



## **MARKET ENTRY DECISION ANALYSIS FOR AIRBNB: A QUANTITATIVE APPROACH**

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### **ABSTRACT:**

Through a quantitative examination of publicly available Airbnb listing data in New York and San Francisco as well as a competitor analysis, this project investigates the possible elements that impact Airbnb's decision-making about market entry strategies in new markets. Our goal is to develop a framework that would enable Airbnb to make data-driven judgments about market entry by looking at factors like pricing, availability, amount of reviews, and guest attitude. We determine the key factors influencing pricing using sentiment and regression analysis, and we offer suggestions on how Airbnb might modify its approach in response to shifting market conditions. In order to comprehend the competitive environment and guide Airbnb's strategic posture, a thorough competitor study will also be conducted.

**KEYWORDS:** Airbnb, Market Entry, Pricing Strategy, Sentiment Analysis, Regression Analysis

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## 1. INTRODUCTION

Airbnb is a global leader in providing a marketplace for short-term rentals, connecting tourists with homeowners worldwide. Knowing the elements that influence listing prices is essential for strategic planning as Airbnb explores entering new countries. By examining data from two current markets—New York and San Francisco—this research is set up to give Airbnb a clear framework for judgments about market entry. In order to assist Airbnb in making data-driven decisions, it contains an explanation of the methodology, data analysis results, and managerial and practical implications.

## 2. PROJECT OBJECTIVE

The goal of this study is to discover the important characteristics that influence Airbnb's pricing approach using New York and San Francisco as case studies. By analyzing how factors such as availability, guest ratings, and attitude affect listing prices, we hope to create a framework that Airbnb can use in new regions to optimize pricing and gain a competitive advantage. Exploring this topic will allow Airbnb to make data-driven market entry decisions, lowering uncertainty and increasing profitability.

## 3. DATA/ PROBLEM ANALYTICS

### 3.1 DATA

Our analysis relies on publicly available data source websites such as Hotels.com, SF gov, NYC gov, and Inside Airbnb, which include pricing, occupancy, reviews, and guest comments for New York and San Francisco listings. In order to provide a comparative context for Airbnb's existence, we also used data from OpenStreetMap to access the competition density and other competitor accommodations in these areas. These combined data sources allowed for a comprehensive study of both internal and external elements influencing Airbnb's decision-making process.

### 3.2 METHODS

Several quantitative techniques were used in order to comprehend Airbnb's pricing strategy and competitive stance. First, we ran regression analysis to see which characteristics (availability, reviews, sentiment) have a significant impact on listing prices. Second, we used sentiment analysis on guest reviews to determine the impact of consumer happiness on pricing. Finally, in order to place Airbnb's pricing approach in the perspective of the larger market, we integrated competitor analysis by evaluating rival density and average hotel price. When combined, these techniques offer a comprehensive framework that Airbnb may utilize to guide its market entry plans.

### 3.3 DATA/ PROBLEM ANALYTICS

This section examines the internal and external factors that affect Airbnb's pricing and competitiveness in New York and San Francisco. In order to examine external pressures from hotels, we included competition density, pricing, and sentiment comparisons; for internal factors, we used regression and sentiment analysis. Each analysis is supported by the appropriate graphics.

#### 3.3.1 NEW YORK ANALYSIS

##### Regression Analysis

We performed multiple linear regression with price as the dependent variable and availability\_365, number\_of\_reviews, review\_scores\_rating, and sentiment as predictors. As for Availability, a favorable price impact that is statistically significant. For every extra day of availability, the price goes up by about \$0.20. In terms of the quantity of reviews, Positive and statistically significant; the price rises by roughly \$0.08 for every extra review. In relation to sentiment, negative effect on price, showing that a unit rise

in negative sentiment lowers price by \$0.02 and that bad reviews reduce pricing power. Our regression analysis in New York demonstrates that positive ratings and increased availability are essential for raising listing prices, highlighting the significance of customer involvement and optimizing availability.

