

عنوان مقاله:

Stability analysis and optimal strategies for controlling a boycotting behavior of a commercial product

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خلاصه مقاله:

In this work, we propose a mathematical model that describes citizens' behavior toward a product, where individuals are generally divided into three main categories: potential consumers, boycotters who abstain from it for various reasons, and actual consumers. Therefore, our work contributes to understanding product boycott behavior and the factors influencing this phenomenon. Additionally, it proposes optimal strategies to control boycott behavior and limit its spread, thus protecting product marketing and encouraging consumer reuse. We use mathematical theoretical analysis to study the local and global stability, as well as sensitivity analysis to identify parameters with a high impact on the reproduction number  $R_0$ . Subsequently, we formulate an optimal control problem aimed at minimizing the number of boycotters and maximizing consumer participation. Pontryagin's maximum principle is employed to characterize the optimal controls. Finally, numerical simulations conducted using MATLAB confirm our theoretical results, with a specific application to the case of the boycott of Centrale Danone by several Moroccan citizens in April 2018.

کلمات کلیدی:

Modeling a boycott behavior, Local and global stability, Sensitivity analysis, Optimal control problem

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