

Peer-to-Peer Accommodation and Hotel Quality: A Municipal-Level Panel Analysis

Andrea Guizzardi¹[0000-0001-8674-7604], Michele Costa²[0000-0003-3045-7979], Ercolino Ranieri³

¹ Department of Statistical Sciences, University of Bologna, Via Belle Arti 41, 40126 Bologna, Italy, andrea.guizzardi@unibo.it

² Department of Economics, University of Bologna, Piazza Scaravilli 2, 40126 Bologna, Italy, michele.costa@unibo.it

³ Xenia S.p.A. SB, Via Gramsci 79, 66016 Guardiagrele (CH), Italy, ercolino.ranieri@xenihas.com

Abstract. The impressive growth of online short-term rental platforms such as Airbnb has substantially reshaped competition in the hospitality sector. While most existing research examines Airbnb's effects on hotel performance and market shares, much less is known about its influence on hotel quality. This paper investigates the relationship between the expansion of Airbnb and changes in hotel quality, focusing on the local dimension by conducting the analysis at the municipal level. Using data from 43 municipalities in the Emilia-Romagna region of Italy, we examine how patterns of Airbnb activity are associated with improvements or declines in hotel quality over time. By jointly considering destination types and measurement choices, the study provides a more nuanced understanding of how online accommodation platforms can shape hotel quality dynamics and offers implications for both hotel management and local tourism policy. We find that Airbnb activity is associated with broad quality improvements in both hotels and peer-to-peer accommodation, but with heterogeneous patterns across destination types, highlighting the need for context-sensitive quality strategies.

Keywords: Airbnb, Tourism economics, Destination type, Competition.

1 Introduction

In recent years, the hospitality industry has undergone significant transformations driven by the growth of online short-term rental platforms, with Airbnb emerging as a key disruptive force. Its rapid expansion has altered competitive dynamics of accommodation markets, affecting demand, pricing, and consumer choice. While Airbnb offers diversified and localized lodging options, its rapid rise raises important questions about how traditional hotels adapt to increased competition.

Most extant research has focused on Airbnb's effects on performance and market shares, while service quality, a crucial dimension of hotel competitiveness, has received less attention. This paper addresses this gap by investigating how Airbnb activity at the municipal level correlates with changes in hotel quality over time.

Our analysis is based on a panel of 43 municipalities in Emilia-Romagna, a highly visited Italian NUTS-2 region, covering different tourism contexts (coastal, mountain, and cultural destinations) over the period July 2021 to June 2025. By focusing on quality dynamics rather than price effects alone, the study contributes to a more nuanced understanding of how hotels respond to platform-based competition and provides insights for both managerial strategies and local tourism policy.

2 Theoretical framework

As frequently happens in the tourism and hospitality literature, understanding Airbnb’s impact on traditional hotel quality requires integrating insights from different theoretical perspectives [8]. We draw on three complementary frameworks: dynamic capabilities theory, total quality management (TQM), and competitive differentiation. Dynamic capabilities theory [7] explains how firms adjust resources and competencies to meet environmental change. In hospitality, Airbnb represents a major disruption, requiring hotels to develop adaptive capabilities such as process innovation, service model re-configuration, and responsiveness to evolving customer demands. Empirical evidence shows that hotels dynamically adjust quality priorities, such as cleanliness and service reliability, in response to external shocks [1], supporting the view of quality as an active strategic process. TQM complements this perspective by emphasizing continuous, organization-wide quality improvement through customer-centric and employee-engaged practices [4]. In the context of Airbnb competition, TQM provides a managerial framework for systematically enhancing quality attributes that differentiate hotels from short-term rentals. Finally, competitive differentiation theory [5] highlights quality-based differentiation as a key mechanism for sustaining competitive advantage. While Airbnb expands rapidly through heterogeneous offerings, hotels can invest in service excellence, technology, and brand reputation to create durable advantages. The literature on Airbnb has largely focused on pricing and market share effects ([9]; [2]), leaving the quality domain relatively underexplored. Recent studies suggest that hotels actively re-configure quality dimensions in response to platform competition [1], while guest review analyses highlight distinct quality perceptions between hotels and Airbnb [6].

Beyond these theoretical perspectives, our study also relates to the growing literature on hotel reputation measurement showing that online ratings are often combined through non-uniform weights that give more importance to certain observations (e.g. high-volume hotels, platforms, or reviews) rather than simple averages. Building on these insights, our empirical strategy uses capacity - and length-of-stay-weighted review-based measures, treating guest-nights as the relevant unit of exposure to hotel quality and allowing quality changes in larger, more frequently used hotels to exert a proportionally greater influence on destination-level indicators ([3]; [10]).

