

# NYC Airbnb Pricing and Reviews Analysis Project

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## Part I: NYC Airbnb Pricing Key Findings Summary

### Executive Summary

This comprehensive analysis of NYC Airbnb pricing data examined multiple factors expected to influence rental rates, including geographic location, property characteristics, host attributes, and booking policies. Through A/B testing methodology and statistical analysis of over 100,000 listings, the study reveals a counterintuitive finding: NYC's Airbnb market demonstrates remarkable price uniformity across virtually all traditional pricing factors. This suggests a highly mature, competitive market where conventional real estate premiums have been largely eliminated through market forces.

### Key Findings

#### Geographic Pricing

- **No Manhattan Premium:** Despite containing the highest volume of listings, Manhattan does not command higher average prices than other boroughs.
- **Borough Price Convergence:** Average prices across all five boroughs fall within a narrow \$9 range, indicating remarkable uniformity for a major metropolitan market.
- **Geographic differences eliminated:** Traditional location-based pricing advantages appear to have been competed away.

#### Property Features Impact on Pricing

##### Room Type Analysis

- **No Entire Home Premium:** Contrary to expectations, entire homes do not consistently command higher prices than private or shared rooms across NYC.
- **Minimal price differentiation:** Most room type differences fall within a \$5 to \$15 range, representing less than 1% price variation.
- **Hotel rooms exception:** Only hotel rooms show substantially higher pricing (appx. \$30+ premium), likely due to a different market positioning and/or service model

- **Borough-specific variations:** Room type premiums vary slightly by location but remain minimal overall

## Property Age Impact

- **Property age premium reversed:** Newer properties (built 2011+) actually cost slightly less (-\$3.34) than older properties (built in 2010 or earlier). This, however, remains insignificant.
- **Location interaction effect:** This property age impact varies by borough:
  - ◆ *Core areas (Manhattan/Brooklyn):* There is a slight price increase for older properties, potentially due to established neighborhood value, tourist destination proximity, and/or character.
  - ◆ *Outer boroughs (Bronx/Staten Island):* There is a premium for newer properties, likely reflecting modern amenities and construction quality.

## Host Characteristics Impact

- **No verification premium:** Host identity verification shows no meaningful impact on pricing (-0.44% difference).
- **No portfolio size effect:** Professional hosts (5+ properties) vs. casual hosts (1-2 properties) show minimal pricing differences.
- **Trust signals ineffective:** Traditional trust and credibility indicators do not translate to pricing power in this set of rental properties.

## Policy Impact Analysis

- **No effect of instant booking:** No price premium observed for instant bookable properties (0.05% difference).
- **Cancellation policy irrelevant:** Strict, moderate, and flexible cancellation policies show no significant pricing differentiation. Rentals don't appear to charge more for cancellation flexibility.
- **Policy optimization unnecessary:** Booking policies appear to be operational rather than pricing strategy tools.

## Business Implications

### For Current and Prospective Hosts

- Since traditional differentiators (location, room type, age) provide minimal pricing advantage, **hosts should prioritize service quality, guest experience, and operational efficiency.**
- Attempting to charge premiums based on property features or location is unlikely to succeed; **competitive market pricing is essential.**
- **Property acquisition decisions should focus on operational ease, maintenance costs, and regulatory compliance** rather than assumed pricing premiums.

## For Platform Strategy (Airbnb)

- The price uniformity in this analysis suggests that NYC represents a mature market. Thus, platform growth may need to come from service differentiation rather than simple market expansion pushes.

# Part II: NYC Airbnb Reviews Key Findings Summary

## Executive Summary

This comprehensive analysis of NYC Airbnb pricing data examined the relationship between multiple features of Airbnb rental and corresponding review metrics, namely the number of reviews and ratings of these rentals. Through A/B testing methodology and statistical analysis of over 100,000 listings, the project showed that most conventional host signals and property attributes exert minimal influence on reviews. Rather, review volume and sentiment is shaped more by operational factors (e.g., host portfolio size, rental room type, and stay requirements).

## Key Findings

### Host Impact on Reviews

- **Host portfolio size shapes reviews in unique ways:**
  - ◆ Professional hosts with larger portfolios receive slightly higher average review ratings (+4.12%).
  - ◆ However, casual hosts receive significantly more reviews per listing (+17.56%), contradicting the initial hypothesis.
- **No effect of host verification status:** Professional hosts (5+ properties) vs. casual hosts (1-2 properties) show minimal review differences in terms of review ratings or volume.

### Property Features Impact on Reviews

#### Room Type Analysis

- **No significant effect of room type on review ratings:** None of the room types demonstrated significantly different review ratings compared to the other types.
- **Room type only impacted review volume for hotel rooms:** Hotel rooms attained 3–4 times more reviews than other room types. Yet, the remaining room types (i.e., shared rooms, private rooms, and entire homes) show no significant differences in terms of the number of reviews.
- Only hotel-style listings drive an increase in reviews, highlighting a distinct market segment within Airbnb.

#### Property age

- **No effect of property age:** No significant differences in ratings or review counts between older and newer properties.

## Policy Impact on Reviews

### Policy Impact Analysis

- **No effect of instant booking:** No significant increases in ratings or review counts premium observed for instant bookable properties.
- **Cancellation policy irrelevant:** Strict, moderate, and flexible cancellation policies show no significant review differentiation.
- **Minimum stay requirements hurt the number of reviews but do not affect the rating of reviews:**
  - ◆ There was no significant relationship ( $p > 0.05$ ) between minimum stay requirements and review ratings.
  - ◆ However, there **was** a significant **negative** association ( $p < 0.001$ ) between minimum stay requirements and review counts, where **longer stay requirements were associated with fewer reviews**.
  - ◆ It is important to note, though, that the effect here was small ( $r = -0.0501$ ).

## Business Implications

### For Current and Prospective Hosts

- Since traditional differentiators (location, room type, age) provide minimal review advantage, **hosts should prioritize service quality, guest experience, and operational efficiency.**
- Smaller hosts may benefit from higher review counts, improving visibility despite limited portfolios.
- **Avoid long minimum stay requirements to maintain review flow and visibility.**

### For Platform Strategy (Airbnb)

- Hotel-style listings stand out for generating guest engagement, suggesting value in promoting this segment.
- Policy-based differentiators such as instant booking and cancellation flexibility do not impact pricing, so platform growth should emphasize service quality and trust.

## Overall Study Limitations and Methodology Notes

This analysis utilized cross-sectional data representing a snapshot of the NYC Airbnb market. The findings reflect market conditions at the time of data collection and may not capture seasonal variations or temporal trends. All statistical analyses employed rigorous A/B testing methodology with sample sizes exceeding 30,000 listings per comparison group, ensuring statistical validity of results. The absence of significant pricing differentials across traditional real estate factors represents a key finding about market efficiency rather than a limitation of the analysis.

## Data Source Acknowledgment

This project uses the *New York City Airbnb Data Cleaning* dataset by Arian Azmoudeh, available on Kaggle (<https://www.kaggle.com/datasets/arianazmoudeh/new-york-city-airbnb-data-cleaning>). The dataset is provided under the Open Database License (ODbL v1.0). The original data was sourced from the Airbnb Inside project (<http://insideairbnb.com/explore/>).