Selling an asset to a competitor

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ABSTRACT

A seller decides whether to allocate an item among two potential buyers. The seller and buyer 1 interact ex post in such a way that each of them suffers a negative externality if the other possesses the item. We show that the optimal allocation rule favors buyer 2, who does not interact ex post with the seller, and in particular bidder 1 may not obtain the good even if his valuation is highest. The auction is therefore subject to resale. When resale is possible, the seller must distort the original auction. We show that the mechanism depends crucially on the way resale is organized ex post. The seller may decide to always allocate the good to the agent with the highest valuation when rents are fully extracted by an intermediary on the resale market. However, she may resort to a stochastic mechanism when the winner of the primary auction has full bargaining power in the resale stage.

1. Motivation

Consider a firm engaged in several profitable activities. Some of them are close substitutes and are competing inefficiently against each other. The board of managers contemplates the possibility of selling a subdivision of the firm that runs one particular activity. There are two potential buyers: a direct competitor and a company that operates in a foreign market. One manager argues that selling to a competitor may be detrimental for the profitability of the remaining activities, although it is difficult to estimate the loss with accuracy. Another manager points out that a competitor may have higher stakes in avoiding competition, and may therefore be willing to pay a higher price. However, it seems that the competitor cannot assess those stakes with certainty either. The competitor would certainly pay a high price if it anticipates it will be driven out of the market in the next few years. Someone explains that behaving as if there is no hurry to sell may prompt this belief. Someone else replies that only a naive competitor would be tricked by that strategy. When they almost agree that the foreign firm would be a better choice, someone emphasizes that this will not prevent the competitor from acquiring the division: the foreign firm may sell the division in the future. Therefore, the firm may as well sell directly to its competitor or, better, keep the division.

The example above illustrates a situation common to many applications where a seller (she) decides whether to allocate an indivisible asset among several buyers (he) with whom she may interact ex post. To cite a few other examples, firms need sometimes to sell part of their assets (e.g. capital, equipment, brands, etc.) to regain financial health or simply to reorganize their activities. Assets can be transferred to competitors, or to buyers from other markets. Patent transfers or

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exclusive licensing agreements is another example with those features. A technology may have applications in the market in which the patentee participates and possibly in a secondary market in which it does not. Sports is another application. European soccer teams and American MLB or NFL teams may be reluctant to transfer players to other clubs competing in their same domestic championship or division. In all these cases, the owner of the asset faces a dilemma: should it sell its asset to nobody, only to firms in markets where it does not participate or can it be optimal to sell to its own competitors? The seller is likely to take the *identity* of the buyer into account to make a decision. Also, the seller faces informational asymmetries and has to make a decision based on her belief about the ability of the competitors to use the good. In particular, the extra payoff a potential acquirer may enjoy by obtaining the good is unknown to the seller, and she may also be unable to anticipate the effects of selling the good on her own payoff. This raises an interesting theoretical question: what is the optimal allocation mechanism of the item in that situation?

The examples also point to two additional issues. First, the seller's value for the asset is likely to be private information. Then, buyers face information asymmetries as well, and will make inferences from the design of the trade offer itself. The seller should account for those inferences and design an allocation mechanism accordingly. This raises the following question: how should the mechanism be designed to signal information? Second, trades between two parties are not sealed forever. The decision to allocate the item to one party can be reversed by ex post resale. Given the presence of externalities, the seller may be affected if this occurs. Then, should the seller take preventive measures to allocate the good in the first place?

The objective of the paper is to characterize the optimal allocation mechanism in these three situations. To do so, we propose the following basic model. There are three players. The first player (or seller) owns an asset that is relevant to all three players. The first and the second player are direct competitors, while the third player operates on a different market.

We first investigate the benchmark case. This corresponds to the setting in which *only buyers possess private information and there is no possibility of resale*. More precisely, the seller does not observe the willingness to pay of the bidders. Also, she does not know the level of the externality she will suffer if she decides to sell to her competitor. Given the ability to turn the asset into profit and to inflict externalities on the seller are generally linked, we assume that the intrinsic value for the good is correlated with the externality. We show that the optimal mechanism has two main elements (Proposition 1). First, the allocation rule is asymmetric and favors the bidder who does not ex post compete with the auctioneer. There are two asymmetries: then deciding whether to keep the good or sell to one of the two agents, the seller is inclined to keep the good more often when the alternative is to sell to her competitor. Then, agents face different reserve prices. When deciding whether to give the good to one of the two agents, she prefers to favor the non-competitor who is not exerting any externality on her. Then, she sometimes allocates the good to that agent even though his willingness to pay for the good is lower. Second, the presence of informational asymmetries lead the seller to increase the probability of keeping the good compared to the scenario with full information. This result is standard and reflects the usual trade-off between rent and efficiency. Note that allocation asymmetries result from the presence of asymmetric ex post interactions between the seller and the bidders. Given the seller feels differently about allocating the good to the two bidders, she will require different prices. We show in Appendix B that the mechanism can be implemented with a suitably modified second-price sealed bid auction with entry fees, ex post subsidies and different reserve prices for the different bidders.

With this in mind, we analyze the case in which *the seller is also privately informed*. Precisely, her valuation or willingness to keep the good is not observed by the buyers. Besides, her direct competitor does not know the level of the externality he will suffer if she decides to keep the good (again, because of the correlation between valuation and externality). We consider "transparent" mechanisms,[1] that is, mechanisms in which the seller offers a game form but does not participate in the subsequent message game. We characterize the general properties of the equilibrium, and we show that, at a separating equilibrium comparable to the benchmark case, the qualitative properties of the optimal mechanism described before are preserved (Propositions 2 and 4).[2] Still, the inability to observe the type of the seller affects the probability that the item changes hands differently depending on the type of goods. A direct competitor is always willing to increase his payment to induce the seller to sell when he anticipates his loss will be high otherwise. When the willingness to pay and the externality an agent inflicts on his/her competitor are positively correlated (e.g. the transfer of a drastic innovation), the seller keeps the good more often than in the benchmark case. This occurs because making trade difficult (e.g. by increasing the reserve prices) is a way to signal the externality will be high if the seller keeps the good. The double asymmetric information problem results in a further reduction in the level of trade compared to the full information case. By contrast, when the willingness to pay and the externality an agent inflicts on his/her competitor are negatively correlated (e.g. the transfer of an innovation that allows firms to differentiate their products), the seller sells the good more often when her valuation is unknown. Here, facilitating trade (by lowering the reserve prices) helps to signal that the externality will be high if the seller keeps the good. Then, the solution with double asymmetric information is less inefficient than the solution of the benchmark case.

In the last part of the paper, we extend the benchmark case to the situation where *buyers can trade ex post*. Note that resale emerges naturally because the optimal (static) auction treats bidders asymmetrically. Then, the optimal allocation

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[1] This terminology was introduced in Zheng (2002). Such mechanisms are to be contrasted with mechanisms analyzed in Maskin and Tirole (1990). This will be discussed later in the analysis.

[2] Other separating and non-separating equilibria may exist.