3 Data and methodology

We measure hotel and property quality (our key variables of interest) as a weighted average of review scores, using both size (number of available beds) and length of stay

(LoS) as weights. The data are collected via web scraping from Booking.com for hotels and purchased from the provider AirDNA for peer-to-peer accommodation. Our empirical analysis relies on a monthly panel dataset that spans the period from July 2021 to June 2025. AirDNA data for peer-to-peer accommodation are available from July 2021 to June 2024, while Booking.com review data for hotels are available at the daily level from July 2022 to June 2025 and are aggregated to the monthly frequency by averaging the quality scores. We acknowledge that review scores are not perfectly comparable across platforms, since Booking.com and Airbnb may differ in rating scales, review solicitation, and user expectations. Nevertheless, our analysis is primarily concerned with within-platform dynamics over time and with cross-municipality variation, so the main results are less sensitive to differences in the underlying rating scales. Accordingly, we interpret the evidence as capturing relative quality adjustments rather than strict cross-platform equivalence.

The statistical units include all three-star-and-above hotels and all properties listed on Booking.com and Airbnb in 43 municipalities in the Emilia-Romagna region, representing different tourism typologies (coastal, mountain, and cultural destinations) as defined by the official ISTAT classification. The AirDNA dataset also provides a rich set of control variables, which we group into three clusters capturing different dimensions of the supply side: consistency, selling strategies, and quality (see Table 1).

Table 1. Variables from the AirDNA database.

Consistency	Strategies (pricing/inventory)	Quality
• share of Airbnb properties among all accommodation establishments (hotels and non-hotels) • share of Airbnb beds relative to municipal capacity (size, population, total beds)	• Average daily rate (ADR) • Pricing policy (flex or not) • Airbnb Superhost (yes/no) • Response Rate • # of available rental days • Number of reservation day	• # of Reviews • guest ratings on seven quality dimensions (overall, communication, accuracy, cleanliness, check-in, location, value)

In a first step of our analysis, we focus on quality trends i.e., the presence and direction of changes over time in the quality of hotels and Airbnb accommodations. The methodology is simple: we estimate a regression of the monthly quality on a linear trend

$$Q_{i,t} = \mu + \beta_i t + \varepsilon_{i,t} \quad i = 1, 2, \dots, 43; \quad t = 1, 2, \dots, 36 \quad (1)$$

where $Q_{i,t}$ denotes supply quality in municipality i at month t . The regression, estimated separately for hotel quality and peer-to-peer market quality, allows us to classify destinations into three trend categories: positive, negative, and stable (i.e., not significant β_i , p-value > 5%). In a second step we estimate a panel data model with municipality and time fixed effects to isolate within-municipality variation over time and control for common monthly shocks:

$$Q_{i,t} = \alpha_i + \delta_t + \beta_t X_{i,t-12} + \varepsilon_{i,t} \quad (2)$$

Here Q_{it} denotes hotel quality in municipality i at time t , α_i are municipality fixed effects, δ_t are month fixed effects, and X_{it} is a vector of lagged Airbnb and municipal control variables. Municipality fixed effects account for time-invariant local characteristics correlated with both Airbnb activity and hotel quality, while time fixed effects control for aggregate shocks. The use of lagged regressors strengthens temporal ordering; however, some reverse causality could occur if high-quality hotel destinations also attract more Airbnb hosts and guests. Furthermore, since endogeneity and unobserved time-varying factors cannot be fully ruled out, results should be interpreted with caution as associative rather than causal.

4 Results and conclusions

A first result emerging from the analysis of supply-quality dynamics is that quality improvements are widespread in both market segments: nearly half of the municipalities display a simultaneous and statistically significant increase in both hotel and Airbnb quality over time, while instances of declining hotel quality are rare (see Table 2).

Table 2. Trends in hotel and Airbnb quality by municipality.

Hotel \ Airbnb	Negative	Stable	Positive	Total
Negative	0	0	1	1
Stable	4	2	11	17
Positive	2	4	19	25
Total	6	6	31	43

Although a chi-square test does not reject the null hypothesis of independence between hotel and Airbnb quality trends, the observed distribution indicates that improvements in Airbnb quality are frequently accompanied by parallel improvements in hotel quality, pointing to common structural drivers, such as competition and innovation, that lead to an increase in the standards of both sectors.

