

Improving Merger Analysis With Randomized Control Trials

Law360, New York (July 19, 2016, 11:25 AM ET) -- A few years ago, my son and I were making cookies together. We put in all of the ingredients, stirred it up and then my son tasted the batter. "Delicious," he told me. Next, we stirred in some nuts. He tasted the batter again, and as soon as he did, hives spread across his face. It was obvious immediately that he was allergic to nuts.

Why was the conclusion so clear? Because this was the simplest and cleanest (albeit inadvertent) test around a causal relationship: eating cookie dough without nuts compared to eating the same cookie dough with nuts. Since everything else was exactly the same, except for the nuts, it is simple to draw the correct conclusion that the nuts caused the reaction.

In antitrust, however, making the correct conclusion about a causal relationship — for example, will a merger cause consumers to pay higher prices — is rarely this simple. It can be difficult to test economic theories in antitrust because often, the data needed to test the theory are not available.

Instead of a controlled experiment, like the one involving my son eating nuts, antitrust lawyers, economists and regulators often rely on natural experiments to predict whether a merger will cause prices to rise. A natural experiment analyzes historical events in the marketplace, such as how firms responded in the past when a new rival entered the market. The idea behind a natural experiment is that the outcome of the past event will be informative as to customer substitution patterns and diversion ratios.

The tricky thing about using natural experiments in antitrust, however, is that not all of these kinds of historical events fit the gold standard of a controlled experiment. In particular, there may be other confounding events occurring at the same time.

One common confounding event is a simultaneous reduction in costs. For example, if entry by a new rival coincided with a reduction in the cost to serve the market, then it can be very hard to figure out if a competitive response is attributed to the entry of the new rival or attributed to the decline in the cost to serve. It can be very difficult to disentangle cause and effect when more than one thing occurs at the same time.

In this new world of "big data," there are many instances in which antitrust practitioners may be able to do better in their ability to draw causal relationships in merger analysis by using a controlled experiment technique that the medical, economics and public policy fields refer to as randomized control trials, or RCTs for short. RCTs are considered the gold standard for high-quality empirical evidence because they require the fewest assumptions and leaps of faith when drawing conclusions.

Antitrust practitioners may be surprised to learn that many businesses today regularly rely on RCTs to make strategic decisions in the ordinary course of their business. In the business world,



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RCTs are often called A/B tests or split tests. These tests are more powerful than the natural experiments used in antitrust because they are controlled. Many firms that operate in online environments as well as firms that are technology-oriented regularly use A/B tests in the ordinary course of business before making strategic decisions related to product pricing, promotions, content and advertising. Google, Twitter, Amazon, Trulia, Netflix, eBay and Yahoo are just a few examples of firms that use these empirical tests.

How do these tests work? Suppose a firm sells online ads and wants to convert more website visitors into customers who buy online ads. The firm wants to know if more visitors buy ads when the Buy Now button is changed from a small, green square to a large, red circle that contains the phrase “Buy Now.”

To test this hypothesis using an A/B test, the firm creates two versions of its landing page, version A and version B, and then compares the ad-buying take-up rate between the two versions. In particular, when visitors go to the firm’s homepage, they are randomly assigned to see either version A of the landing page — the control with the current green square — or version B of the landing page — the treatment using the large, red circle.

Once the data roll in, the firm compares the percentage of visitors buying ads on version B (the treatment) to version A (the control). Since all else was held equal through randomization, any difference in the ad-buying take-up rate between the two groups is cleanly attributed to the “Buy Now” icon. For example, if the difference in the ad-buying rate between version B and version A is positive and statistically significant using a simple t-test, then the firm concludes the large, red “Buy Now” circle causes a higher ad-buying take-up rate. Based on this conclusion, the firm changes the landing page that all of its visitors see to one with a large, red “Buy Now” circle.

In this new world of big data, antitrust lawyers and economists can leverage businesses’ familiarity and expertise in running controlled experiments to address questions that frequently arise in merger analysis.

For instance, A/B tests can be used to assess how frequently customers of the acquiring firm switch to the product or service sold by the target firm in response to a relative change in price. To address this question, randomly select a treatment group and a control group among the customers of the acquiring firm. For the treatment group, increase the relative price at the acquiring firm by 5 percent. Because all else is held equal in this A/B test, any difference in customer switching behavior between the treatment and control groups is cleanly interpreted as being caused by the relative price change. This type of control trial can also be run from the perspective of the target firm rather than the acquiring firm, and the price change can be implemented to make the acquiring firm relatively less expensive rather than relatively more expensive.

Under a joint defense agreement, it may also be possible to calculate diversion ratios between the acquiring firm and the target firm by identifying which customers switched away from the acquiring firm and then accessing the target firm’s data to see which of these lost customers, if any, were picked up by the target firm.

Although a controlled experiment approach to addressing questions that arise in merger analysis may not work for all types of firms and all types of products and services, in this new world of big data, there are many instances in which antitrust practitioners may be able to do better than under current approaches. Moreover, for antitrust practitioners, it is notable that businesses and academics are already using these empirical techniques. For these reasons, it is no longer a question of whether controlled experiment techniques will come to merger analysis — but when.

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