

## **Research on Procurement Stratagem considering Supplier's Quality Level**

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### **Abstract**

This paper studied how to design procurement stratagem in a two-level supply chain system considering supplier quality level. The supply chain included with a single supplier and single manufacturer who sells the product to the final market. Manufacturer orders from supplier according to market demand and the market demand function is given by linear demand function in quality and price. Define quality as the supplier's conforming rate, that is, the proportion of units that satisfy product specifications, the widely used quality measure. We employed the game theory to design three procurement stratagem considering supplier quality level: optimal procurement stratagem in centralized control situation; wholesale price procurement stratagem while the dominated supplier as the leader of the game in decentralized control situation; and profit margin procurement stratagem while the dominated manufacturer as the leader of the game in decentralized control situation. The numerical analyses show that the optimal procurement stratagem is the optimal stratagem among the three, and the wholesale price procurement stratagem is the worse stratagem among the three.

**Keywords:** procurement stratagem; game theory, supply chain, quality level