

# Market Entry Strategy

## Using Game Theory & Product Analytics

### 1. Introduction

Urban mobility platforms operate in highly competitive markets where pricing, timing, and incentives directly influence user adoption and long-term profitability. This project studies a hypothetical **second platform entering the NYC ride-hailing market**, using historical taxi data as a proxy for incumbent behavior.

The objective is to design a **sustainable entry strategy** that balances customer acquisition with strategic stability.

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### 2. Dataset

#### NYC Open Taxi Trip Data

- Pickup timestamps
- Fare amounts
- Trip frequency

The dataset represents **Platform A (incumbent)** as the market benchmark.

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### 3. Exploratory Data Analysis

#### Demand Patterns

- Demand varies strongly by hour
- Peak hours show high but competitive pricing
- Off-peak hours present entry opportunities

#### Pricing Benchmark

- Average fare used as baseline
  - Hourly fare stability suggests price sensitivity
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## 4. Product Strategy Framework

### Product Lifecycle Application

#### Introduction Phase

- Enter during off-peak hours
- Offer moderate discounts
- Use subsidies strategically

#### Growth Phase

- Reduce subsidies
- Expand operating hours
- Focus on retention

#### Maturity Phase

- Feature differentiation
  - Loyalty programs
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## 5. Game Theory Modeling

### Strategic Interaction

- Platforms compete on price
- Excessive discounts resemble a Prisoner's Dilemma
- Mutual discounting leads to losses for both

### Nash Equilibrium Insight

- Stable strategies occur at **moderate discounts**
  - Extreme pricing is a dominated strategy
  - Retaliation risk increases with aggressive entry
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## 6. Profit & Demand Modeling

A demand elasticity model links price discounts to demand capture.

Profit is computed as:

$$\text{Profit} = (\text{Price} \times \text{Demand}) - (\text{Subsidy} \times \text{Demand})$$

This allows simulation of:

- Price wars
  - Sustainable pricing
  - Subsidy burn rates
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## 7. Dashboard & Decision Support

An interactive Streamlit dashboard allows:

- Executives to test strategies
- Analysts to visualize outcomes
- Product teams to align decisions with lifecycle goals

The dashboard dynamically updates:

- Demand
  - Profit
  - Strategic warnings
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## 8. Key Findings

- Data-driven moderation beats aggressive competition
  - Game theory prevents destructive pricing decisions
  - Product management principles align naturally with strategic analytics
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## 9. Conclusion

This project demonstrates how **real-world data**, when combined with **game theory and product strategy**, can guide robust market entry decisions. The approach is transferable to any two-sided platform market.

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