Superhost Pricing Differentiation in Berlin's Airbnb Market: Multi-methodological Statistical Analysis

Research Objective and Hypotheses Empirical analysis of Airbnb Superhost pricing differentiation strategies in Berlin's market (n=8,783, InsideAirbnb, July 2025). | Temporal Focus: Post-COVID market dynamics enable analysis of evolutionary strategy adaptations. | H0: Superhost premiums are identical between private rooms and entire apartments. Empirical findings reject H0: Private rooms -22.19% vs. entire apartments +16.79% (Difference=38.98 percentage points, $p < 2.2e\text{-}16$, Cohen's $d = -0.559$).

Methodology Sample Design: 3-sigma outlier removal (14,187→8,783 observations). | Analysis Pipeline: (1) Welch's t-tests; (2) Quantile regression (25%/50%/75%/90%); (3) Tertile-based market segmentation; (4) Linear regression models with 70/30 train-test validation (R^2=0.0087, RMSE=€399.05). | Robustness: Bootstrap confidence intervals (1,000 iterations).

Empirical Results Main Findings: Inverse pricing differentiation with substantial effect sizes. Private rooms: -22.19% (95% Confidence Interval: [-27.33%, -15.06%]); entire apartments: +16.79% (95% Confidence Interval: [18.52%, 29.85%]). | Market Segmentation: Budget segments (+5.3% to +14.0%) vs. luxury segments (-19.9% to -40.5%). Quantile regression confirms effect consistency across entire price distribution.

Statistical Validation Inference Validation: Welch's t-tests (t=-6.78 and t=8.37, $p < 2.2e\text{-}16$), bootstrap confidence intervals and quantile estimators converge to consistent conclusions. | Performance: Out-of-sample validation (RMSE=€399.05) confirms practical relevance.

Scientific Contribution Knowledge Gain: First-time documentation of sophisticated Superhost pricing differentiation. | Paradigm Shift: Move away from premium strategies toward segmentation approaches. | Innovation: Integration of parametric tests, quantile regression, and out-of-sample validation. | Implications: Price optimization, platform design, regulatory guidance.

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