PROGRAMMING FINAL PROJECT

Airbnb Simulation & Seasonal Analysis

Xavi Cuyas, Guillermo Comerma, Emilio Palay & Arnau Villegas

Part 1: Simulation

How do different bidding rules shape the evolution of the Airbnb market?

Model & Method

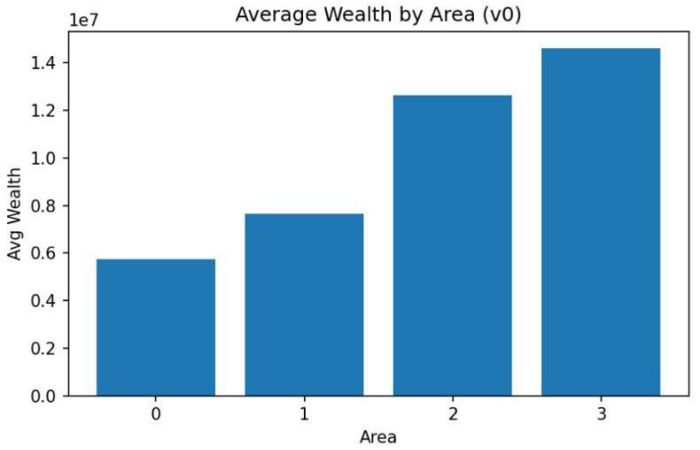
-Agent-based model with three main entities: City, Hosts, and Places.
-Each month, hosts earn profit and use it to bid for reachable listings.
-Ownership updates depend on profit, distance, and bidding rule.
-Simulated multiple months under two behavioural rules.

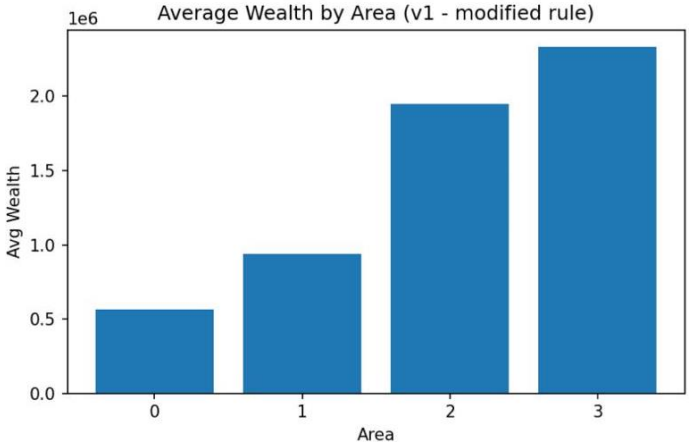
Bidding rules

V0 = Aggressive
-Hosts Invest 100% of profits into bidding
V1= Conservative
-Hosts invest 70% of profits leading to a slower expansion

Conclusion

-Bidding strategy strongly affects long-term market structure.
-v0 creates fast concentration & v1 yields more balanced growth.





Part 2: Seasonal Analysis

How does seasonal availability vary across time in Barcelona?

Data & Method

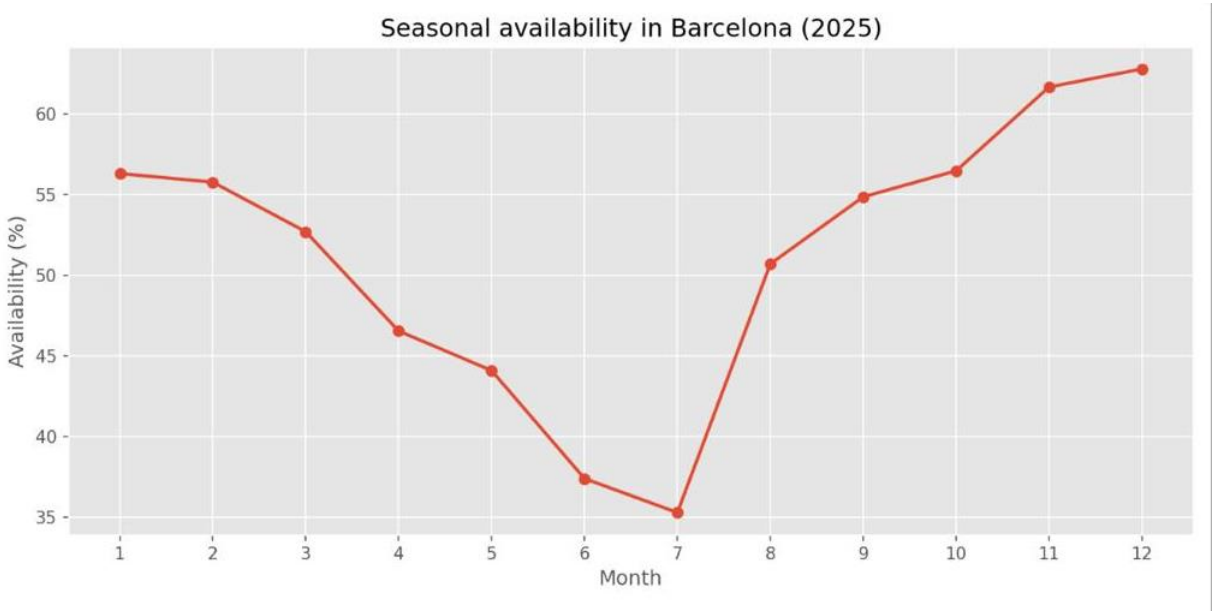
-Dataset: Inside Airbnb, **Barcelona calendar (June 2025)**.
-Cleaned dates and availability values.
-Computed average monthly availability rate.

