Clarifying Common Misconceptions About the Two-Step Econometric Method for Establishing Common Impact

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CLASS ACTION ANTITRUST LAWSUITS are often conducted in two principal stages: the class certification stage and the merits stage. At class certification, a court may want to determine, among other things, whether a group of plaintiffs can proceed as one unit with a common claim and whether damages are measurable on a classwide basis. Once the court certifies a class, the court then proceeds to the merits stage, where it determines whether the alleged antitrust violations occurred and, if so, whether the alleged anticompetitive conduct caused antitrust injury. Thus, it may be of primary importance in an antitrust class action to establish whether a common method is capable of resolving questions of both classwide injury and damages. Often, antitrust class actions involve allegations of elevated prices, and, therefore, the proposed common method may need to establish that, but for the alleged anticompetitive behavior, prices would have been lower across the class.[1] Determining whether antitrust injury was classwide, often referred to as common impact, can typically be analyzed using sound econometric methods that withstand the rigorous standards applied by courts at both the class certification and merits stages of litigation.

A two-step econometric method is capable of resolving the classwide question of both damages and common impact in "one stroke," a concept the Ninth Circuit sitting en banc supported in *Olean Wholesale Grocery Coop., Inc. v. Bumble Bee Foods LLC*.[2] But some common misconceptions persist regarding this econometric methodology. We address three of these misconceptions and provide clarifying details of the two-step econometric method. For purposes of discussion, we assume that a price-fixing conspiracy has been alleged as in *Olean* and that transaction data are available for both a benchmark period presumed to be free of conspiratorial price effects and a conduct period (sometimes also called a "class period") during which the conspiracy is alleged. The concepts discussed here also apply to monopoly or monopsony allegations.

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The Two-Step Econometric Method

The two-step econometric method is capable of establishing both common impact and classwide damages. The first step of the two-step method entails specifying a multiple regression model utilizing all available and reliable data to estimate the relationship between the variable of interest—typically price or wages in an antitrust matter—and a set of explanatory variables that explain the variable of interest (i.e., the price or wages, as the case may be). Both forecasting and dummy-variable multiple regression models are viable options, and the principles discussed here apply to both.[3] The multiple regression model yields an aggregate measure of damages across the class as a whole.

The second step of the analysis entails unraveling that aggregate measure of damages to determine the degree to which particular segments of the proposed class are contributing to the classwide damages. This is accomplished by comparing the but-for prices estimated by the model to the actual prices paid by class members during the conduct period. The model's explanatory variables, which are assumed to be unrelated to the challenged conduct, contribute to the estimation of the but-for prices. The explanatory variables often include measures of relevant costs and demand, as well as specific customer, product, and market characteristics, such as customer size, product identifiers, and geographic locators for each transaction. This decomposition of the aggregate overcharge estimate results in an estimation of the difference between but-for price and actual price for individual purchases by individual class members during the conduct period.[4] If the actual price exceeds the but-for price estimated by the model in step one, the transaction is deemed impacted by the conduct. A class member's individual transaction overcharges can also be aggregated to obtain an unbiased estimate of the class member's mean overcharge during the class period. The percentage of class members impacted on at least one transaction, and the percentage of class members with positive mean overcharges, can be reported as quantitative measures of the degree to which the class experienced overcharges, that is, as measures of classwide impact. Additionally, either criterion can be used to identify potentially unimpacted members of the proposed class. An impact assessment follows only if the estimate of aggregate classwide overcharges is statistically

significant. The combination of statistical significance of the aggregate overcharge and a high percentage of impacted class members (whether measured by at least one overcharge or net overcharge) provides econometric evidence of class-wide impact.

Whether formal statistical testing is appropriate for any group of estimated overcharges depends largely on two things: First, whether the test is motivated by an *a priori* rationale related to the case and, second, whether the sample size (number of transactions being tested) is sufficient to produce a reliable test. Most proposed classes consist of a large number of customers, each with a small number of transactions. The presence of numerous customers with few transactions is often a primary motivation for class actions. Small customers with fewer transactions that were, in fact, impacted by the conspiracy are less likely to produce statistically significant overcharge estimates than larger customers with a large number of transactions. Technically, the power of tests to find statistical significance is low for small customers with relatively few transactions; such tests are likely to result in numerous false negatives—finding no impact when in fact the customer was impacted.[5]

More powerful tests, however, could be conducted on large aggregations of individual overcharge estimates. For example, customers or products with large numbers of transactions could be tested for statistical significance with greater power to detect overcharges. Any statistical significance testing should be confined to large aggregations of data and hypotheses motivated by specific aspects of the case, such as *a priori* questions pertaining to the involvement of a particular subset of class members or a particular subset of products in the conspiracy. Testing based on selection of post hoc subsets is subject to "cherry-picking" that can lead to unreliable inferences.[6]

Aggregate Damages Estimates, But Not an Assumed Average Overcharge

One criticism of the aggregate damage estimate is based on the claim that it implies that all class members had the same average overcharge. The *Olean* dissenting opinion found that the plaintiffs' expert opinion was admissible but not persuasive:

> The majority contends that the expert's model is capable of measuring class-wide impact through an "averaging assumption" of 10.2% price inflation from the price-fixing conspiracy. Put another way, the model assumes that almost all class members suffered an injury because the price-fixing would elevate the list price of tuna for everyone, even if individual class members ultimately paid different prices for the tuna. But the expert's assumption flies against common sense and empirical evidence. Powerful retailers (like Walmart) are not passive or ill-informed consumers; they will not sit still when faced with a price increase. They will fiercely negotiate the list price down, or more likely, demand promotional credits or rebates that offset any price increase.[7]

