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Summary: In this article, we consider customers’ strategic behavior in an M/M/1 queue with the N-policy, setup time and server breakdown. The server is closed whenever the system becomes empty, and is activated when the number of customers in the system reaches a threshold. The setup time follows an exponential distribution. The server may break down when it is busy. Once a fault occurs, it will be repaired immediately, and the time of repair follows an exponential distribution. We obtain the equilibrium arrival rates in different states and give the expression of equilibrium social welfare. Finally, the equilibrium arrival rates and equilibrium social welfare are investigated numerically.

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91B42 Consumer behavior, demand theory
90B22 Queues and service in operations research

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queueing; equilibrium strategy; N-policy; setup time; server breakdown