Findings

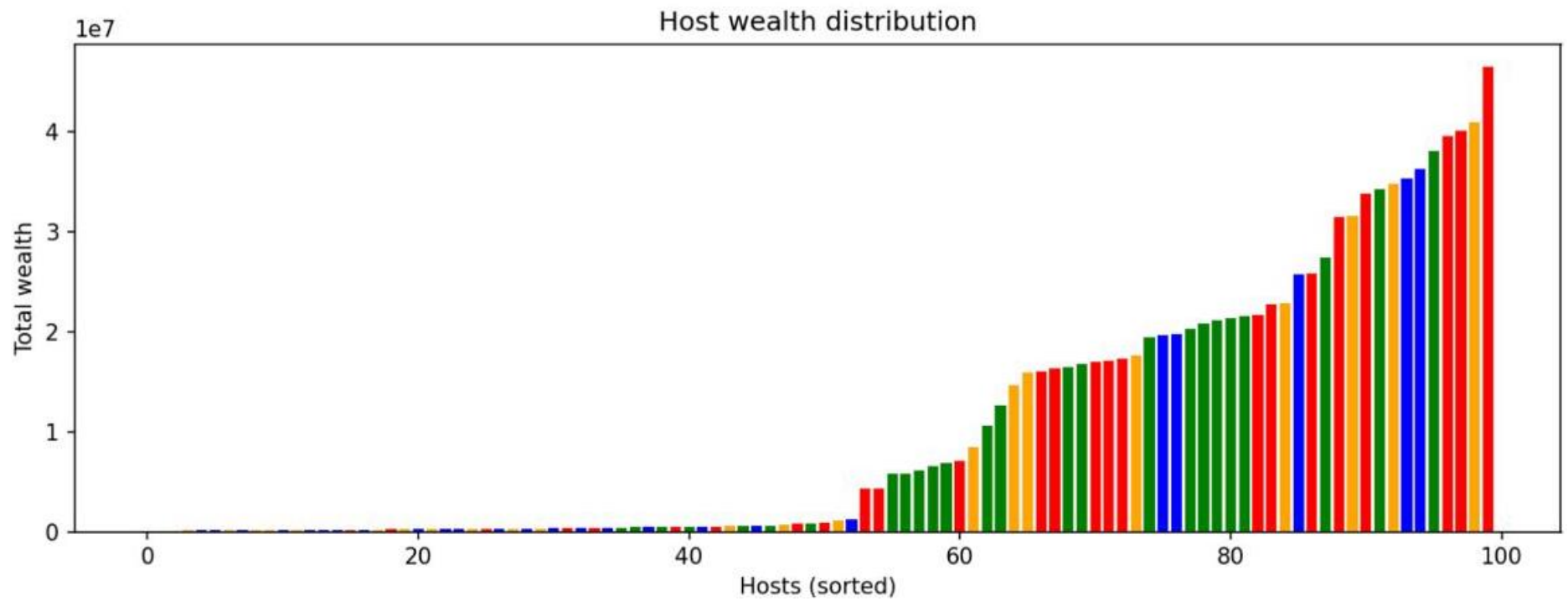
•Strong seasonal pattern across months.
•Lowest availability in July (peak tourism).
•Higher availability across autumn and winter.

Conclusion

•Our monthly availability curve confirms the expected demand seasonality.



ANNEX


Host wealth distribution
1e7
Total wealth
0
1
2
3
4
0
20
40
60
80
100
Hosts (sorted)