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The Interplay of Inventory Management Decisions and Scarcity Behavior: Experimental Insights

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A well-known phenomenon related to inventory, but often neglected in inventory management, is the scarcity effect, i.e. the increase in the demand if inventory is low. I consider a repeated purchase setting and address the question of whether inventory management decisions concerning the control policy and the service configuration (determining when and how much to order) impact scarcity behavior arising from buyers' stock-out perception. I study common inventory control policies that assume a demand independent of the inventory management and I challenge this assumption of an exogenous demand. This research explores two prevalent classes of inventory policies widely used in practice (periodic & continuous) configured according to fill-rates, a popular way of measuring service. I conduct a laboratory experiment with four treatments (2 policies $\times$ 2 configurations) where participants act as buyers. I observe stock-out induced scarcity and find support for the hypothesis that the periodic policy leads to a stronger effect compared to the continuous policy if the service level is low. The study also supports the hypothesis that buyers act forward-looking as their demand peaks before the inventory reaches its lowest level. These findings are in line with the behavioral scarcity model that I propose. My research provides a new perspective on inventory management as it reveals that both the chosen control policy as well as the chosen service configuration influence stock-out pressure induced inventory runs. Inventory managers should be aware of scarcity effects and its consequences, like the disadvantages of a periodic policy for low service level.

Key words: Behavioral Operations; Inventory Control Policy; Scarcity Effect