How Natural Experiments Can Help In Estimating Damages

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Law360, Los Angeles (February 15, 2018, 11:40 AM ET)

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Damages experts routinely attempt to establish causality between the allegedly wrongful conduct and the quantity of damages asserted.[1] Establishing such a causal link can be one of the most challenging aspects of an economist's assignment.

Fortunately, increasing volumes of real-world data — including transactions, industry information and other data sources — are available to the damages expert. Availability of these data allow a variety of approaches to estimating damages that would be unavailable with limited information.

This article provides an overview of natural experiments — based on observational rather than clinical data — and their application to calculating economic damages as a way of establishing causality, and it presents a stylized case study using real-world data. It shows how natural experiments can be effective in advancing causality arguments and estimating damages.

Estimating a "But-For" World Is a Contentious Issue Between Opposing Experts

The general framework that experts use to quantify damages caused by a claim is a hypothetical or "but-for" world, where all factors are identical to the actual world but for the alleged act. By comparing the but-for world to the actual world, an economic expert can isolate the effects that are caused by an alleged act.

Establishing a but-for world, however, is a contentious issue between opposing damages experts because of its counterfactual nature. Additionally, courts themselves act as gatekeepers to exclude expert testimony regarding damages that they deem speculative (i.e., damages that are not reasonably certain or do not follow from the alleged act).[2]

The plaintiff's burden of proof as to damages may not be met simply with evidence of declining profits or a loss in valuation after the alleged wrongful act. Instead, the expert witness must be able to show that the lost profits or value were caused by the defendant's conduct and nothing else.nd mi in nulla.

Natural Experiments May Be Used to Construct a But-For World

Controlled experiments are ideally suited to establish causality because the experimenter can hold all factors constant except for a single variable of interest. New drugs, for example, are frequently tested using a control group that is given a placebo and an experimental group that receives the real drug. Participants are randomly assigned to the control and experimental groups, so that any differences in results between the two groups can be properly attributed to the drug and not to other known factors.

For economic matters, however, conducting controlled experiments is almost never possible. In practice, the data generated in the normal course of business are often used to make inferences about a variable of interest. Constructing a but-for world often involves assessing a decline in sales or profits using only the "actual" financial results, then applying economic theory and analysis to ascertain the effect of a harmful act.[3]

These real-world data, however, are often incomplete in that they do not capture every variable that might explain a drop in sales, increase in costs or other aspect of the but-for world.[4] As a result, economists' attempts to control for all factors using only the available real-world data can sometimes come up short.

Fortunately, it is sometimes possible to use a natural experiment to identify and control for important factors that may explain some or all of the differences between the actual and the but-for worlds.[5] A natural experiment, like a controlled experiment, uses control and experimental groups to isolate the effect from a single cause. Because

the study design is similar to a randomized experiment conducted in a laboratory, the results of a natural experiment may be used to show causal inference rather than correlation or statistical inference alone.

Natural experiments differ from controlled experiments because they are backward-looking and use naturally occurring, real-world data rather than experiment-generated data. They also differ from typical inferential analysis because the data used in a natural experiment are randomly assigned to control and experimental groups. The control and experimental groups are naturally generated in real-world data over time because of changes in business dynamics at the firm, industry and macroeconomic levels, including price changes, new products, revised marketing campaigns, new competition, changes in regulation and shifts in consumer preference, among other factors.

Given sufficient data, a competent economic expert will be able to identify the potential to use natural experiments in helping to establish damages attributable to an alleged bad act. Economists typically develop a deep understanding of the data that are available and the economics of a given situation. There is no cookie-cutter approach to developing a natural experiment, so it is important for an expert to understand the nuances specific to each case.

Even cases that appear similar may have subtle differences that can have consequential impacts. And even when an expert is diligent about understanding the data and controlling for the right factors, it is still possible to overlook an important factor in the damages analysis.

Case Background and Discussion of Real-World Data that Make a Natural Experiment Possible[6]

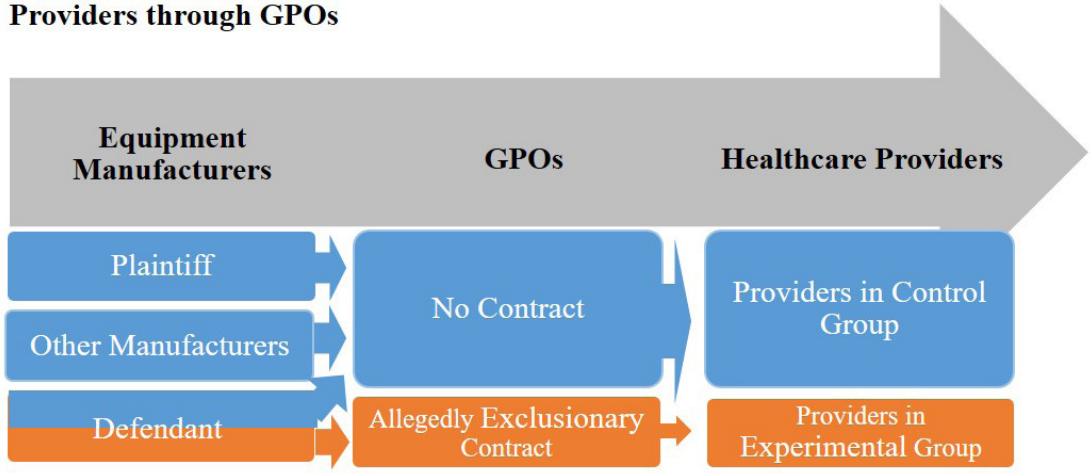
A recent litigation matter provides an informative case study involving a quasi-natural experiment that was constructed to assess a causal link between the alleged wrongdoing and damages.[7]

