

Strategic Interactions in Price Setting: Evidence from Consumer Electronics Markets

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How do retailers interact in their pricing? The purpose of this paper is to empirically address this question using a unique dataset collected through a Japanese price comparison site called “Kakaku.com”. The dataset consists of a set of prices quoted by each retailer for each product, as well as a set of clicks done by consumers to each retailer for each product, both with second timestamps.

A retailer may or may not change its price when other retailers do. If a retailer mimics others in changing or not changing its price, it is a sort of herding or strategic complementarity. To see how retailers’ pricing behaviors are correlated with each other, we calculate a dynamic correlation between them. We define a zero-one indicator variable $Q_i(t)$, which takes a value of one if retailer i changes its price in period t , and zero otherwise. Then we calculate correlation coefficient between $Q_i(t+\tau)$ and the average of $Q_j(t)$ over j except i . The results for two retailers selling a digital camera are presented in Figure 1. We see that the retailer 1 adjusts its price before others do, suggesting the possibility that he is a kind of price leader in this market. On the other hand, the retailer 2 tends to adjust its prices after others do, suggesting that he is a follower.

However, this simple correlation does not tell us much about strategic interactions. For example, suppose there exist no strategic interactions between the retailer 2 and others, but the retailer 2 reacts to a shock, which is common to all retailers, with a longer delay. In this case we observe a positive, but spurious correlation.

The main task of this paper is to characterize correlation in pricing behaviors, and to identify its source: namely, whether it comes from correlation in exogenous shocks or from correlation in endogenous pricing behaviors. We will do this step by step. First, we will search periods in which retailers compete with each other by changing their prices frequently, and consequently prices fall sharply. So far we have found from the data that retailers change their prices more frequently during high demand periods, like Christmas season, when more people visit the site and the number of clicks significantly increases. Also, we have found frequent price changes occur for a product immediately after its birth. Second, we will investigate how prices, especially the lowest quote, behave during these periods. Specifically, we are interested in how a fall in the lowest quote starts, how it accelerates over time, and how it ends. Third, we will investigate how such a cascade type fall in the lowest quote is related to strategic interactions among retailers. Finally, we will look at the distribution of price durations, i.e. the time interval between a price change done by a retailer and a price change done by its competitor immediately after that.

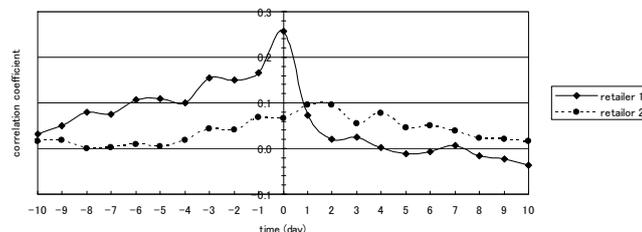


Figure 1: Dynamic cross-correlation between price adjustments for retailers selling a digital camera

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