



# Competitive pricing reduces wasteful counterproductive behaviors



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## ARTICLE INFO

### Article history:

Received 10 February 2017

Received in revised form 10 August 2017

Accepted 15 August 2017

Available online 19 August 2017

### JEL classification:

C91

D31

D63

P10

### Keywords:

Counterproductive behavior

Competitive pricing

Markets

Auctions

Efficiency

Inequality

## ABSTRACT

Counterproductive reactions to unfavorable trading prices can cause inefficiencies in economic exchange. This paper studies whether the use of a competitive pricing mechanism reduces such wasteful activities. We report data from a laboratory experiment where a powerful buyer can trade with one of two sellers—an environment that can lead to very low prices for the sellers. We find that low procurement prices trigger significantly less punishment by sellers if the buyer uses a competitive auction rather than his price-setting power to dictate the same terms of trade directly. Our data suggest that the use of competitive pricing mechanisms can mitigate inefficient reactions to unequal distributions of trade surplus.

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## 1. Introduction

Competitive markets are associated with desirable properties such as decision-making autonomy, free entry, and efficient allocation of resources. Our paper studies an additional, potentially desirable, welfare-enhancing property of competitive markets. We report experimental data showing that a competitive pricing mechanism reduces—relative to a non-competitive mechanism—wasteful counterproductive behaviors in response to unequal distributions of trade surplus. Examples for counterproductive behaviors triggered by distributive conflicts include industrial actions such as strikes, rulebook slowdowns, and acts of outright sabotage in response to low wages,<sup>1</sup> or quality shading by suppliers when the terms of trade

are unfavorable.<sup>2</sup> The latent threat of counterproductive actions implies that judgments of the *overall* efficiency of the mechanisms used to coordinate economic activity require not only understanding their allocative efficiency but also their effects on people's reactions to the resulting outcomes. If a mechanism reduces wasteful behaviors of less favored actors it will also increase, *ceteris paribus*, efficiency. Given the central role that competition plays in business life, and many realms of society at large, it is particularly important to understand how competitive mechanisms affect wasteful counterproductive behaviors.

Our paper provides experimental evidence that the use of a competitive mechanism—compared to the use of power or authority—attenuates wasteful reactions to unequal monetary payoffs. Our baseline condition reflects a stylized trading situation where a powerful, monopsonistic buyer can trade with one of two sellers. The terms of trade—that is, the markup that the buyer pays on top of

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<sup>1</sup> Krueger and Mas (2004), e.g., report data suggesting a link between management's attempts to negotiate lower wages (and generally less favorable employment conditions) and faulty tire production at a Bridgestone/Firestone plant. Similarly, Mas (2006) shows that arrest rates decline after unfavorable arbitration outcomes for police officers.

<sup>2</sup> Research in the supply chain management and marketing literatures argues that increased pressure on terms of trade can induce trading partners to lower levels of service or product quality (see, e.g., Carter and Kaufmann, 2007; Samaha et al., 2011).

the seller's cost—are reflected in the number of points that the buyer transfers to one of the sellers. It is an important feature of the experimental design that the buyer can choose between two different mechanisms to determine the transfer. He can either use his price-setting power to set the transfer directly or he can let the transfer be determined in a competitive clock auction. If the buyer uses his price-setting power, he simply dictates the transfer to one of the two sellers and trades with that seller. The other seller receives nothing. Under the competitive mechanism, in contrast, the buyer lets the two sellers compete with each other in an auction. The transfer in the auction increases automatically every second until one of the sellers accepts. The seller who first accepts receives the transfer; the other seller receives nothing. After the transfer is determined—either by use of the buyer's price-setting power or by competition—the sellers can engage in counterproductive behaviors. This is implemented in form of a costly punishment option that allows retaliating against both the buyer and the respectively other seller.<sup>3</sup>

We find that—for given distributive outcomes—the competitive mechanism triggers less punishment for the buyer compared to when he uses his market power to set the same transfer directly. Moreover, we find that the use of the competitive mechanism leads to a partial shift of punishment. While the buyer is punished less under competition, the sellers punish each other more. Since the increase in the sellers' mutual punishment is smaller than the reduction of the punishment of the buyer, the competitive pricing mechanism decreases the total inefficiencies that occur in response to given unequal distributions of the trade surplus.

