

Socially optimal procurement with tight budgets and rationing

Signe Anthon, Peter Bogetoft, Bo Jellesmark Thorsen*

University of Copenhagen, Faculty of Life Sciences, Rolighedsvej 23, DK-1958 Frederiksberg C, Denmark

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Abstract

We investigate the behaviour of a social planner that secures the supply of a good, e.g. an environmental benefit, through contracting with private agents. While the social planner seeks to maximise net social benefits, she is also controlled with a fixed budget. Private agents are profit maximising and hold private information concerning their variable costs of production. They also have known fixed costs of contracting. We find that budget constraints and fixed costs change the optimal contract design in more than one way: the social planner minimises costs, rations high-cost contracts to reduce fixed costs and information rents, and distorts contracts for all agent types, including low-cost agents. We find that rationing improves social welfare. Also, even though social costs – including tax distortion – are explicitly taken into consideration, they do not affect the design of optimal contracts when budgets are tight. In those cases the budget constraint dominates the solution.

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1. Introduction

1.1. Issues in public procurement

States, regions, municipalities and other public bodies ensure the provision of many goods. The production of the goods is sometimes done by public firms, e.g. in the case of defence and police. Often, however, the production is delegated to private agents and the role of the public

* Corresponding author. Tel.: +45 3528 1700; fax: +45 3528 1508.

E-mail addresses: sia@life.ku.dk (S. Anthon), pb@life.ku.dk (P. Bogetoft), bjt@life.ku.dk (B.J. Thorsen).

body becomes one of creating incentives. Moreover, the incentives often take the form of subsidies as when private landowners are partially compensated to supply environmental goods, or when general practitioners or dentists are subsidised to provide cheap health care.

Since the seminal work of Akerlof (1970) such procurement problems have routinely been modelled as principal-agent problems. The agency framework is now textbook material (e.g. Salanié, 2001). The standard case involves a principal responsible for the design of procurement schemes. The agents have private information about production costs and they use this to extract information rents, i.e. payments in excess of their actual costs. The principal seeks to maximise the net social benefit, i.e. the value of the goods procured net of the social costs of providing them. The social costs usually include the actual production costs and information rents plus the tax distortions created by covering these.

This model has proven productive and informative, but nevertheless is not in all cases an entirely suitable description of the problem faced by a public procurer. The procurer should ideally act according to the objective stated, i.e. maximise net social benefits, and hence take the place of the benevolent social planner. Nevertheless, such public procurement bodies are *also* – more often than not – working under a budget constraint. Furthermore, in many realistic procurement cases, the social planner must expect to compensate agents not only for their variable costs of production and possible information rents caused by asymmetric information, but also for their fixed costs related to the production. In this paper, we investigate the implications of having a budget constraint and production involving fixed costs.

To illustrate the relevance of this last aspect, the presence of fixed costs of contracting and producing the good, we provide a couple of examples. First, we may think of the procurement of environmental goods and services from several landowners in a particular area. The procurement may have the goal of making the landowner shift his land-use from intensive agriculture to a more environmentally friendly management or to shift land-use entirely, e.g. to wet-lands or afforestation and to make an effort to restore natural habitats. The variable costs of afforestation, closing ditches, digging water holes etc., may vary quite a lot across agents due to differences in access to and opportunity costs of machinery, access to know-how and other issues. Furthermore, the landowner may experience significant fixed costs, and one reason for this is, e.g. that to qualify for the compensation grants from the public agency the landowner will be asked to undertake a not insignificant work in terms of supplying documentation for the extent and effects of his effort, contacting and interacting with various consultants and experts as well as local authorities and so on. The costs associated with these efforts are to a large extent independent of the amount of good produced. Often these activities go on for some years into the contract, and not only in the initial phase. This is, e.g. the case with afforestation grants in the EU. Such fixed costs are implied by the contracting relation and known for the principal. Similarly, society may have schemes for the procurement of building and city renewal or renovation programmes in key parts of important cities. These programmes may require the interested developer to undertake such projects in ways that suit the particular architecture of the area, use specific building materials and so on. While these requirements of course imply variable costs, they may also imply significant fixed costs. If nothing else, to qualify for the procurement grants the developer will usually be asked for a not insignificant amount of documentation of process, methods and materials, and he may need to interact with specialists and experts not otherwise needed.

With regard to the first issue, that the principal may face a budget constraint, this is not controversial. Rarely, if ever, are public agencies asked to undertake procurement in the absence of budget constraints. The motives for such budget limitations may be many, and in fact any organisation with multiple administrative or political layers faces coordination and motivation

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