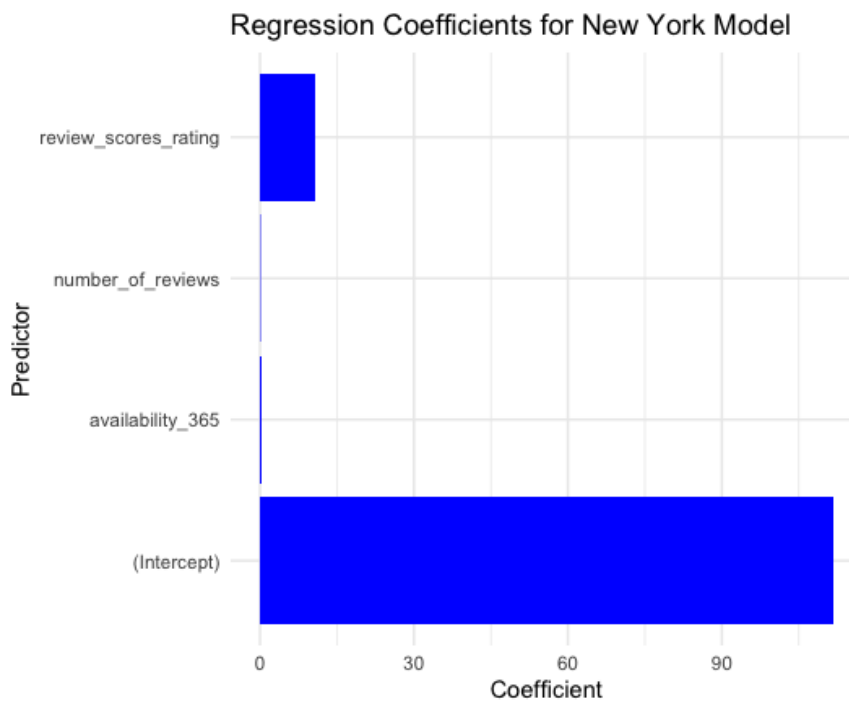


Fig 1: Plot of regression coefficients in New York model

### Sentiment Analysis

Airbnb listings in New York had an average sentiment score of -1192, indicating usually lower levels of guest satisfaction. In contrast, New York hotels had an average sentiment score of 56, indicating that hotels are more satisfied with their guests than Airbnb. Airbnb's sentiment score of -1192 indicates that customers may be less satisfied with their stays than hotel guests, limiting Airbnb's ability to charge premium rates in New York.

### Sentiment Score Comparison in New York

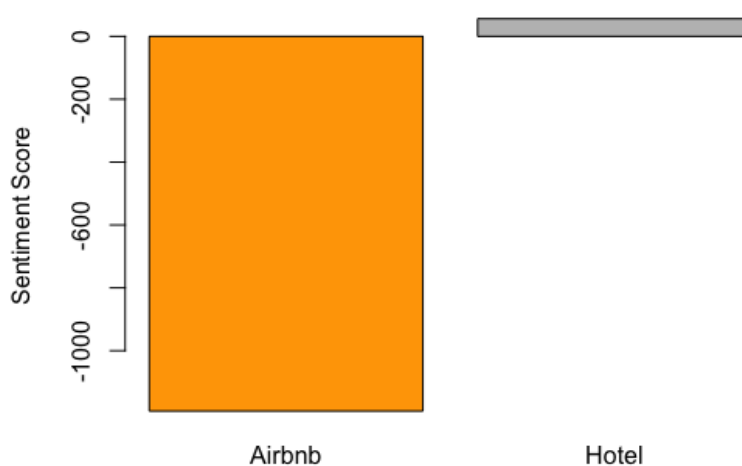


Fig 2: Visualization of sentiment score comparison in New York

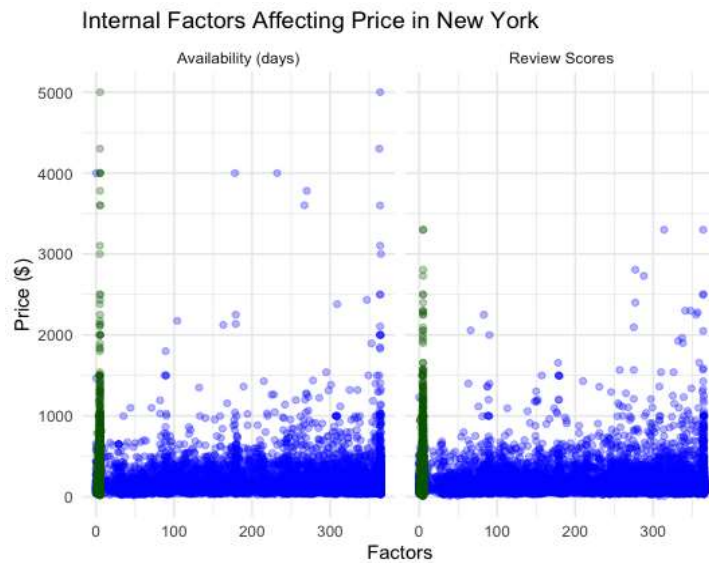


Fig 3: Plot visualizing the internal factors affecting price in NYC

### Competitor Analysis

The competitor density in New York was calculated to be 15.84%, showing that Airbnb operates in a less competitive climate than in San Francisco. In New York, the average cost of an Airbnb is \$232.89, which is \$68.72 less than the average cost of a hotel (\$301.61). Given that hotels have a 26.86% higher occupancy rate than Airbnb, it's possible that the latter is better at meeting demand. Although it still has issues with guest happiness and occupancy in comparison to hotels, Airbnb offers itself as a cheaper option in New York based on its lower pricing and higher competitor density.



