OPTIMAL LOTTING MECHANISM FOR EXPANDING SMALL BUSINESS PARTICIPATION IN PUBLIC PROCUREMENT

Axmedjanov Sardorbek
PhD in Economics, Independent Researcher, Tashkent State University of Economics

Abstract. This thesis substantiates the economic importance of dividing large public procurement contracts into lots that correspond to the financial and productive capacities of small businesses. An optimization approach is proposed for determining the number of lots by jointly considering market access, the level of competition, administrative costs, and technological interdependence among lots.

Keywords: public procurement, small business, lotting, competition, transaction costs, budget savings.

Public procurement can serve as a stable source of demand for small businesses. However, when procurement objects are structured as excessively large packages, the ability of small firms to participate in tenders may be constrained. Large contracts often require substantial working capital, high-value guarantees, broad geographic coverage, and the capacity to fulfil a significant volume of orders simultaneously. As a result, small enterprises capable of efficiently delivering individual components of the procurement package may still be excluded from competition.

One effective instrument for addressing this problem is the division of procurement into economically and technologically justified lots. At the same time, excessive fragmentation can increase administrative, documentation, coordination, and monitoring costs. Therefore, determining the optimal number of lots requires a balance between the benefits of improving market access for small businesses and the additional transaction costs borne by the procuring entity.

To formalize this trade-off, the study applies the objective function $E(L) = A \cdot L + B/L + C \cdot (L-1)^2$, where L denotes the number of lots; $A \cdot L$ represents administrative costs that increase with each additional lot; B/L captures market-access and competition losses associated with excessively large lots; and $C \cdot (L-1)^2$ reflects technological and coordination costs arising from interdependence among lots.

Using a hypothetical procurement package for digital educational equipment valued at UZS 13.811 billion, the safety-adjusted implementation capacity of small businesses was estimated at UZS 3.154 billion. The calculations yielded a continuous optimum of 4.9642, while the discrete optimal solution was identified as five lots.

Under the five-lot configuration, the average lot value remains below the target capacity of small businesses. According to the model, the expected number of bidders increases from 2 under a single-package arrangement to 7.01 when the procurement is divided into five lots. At the same time, the gross savings rate reaches 6.8%, while net budget savings after deducting administrative and coordination costs amount to UZS 907.9 million.

Lotting decisions should not be based solely on the monetary value of individual lots. The technological integrity of the procurement object, warranty obligations, servicing requirements, system integration, and boundaries of responsibility must also be taken into account. Therefore, procurement should not be mechanically divided into equal-value lots; instead, functional and territorial modules should be formed. In the analyzed model, interdependent components such as servers, software licences, and warranty services are retained within a single module in accordance with this principle.

Optimal lotting in public procurement can expand small-business access to tenders while simultaneously strengthening effective competition and improving the efficiency of public expenditure.

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For high-value procurement, it is advisable to introduce an economic lotting analysis as a separate component of procurement documentation and to develop electronic-platform tools such as a lot calculator, a market-capacity indicator, and a scenario-based assessment module. Model parameters should be calibrated separately for different procurement categories, and the final decision should be combined with professional technical expertise.

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