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Protection in government procurement auctions ☆

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ABSTRACT

Discrimination against foreign bidders in procurement auctions has typically been achieved by price preferences. We demonstrate that in the bidding game, each level of protection via a price preference can be achieved by an equivalent tariff. When government welfare depends only on net expenditures, this equivalence carries over to the government's decision. As such, this equivalence provides a justification that agreements to eliminate price preferences to be taken in tandem with agreements to lower tariffs; e.g., the Government Procurement Agreement (GPA) in the broader context of the WTO.

1. Introduction

Government procurement contracts are a significant part of many economies, often amounting to 15–20% of GDP (World Trade Organization, 2013). When seeking a provider for a government contract, it has been a long-standing tradition that the nature of the bidding favors domestic firms over foreign ones. One common method of doing so has been the use of a price preference in which the contract is awarded to a foreign firm only if that firm's bid is sufficiently lower than the lowest bid tendered by a domestic firm. For example, under the European Community regulations, the contract was awarded to a member firm so long as its bid was no more than 3% higher than the lowest non-member bid (Branco, 1994). Across OECD countries, the estimates of Francois et al. (1996) find that the implied margins can be as large as 30%.Such a preferential procurement policy can arise from a number of causes including different costs across countries (as in McAfee and McMillan, 1989) or a government which values domestic firm profits more than those of foreign firms (central to Branco's (1994), analysis).

Obviously, price preferences are not the only policy which discriminates against foreign firms, with tariffs being but one alternative. Given the general drive towards trade liberalization, it is therefore important to understand how price preferences and tariffs compare with one another. In particular, in 1996, the Government Procurement Agreement (GPA) took steps towards non-discrimination in which signatories agree to a procurement selection process in which foreign firms are treated no differently than their domestic competitors.[1] As this agreement is among WTO members, understanding the substitutability between equal treatment under

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[1] See World Trade Organization (2013) for a detailed description of this agreement. For a thorough review of the successes and shortcomings of the WTO, see Bagwell et al. (2016).

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the bidding process and trade policy is important in understanding how the two agreements may complement each other in the broader push towards trade liberalization.[2]

In this paper, we compare the use of price preferences to tariffs, establishing conditions under which the two are equivalent and when that equivalence fails, which provides insights into the ability of bans on price preferences in reducing protection against foreign firms. The environment that we consider is an auction for a government contract in which two firms, one domestic and one foreign, tender bids to the domestic government. Under a price preference, following practice, the contract is awarded to the domestic firm so long as its bid is no more than a fixed percentage higher than that of the foreign firm. In contrast, under an ad valorem tariff on a successful foreigner's bid, the contract goes to the firm with the lowest bid. Here, however, a successful foreigner must pay a tariff to the government.[3]

We begin by establishing an equivalence in the bidding game between the two policies, i.e., for each price preference there exists an ad valorem tariff that results in equal expected profits. In particular, under the equivalent tariff, the foreign firm scales up its bid so that it achieves the same net-of-tariff payoff if it wins the contract. We then continue by considering government welfare under the two policies in a setting where, as in Branco (1994), it may value domestic firm profits. In addition, and critically, we allow the government to value savings from a lower price differently from tariff revenues (as might be the case if tariff revenues are costly to collect). When government welfare depends simply on net revenues, i.e., tariff revenues are valued equally (but opposite) from expenditures, the same tariff equivalent to the price preference in the bidding game results in equivalent government welfare. Thus, as in Branco (1994), the optimal tariff would be positive. Further, this equivalence allows us to utilize the variety of results found in the price preference literature in a tariff setting. In addition, it suggests that in such a situation, even when price preferences are eliminated, it does not necessarily affect the equilibrium levels of protection or welfare since the government can switch to an equivalent tariff. As such movements to reduce protectionism are likely to be most effective when considering both tariffs and non-tariff interventions such as price preferences jointly.

That said, there are situations in which the bidders' equivalent tariff is not equivalent for the government. For example, it may be the case that tariff revenues are valued differently than expenditures. This can be the case if, as found by Riezman and Slemrod (1987), tariffs are costly to collect, implying that a dollar of gross tariff revenues are less valuable to the government than reducing expenditures by a dollar. Other examples include additional features of government welfare that depend on the tariff (such as the impact of a tariff on non-governmental consumers) or when other commitments (such as free trade agreements) constrain tariffs. In particular, if tariffs are less valued than expenditures, we find that moving from the price preference to an unconstrained tariff still works to reduce protection. Finally, note that these results are not specific to competition between domestic and foreign firms. As such, our results contribute to the more general discussion on discrimination in public procurement auctions.