Fig 4: Plot comparing density and prices in NYC

### 3.3.2 SAN FRANCISCO ANALYSIS

#### Regression Analysis

Multicollinearity problems prevented a reliable estimation of predictor influences in the regression model that was attempted for San Francisco. Given the intricacy of the San Francisco market and the

greater number of competitors, Airbnb's pricing strategy may become more challenging. We were unable to separate the effects of particular predictors due to multicollinearity, which may indicate that outside variables or governmental regulations have a significant impact on Airbnb's price in San Francisco.

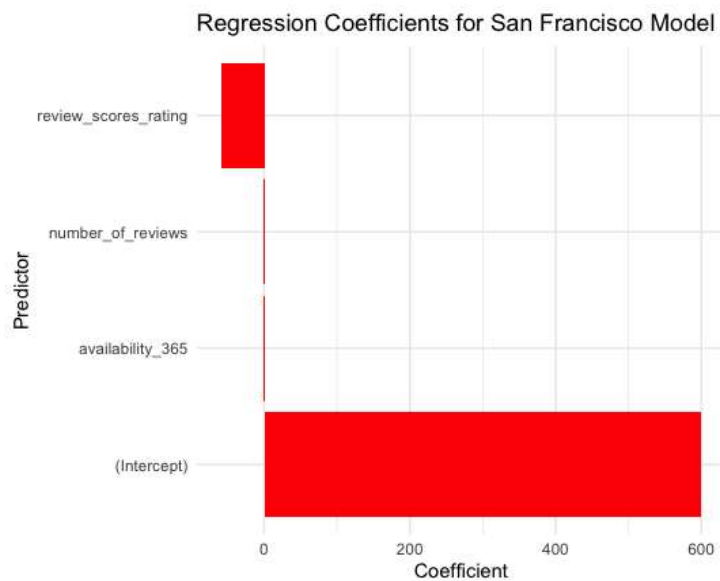


Fig 5: Plot of regression coefficients of San Francisco model

### Sentiment Score Analysis

Airbnb properties in San Francisco had an average sentiment score of -787. Hotels, on the other hand, earned a sentiment score of 47.6, which suggests that visitors are more satisfied. In addition to having a sentiment score of -787, San Francisco Airbnb listings have worse customer satisfaction ratings than hotels, which affects their capacity to maintain premium pricing.

