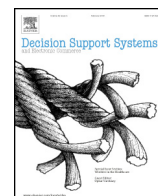




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## Information revelation and customer decision-making process of repeat-bidding name-your-own-price auction

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### ABSTRACT

Information revelation has become increasingly popular among name-your-own-price (NYOP) providers as a strategy to influence buyers' behavior and facilitate the transaction success rate in industrial practice. However, the mechanism underlying how disclosed information affects a bidder's decision-making process, as well as the consequent bidding results, remains unknown. In this study, we adopted an adapted dynamic choice model to simulate the bidders' decision process, which led to our proposal of a novel mechanism to explain how specific price information affects bidders' willingness to pay, expectation on threshold price and haggling willingness. The relationship model was then tested using real transaction data from the Shanghai Steel Transaction Center, one of the biggest steel spot transaction platforms in China that employs the NYOP pricing system. Our empirical results showed that a bidder's haggling behavior can be influenced by both personal transaction experience and revealed environmental information; therefore, sellers who intend to hinder haggling behavior can choose to reveal list price information that is more consistent with their bidders' internal reference price. Interestingly, we also found that haggling behavior may not always be harmful because it can enhance the bidders' net utility under certain conditions. Analysis of the combined effects on customer behavior—when more than one kind of relevant price information is disclosed—showed that additional market condition information (i.e., market price fluctuation) has a moderating effect on how current revealed list price information influences a bidder's decision. Thus, by very slightly increasing threshold price, sellers can facilitate haggling in order to increase customer utility in a volatile market. In summary, our study investigated an approach to understand a customer's behavior under different price information environments in the NYOP context. The results indicate that platform providers can implement various information revelation strategies to facilitate dynamic adjustment in the threshold price by sellers to maximize their profits.

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### 1. Introduction

Name-your-own-price (NYOP) has become an increasingly popular strategy in industrial practice and as a topic of academic research since it was first introduced by priceline. In NYOP bidding participants are allowed to provide their own quotes for prices of various products. The eventual transaction is made at the quoted price, if it is not lower than the secret threshold price set by the sellers. Otherwise, the transaction is either terminated (as in the single-bid model) or the bidder is asked to provide another quote (as in the repeat-bidding model). NYOP has been well adopted throughout many industries, including online travel and software retail, as well as for B2B transactions. Customers have responded positively to the opportunity for negotiating a price,

while sellers have been attracted by the flexibility of setting a threshold price that can be dynamically adjusted according to current market conditions. However, the various bidding experiences and heterogeneous customer types mean that participants might respond significantly different to NYOP.

Scholars and practitioners have sought to understand customer behaviors in NYOP, following various approaches. Some of the earliest studies investigated the influence of customers' individual-specific factors, such as bidding experience and socio-demographic variables [11] or emotional factors [5]. As customers become more strategic and informed, however, the NYOP bidding settings evolved into the more complex forms in practice currently. One direct approach used by sellers to affect participants' bidding behavior involves modifying transaction processes and rules, such as the amount of quotes allowed [8,31], the frequency at which the threshold price changes [7] and whether the adaptive threshold price policy is permitted [14]. Although process adjustment is sometimes effective, it may also lead to negative publicity.

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Amazon's dynamic pricing strategy, which uses buyers' profiles to charge different prices, is a widely criticized example, and the company had to invest huge effort to earn back its reputation [1].

Information revelation is an alternative that has been applied to influence NYOP market results. Priceline.com uses this approach, disclosing to customers the current median retail price as a reference. Other sellers have chosen to reveal their products' list price, while still others have published the bidding procedures and rules that were previously opaque to buyers. Compared to directly altering transaction processes and rules, the effect of information revelation is more complex. Whether and how specific information revelation affects a customer's decision and contributes to better bidding outcome is vital, but remains under-researched. Therefore, we provide here an approach to demonstrate how NYOP customers respond to different revealed price information.

Prior research has discussed disclosed information specific to the product [32], the price [37] and the bidding mechanism [10,14,34]. Although some important conclusions have been drawn from the final bidding results related to specific disclosed information, the decision processes of bidders facing distinct bidding environments have not been studied in depth.

With the aim of obtaining real transaction data that reflects participants' bidding decisions—and the effects of information revelation—we utilized the Shanghai Steel Transaction Center (*shgt.com*), which is recognized as one of the top Chinese steel spot transaction platforms. In its first year, *shgt.com* had a trading volume of more than three million tons; since then, about twenty thousand buyers have registered in the platform. Most of the buyers identify as self-employed steel traders or small metal-processing companies.