The paper proceeds as follows. In Section 2, we present the model and demonstrate the equivalence of the price preference and the tariff in the bidding game. Section 3 describes government welfare and lays out conditions under which the equivalence does — and does not — extend to the government. This section also compares welfare for the various players under the two policies and compares them to the optimal price preference derived by Branco (1994). Section 4 concludes.

2. The model

The model has three players: a government, a domestic firm, and a foreign firm. The government has a project of value V that it wishes to be completed. Prior to the commencement of the game, each firm $i = d,f$ obtains a private cost c_i drawn independently from cumulative distribution $G_i(\cdot)$ with density $g_i(\cdot)$ on support $[\underline{c}_i, \bar{c}_i]$, where $\underline{c}_i \geq 0$. We assume that $V > \max\{\bar{c}_d, \bar{c}_f\}$ so that in equilibrium the contract is awarded to one of the firms.[4] Both firms simultaneously submit bids b_i with the winner, determined by the governmental policy in place, being paid its winning bid. The mechanism for determining that winner, however, differs across policy regimes (price preference or tariff). The timing of the game is that, given its policy regime, the government chooses the extent of protection, following which bids are submitted and a winner is chosen. We assume that G_i has properties such that the equilibrium bid functions are monotone in c_i and the bid functions are continuous in the range of non-prohibitive price preferences/tariffs.[5] In this section, we focus on the subgame given the policy regime and the level of protection.

2.1. Price preference

We begin with the price preference. Here, the domestic firm enjoys a price preference of p, where $0 < p < 1$, and wins as long as $(1-p)b_d < b_f$, i.e., so long as its bid is no more $1/(1-p)$ times that of the foreign firm's bid. Note when $(1-p)b_d = b_f$, the contract is randomly awarded. Also notice that this price preference is linear with respect to the bids and reflects the norm used in practice.[6] The linear price preference studied here is a restriction on the policy space relative to that considered by McAfee and McMillan (1989) and Branco (1994), a distinction that will be important when considering welfare in the next section.

With a price preference p in place, the expected profit for the domestic bidder is

$$\mathbb{E}(\pi_d) = (b_d - c_d)\Pr\left(b_d < \frac{b_f}{1-p}\right). \tag{1}$$

Similarly, expected profit for the foreign bidder is

$$\mathbb{E}(\pi_f) = (b_f - c_f)\Pr\left(\frac{b_f}{1-p} < b_d\right). \tag{2}$$

From the first order conditions of these equations, one obtains bid functions $b_i(c_i; p)$, i.e., the bid each firm would submit conditional on its own cost and the price preference. We make the standard assumption that a firm never bids below its cost even when it has a zero chance of winning.[7] We define inverse bid functions $c_i(b_i; p)$,

[2] In a model of perfect competition (which is fundamentally different than the auction literature we draw from) Evenett and Hoekman (2005) compare price preferences to non-transparency, measured as a cost to foreign firms.

[3] Though, in this paper, our use of a tariff is literally a discriminatory tax on the foreign firm, it need not be the case in the real world. For instance, the government could be imposing a tariff on an imported input specific to the foreign firm but which is also used throughout the domestic economy. Alternatively, the tariff could represent a profit tax on both firms, but the domestic firm is able to take advantage of a tax credit that the foreign firm can not. Thus this is discriminatory, but not overtly so. We discuss such extensions after establishing our baseline results.

[4] This assumption eases the presentation of the results on the optimal level of protection as the contract is always fulfilled in equilibrium. When this is not the case, it is necessary to modify the welfare function by integrating only across the cost space resulting in bids no greater than V. Further, having a V that is finite also eliminates other equilibria. See Kaplan and Wettstein (2000).

[5] See Reny and Zamir (2004) and Lebrun (2006) for the necessary assumptions.

[6] See Evenett (2002) for discussion.

[7] This assumption eliminates multiple equilibria. See Kaplan and Zamir (2015).