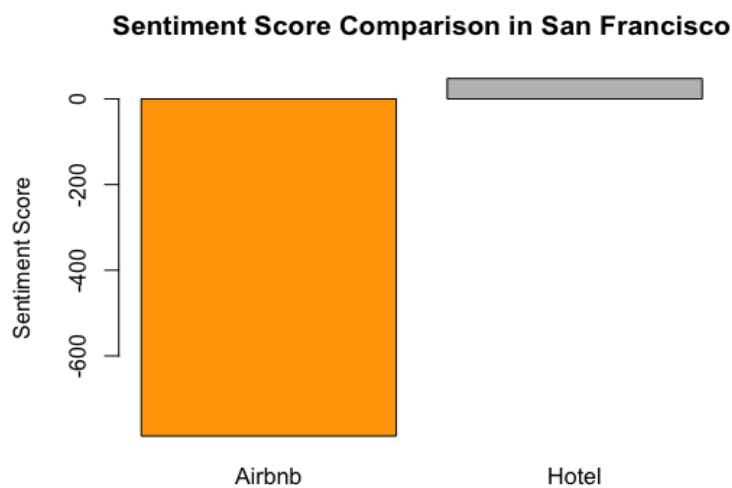


Fig 6: Visualization of sentiment score comparison in San Francisco

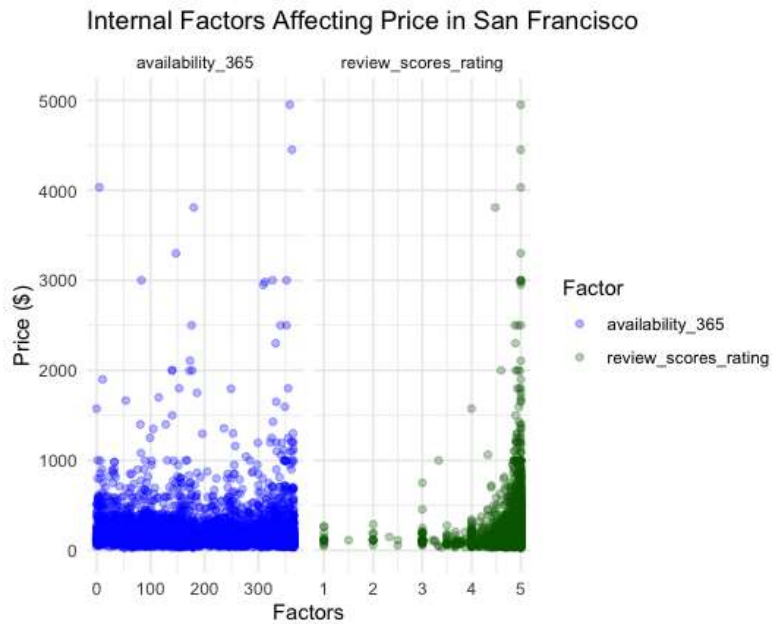


Fig 7: Plot visualizing the internal factors affecting price in SF

### Competitor Analysis

San Francisco's competitor density, at 38.75%, is far higher than New York's, suggesting a competitive market with fierce hotel competition. In San Francisco, the average cost of an Airbnb is \$239.67, which is \$69.67 more than the average cost of a hotel, which is \$170. Compared to hotels, Airbnb's occupancy rate is 34.78% lower, indicating an excess of supply over demand. In San Francisco, Airbnb is positioned as a high-end substitute because to its premium pricing approach. Lower occupancy rates and a high competitor density, however, suggest that Airbnb needs to set itself apart from lodging establishments in order to be competitive.

