

## Linking Customer Behavior and Delay Announcements: Are Customers Really Rational?

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Delay announcements that inform customers about anticipated delays are prevalent in services. To effectively manage service systems, it is important to understand how customers actually respond to delay announcements. In this paper, we propose a flexible framework to empirically explore customers' abandonment behavior in the presence of delay information using data from a call center. The key assumption made in previous work is that customers are rational or at least partially rational in responding to announcements. In contrast, our paper relaxes all rationality assumptions and explicitly allows for the following possible behavioral factors: (1) the potential reference effects and customers' loss aversion behavior as induced by the announcements, and (2) customers' potential sunk cost fallacy. To the best of our knowledge, this paper is among the first to empirically test and quantify the reference effect of delay announcements and customers' sunk cost fallacy in waiting time.

**Data Description:** Our data comes from an Israeli bank's call center and contains many different customer classes. The data contains detailed information about each individual call. In particular, the data captures the time when a customer enters the queue, the time when she leaves the queue, and her outcome (e.g., abandon or not). Customers may receive multiple delay announcements over time depending on how long they wait in the queue. In each announcement, customers are given estimates of the anticipated delay to the second.

**Main Results:** Our findings indicate that customers exhibit loss aversion behavior, where they are less likely to abandon prior to the announcement-induced reference point and then much more likely to abandon after it. Customers may receive multiple announcements over time in this call center, and our results show that customers may update their reference point as they receive subsequent announcements. In addition to loss-averse behavior, customers may fall for the sunk cost fallacy, becoming less likely to abandon as more time is spent in queue. We demonstrate the importance of accounting for these effects using a classic staffing model.