The Flat Rental Puzzle (ms 12663)

The paper presents a puzzle: how come car rental rates do not vary with the age or odometer of the rental cars? The authors use rich data from one particular car rental company to estimate (in a separate paper) a complex dynamic model of car rentals and replacement. They then use this model to simulate an alternative scenario in which the company holds their cars for longer periods and offers a discount for individuals who rent older cars. The authors show that even when they make conservative assumptions about individual preferences for newness and for the increase in maintenance costs when cars age, the company could become much more profitable by adopting this alternative policy. That is, the puzzle is solved by the claim that this company (and presumably others) simply gets it wrong.

Comments

1. While I am pretty sure that the basic facts are correct, I wish the authors presented them more carefully. For example, the claimed facts about how maintenance costs, resale price, and even rental rates vary with age or odometer could be driven by selection. It seems natural to think that the company sells a car when it shows the first sign of mechanical or other "issues": scratches, higher than average maintenance costs, etc. If this is true, we would expect to see flat cross-sectional relationship between age/odometer to any of the variables above, even though the hazard rate of selling a car would be increasing, so actual value to the company wouldn't be flat anymore.

2. Do I believe that firms' behavior does not always match optimal behavior, as prescribed by the model we try to write down for firms? Yes. But this paper doesn't help me understand why or when firms are less likely to "obey" our models. The obvious horse race in such a setting could be between two hypotheses: do the firms have problem optimizing or do the firms solve (optimally) a different model from the one prescribed to them? It seems that the current paper assumes the answer by postulating a particular model for firms, and challenges the readers to come up with alternatives. I think the authors should be the ones exploring these alternatives, and explaining why they are unlikely to resolve the puzzle.

3. I wasn't entirely sure what the exact puzzle is. Is it only about the flat rental rate (as the title suggests)? Or is it also about the suboptimal car replacement policy? Or may be car replacement is optimal given the flat rental rates and is only suboptimal if rental rates were allowed to vary with car age? Focusing on the pricing puzzle is interesting, although not entirely new. There is plenty of evidence that firms are somewhat reluctant to have as much price variation as an economic textbook pricing model would suggest (e.g., Levitt's bagels paper the authors mention). I think that there is value to identifying why, but I'm not sure that the setting the authors analyze best suites for this exercise: it is a fairly complex setting, with a range of products, prices, and customers. A lot of price variation is already in place (across classes of cars, for different terms of rentals, etc.), so attributing all the difference between the model's prediction and the firm's behavior to suboptimal behavior by the firm is a bit iffy. Just to give one example, many of the rental agreements are booked ahead of time, with car availability (and clearly mileage) yet unknown at the time of booking, so which price should the company quote to the individual at the time of booking? The paper is completely silent about what's exactly going on in the setting it tries to model, and what other constraints the firm is facing that could lead it to not vary rental rates by car age.

4. Some random thoughts:

a. The main puzzle presented by the authors could be at least partially resolved if renters sorted across companies, instead of across cars within a company. For example, if renters who value newness less would rent from *Rent a Wreck*, then perhaps even a deep discount for older cars cannot attract new renters profitably.
b. Why do we expect the renters to care about mileage or age? I never look at the mileage or age of cars I rent. Renters would probably mainly care about the probability of a breakdown, which, for the type of cars observed within the data, may not be that correlated with age/odometer, for exactly the same reasons pointed out at my point 1 above.
c. To what extent would the pricing experiment the authors mention have different short-run and long-run effect? Perhaps firm's reputation would be hurt due to more frequent breakdowns, perhaps greater marketing expenditure is needed to attract the different population of buyers, and perhaps more fixed costs expenses are needed to deal with older cars.

5. Much of the estimation used in this paper is done in a separate paper. First, I'd like to see more details of it in the current paper (perhaps in an appendix). Second, I'd like to understand under which conditions the policy experiment the authors run is correct. For example, my understanding (without carefully reading the other paper) is that cars are modeled as switching between four states (long and short term rentals, and waiting in the lot after each). I have two related concerns. First, are these states random? Wouldn't the very same company that decides about replacement and pricing also decide how and when to allocate cars to renters? Second, when the set of cars change and/or their pricing, isn't it natural that the transition probabilities between states also change? E.g., perhaps renters of old cars (who would be getting a discount in the policy experiment) will hold the cars for longer periods?

6. Write-up:
a. The paper is way too long and has way too many figures.
b. The figures could use more notes below them, so it's easier to understand what we look at.
c. I realize and appreciate that the authors don't want to say too much about the relevance of their findings to other settings, but I think that the paper can benefit from at least a little bit of the authors' thoughts of why an economist who is not particularly into car rental pricing should care about the findings. This is even more true if the intended outlet is a general-interest journal.