Research in Economics 69 (2015) 63–74

Contents lists available at ScienceDirect

Research in Economics

journal homepage: www.elsevier.com/locate/rie

The impatient salesperson and the delegation of pricing authority[☆]

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ARTICLE INFO

Article history:
Received 5 September 2014
Accepted 9 October 2014
Available online 7 November 2014

Keywords:
Pricing
Delegation of authority
Agents
Principals
Reserve prices
Reservation values

ABSTRACT

Sales agents are impatient relative to owners. If a good fails to sell, the owner still retains possession of that good and can enjoy its services, whereas the agent receives nothing. As a consequence, sales agents prefer a lower price than does an owner. Owners are therefore reluctant to delegate pricing authority to sales agents even when the agents have superior market information. Pricing authority is more likely to be delegated to agents when the owner lacks monopoly power and sells competitively and when the good is a non-durable. Agents who are given pricing authority are less likely to be paid commissions and more likely to be on a straight salary.

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1. Introduction

When a seller offers a good like an antique, painting, or piece of used electronic equipment for sale on consignment or through an auction process, the seller is usually asked to set a reservation price below which no sale occurs. The seller could allow all the pricing decisions to be made by the agent who presumably has better information about the market than does the seller. In most cases, though, for example in online auctions like eBay, the seller is asked to set a reserve price.[1] Why does not the owner simply trust the agent to price the good in accordance with the owner's interests? Do agents have different pricing incentives than owners?

In particular, the existence of reserve prices that are set by owners suggests that a sales agent might choose too low a selling price.[2] Although it is true that a pure commission salesperson does not reap the full benefit of the sale, the price that maximizes profit also maximizes any fraction of profits as well. Specifically, if profit, π, is a function of price, R, given by $\pi(R)$, and if the salesperson receives λ of profit, then the R that maximizes the owners profit

$$(1-\lambda)\pi(R)$$

also maximizes the salesperson's profit

$$\lambda\pi(R)$$

[☆] This work on pricing and authority is in memory of Dale Mortensen, much of whose life work was on search, pricing and wage setting. Dale was a great friend and scholar and his research and friendship will be missed. The literature that his ideas generated will continue to flourish.

Comments from Steven Levitt, Paul Oyer, Glen Weyl, and Florian Zettelmeyer are gratefully acknowledged.

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[1] The concept of setting reservation wages and prices was explored early by Burdett and Mortensen (1978, 1989), Burdett et al. (1984), Mortensen (1986) and by Diamond (1981, 1982) in search frameworks.

[2] Bryan et al. (2007) finds that setting reserve prices has positive effects on the auction price if the good sells. Analyses of reserve prices in auctions include papers on why reserve prices might be set for information reasons. See Brisset and Naegelen (2006), and Cai et al. (2007).

http://dx.doi.org/10.1016/j.rie.2014.10.001

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The scalars, $(1-\lambda)$ or λ, drop out of the first-order condition, which is simply $\pi'(R)=0$ in both cases. Given this result, it is not obvious why a sales agent would choose a lower price than would an owner.

In the case of eBay, on typical goods, the seller pays a fee of 10% of the sale price to eBay up to a maximum of $250 (see Appendix A). The maximum creates a clear distortion because setting a price above $2500 results in no additional revenue to eBay, while decreasing the probability of a sale. The owner might be willing to trade off lower a lower selling probability against higher revenue received if a sale does occur. But even without a cap on commissions like that in the eBay contract, agents are too anxious to sell the good as compared to the owner.

There are two reasons why an agent will choose a lower price than the owner. The first relates to the standard principal-agent effort issue. A bird-in-the-hand is often more valuable than the two-in-the-bush when securing the second bird requires that additional effort be expended. Although valid in many circumstances, that explanation cannot be relevant in the case of online auctions because there is no additional effort involved in allowing the good to remain on the website at a high price for a longer period.

The more subtle, but conceivably more important reason is that the owner can continue to enjoy the services of the good if it does not sell, whereas the agent gets nothing out of a no-sale. The owner of a painting that fails to sell at auction still has the painting to enjoy, but the auction house gets no commission. As consequence, the owner has a higher reservation value than the agent, which causes the owner's desired price to exceed that of the agent. The owner can alter the compensation scheme to attempt to align incentives, but only by using a compensation scheme that is equivalent to selling the agent the good and thereby turning agent into principal can the owner induce the salesperson to price the good appropriately.

If salespersons' and principals' incentives differ, a principal will be reluctant to delegate pricing authority to an agent. Some agents, like sales managers at new car dealerships, are given price-setting authority (including choice of the reservation price) whereas others, like online auctioneers, are not. Realtors are almost always required to obtain authorization from the owner before a buyer's offer can be accepted.[3] What accounts for the difference?

The delegation of authority is a standard topic in personnel economics[4] but its interaction with price setting has not been explored in much detail. The goal here is to study pricing behavior and to use the implications of the theory to predict the amount of pricing discretion given to agents in different settings. The main findings are:

1. An agent prefers to set a lower price in order to obtain a higher probability of sale than that chosen by an owner.
2. Paying agents appropriately can remedy the incentive problem, but as is the case in the basic principal agent problem, this requires the equivalent of selling the asset to the agent and making him the principal.
3. Pricing authority is more likely to be delegated to the salesperson in firms that operate in highly competitive markets than those having significant monopoly power.
4. Pricing authority is more likely to be delegated for perishable goods than for durables.
5. Agents who are rewarded on a longer-term basis over multiple sales possibilities are more likely to be given pricing authority than those who receive the compensation based on single or a series of single sales opportunities. This explains why the managers at auto dealerships are given pricing authority, but the individual auto salespersons are not.
6. Those agents who are given the authority to set prices are less likely to be paid on a commission basis.

2. Basic model

Consider first how an owner would behave if she were selling the good, e.g., an antique, by herself. There are two variables of interest: the price that is charged and the effort put into the activity.

Initially, assume one period and let there be at most one customer who comes to examine the good. Most of the intuition can be gleaned from this simple structure. Let the cost of effort, e, be given by $C(e)$. The probably of that a customer examines the good depends on effort by the seller. Let $P(e)$ denote that probability with $P'>0$, $P''<0$ so that the probability of a sale is increasing and concave in effort. In this case, effort consists of marketing the good and displaying it to potential buyers.

Customers who view the good may attach different valuations to it. The valuation is given by $V\sim g(V)$ with distribution function $G(V)$. The price is R so that the probability of a sale, given a customer, is the probability that $V>R$ or $1-G(R)$. Since the probability that a customer arrives is $P(e)$, the probability of a sale is

$$\text{Probability of a sale} = P(e)\ [1-G(R)]. \tag{1}$$

Consider an owner who sells the antique without an agent. If the antique does not sell, the owner can continue to enjoy the antique and obtain value A. Then the problem for the owner is to choose price, R, and effort, e, so as to maximize

$$RP(e)[1-G(R)]+A\left\{1-P(e)[1-G(R)]\right\}-C(e) \tag{2}$$

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[3] Occasionally, realtors buy houses from the owners and resell them, which avoids any conflict.

[4] See Mayer (1960), Rosen (1982), Freeman and Lazear (1995), Lazear (1998, pp. 452–460 and 474–476), and Garicano (2000).

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