Paraphrase of

"Optimal Pricing with speculators and strategic Consumers"

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Many items are available only in limited quantities and sometimes the demand for these products is more than what is supplied which gives an opportunity to the speculators to enter the market and earn profit.

The paper takes into consideration that due to limited supply by the monopolist (restricted capacity constraints), speculators enter the market as there is a difference between the price of the monopolist and the price consumers are ready to pay due to shortage. In such a scenario the equilibrium price of seller and speculator is evaluated to analyse the long run capacity decisions of the seller.

The model is as follows –

There are three agents in the market –

1. Monopolist (seller-supply side),

2. Consumers (Demand side),

3. Speculators have no use for the product.

There are two time periods, period 1 and period 2. Seller has a fixed quantity of goods i.e K which he can sell in both the time periods. In the first period, there are a fixed number of consumers in the market which are divided into strategic, myopic and low demand consumers.

Strategic consumers have a high valuation for the product i.e Vh but will only buy the product only if the price is sufficiently attractive according to their valuation, otherwise they wait for period 2. Myopic consumers will purchase in period 1 only if price does not exceed their valuation otherwise they'll leave the market. Low demand consumers have a low valuation for the product i.e VL hence they wait for the seller to drop the prices. So in time period 1 :

- Seller has k units out of total output.
- Speculator buys S units of output.
- Random demand X is realized and αW myopic consumers buy,W2 strategic consumers wait for next period.

Equilibrium analysis-

- Finding 1-

  Using backward induction method price charged by the seller and speculator is calculated,

  So starting from the resale market i.e in period 2 where speculators resell the product and both seller and speculators supply the commodity .

After selling some units in period 1 seller's remaining capacity is K2, and speculators has S units(purchased in period 1)which he wants to sell, so in period 2 Total supply = K2+S, some new consumers X enter the market and strategic consumers W2 who didn't buy in period 1 are present so in period 1 Total demand = X+W2.

As seller has a fixed price in both time periods resale market determines the price of speculators (ṕ)

Which is calculated as follows

$$\begin{cases} VL & \text{if} \quad W2+S < S \text{ (low demand situation)} \\ P & \text{if} \quad S < W2+X < S+K2 \text{ (moderate demand)} \\ Vh & \text{if} \quad W2+X > S+K2 \text{ (high demand situation)} \end{cases}$$

Thus the expected price of the speculator can be written as follows –

$$E(\acute{p}) = VL * F(S-W2) + p * Pr(S-W2 < X < K-W) + Vh * F(K-W)$$

this is because W2+S<S in the first equation is equivalent to X<S-W2 and W2+X>S+K2 in the last is equivalent to X>K-W because K2 = K-S-W+W2 where K2 is the remaining units of seller as out of total K units he has sold S to the speculators, W- W2 represents the total random demand and myopic consumers who buy in period 1 ,W2 represents the strategic consumers who didn't buy in period 1 but will buy in period 2.

When demand is low speculators undercut each other and drive the resale price down to VL and as the number of speculators rise in the market the expected price of the commodity falls.

In the primary market i.e in period 1 the seller chooses a price p≤Vh which decides whether speculators will enter the market or not as if the price p is too high speculators seeing that there is no profit to sell in the resale market will not enter, also strategic consumers decide whether to buy at this price in period 1 or wait for period 2 , which in turns affects the demand and supply in period 2 (resale market). As in period 2 both seller and speculator supply the commodity at different or same prices, it is profitable for the strategic consumers to wait for period 2 and not buy immediately.

The entry of speculators is determined by the seller's decision as if the seller wants to share some of his risk of unsold inventory he will keep the price low which acts as incentive for speculators to enter the market, otherwise he can keep the price sufficiently large to completely eliminate speculators from the market.

- <u>Finding 2-</u>

  The seller or the monopolist faces the following 2 conditions-

Either he can exercise dynamic pricing (different prices in two time periods) instead of keeping the same price level and shutting the entrance of speculators in the market by keeping price in period 1 high in which only some random demand will be realised and then lowering the price in period 2 so that strategic consumers who didn't buy in period1 can buy in period 2

Or he can keep the price low in period 1 and let speculators enter the market where his risk of unsold inventory is shared by the speculators as when the price is low in period 1 speculators will purchase the goods in lieu of profits.

It was observed that seller's profit in situation 2 is greater than situation 1 and seller by keeping the same price level in both the periods can take advantage of dynamic pricing of the speculators which works as a proxy for sellers.

Finding 3-

Speculators behaviour also influences whether firm would like to make long run investment decisions or not as, if the seller will expand his capacity it will smoothen the supply side resulting in equilibrium as supply will be able to match the demand shutting the emergence of speculators in the market, so the expansion of capacity will not add value to the firm and seller will be less inclined to make capacity investment even if it's free.

Conclusion

The paper tries to formulate and quantify the effect of entry of speculators in the market, and one of the main conclusion is that speculative behaviour may enhance profits , as speculators helps firm in 2 ways - by sharing the burden of unsold inventory when demand is low and in case of high demand they extract the consumer surplus form the market which indirectly increases the sales of the firm as there is sometimes a huge difference between the price charged by seller and speculator so strategic consumers even with high valuation try to buy from a low priced seller first and then moves to other if there is shortage in supply. another conclusion shows that the entry of speculators is determined by price charged by the seller, also speculative behaviour acts as a proxy for dynamic pricing as, if the seller charges different price in period 2 speculators acts as competitor and seller has no option but to take them out of the market but if speculator is there he will add extra profit at lower price to the seller as he will buy more to sell in the resale market.