter, 2.1 mln/period and 29.5 mln overall

# Fee cap

- OTA market power: contractual externality→ fee may be higher than profit gain generated by the platform's service (*Gomes and Mantovani 2025*)
- Optimal fee provides incentives to invest (PPC ban may not)
- Fee cap on US food delivery platforms:
  - prices react, making cap less effective (*Sullivan 2024*)
  - platforms promote firms on higher fee (*Li and Wang 2024*)

# Fee cap boosts sales and profits

Reduce fee to 10% (≈6% drop in mc)

| | Δp | Δs | ΔΠ |
|---|---|---|---|
| OTA | -5.3% | 85% | 94% |
| CRO | -0.01% | -6.6% | -5.9% |
| GDS | -0.01% | -3.6% | -6.9% |
| INN | -0.01% | -6.2% | -4.3% |
| OTHER | -0.01% | -8.3% | -6.6% |
| WEB | 0.00% | -5.9% | -4.5% |
| WHOLESALE | -0.02% | -10.1% | -4.5% |

- +7% roomnights, 330 hotel-quarter → occupancy approaches capacity
- Hotel profits +8%, CS↑ EUR 15k market/period, 14.7 mln overall
- Detrimental to independent hotels (outside option), 70% of OTA bookings

# Hotels steer users to website

- DMA art. 5(4): transactions initiated on platform allowed to be concluded off platform ≈ showrooming →
- *Cazaubiel et al. 2020*: absent one OTA, switch to another OTA before booking direct
- Hotels offer lower price on WEB to OTA users
  - loyalty discounts ≈10% or match $p^{OTA}$
  - only return customers: Booking.com interpretation →
  - average return customers EU 2014: 37%

# Loyalty discounts

- Price promotion boosts sales but hurts profits
- On average, $p^{WEB} \downarrow 2.5\%$
- 10 roomnights by hotel/quarter steered from OTA to WEB
- Profits drop 22%, due to lower margins
- If $\uparrow$mc (marketing to contact customer), profits may drop more

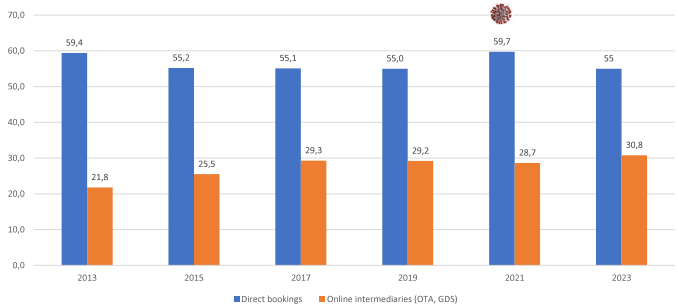
# Conclusion

- Role of platforms in the hotel industry and regulatory impact
- Data: (chain) hotel perspective, detailed quantity and channel info
  - OTA as non-strategic player
  - no independent hotels
- Interplay between hotel (multi-channel) strategy and regulatory constraints
- Lower bound: independent hotels more reliant on OTAs

Thank you!

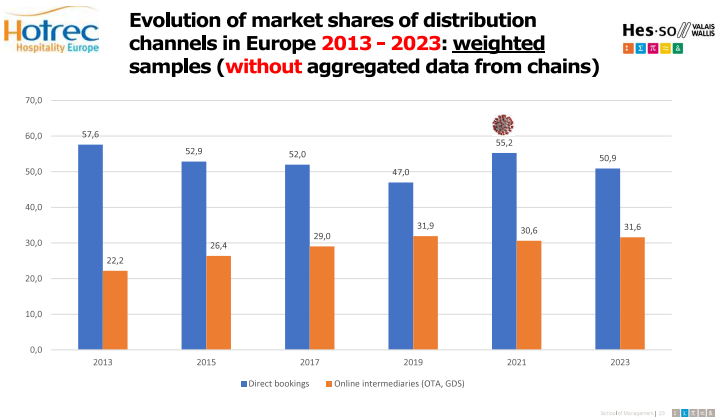
# OTAs in the European hotel industry

**Evolution of direct bookings and bookings via online intermediaries in Europe 2013 - 2023**




**Values from overall unweighted sample.** Market shares in % of overnights.

# Channel shares for independent hotels



# The model: demand

- Random utility model - discrete choice, BLP
- $i$=consumer, $h$=hotel, $c$=channel, $t$=market