The *shgt.com* platform allows for implementation of various pricing schemes, including posted price channel and NYOP. In its NYOP setting, customers are allowed to quote three times, at most, in one bargaining. The list price is always disclosed to buyers, representing a major difference from traditional NYOP settings. Moreover, additional information concerning the congeneric products' average transaction price history is also revealed in the platform; this latter strategy was implemented at about half a year after the platform's launch. The transaction price history shows bidders how the average price of congeneric products fluctuates recently (Fig. 1).

In this study we applied an adapted dynamic choice model proposed by [6,8,11,14,31] to simulate participants' decision process. Previous studies have demonstrated frictional cost as the key element in determining customers' haggling behavior (i.e., whether and how to increase quotes with the notification of whether the prior quote is accepted). Rational bidders facing positive frictional cost are expected to increase

quotes at a decreasing rate. However, in NYOP practice, irrational behaviors following increasing or constant increment patterns abound [18,32]; unfortunately, this phenomenon cannot be explained by the existing frictional cost framework. This gap between theory and practice results from the fact that the frictional cost model considers frictional cost as the only factor affecting customers' haggling behavior. In line with the results from [15,16] that demonstrated that information revealed by sellers also affects bidders' behavior, we hypothesized that bidders' haggling willingness is affected by both frictional cost and extra information utility. Our investigations reveal that customer information utility is largely influenced by information revealed by NYOP sellers; in particular, bidders with the same frictional cost show different haggling patterns in distinct information environments. Furthermore, we examined the current revealed list price and the customer internal reference information as direct factors affecting customers' haggling willingness and final bidding results. Our results validated the moderating effect of price fluctuation shown by extra-disclosed price history information.

Since all these types of information are available to NYOP sellers, the findings from this study provide these sellers with a better understanding about and prediction ability for participants' bidding behavior, which will allow them to more appropriately set threshold price and facilitate the disclosure of price information that will maximize profits. Transaction platforms may also benefit as these findings can help guide design of the information disclosure mechanism that will facilitate the transaction success rate and bidder's utility.

The remainder of this paper is organized as follows. In Section 2, we review the related literature on the NYOP decision-making process and haggling behavior and on the effect of information revelation. Section 3 then builds up a research model and puts forward research questions for future study. Section 4 sets up the relationship model concerning bidders' decisions and revealed information. In Section 5, we present the data and methodology. Section 6 explains the empirical results and Section 7 closes with a discussion of our conclusions and the implications for the future of the field.

## 2. Literature review

### 2.1. Decision process and bidding behavior in NYOP

Prior research has examined customers' bidding behavior in several NYOP settings. Hann and Terwiesch [11] were the first to introduce the concept of frictional cost, which they define as the disutility a customer faces when asking for an extra quote in an NYOP auction. Using a dynamic choice model, the authors demonstrated how rational bidders

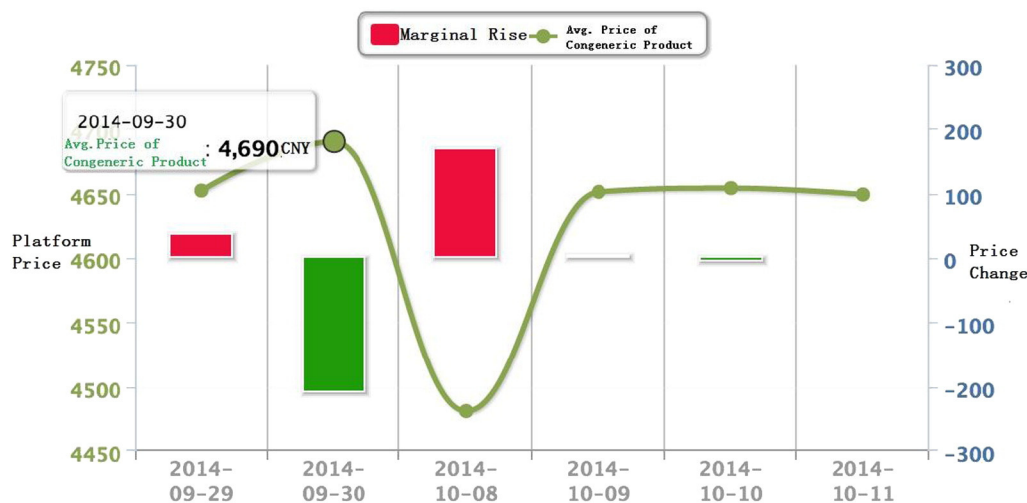


Fig. 1. Information revelation use of congeneric products' average price history.

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