In this matter, the plaintiff and the defendant competed in the U.S. market for a medical product that is routinely used in patient care and is sold to hospitals and medical clinics. The plaintiff alleged that the defendant "foreclosed competition" in this market by engaging in anticompetitive contracting, consisting of sole-source contracts, loyalty discounts and market-share rebates. These "exclusionary" contracts allegedly caused health care providers to reduce their purchase share of the plaintiff's products in favor of the defendant's products.

Although the defendant entered into the at-issue contracts with hospitals and clinics, intermediaries called group purchasing organizations administered the contracts by educating health care providers and enforcing contract terms with them. Figure 1 below presents the supply chain and the role of GPOs as intermediaries between the manufacturers and providers. In this figure, the defendant's sales using allegedly exclusionary contracts are displayed in orange, and the plaintiff's sales using no contract are displayed in blue.

For purposes of constructing a natural experiment, it is important to note that the defendant initiated the contracts through only one GPO for a period of nine months before implementing the contracts to remaining GPOs. This staggered implementation created two separate health care provider groups, the first comprising providers that purchased under the allegedly exclusionary contracts, and the second providers that purchased without the contracts.[8] These two groups are presented as the experimental and control groups in the rightmost column of Figure 1.

Figure 1: Supply Chain: Equipment Manufacturers Sell to Healthcare Providers through GPOs



Notably, the defendant had no rationale for initiating the contract to the GPO in question rather than other GPOs, and the health care providers purchasing through the GPO in question were not systematically different from the providers purchasing through other GPOs. As a result, the assignment of health care providers to the experimental and control groups was essentially random.

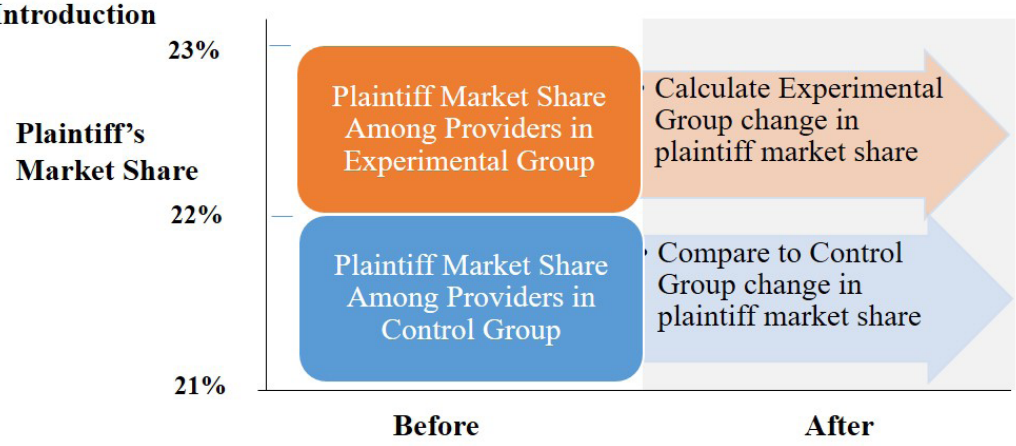
Natural Experiment Design

In this matter, the real-world conditions were favorable to construct a quasi-natural experiment: There were naturally formed experimental and control groups with no systematic differences except for the stimulus in question relating to the contract.[9]

Given these data, an economist can construct an experiment to test the impact of the allegedly exclusionary contract on health care providers' purchasing behavior by measuring the difference in the plaintiff's market share[10] between the experimental and control groups. In particular, the experimental design measured whether the plaintiff's market share among health care providers in the experimental group declined after the introduction of the allegedly exclusionary contract by a greater, lesser or equal amount compared to the plaintiff's market share among the control group providers.[11]

Figure 2 below graphically presents the experimental design framework. A larger decline in the plaintiff's market share in the experimental group compared to the control group would constitute evidence of a causal link between the allegedly exclusionary contract and damages suffered by the plaintiff.

