Class Action Lawsuits: Opportunities to Apply Econometrics and Statistics

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Economic consulting includes providing expert witness testimony—written reports, depositions, and trial testimony—in litigation. This testimony is supported by analysis directed by an economic or statistical expert. Many economists, including the three of us, have doctorates in economics, which build on training in real analysis, linear algebra, and statistics from our undergraduate math degrees. In our profession, econometrics, the application of statistics to economics, is an important component of our toolkit.

One area where economic and statistical experts offer expert witness testimony is in class action lawsuits (“class actions”). Class actions are lawsuits filed by one or more plaintiffs seeking to represent themselves and other similarly situated individuals [2]. Class actions can arise in various types of cases, including those related to securities law, antitrust law, and consumer protection laws. Class

action lawsuits are typically useful in situations in which many individuals have been potentially harmed in a similar manner. In situations in which the potential damages are too small to justify the cost of a separate lawsuit by each individual, a class action may be an appropriate means to pool many individuals’ claims into one lawsuit that would be economically viable. One example of a class action involving small claims was a case brought by a class of consumers that bought washing machines that they claimed were prone to mold problems (*In re Whirlpool Corp. Front-Loading Washer Products Liability Litigation*). Class actions may be useful in instances when plaintiffs’ claims may not be small but, nevertheless, combining similar claims and trying them all at once may be more efficient due to the similarity of the claims. An example of such a class action is one brought by the residents of Hinckley, California, involving groundwater contamination. This case may be familiar from the movie *Erin Brockovich* (see, e.g., [4]). An example of a class action involving investors would typically allege that the price at which investors bought a security (such as a stock or a corporate bond) had been artificially inflated either because the issuer has made unsubstantiated false claims or failed to correct information it knew to be false. A class action allows for many investors to pursue such claims and at the same time take advantage of the cost and other savings where the actions of one plaintiff are allowed to benefit all others in the class. Major securities

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class actions have claims that are in the billions of dollars [8, Figure 4]. The overwhelming majority of securities class action cases settle, rather than go to trial [9, p. 38].

In the United States, federal class actions are governed by Rule 23 of the Federal Rules of Civil Procedure, which outlines the necessary conditions to bring a lawsuit as a class action [5]. These include the following conditions: “(1) the class is so numerous that joinder of all members is impracticable; (2) there are questions of law or fact common to the class; (3) the claims or defenses of the representative parties are typical of the claims or defenses of the class; and (4) the representative parties will fairly and adequately protect the interests of the class” [5]. The second item on this list, which is referred to as the “commonality,” frequently lends itself to data analysis, especially pertaining to heterogeneity in the putative class. Therefore, expert economists and statisticians are often called upon to provide courts opinions as to whether data analyses or models can be applied to members of the class that can reasonably provide answers to questions of law and fact across all class members.

Price fixing litigation is one setting in which class action lawsuits arise and where economists and statisticians are called upon to opine on commonality. Price fixing occurs when competitors agree to restrict competition with one another to effectuate a coordinated price increase. This is a violation of antitrust laws. Price fixing cases have occurred across a wide range of commerce—vitamins, LCD screens, auto parts, and tuna, to name but a few. Economists and statisticians are often called upon to develop models to determine whether the impact of the alleged price fixing conduct on prices is common or can be determined using common methods across all or most members of a proposed class. This often involves the construction of a forecasting model (e.g., a regression model) capable of “predicting” the price that would have prevailed if the price fixing never took place. This is what is referred to as a model of the “but-for world” since it is a model of the world but-for the price fixing. The challenge for the economist or statistician is to build a model that is flexible enough to determine what the price would have been for each member of the class, but specific enough to capture variations in prices that naturally would have occurred across members of the class—or to explain why such an exercise is not feasible. This could include individual characteristics like the negotiating prowess of an individual customer. The economist or statistician must not only build a model, but also calibrate it with historical data, and test the model to see that it performs well at identifying the impact of the price fixing. This typically involves a combination of statistical modeling, data analysis, and qualitative analysis of the industry at issue. Data used in the analysis include administrative data produced in discovery¹ (e.g., units sold,

prices, rebates, dates of sales, product identifiers) and publicly available information (e.g., price indices for inputs). Models presented by an economist or statistician are often rebutted by other economists or statisticians, which encourages rigor in analysis. We have seen various types of models presented, many of which are generalized linear models, including causal models such as difference-in-difference analyses. “In antitrust cases, the issues surrounding expert testimony seldom involve the reliability of the method itself, but rather the ‘fit’: whether the method yields relevant results” [6, §12.07].

