

# Trust in procurement interactions

Nicolas Fugger  
University of Cologne  
Albertus-Magnus-Platz, 50923, Cologne, Germany,  
fugger@wiso.uni-koeln.de

Elena Katok  
University of Texas at Dallas  
Richardson, TX 75080  
ekatok@utdallas.edu

Achim Wambach  
University of Cologne, CESifo  
Albertus-Magnus-Platz, 50923, Cologne, Germany,  
wambach@wiso.uni-koeln.de

## Extended Abstract

Reverse auctions, and in particular non-binding reverse auctions are commonly used in procurement (Elmaghraby, 2007). However, an often heard argument against procurement auctions is that reverse auctions can have a negative impact on the relationship between the buyer and the supplier (Smeltzer and Carr, 2003 and Jap 2002, 2003, 2007). This relationship is particularly important if a third party cannot verify the exact specifications of the good and the buyer has to trust the supplier.

In this paper we want to investigate if the mechanism used for procurement has an influence on the degree of cooperation between the buyer and the seller once trade takes place and on trust that is necessary for trade to take place. For this purpose we compare a binding first-price auction and a non-binding buyer-determined auction in a framework, where after the sourcing the seller decides on the quality of the product she delivers. It is shown that the buyer-determined auction induces a significantly higher degree of trust and cooperation, but at the same time leads to higher prices. Interestingly, it can be worthwhile for the buyer in a buyer-determined auction to choose the higher offer instead of the lower one.

To organize the results, we discuss a model based on other-regarding preferences. While standard reasoning implies that both mechanisms should lead to the same outcomes, allowing for other-regarding preferences helps to explain the results of the experiment.

In the experiment, both in the binding auction as well as in the buyer-determined auction the suppliers place a sealed offer. While in the binding auction, the buyer can only accept the lowest offer or refuse to trade, he can also accept a larger offer in a buyer-determined auction. Once the seller and the price are determined, the selected

seller decides on the quality of the good and delivers it. A higher quality is more valuable, but also more costly to the seller.

Now, with standard preferences, the seller will deliver lowest quality in all cases, as quality is not part of the contract. As there is competition between the sellers, both mechanisms thus lead to prices equal to marginal costs of the lowest quality, which is assumed to be the same across sellers. With other-regarding preferences in the form of inequity aversion both sellers and buyers might care for the profit the others obtain. Then individuals have two objectives. On the one hand they still want to maximize their monetary payoff, but on the other hand they also have an incentive to minimize the gap between their own and the others' monetary payoffs. Thus, when prices are high there is a trade-off for inequity averse suppliers. Increasing quality decreases their own monetary payoff but also results in more equitable outcomes. Therefore quality is no more independent of prices and high prices induce high quality if the supplier is sufficiently affected by inequity aversion and gains from cooperation are high. As a consequence the equilibrium outcomes of auctions and buyer-determined auctions differ strongly. While buyer-determined auctions result in high price and high quality if suppliers are inequity averse, the same suppliers will compete to lowest costs and provide minimum quality in auctions.

This paper contributes to the literature on buyer-determined auctions. Engelbrecht-Wiggans et al. (2007) compare a price-based and a buyer-determined mechanism in a setting where costs and qualities are correlated. They show theoretically that buyer-determined auctions are more profitable for the buyer if the correlation between costs and quality is high and the number of bidders is not too low. They also provide experimental evidence for their predictions. In contrast to our study, they assume that quality is exogenously given; in our setting, the supplier decides about quality after the selection. In Fugger, Katok and Wambach (2013) we analyze a setting where the buyer cannot communicate his preferences about suppliers in advance and suppliers bid either in a dynamic buyer-determined or a binding reverse auction. In such a setting, there is a trade-off between binding price-based auctions and buyer-determined auctions. Price-based auctions induce low prices but might force the buyer to select a non-preferred supplier. On the other hand, buyer-determined auctions allow the buyer to choose the best offer but can also enable tacit collusion which results in high prices especially when the number of bidders is small.

The work in the procurement literature closest to ours is Brosig-Koch and Heinrich (2012). In an experimental study, they find that price-based auctions are less profitable for buyers than buyer-determined mechanisms, where buyers can base their selection on bidders' past performance, in presence of incomplete contracts. However their approach differs from ours in two major aspects. First, their explanation of differences between auctions and buyer-determined auctions is based on reputation building. In their setting reputation building can only be profitable in the buyer-determined mechanism. While the buyer has to select the lowest bid in the auction, he is free to make his selection based on bids and suppliers' reputation in buyer-determined auctions. This gives suppliers an incentive to provide high quality and thus results in more efficient outcomes with higher prices but also higher profits for buyers in buyer-determined auctions. In contrast to their set-up, we rule out reputation building as a possible explanation. As a consequence of the anonymity in our setting, other-regarding preferences rather than reputation can explain differences between the price-based and the buyer-determined mechanisms. Second, in their setting all procurement mechanisms are binding in the sense that trade always takes place and trade is always profitable for the buyer. In our approach buyers can be at risk of making losses and are free to refuse trade. This specification gives us the opportunity to analyze the influence of the procurement mechanism on buyers' trust.