Figure 2: Experimental Design: Compare Change in Plaintiff's Market Share Between Experimental and Control Groups After Allegedly Exclusionary Contract Introduction



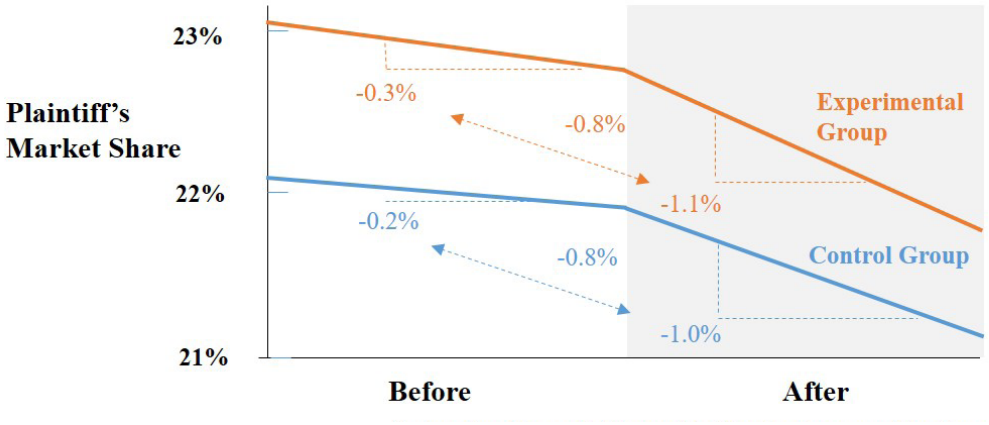
This experimental design allows an economist to attribute any difference to the allegedly exclusionary contract, rather than to a confounding variable. Accordingly, if the contract were found to be unlawful, the lost market share suffered by the plaintiff that was caused by the contract would comprise lost sales.[12]

Results of the Natural Experiment

In this matter, the change in the plaintiff's market share was no different between the experimental and control groups, refuting the plaintiff's assertion that it lost market share due to the defendant's allegedly exclusionary contracts.

Figure 3 below presents the real-world data in a simplified format: In this experiment, the plaintiff's market share declined by 0.8 percent more in the period after the allegedly exclusionary contract introduction for both the experimental and control groups. This statistically identical result supports the conclusion that the allegedly exclusionary contract did not cause the decline in the plaintiff's market share that the plaintiff observed. In a but-for world in which the allegedly exclusionary contract was not introduced, the plaintiff would have had the same decline in market share as observed in the actual world.[13]

Figure 3: Change in Plaintiff's Market Share Was No Different Between Experimental and Control Groups



Accordingly, damages were zero. Relying in part on this information, the jury returned a verdict rejecting the plaintiff's claims and rejecting damages for anticompetitive contracting. The appeals court affirmed the jury's conclusion.

Survey Approaches Can Supplement Empirical Analysis

While natural experiments can be powerful analytical tools, they have limitations, since the data must conform to an experimental design framework consisting of random assignment from the population to groups. To overcome these limitations, economists use other tools such as survey experiments, which can simulate a real-world stimulus such as the introduction of a contract.

For example, purchasing agents could be surveyed to assess their purchase behavior under various stimuli such as the allegedly exclusionary contracts. Surveys are increasingly accepted and relied upon by judges and juries to estimate a but-for world.[14] A damages expert with economics and marketing expertise can combine real-world data and surveys to generate robust conclusions.

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Endnotes

1 See Roman L. Weil, Daniel G. Lentz, Elizabeth A. Evans, Litig. Serv. Handbook, 4.2 Fundamentals of Causation (6th Ed. 2017). See also El Aguila Food Prod. Inc. v. Gruma Corp., 131 F. Appx. 450 (5th Cir. 2005).

2 Tractebel Energy Mktg. v. AEP Power Mktg. Inc., 487 F.3d 89, 110 (2d Cir. 2007) ("[D]amages ... 'must be not merely speculative, possible and imaginary, but they must be reasonably certain and such only as actually follow or may follow from the breach of the contract." quoting Wakeman v. Wheeler & Wilson Mfg. Co., 56 Sickles205, 209, 101 N.Y. 205, 209 4 N.E. 264, 266 (1866)).

3 Survey research is a valid and frequently used tool in litigation to ascertain the value of something, such as a patent, trademark or copyright.

4 Unobservable factors may include, for example, how a competitor's product introduction affects sales of existing manufacturers.

5 In practice, it is usually impossible to control for all factors.

6 The parties and details in this case study are purposely omitted to protect confidentiality.

7 This is a "quasi-natural experiment" because the design relied on real-world data and all factors could not be perfectly controlled.

8 These two groups can be considered the experimental and control groups.

9 The experimental group comprises health care providers that purchased through the GPO with the allegedly exclusionary contract; the control group only includes the health care providers that purchased through a GPO without the contract.

10 The plaintiff's market share is the plaintiff's sales as a share of the whole market sales.

11 The design compared the plaintiff's market share before and after implementation of the allegedly exclusionary contract to control for any group-specific differences in the market shares.

12 Lost market share would be calculated as the difference in the market share decline in the experimental group and the control group.

13 A new competitor's entry into the market that coincided with the defendant's "exclusionary" contract most likely explains the plaintiff's loss in market share.

14 See, for example, Kirk Fair, Rebecca and Laura O'Laughlin, "Ensuring Validity and Admissibility of Consumer Surveys," American Bar Association, Consumer Litigation, Winter 2017, Vol. 17 No. 1.