



What at first may seem like an optimal pricing structure can look very different when taking into account a competitor's reaction. In this article, the authors present a case study that analyzes the importance of considering competitors' reactions when a price-leader is planning to optimize its portfolio pricing. Juan Andrés Tello is Senior Director Americas and Roberto Segura is an Analyst at SKIM, a research and customer insights agency with offices in Europe, the US, Latin America, and Asia. They can be reached via skimgroup.com.

Applied Game Theory Reveals Competitor Reactions to Pricing Optimization

In most markets, brands compete at least somewhat on price. That's why it's so important to consider potential competitor reactions to a new pricing strategy. Existing literature and game theory (the science of logical decision making) identify two types of market players: price leaders and price followers. A price leader, by definition, makes the first move on pricing. The follower responds with its own reactionary price decision. When a price leader optimizes its strategy, it must consider and anticipate a follower reaction based on prior evidence. Like a game of chess, each player must consider the past and future moves of the other. Historical information informs one's expectations for a reaction.

you are the price leader. Your competitor is following your pricing strategy. However, if your competitor decreases their price, this aggressive reaction indicates they are not following your pricing strategy. By analyzing past competitor reactions, one can make more effective pricing decisions – and win the game.

What at first may seem like an optimal pricing structure can look very different when taking into account a competitor's reaction. For instance, if the follower's price reaction goes in the same direction as the leader's price change, then the leader has an extra incentive to optimize with a price increase compared to a scenario in which there is no competitor reaction. If you're not considering your competitor's reaction, you do not have a fully developed pricing strategy.

If, when you increase your price, a competitor always responds with a price increase one month later, congratulations,

[CONTINUED ON NEXT PAGE ➔](#)

In This Issue:

Applied Game Theory Reveals Competitor Reactions to Pricing Optimization.....	1
Business Model Digital Transformation: What Does It Mean for Go-to-Market Strategies?.....	3
Boosting Average Selling Prices to Drive Profitability	5
Smart Packaging 4.0: Opportunities and Risks of Industry 4.0	8

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A leader price change can trigger two different potential effects:

- **Direct Effect:** An example of a direct effect is when a leader's price increase causes a decrease in its volume share because some consumers either switch to another brand or leave the market altogether.
- **Indirect Effect:** An indirect effect is triggered by a competitor's reaction and is often longer-term. For example, if a competitor answers the price increase with its own price increase, it may lead some follower consumers to switch to the leader sub-brands, thereby increasing the leader's market share.

These two different events were both triggered by the same initial pricing action. One could be easily predicted, but the other requires more historical information.

There are many FMCG (fast-moving consumer good) examples of competitive pricing reactions. One of the best known is the case of Kellogg's versus General Mills in the breakfast cereal category. Pricing researchers often study the years-long pricing battle that resulted in the two companies switching their pricing positions over time.

Similar scenarios have played out in the candy industry between Nestlé and Mars in Canada where Nestlé has been increasing its prices while competitors including Hershey's and Cadbury have followed with price increases.

In this case study, we analyze the importance of considering competitors' reactions when a price-leader is planning to optimize its portfolio pricing. In 2015 SKIM conducted a study of two CPG brands in the packaged food category, one a price leader, the other a price follower. We will refer to them by the names Leader and Follower.

We applied three different Follower reactions to Leader's price changes:

Figure 1

Reaction Scenario	Total # of Scenarios	# of revenue increasing scenarios	Maximum revenue increase
Full	7776	1387	5.9%+
Partial	7776	591	2.8%+
No reaction	7776	70	0.3%+
Aggressive	7776	943	1.9%+

1. **Full:** When Follower fully follows Leader
2. **Partial:** When Follower partially follows Leader
3. **Aggressive:** Follower reacts in opposite direction of Leader

For each different reaction, researchers estimated thousands of potential scenarios with price variations between sub-brands based on current scenarios (prices can shift from -10% to +15%), to find the optimal pricing strategy that Leader could adopt depending on Follower's reaction. They came up with three findings.

Finding 1: The expected revenue of optimal scenarios can change dramatically when taking into account a competitor's reaction.

If Leader does not consider Follower's reaction when optimizing its portfolio, there will be very few revenue increasing scenarios (70 scenarios) with a maximum 0.3% revenue lift. However, if they do take into account Follower's reaction, the number of scenarios resulting in increased revenue are not only greater, but also the highest expected revenue changes dramatically (please, see [Figure 1](#)).

Finding 2: What seems to be a good pricing strategy for the short term (the period of time before a competitor's reaction) might backfire in the long term.

All revenue increasing scenarios in which the Follower does not follow were compared to the reaction scenarios (fully, partial and aggressive). Researchers found that there is significant risk of a

detrimental revenue impact when the Leader does not consider the Follower's mid-to-long term reaction.

Scenarios that are profitable in the short term (no competitor reaction), are not necessarily profitable in the long term (late competitor reaction). As companies aim to achieve an equilibrium between short and long term forecasting, they should look at scenarios that are revenue increasing for both.

Finding 3: A price leader might find it profitable to increase a brand's price and sacrifice market share to induce a large competitor brand to follow in order to attract consumers to the leader's other sub-brands.

For example, Leader has sub-brands LX and LY and Follower has sub-brand FX that follows LX. With foresight as to Follower's pricing strategy, Leader could leverage LX by increasing the price and, thus, forfeiting market share. FX reacts with price increases and, consequently, some consumers switch to not only LX, but also to LY. Since there is a possibility that one or multiple Follower sub-brands will increase their market share, there is an extra incentive in favor of price increases.

In competitive industries, small moves can have big consequences. And as in chess, understanding your opponent well enough to anticipate competitive reaction is critical. Game theory gives pricing decision makers the power to see into the future by examining the past. Armed with the right information, your competitor's next move won't take you by surprise.