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## Strategic outsourcing and optimal procurement



Frank Rosar

*Department of Economics, University of Bonn, Lennéstr. 37, Bonn 53113, Germany*

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### ABSTRACT

I study a procurement problem where each seller can ex ante decide to become an intermediary by outsourcing production to a subcontractor. Production costs are independently distributed and privately learned by the producer in each supply chain. I provide a rationale for outsourcing that relies on procurement and subcontracting mechanisms being designed in a sequentially rational way but not on cost savings. I show how my rationale extends to the case with cost savings and I discuss the sellers' incentives to engage in nested outsourcing. The driving force behind my rationale is that outsourcing makes the distribution of a seller's cost of providing the product more dispersed. I explain also how my analysis extends to problems where such a dispersion arises for other reasons than outsourcing.

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## 1. Introduction

When a buyer wants to procure a specialized product, the sellers are typically better informed about their respective production cost, but the buyer can affect how the sellers compete through her procurement mechanism choice.<sup>1</sup> The design of the optimal

Fax: +49 228 73 7940.

E-mail address: [email@frankrosar.de](mailto:email@frankrosar.de)

<sup>1</sup> Three types of players are relevant in my article, a buyer, sellers and subcontractors. All players are either firms or organizations. To improve readability and to better distinguish between these players, I will refer throughout this article to the buyer as 'she', to each seller as 'he' and to each subcontractor as 'it'.

procurement mechanism for given, commonly known cost distributions is a standard exercise in Bayesian mechanism design (Myerson, 1981).

Yet in many applications, a seller can affect his cost distribution through some publicly observable long-term decision before the procurement mechanism is designed. I will focus in the main part of this article on an important example for such a decision: outsourcing of production to a subcontractor.<sup>2</sup> Outsourcing often affects a seller's cost of providing the product to the buyer through two channels. On one hand, it typically leads to a loss of information and thus to an information rent that has to be left to the subcontractor. On the other hand, outsourcing might imply cost savings. My aim is to understand the sellers' outsourcing incentives prior to competing in a subsequently designed procurement mechanism.

In the absence of cost savings, outsourcing transforms a seller's cost distribution in two ways. First, it increases his cost because of the information rent he has to leave to his subcontractor. Second, it makes his cost distribution more dispersed. A rough intuition for the second effect is that the subcontractor's information rent is small (large) if the subcontractor has to produce only (also) when its production cost is small (large).

Even though outsourcing appears to be purely wasteful for a seller, it can be beneficial for strategic reasons. Responsible for this is the dispersion effect. To get an intuition for why the dispersion effect can render outsourcing beneficial, consider the hypothetical case where the buyer does always want to procure from a specific seller. This seller's rent corresponds then to the difference between his highest possible provision cost realization (which is what the buyer will pay him) and his expected actual provision cost. Under a regularity assumption, a more dispersed cost distribution increases the rent that the seller earns. On the other hand, when a seller's provision cost and the rent that he can earn increases, it becomes more attractive for the buyer to procure from a different source; that is, when the buyer is not predisposed to procure from any specific seller, outsourcing is associated with a trade-off. A seller's incentive to engage in outsourcing depends on the relative strength of the "higher rent from winning effect" and the "lower winning probability effect" for given outsourcing decisions of the other sellers.<sup>3</sup>

After introducing the model in [Section 2](#) and deriving the implications of optimal subcontracting and optimal procurement in [Section 3](#), I investigate the sellers' outsourcing incentives in the absence of cost savings in [Section 4](#). I establish the sellers' trade-off and I derive conditions under which outsourcing arises in equilibrium for strategic reasons. As outsourcing implies in many important applications cost savings, I explain in [Section 5.1](#) how the strategic effects associated with outsourcing interact with cost savings. The more general framework with cost savings enables me also to discuss different extensions. In [Section 5.2](#) I discuss how my analysis extends to problems where each seller can

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<sup>2</sup> I will discuss how my analysis extends to problems with other instruments than outsourcing in [Section 5.2](#).

<sup>3</sup> How the "higher rent from winning effect" arises depends on how the optimal procurement mechanism is implemented. If it is implemented indirectly through an auction, the effect can arise because outsourcing induces less intense competition. If it is implemented directly, it arises because a higher dispersion leads to a higher information rent by making lying more attractive.

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