Still in the framework of the analysis of dynamics in hotel and Airbnb quality, we aimed to investigate the heterogeneity in Airbnb’s quality dynamics compared to hotels. In particular, we focused on ISTAT classification categories of our municipalities, looking for the presence of a “product-type effect”. Table 3 reports the percentage of municipalities within each ISTAT classification category where hotel and Airbnb quality showed a positive or negative trend over time. The results (see Table 3), suggest relevant differences across destination types: for example, in municipalities with a cultural, historical or artistic vocation, the trend in quality is largely positive, with Airbnb outperforming hotels (87% vs. 67% of municipalities showing improvements). However, negative trends are observed only for Airbnb (13%), while no cases of decline are found for hotels. In seaside destinations, both hotels and Airbnb improve significantly, while in mountain areas, Airbnb shows stronger progress (75% vs. 25% for hotels). Thermal tourism municipalities display more mixed results, with a positive trend for hotels in half of the cases but a decline for Airbnb in 50% of municipalities. Overall,

Airbnb quality appears to improve more frequently than hotels (72% vs. 58%), but it also shows a higher frequency of negative trends (14% vs. 2%), suggesting greater variability and sensitivity to local markets.

Table 3. Trends in hotel and Airbnb quality by tourism destination type (percentage of municipalities with positive or negative trends within each ISTAT category).

Destination type	Hotel (Positive)	Airbnb (Positive)	Hotel (Negative)	Airbnb (Negative)
Cultural, historical, artistic	67%	87%	0%	13%
Seaside	83%	100%	0%	0%
Mountain	25%	75%	0%	0%
Thermal tourism (SPA)	50%	25%	0%	50%
Other tourist municipalities	50%	57%	7%	14%
Total	58%	72%	2%	14%

Panel model (2) estimation results (see Table 4) highlight a positive effect of Airbnb listings with “lower cleanliness rating” on hotel quality suggesting that Airbnb cleanliness ratings are an aspect to be monitored as a competitive lever for hotels, representing a good opportunity to differentiate successfully (perhaps by raising hygiene standards) when competing against perceived subpar Airbnb cleanliness. Conversely, higher Airbnb value-for-money ratings correlate with increased hotel quality, indicating stronger price competition pushing hotels to improve quality to maintain differentiation. It is worth highlighting that the coefficient magnitudes suggest Airbnb’s competitive pressure is more impactful on price dimensions than on cleanliness.

Table 4. Panel estimates for hotel quality (weighted by length of stay and hotel size).

Variable	Estimate	Std. Error	p-value
Airbnb Cleanliness Rating	-0.273	0.102	0.008
Airbnb Value Rating	0.227	0.103	0.028
Number of Reservations	0.042	0.016	0.007
Share of Properties	0.179	0.095	0.059

Regarding strategic market effects, only the demand size variable (number of Airbnb reservations) significantly correlates with hotel quality. Increased Airbnb reservations the previous year are associated with subsequent improvements in hotel quality, possibly reflecting market stimulation as rising visitor numbers motivate hotels to enhance service to attract more customers and to exploit dynamic pricing practices that generate a more favourable pick-up curve. A nearly significant coefficient on the share of Airbnb properties relative to officially registered accommodations points to intensified competition, which in turn appears to foster broader market-wide quality improvements among hotels. In summary, hotels respond to Airbnb price competition by elevating quality, consistent with dynamic capabilities and competitive differentiation theories.

Overall, the evidence indicates that Airbnb does not erode hotel quality; rather, it contributes to a more competitive environment in which quality standards tend to improve over time in both peer-to-peer and business-to-consumer segments. Quality dynamics are heterogeneous across destination types: in mature seaside resorts, hotels and Airbnb often improve together, while in fast-growing mountain areas Airbnb tends to lead quality upgrading, raising concerns about hotels' ability to innovate in structurally weaker contexts. In spa destinations, by contrast, hotel quality improves while short-term rentals frequently show declining performance, suggesting that higher entry barriers and more demanding guests limit Airbnb's competitiveness in this segment. Across these varied contexts, Airbnb prices, demand patterns and guest ratings emerge as salient market signals that hotel managers can use as competitive benchmarks, informing strategic decisions on where and how to upgrade quality, differentiate their product and allocate marketing efforts.

Acknowledgements

This work was partially carried out within the ECOSISTER – Ecosystem for Sustainable Transition in Emilia-Romagna project, funded under the Italian NRRP and the European Union's NextGenerationEU initiative. The authors acknowledge support from this programme..

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