Consider procurement auctions as one concrete example for the implications of our findings. The existing literature argues that asymmetric information about the sellers' costs of production is the key reason for the use of procurement auctions (see, e.g., Klemperer, 1999). Our results show that buyers with strong market power, who intend to buy intermediate products from outside suppliers, may not only want to use a procurement auction because it allows elicitation of sellers' costs, but also because it attenuates inefficiencies caused by counterproductive behaviors of sellers if prices are low.<sup>4</sup>

More generally, our paper adds a new angle to transaction cost economics. When comparing the costs and benefits of the use of markets versus hierarchies, the incomplete contracting literature emphasizes the trade-off between inefficiencies caused by opportunism in outsourced producer-supplier relations and bureaucracy costs in authority-based, vertically integrated firms (Williamson 1975, 1985). Buyers in our experiment do not face an explicit make-or-buy decision, but the available options—competition or power—can very naturally be interpreted as the choice between markets and hierarchies. Our results thus suggest an additional benefit of using the market: replacing authority-driven, in-house governance with a competitive market mechanism might

avoid retaliatory counterproductive behaviors that may occur otherwise.

To check the robustness of our results we implemented a series of additional treatments. In a first treatment, we test whether our results are driven by self-selection of different types of buyers into different mechanisms. Sellers' punishment decisions might, for instance, be driven by the belief that “unkind” buyers use their price-setting power, while “kind” buyers use the competitive mechanism. Hence, to isolate the effect of the mechanism itself, from the effect of the buyer's choice, mechanisms are randomly assigned to buyers in this treatment (which is known to the sellers). In a second treatment, we study the impact of average transfer levels on punishment in the two mechanisms. Average transfers turned out to be higher under competition than under price-setting power in our baseline condition. To preclude this from affecting our results, we modified the experimental parameters to reverse this relation. In a third treatment, we add a third seller to our game to test whether increased competition affects punishment behavior. We find that all our results are robust to these design variations.

Moreover, to study possible determinants of the punishment-reducing effect of competition, we implemented three further treatments. First, we explore the extent to which our results are driven by the property of free entry under competition. In our baseline condition the buyer's choice of competition grants all sellers an equal chance to obtain the transfer. When the buyer uses his price-setting power, in contrast, one seller is predetermined to receive the transfer. To identify the effect of symmetric participation opportunities, the additional treatment randomizes which seller gets the transfer when the buyer uses his price-setting power. This ensures that all sellers have the same chances of getting the transfer in both mechanisms. Second, we study the importance of decision-making autonomy on the sellers' punishment behavior. In the baseline condition sellers make an active acceptance decision only under competition, but not when the buyer uses his price-setting power. We therefore introduce an active acceptance decision also in the latter case. In a final treatment, we analyze the extent to which increased buyer involvement in the competitive mechanism affects the sellers' punishment decisions. We directly involve the buyer in the competitive transfer determination by letting him set the sequence of increasing transfers in the auction (which is known to the sellers). We find that all our results remain unaffected by these additional modifications.

The paper is organized as follows. Section 2 discusses related literature. Section 3 describes the design of our baseline condition. Section 4 presents our main results on punishment behavior. Sections 5 and 6 document the robustness of our results and study possible determinants. Section 7 investigates individual heterogeneity in sellers' punishment behavior. Section 8 analyzes buyers' choices. Section 9 discusses questionnaire evidence on sellers' motivations to punish. Section 10 concludes.

## 2. Related literature

The idea that the same outcome is judged differently depending on the procedure that leads to it is deeply entrenched in psychology (e.g., Thibaut and Walker, 1975) and not foreign to economics (e.g., Frey et al., 2004). The existing work on procedural fairness in economics focuses on the role of biased vs. unbiased random procedures to capture the idea of equal opportunity, “level playing field”, or ex-ante fairness (e.g., Bolton et al., 2005; Trautmann, 2009; Krawczyk and Le Lec, 2010; Sebald, 2010; Krawczyk, 2011; Brock et al., 2013; Cappelen et al., 2013a). Our paper contributes to this literature by focussing on the procedure of competitive pricing. In particular, we show that the same distributive outcome triggers different punishment behavior by sellers, depending on whether the

<sup>3</sup> A real-world seller can, e.g., hurt the buyer by lowering the quality of the product or service delivered. Another potential form of retaliation is malicious gossip to destroy someone's standing. This kind of punishment can be used also by the out-competed seller and may be targeted at both buyer and competitor. Both forms of punishment are potentially costly. The punishing seller's reputational capital is at stake if there is a risk of detection in repeated interaction or a seller could have an intrinsic preference for delivering high quality (see, e.g., Hart and Moore, 2008; Fehr et al., 2011).

<sup>4</sup> In real-world procurement contexts, bilateral negotiations are arguably the most natural alternative to competitive auctions. The alternative to the competitive mechanism in our study, the use of the buyer's price-setting power, shares all the features of a dictator game, which can be seen as a bilateral negotiation between a seller with very little and a buyer with very strong bargaining power such that the buyer is able to obtain his desired prize in the negotiation. We pick this extreme version of a bilateral negotiation, because the buyer in our experiment is endowed with strong market power if he uses the auction and it is plausible to assume that this market power is also present in bilateral negotiations of the terms of trade.

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