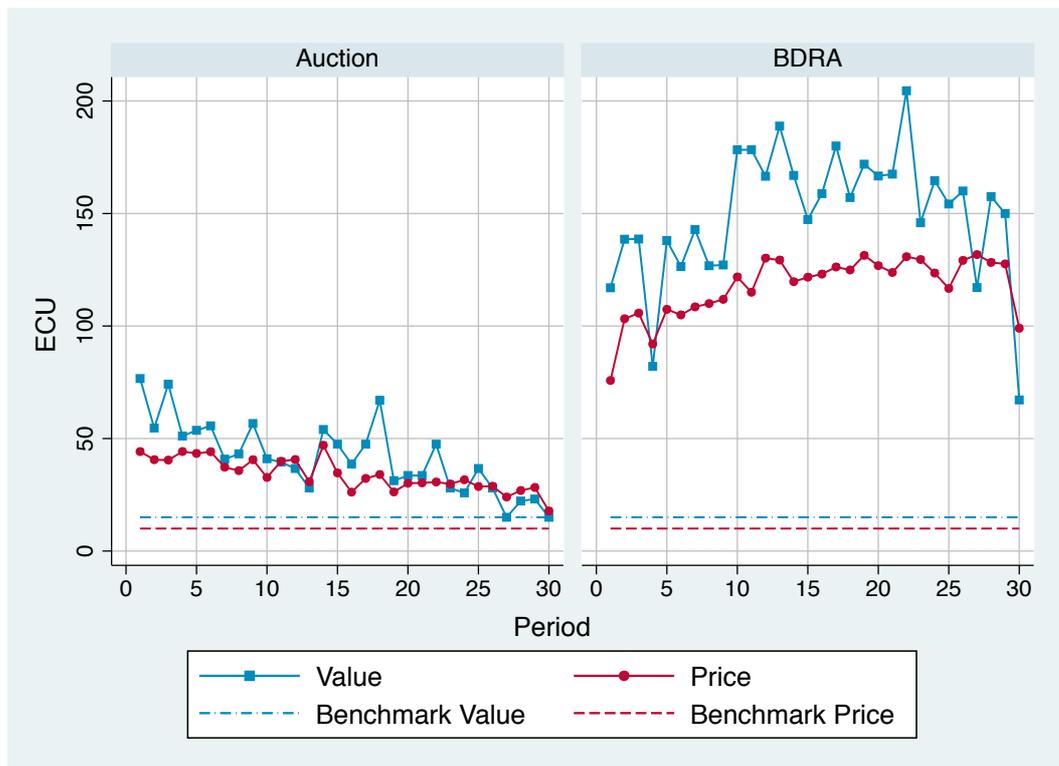


Figure 1 Evolution of prices and values

Figure 1 illustrates the evolution of prices and values. Both prices and values are substantially higher in buyer-determined reverse auctions. While prices and values are decreasing over time in the binding auction, they are stable in the buyer-determined reverse auction. Since Figure 1 only contains successful trades, i.e. those interactions where the buyer accepted an offer, it is important to also look at the share of successful trades. Figure 2 displays the share of successful trades over time.

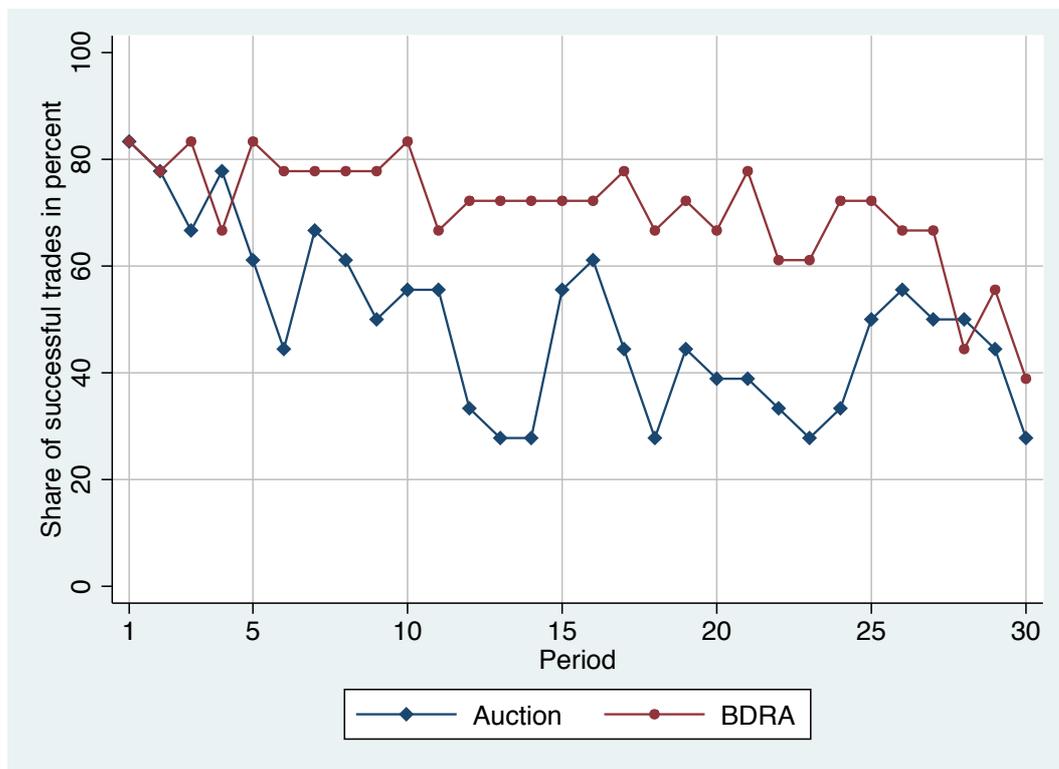


Figure 2 Share of successful trades over time

Both mechanisms reach a high share of successful trades in the first periods. This share is decreasing over time, but the average share of successful trades is higher in buyer-determined reverse auctions compared to binding auctions. This is particularly interesting because prices are higher in the buyer-determined reverse auctions and therefore more trust is required as the potential losses from trade are larger.