Another setting in which economists and statisticians have been called upon to answer questions of commonality is in disputes in the online advertising industry. Online advertising, at first glance, would be an industry in which legal disputes would be particularly well-suited to adjudication through class actions. There are millions of customers accessing a similar system to buy advertisements. While some large advertisers (e.g., car companies, large retailers) have huge ad budgets that could justify an individual lawsuit should a dispute arise, the majority of online advertisers are small advertisers, with ad budgets that may just be a few thousand dollars and disputes involving just a few hundred dollars. In addition, the data kept on online advertising is extensive and would be a useful resource in building empirical models to answer questions in a common fashion. Yet, even in such a setting, significant challenges await an economist or statistician building models to answer common questions. *In re Google Adwords Litigation* illustrates some of these complexities. This case involved an allegation from a class of online advertisers that Google had promised to show their advertisements only on high-quality web pages, but instead placed their advertisements on error pages and “parked domains.” A parked domain or error page would be, for example, a web page with a valid domain name, but with no content on it other than the advertisements served by a company like Google. While it might seem reasonable to assume that the value of such advertisements was minimal, and, therefore, advertisers with ads on these pages should get full refunds, these advertisements may actually be quite valuable for advertisers. For example, if “shoes.com” is a parked domain with no web content, an advertisement on this domain could be very valuable to an advertiser looking to sell shoes. Developing a model—be it reduced form (e.g., OLS), structural (e.g., BLP [1]), or other—that can account for the heterogeneous preferences across advertisers for where their ads are shown and the heterogeneous impact of ads across different domains is a challenging modeling and data analysis problem to say the least.²

²To complicate matters further, online advertisements are typically sold via auctions, so creating models of the amount online advertisements would have cost if they were shown on different web pages would have to incorporate auction dynamics, which would likely be based on theories of how auctions function.

¹Discovery is a formal process of exchanging information and materials related to a case. See, e.g., [7].

In securities class actions, members of the proposed class must also establish a common way in which they have all been harmed by the allegedly fraudulent company statements. While certain members of the investing public may have followed the company closely and heard or read the allegedly fraudulent statements themselves, many others would not have done so. Nevertheless, certain legal arguments have allowed for these other investors to also claim that they effectively made their purchase while relying on the fraudulent information. In *Basic v. Levinson*, the Supreme Court outlined the fraud-on-the-market theory, which postulates that in an efficient market the price of a security reflects all material³ publicly known information and, therefore, the allegedly fraudulent information as well. A later decision in the District of New Jersey, *Cammer v. Bloom*, identified five criteria that allowed the court to make a determination as to whether the stock trades in an efficient market and which would then allow the fraud-on-the-market theory to be invoked with respect to investors that did not themselves witness the allegedly fraudulent statements.

The five criteria identified by the court were: (1) average weekly trading volume; (2) the number of securities analysts providing coverage; (3) the existence of market makers and arbitrageurs; (4) whether the company is eligible to file an SEC Form S-3 Registration Statement; and (5) whether there is a cause-and-effect relationship between news and stock price movements. Economic experts are frequently asked to analyze these factors and present for the court's consideration their own opinion as to whether these, and other, factors would support a finding of market efficiency that the presumption of fraud-on-the-market requires. Cammer factor 5, which relates to price response to news, often involves assessing whether "days with news events [...] are more likely to be associated with a statistically significant stock-price movement than days without news events. This is, in fact, a test that provides evidence in favor of market efficiency" [10]. The assessment of whether a stock-price movement is statistically significant is based on a market model (often OLS), which may take into account the movements of other stock prices, perhaps through indices (e.g., the S&P 500 Index) and/or the movements of stock prices of similar companies (e.g., companies in the same industry). Legal theories, and arguments as to commonality, often rise and fall on the court's eventual finding on the issue of market efficiency.

The great variety of class actions and the many factors that are important in different types of matters can make working on class action cases interesting for consultants, as we can apply our skills to diverse settings. It is helpful to think of a new case as an opportunity to ask new applied research questions.

³"Information is considered to be 'material' if its dissemination to the public would likely affect the value or trading price of an issuer's securities—i.e. stock—or if it is information which, if disclosed, would likely influence a reasonable investor's decision to purchase or sell an issuer's securities" [3].

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