Short-term Rentals: Pricing Strategy of Sharing Platforms and Its Implications

In recent years, we have seen the emergence of a number of platforms that facilitate short-term peer-to-peer rentals of housing assets, e.g., AirBnB, as part of the bigger shared services movement. Such platforms differ in how they decide on what price to charge their customers. Specifically, in a platform like AirBnB, the price is effectively set based on a market mechanism that matches supply and demand; the platform itself is a passive player that takes a portion of the revenue. But, some other platforms like casadell.com, corporatestays.com, etc. take a more active role by determining the price on “behalf” of the asset owners that maximizes their profits based on them being paid a share of the price. In this paper, our goal is to understand the implications of this difference in pricing strategy for the direct and indirect stakeholders of the platform. To address the research issue, we develop a modeling framework abstracting a platform-based peer-to-peer short-term property rental system. Our system consists of a two-sided platform with three direct stakeholders, (i) owners on one side with housing assets (e.g., apartment or room) available for customers to rent; (ii) customers (e.g., tourists) on the other side who require such assets for short-term stay; and (iii) the platform acting as the mediator. The indirect stakeholders are those interested in long-term rentals but are affected by the capacity taken up by short-term rentals.

In our framework, utility-maximizing owners first decide between two options: i) join the sharing platform for short-term rentals of their housing assets where they face risks about rental price and occupancy; or ii) rent out the assets through some other channel, possibly for long-term, at a risk-free rate. Subsequently, the uncertainty about customer demand for short-term rentals is resolved. Each customer then chooses between two channels by comparing their utilities: i) rent a non-platform option (e.g., hotel); or ii) use the platform for rentals. Customer utility obviously includes the value they receive from renting and the relevant price to pay. In addition, we assume that customers incur a hassle cost when they opt for the platform channel and they are heterogeneous
with respect to this cost. Finally, all transactions between customers and owners joining the sharing system are mediated by the platform provider. The focus of our work is how the rental price is determined by the platform.

We consider two schemes: i) In the market-based scheme, the price is determined “naturally” based on matching the supply from owners with customer demand as much as possible; ii) in the profit-based scheme, the platform “deliberately” determines the price on behalf of the owners to maximize the total revenue. Under both schemes, the platform receives the same fixed share of the price. We fully characterize the equilibrium in both cases for: i) what prices are paid by the customers depending on the state of demand; ii) how many owners decide to list their assets for rentals on the platform (termed availability); and iii) how many listed assets are rented by customers who join the platform (termed occupancy rate = \( \min\{1, \text{demand/supply}\} \)).

We find that there are two factors that play a big role in any pricing scheme: i) price gap: the gap between the minimum amount that the platform can charge (that will allow it to attract all customers) and the risk-free return that the owners can obtain by joining the non-platform channel; and ii) quantity risk: driven by the volatility in demand. A large price gap incentivizes more owners to list on the platform and so increases availability. Indeed, we find that all owners may choose to participate in the sharing platform even though the occupancy rate is guaranteed to be less than 100%. But, this glut of supply in the platform channel reduces capacity available for long-term renting. This phenomenon of “crowding out” is one of the banes of short-term rental platforms that have been of concern for regulators in a lot of cities, especially where the long-term rents are low. Higher availability also causes concern about occupancy for the owners, especially when the demand volatility is high. Higher price gap enables the platform to charge higher prices to customers, but higher availability puts a dampening effect on prices. On the other hand, a higher quantity risk dis-incentivizes owners from joining the platform and so reduces availability, and
hence, the “crowding out” phenomenon. Higher quantity risk also, in general, increases prices and, so, in spite of lower availability, results in lower occupancy.

Although both pricing schemes are affected by price gap and quantity risk, there is quite a bit of contrast in the extent of the effects. So, it turns out that there are significant differences in equilibrium decisions and how they affect the stakeholders between the two as discussed below.

**Decisions:** In general, the *profit-based (PB) mechanism results in higher prices* for platform customers. Specifically, while in the market-based (MB) scheme the platform oftentimes charges the minimum possible price to attract all customers, this is done much less frequently in PB. Higher prices in *PB attract more owners* and so the availability tends to be higher with that scheme. This means that the “crowding out” of the long-term rental market phenomenon is more severe in the case of PB scheme. But, since PB oftentimes deliberately keep capacity unrented in order to keep the prices at a higher level, *the occupancy rate turns out higher with the MB scheme.*

**Effects on stakeholders:** It is obvious that the platform prefers the PB scheme. For the owners, they receive higher prices with PB schemes, but higher chances of occupancy with MB scheme. Overall, *owners tend to prefer the PB scheme.* On the other hand, *customers prefer the MB scheme* since they are charged lower prices under that scheme, although PB guarantees higher availability. Our numerical analysis suggests that *direct stakeholders as a whole benefit from the MB scheme.*

We end our note with two points. First, there is not much difference between the two pricing schemes when the price in the hotel channel is large since in that case under both pricing schemes the platform can attract all customers by charging (relatively) high prices. On the other hand, the contrasts between them become quite significant when the price in the long-term rental channel is small and/or when the quantity risk is high. Second, our basic model framework assumes the price in the hotel channel to be exogenous. An extension with endogenous hotel price shows our insights are quite robust except that such a competitive scenario reduces the expected price in the platform channel and results in lower owner participation in the platform (and hence less “crowding out”).