$$u_{ihct} = \beta x_{ht} + \alpha_i p_{hct} + \xi_{hct} + \bar{\varepsilon}_{ihct}$$

$$\text{where} \quad \alpha_i = \alpha + \Sigma \nu_i$$

- Outside option: any lodging alternative (incl. none)

$$u_{i0t} = \bar{\varepsilon}_{i0t}$$

# The model: supply

- Hotels compete in price, multi-product (channel) Bertrand-Nash
- Hotel acts independently from chain (*Cazaubiel et al. 2020*)
  - most hotels are franchised and retain price setting rights

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$$max_{p_{hct}} \Pi_{ht} = \sum_{c \in C_{ht}} (p_{hct}(1 - r_{hct}) - c_{hct}) s_{hct} M_t - F_{ht}$$

$$FOC: \quad s_{hct} + \sum_{c \in C_h} (p_{hct}(1 - r_{hct}) - c_{hct}) \frac{\partial s_{hkt}(p_t)}{\partial p_{hct}} = 0 \quad \forall hc \in HC$$

$$\mathbf{p}_t(1 - \mathbf{r}_t) - \mathbf{c}_t = -[\Omega_t D(\mathbf{p}_t)]^{-1} \mathbf{s}_t(\mathbf{p}_t)$$

# The model with PPCs: supply

- Accounting for PPCs: price constraint across channels (*Dubois and Lasio, 2018*)

$$max_{p_{hct}} \Pi_{ht} = \sum_{c \in C_{ht}} (p_{hct}(1 - r_{ht}^{c=OTA}) - c_{hct}) s_{hct} M_t - F_{ht}$$

$$s.t. \quad p_{ht}^{c=OTA} \leq p_{ht}^{c'} \quad \forall c' \neq OTA \quad \text{if } t \in T^{PPC}$$

- Variation across regulatory settings (PPCs enforced vs. banned)
- Marginal cost restrictions to identify constraint: same hotels with and without PPC
- Threat to identification: not binding due to data aggregation, channel room differentiation strategy

# Demand estimates

| | Mean | Sigma |
|---|---|---|
| Price | −0.106 | 0.015 |
| | (0.011) | (0.003) |
| Distance | 0.002 | |
| | (0.003) | |
| Nb. of Rooms | 0.002 | |
| | (0.001) | |
| Review Score | 6.270 | |
| | (0.460) | |
| City Centre | 1.051 | |
| | (0.138) | |
| Restaurant | 1.051 | |
| | (0.114) | |
| Spa | −0.825 | |
| | (0.166) | |
| Constant | −8.607 | |
| | (0.409) | |
| Category FE | ✓ | |
| Country FE | ✓ | |
| Channel FE | ✓ | |
| Chain FE | ✓ | |
| Period FE | ✓ | |

# DMA art. 5(4)

The gatekeeper shall allow business users, free of charge, to communicate and promote offers, including under different conditions, to end users acquired via its core platform service or through other channels, and to conclude contracts with those end users, regardless of whether, for that purpose, they use the core platform services of the gatekeeper.

**Recital 40**
[...]An **acquired end user** is an end user who has already entered into a commercial relationship with the business user and, where applicable, **the gatekeeper has been directly or indirectly remunerated** by the business user for facilitating the initial acquisition of the end user by the business user. [...]Conversely, end users should also be free to choose offers of such business users and to enter into contracts with them either through core platform services of the gatekeeper, if applicable, or from a **direct distribution channel of the business user or another indirect channel** that such business user uses.

# Disintermediation à la Booking.com