Available online at www.sciencedirect.com
ScienceDirect
Economics Letters 98 (2008) 327–334
economics letters
www.elsevier.com/locate/econbase

Procurement with costly bidding, optimal shortlisting, and rebates ☆

Cuihong Fan [a], Elmar Wolfstetter [b,*]

[a] *Shanghai University of Finance and Economics, School of Economics, Guoding Road 777, 200433 Shanghai, China*
[b] *Humboldt University at Berlin, Department of Economics, Institute of Economic Theory I, Spandauer Str. 1, 10099 Berlin, Germany*

Received 22 October 2006; received in revised form 7 April 2007; accepted 2 May 2007
Available online 13 May 2007

Abstract

We consider procurement auctions when bid preparation is costly and shortlisting is adopted. We find that a policy of reimbursing bidding costs is profitable if and only if performance and bidding costs are negatively correlated. Negative rebates dominate positive rebates.

Keywords: Procurement; Auctions; Entry

JEL classification: D44; D45

1. Introduction

In many procurements the drafting of a bid is costly. For example, when contractors bid on the design or construction of a power plant or a national health care system funded by the *World Bank*, a bid consists of two envelopes, one containing the detailed technical proposal, and the other containing the financial proposal. The cost of drafting the technical proposal can easily amount to $100,000 and more. Yet, this

☆ We wish to thank Jimmy Chan, Thomas Giebe, Robert Schmidt, and the anonymous referee for their comments. Financial support was received from the *Shanghai University of Finance and Economics* and the *Deutsche Forschungsgemeinschaft (DFG),* SFB Transregio 15, "Governance and Efficiency of Economic Systems."
* Corresponding author. Tel.: +49 30 2093 5653; fax: +49 30 2093 5619.
E-mail addresses: cuihong@gmx.net (C. Fan), elmar.wolfstetter@rz.hu-berlin.de (E. Wolfstetter).

0165-1765/$ - see front matter © 2007 Elsevier B.V. All rights reserved.
doi:10.1016/j.econlet.2007.05.012

cost cannot be recovered, except by winning the contract. Naturally, contractors are concerned not only about which proposals to make, but also whether to submit a bid at all.

The typical institutional response to maintain incentives for participation is to restrict the number of bidders. For example, the *World Bank* generally requires contractors to first submit an expression of interest (EoI), and then puts a limited number (typically up to six) of those who expressed interest on a "short list." Shortlisted contractors are invited to bid; no one else is allowed to bid.[1]

Another response is to reimburse the cost of bidding in whole or in part. For example, the U.S. Department of Defense has used multiple sourcing policies that subsidize the bid preparation for complex weapons systems (see McAfee and McMillan, 1987). However, if one counts in the cost of reimbursements, it is not obvious whether the procurer can actually benefit from such a policy.

The present paper examines this issue in the framework of a simple procurement auction game that captures the stylized features of complex procurements. The starting point is the "contractors' game" by Lang and Rosenthal (1991). We extend this game to allow for heterogeneous contractors, introduce shortlisting to implement the optimal number of bidders, and allow the procurer to reimburse the cost of bidding in whole or in part.

Our main finding is that reimbursement is profitable only if contractors are heterogeneous and reimbursements can change their sorting. If these requirements are met, a profitable policy exists only if performance and bidding costs are negatively correlated. However, positive rebates are dominated by entry fees in all circumstances.

There is a small literature on the role of reimbursement policies. Kaplan and Sela (2006) explore reimbursements in the framework of a second-price auction. More in line with the present paper, Gal et al. (2007) assume a first-price auction; however, unlike in the present paper, they do not allow the procurer to restrict the number of bidders, and assume a continuum of types. They claim that positive rebates are always profitable, which cannot be confirmed in the present model.

Auctions in which shortlisting is employed to pre-screen bidders have been introduced by Perry et al. (2000) and more recently Ye (2007), who also incorporates bidding costs (see also the experimental analysis by Kagel et al. (2007)).[2]

2. Base model

Our starting point is the "contractors' game" by Lang and Rosenthal (1991). There, $n \geq 2$ identical contractors bid for one indivisible contract in a first- price sealed-bid (reverse) auction. Contractors have two costs: the cost of performing the contract (performance cost), $c>0$, and a nonrecoverable cost of preparing a bid, $d>0$. The procurer's reservation price of the good (and highest accepted bid) is normalized to 1 and $c+d<1$. Contractors have complete information, yet the procurer does not know contractors' costs.

The "contractors' game" has a unique equilibrium in mixed strategies, (q, B). There, each contractor bids with the same probability $q \in (0, 1)$ according to the continuous mixed bidding strategy (c.d.f. of bids) B: $[c+d, 1] \rightarrow [0, 1]$.

[1] See The World Bank (2004a,b).

[2] Unlike in the present paper, in that literature the short list is determined endogenously, in the first round of a two-stage bidding mechanism.