

# Strategies for Retailers Fighting Price Wars

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Researchers have used game theory to identify several strategies that retailers might use to fight price wars, while maximizing their profit and market share.

(PhysOrg.com) -- All retail companies want to maximize their profits, while at the same time maintaining high market share compared with their competitors. One way to do this is by promising to offer the lowest prices in the market. With this strategy, a retailer may risk a decrease in profits, but has the chance to recover the loss by capturing more market share in the future, especially if some of its competitors exit the market.

This price-cutting strategy and others lie at the heart of price wars, which occur when retailers compete with each other by lowering their

prices in an attempt to maximize their profits. However, price wars usually lead to a lose-lose situation, in which all retailers' profits suffer.

In an effort to understand which pricing strategies work the best for fighting price wars, researchers have recently performed a study in which they use game theory to model retail pricing strategies among multiple retailers that sell a certain product. The strategies involve building price walls, with the goal of preventing the huge drop in market price and lost profit. Researchers Chun-Hung Chiu and Tsan-Ming Choi of the Hong Kong Polytechnic University in Kowloon, Hong Kong, and Duan Li of the Chinese University of Hong Kong in Shatin, Hong Kong, will publish their study in an upcoming issue of *IEEE Transactions on Systems, Man, and Cybernetics - Part A: Systems and Humans*.

As the researchers explain, a price war starts when a company tries to increase its market share by cutting prices, with the downside of risking lower profits. Other companies, which still have the goal of maximizing their profits, follow suit by also lowering their prices according to the optimization formula that obeys the Nash equilibrium. This behavior triggers a chain reaction among all retailers to keep lowering their prices. Eventually, all companies suffer a loss in profit - a loss of up to 45%, the researchers calculated. As previous research has shown, price wars seem to occur because of the mistaken belief that lowering prices below competitors' prices is a competitive strategy.

Instead, the researchers found several other strategies that retailers could use to react to one retailer lowering its prices. Rather than base its strategy on maximizing profit, a retailer can react by either not changing its price at all, by increasing its service level, or by raising its price. Each of these strategies can act as a price wall, and reduce the overall profit loss caused by price wars.

“The greatest significance of our study is that we provide several pricing

strategies for retailers to fight a price war,” Choi told *PhysOrg.com*. “The strengths and weaknesses of the pricing strategies are discussed analytically. These can help retailers select the best way to fight a price war.”

Using game theory to model these strategies, the researchers showed that only the “no-action” price wall (not changing the price) is guaranteed to eliminate the price drop of the whole industry. However, the retailer that chooses to not change its price still suffers some loss in both market share and profit, while the first retailer (that started the price war by lowering its price) enjoys increased market share.

“We are rather surprised that the no-action price wall is the only strategy that can guarantee to eliminate the overall price drop of the whole industry,” said Choi. “It actually requires a strong ‘co-opetition’ (instead of competition) mindset among the retailers in order to justify this act.”

In the second strategy, a retailer may choose to increase its service level, which includes all the non-price attributes, such as the company’s reputation, delivery time, refund scheme, warranty period, and customer service. The researchers evaluated two strategies based on adjusting the service level, and found that the tactic may not completely eliminate the industry’s price drop, but the retailer can partially minimize its own loss of profit and market share. Still, similar to the no-action strategy, the first retailer may reap most of the benefits by getting a larger market share.

Finally, the researchers showed that, by raising its prices in response to a competitor’s lowered prices, a retailer may actually increase its own profits, at the expense of decreasing its market share. However, this “reverse price war” strategy only works if the first retailer (that started the price war by lowering its price) follows suit by increasing its price in reaction to the second retailer’s price increase. Then both retailers

benefit, although the first retailer with the lower price benefits significantly more in both profits and market share than the second retailer. Further, if the first retailer doesn't follow the second retailer by increasing its price, the second retailer would fail using this strategy, experiencing lost profit and market share.

“This ‘reverse price war’ is an interesting and tricky act, while it can be a very good strategy if the ‘leader’ can well-predict how the other retailers will react following her price increase,” Choi said.

One catch to all of these price wall strategies, however, is that they enable the retailer that lowered its price first to benefit the most. The other retailers simply minimize their losses (or, in the case of the reverse price war strategy, accept a small gain while the first retailer enjoys a much larger gain). In competitive markets, retailers may not want to enable a greedy competitor to make bigger profits, even if their own company must take a greater loss to avoid benefiting the competitor. Nevertheless, this study shows that all retailers benefit if price wars can be stopped with price wall strategies.

“Among those strategies we investigated, we do not have ‘the best one’ because none of the strategies are dominating,” said Choi. “Each strategy has its respective strengths and weaknesses; a retailer should select the most suitable one to fight a price war based on her own preference and the situation that she is facing.”

More information: Chiu, Chun-Hung; Choi, Tsan-Ming; Li, Duan. “Price Wall or War: The Pricing Strategies for Retailers.” *IEEE Transactions on Systems, Man, and Cybernetics - Part A: Systems and Humans*. To be published.

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