THE IMPACT OF GREEN CRITERIA IN PUBLIC PROCUREMENT ON PURCHASE COSTS

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Overview

Public authorities spend large shares of their GDP on goods and services (12 percent of annual GDP on average for OECD countries (OECD, 2017)) and are therefore responsible for a significant share of embedded emissions. Given this large impact, governments have the responsibility of decarbonizing their purchases, as well as the potential to influence markets towards more sustainability.

So-called 'Green Public Procurement' (GPP) consists in the use of environmental criteria in the procurement process. GPP can thus be used to achieve strategic policy objectives, e.g. such as decarbonising the economy. Despite rising attention given to GPP, the use of environmental criteria in public procurement tenders still remains marginal. One of the main barriers to a broader implementation is the perception of higher procurement costs when including environmental criteria (see e.g., UN, 2017; Chiappinelli and Zipperer, 2017).

A priori, it is however unclear whether using GPP increases the costs of public procurement. On the one hand, the purchase price for environmentally friendly products and services is often higher than for business-as-usual options (e.g., LED bulbs against standard ones). In light of the requirements of public procurement – that is, avoiding that public money be wasted - this poses a big concern to procurement officers, especially at the local level, where often most of the procurement takes place, because of tighter budget constraints and higher reluctance to stress the tax base. Another reason why costs under GPP might be higher is that GPP is perceived to reduce the number of bidders in the competition, thereby leading to a further increase in the purchase price. On the other hand, the introduction of green criteria may in fact encourage the participation of more innovative firms. These firms might have a competitive advantage relative to incumbents with respect to a competition where only price is considered, e.g. because they have invested in low-carbon technologies or products (see Brannlund et al, 2010). GPP may therefore both attract participation and level the playing field for the competition.

Given the high potential of GPP as a decarbonisation policy, it is important to assess whether and to what extent introducing green criteria affects procurement costs. This paper aims at contributing to this question by providing a theoretical and empirical analysis of the competition effect of introducing environmental criteria in the procurement tender, and thus, in turn, the effect on procurement costs relative to standard tenders. To our knowledge this paper is the first in providing a thorough analysis of this question, which is of foremest importance for policy makers to take informed decisions when implementing decarbonisation policies.

Methods

In the theoretical part of the paper, we adopt auction theory methodologies (Klemperer, 1999; McAfee and McMillan, 1987) and develop a model with (technologically) heterogeneous firms (business as usual/incumbents firms and innovative green firms). We study entry and bidding behavior in a GPP auction (multi-dimensional) relative to a standard one (one-dimensional), and assess the effect on the winning bid (purchase price).

In the empirical part of the paper, we use a structural estimation of the model developed in the theoretical part to empirically estimate the magnitude of the effect. We use data from the Tenders Electronic Daily (TED) database which contains public procurement data for the European Economic Area plus Switzerland for 2006 until 2016. The dataset offers information on the contracting authority, the award value, the award procedure, the number of bidders, and more.

Results

The results from the theoretical model indicate that the relative importance given to environmental criteria in the tender with respect to the price affects bidder competition. If the weight given to the green criterion in the score is

very high or very low relative to the weight given to the price criterion, the competition effect is negative: if the weight is too high, incumbents will no longer enter - only green firms will enter. If it is too low, only incumbents will enter. If the weight is intermediate, both types are willing to enter, and competition is increased. Motivated by this preliminary result, we will next implement an optimal auction analysis to determine the optimal weight for the auctioneer to give to the environmental component in order to maximize firm entry, given firm cost heterogeneity.

The preliminary results from the empirical estimation confirm the theoretical analysis. The threshold for both types of firms to enter the competition lies at a weight of 15% given to the environmental criterion. If the weight given to the environmental criterion is higher than 40%, fewer firms enter the competition. These numbers have to be interpreted in the light of the distribution of the weights given to environmental criteria, which, if not zero, has a median weight of 12%. The estimated cost effect of the reduced competition above this threshold is a price increase of up to 20%. In the spectrum where the two types of firms enter the competition, the estimated cost effect is not significantly different from zero.

Conclusions

The results of the theoretical and empirical analysis of the paper call for caution when implementing GPP. Besides positive environmental effects through environmentally friendly purchases, the effect on competition and thus costs of procurement has to be taken into account. An appropriate design of GPP tenders, i.e. giving a significant but not excessive weight to environmental criteria, can however be a suitable decarbonisation policy – especially when considering spill-over effects to the private sector.

References

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