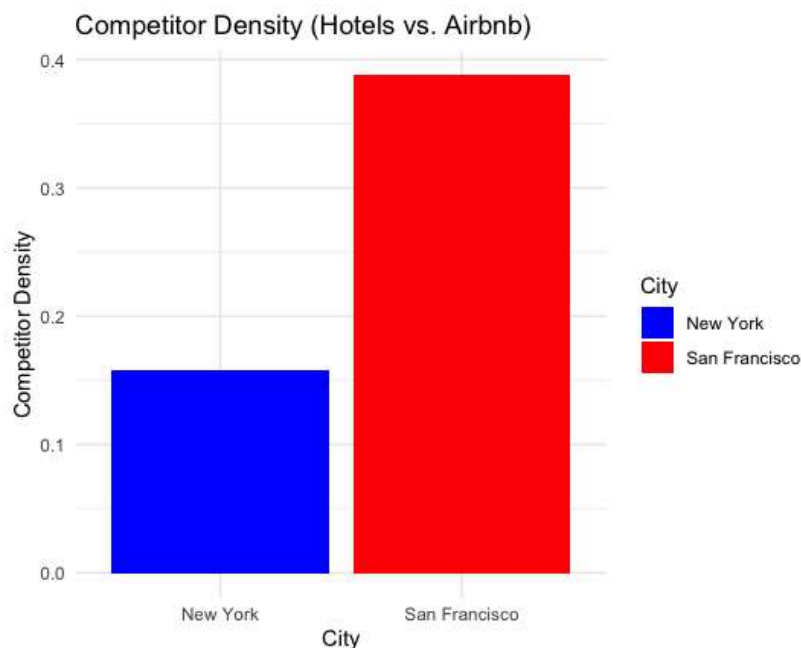


Fig 8: Bar plot of competitor densities



Fig 4: Plot comparing density and prices in SF

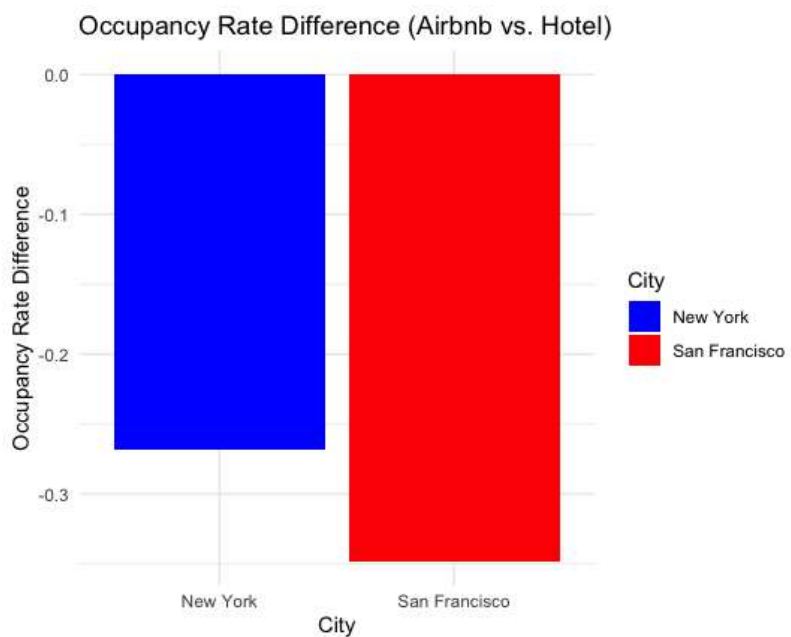


Fig 5: Bar plot visualization of occupancy rate differences

#### 4. FINDINGS/ CONCLUSIONS

This section examines important findings from Airbnb's performance metrics, with an emphasis on visitor satisfaction, affordability, and the influence of availability and ratings on possible prices. We may better comprehend Airbnb's competitive posture in relation to conventional hotels by looking at these characteristics. The following conclusions highlight Airbnb's advantages and shortcomings, laying the groundwork for focused tactics in New York and San Francisco.

#### **4.1. NEW YORK FINDINGS**

Airbnb's competitive advantage is its pricing; on average, its rates are about \$68.72 less than those of conventional hotels, which further solidifies its standing as a low-cost vacation option. The significance of availability and review volume is further shown by our data; listings with greater availability and more reviews often yield better price results, suggesting that these elements directly increase Airbnb's potential revenue. However, with an average sentiment score of -1192, sentiment research shows that Airbnb has a serious problem with visitor happiness. In order to better compete with hotels and strengthen its position in the market, Airbnb may need to improve guest satisfaction.

#### **4.2 SAN FRANCISCO FINDINGS**

San Francisco's market presents both opportunities and challenges for Airbnb. The city's high competitor density, with a rate of 38.75%, points to considerable market saturation. Airbnb has adopted a premium pricing strategy in this environment, with listings priced approximately \$69.67 higher than hotels, positioning itself as a luxury option. However, this strategy faces potential risks, as Airbnb's sentiment score of -787 and a lower occupancy rate than hotels suggest that guest satisfaction and booking frequency may be lacking. For Airbnb's premium pricing to be sustainable, improvements in guest experience and occupancy will be essential.

### **5. MANAGERIAL IMPLICATIONS**

Following these conclusions, the following strategic recommendations are made for Airbnb's market entry and positioning in San Francisco and New York.

For New York,

We recommend that Airbnb prioritize three key projects in order to increase its market position. First, by keeping prices competitive in important markets, Airbnb can further solidify its reputation as an affordable hotel substitute. Second, give priority to customer service improvements to raise guest happiness, as this may improve Airbnb's sentiment score and raise its pricing potential. Lastly, include tools that incentivize visitors to write reviews because it has been demonstrated that listings with more reviews have better price results. When combined, these tactics will help Airbnb expand and strengthen its position in the market.

For San Francisco,

In order to increase Airbnb's market competitiveness, we suggest a number of crucial tactics. First, use a differentiation strategy that highlights premium amenities or unique experiences to draw in a discerning audience and support Airbnb's higher price point. Second, to increase occupancy rates and guarantee more steady revenue flow, think about making calculated price modifications during times of low demand. Last but not least, give priority to improving the client experience because doing so will help you compete with hotels, which now have a sentiment score of 47.6. Airbnb can improve its market presence and increase visitor loyalty by concentrating on these regions.

### **6. IDEA SHARING**

We were able to observe how statistical analysis may produce practical business insights by working with real Airbnb data, especially when it comes to comprehending consumer behavior and competitive positioning. The significance of positioning and distinctiveness in a crowded market like San Francisco was further highlighted by the inclusion of competition data, such as hotel density and pricing. This project has demonstrated that business statistics are a crucial instrument in contemporary decision-



making since they may not only shed light on important factors influencing pricing but also offer a framework for market entry tactics. By presenting these concepts, we intend to draw attention to how important data-driven insights are in forming strategic business plans.

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## 8. APPENDIX

DATE	TASK
October 9, 2024	Project Group Formation
October 23, 2024	Project Proposal Presentation
October 29, 2024	Data Collection and Initial Analysis
November 5, 2024	Model Building and Competitor Analysis
November 18, 2024	Data Visualization and Results Summary
November 25, 2024	Report and Presentation Preparation
December 4, 2024	Project Submission