This averaging characterization, however, fails to recognize the underlying composition of the aggregate overcharge estimate. The estimate of the aggregate overcharge is simply the mean of all transactions' individual overcharge estimates during the class period. That is,

$$EOC = \sum_C EOC_{t,ij} \div N = \sum_C (P_{t,ij} - p_{t,ij}) \div N$$

where EOC is the estimated aggregate overcharge, $EOC_{t,ij}$ is the estimated overcharge on a particular translation for the i^{th} customer purchasing the j^{th} product at time t, $P_{t,ij}$ is the actual price observed for that purchase, and $p_{t,ij}$ is the regression model's estimated but-for price for that purchase. The $\sum_C$ denotes a sum (aggregation) across all transactions in the class period. The estimated aggregate overcharge (EOC) is simply the mean difference between the actual prices paid and the estimated but-for prices during the class period.

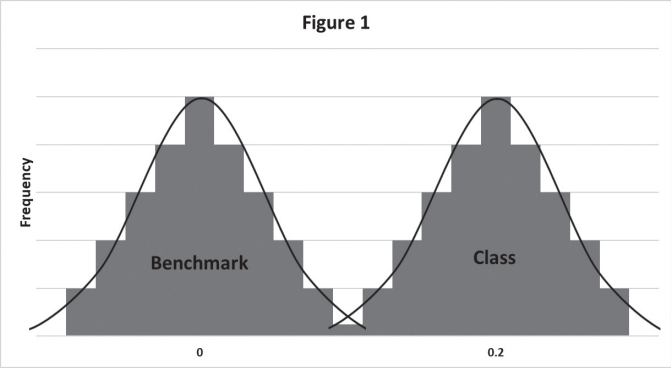
Defendants' experts may rearrange this equation to support a misleading claim that an average overcharge somehow applies to every class member or masks variability between class members[8]:

$$\sum_C p_{t,ij} = \sum_C (P_{t,ij} - EO_C)$$

This rearrangement of the estimated overcharge equation shows that the estimated but-for prices can be mathematically determined by subtracting the estimated aggregate overcharge from the actual price—*after* the model is estimated using all available data and the model specification, which includes competitive price-affecting factors, some of which describe individualized differential characteristics of customers and products. This construct, however, is an aggregation across the entire class, not an equation that describes each class member's overcharge. The appearance of the aggregate overcharge, EOC, in the rearranged equation does not necessarily mean that it represents an identical overcharge for each class member.[9] Any claim that the EOC represents an identical overcharge across the class is belied by the fact that the second step of the analysis, described above, results in different degrees of class members' impact, including a potential finding of no impact for some. The EOC is a summary statistic that aggregates the impact on every purchase by every class member during the class period. But the EOC consists of—can be disaggregated into—individual comparisons of the actual and but-for prices for each purchase during the class period. That comparison will not yield the same overcharge estimate for each purchase or each class member.

Figure 1 illustrates this concept using the results of a hypothetical multiple regression model. It displays the percentage by which the actual prices differ from the corresponding but-for prices estimated by the multiple regression model using only the competitive explanatory variables, shown separately for transactions in the benchmark and class periods. Individual transaction overcharges during the benchmark period center around 0; the distribution of transaction overcharges is shifted to the right during the class period, centered at the model's estimate of the aggregate overcharge, EOC. Not every transaction or every class member is at the center of the distribution; variation occurs in both directions. The EOC is

an aggregated statistic that describes the upward shift in the actual and but-for price differences that are unexplained by the competitive factors in the model and therefore are consistent with having been caused by the challenged conduct. Individual class member overcharges vary from this aggregate overcharge, and the degree of variation can be estimated by applying step two of the econometric analysis.



Classwide Econometric Analyses and Small Customers' Impact

Consider a direct action brought by a customer with purchases only during the class period. Upon what data or documents could that customer rely to establish that the challenged conduct existed and that the customer was injured by that conduct? The direct-action plaintiff can often rely on documents that discuss purchases other than their own and conduct outside of their own interactions with the defendants to establish that the challenged conduct existed. From an econometric perspective, combining this customer's data with that of similarly situated customers can lead to a reliable inference about the impact of the challenged conduct on small customers, even those with purchases only during the class period. Additional supportive analyses can be conducted to confirm that small customers are similarly situated to customers for whom injury can be directly established. These include correlation analyses, price level comparisons, customer size analyses, list price analyses, and review of relevant contracts or communications. From an economic perspective, however, once the largest customers with the most buying power have been established as impacted, the inference of impact to customers with few purchases needs little or no additional econometric support. In fact, since the EOC is, as a mathematical fact, primarily determined by the customers with large numbers of purchases, its application to small customers is likely to understate the small customers' damages.[10]

Both the majority opinion and the dissent in *Olean* discuss the defendants' expert's specification of a multiple regression model that intended to estimate a separate overcharge for each customer by utilizing a separate class period indicator variable for each customer.[11] For example, if there were 600 class members, the defendants' expert's model would include 600 overcharge variables in the model, one for each class member. This model, in effect, slices and dices the data into hundreds of customer-size pieces.[12] The defendants' expert claimed that this approach resulted in 28% of the class failing to show a positive and statistically significant overcharge estimate—and thus, potentially being uninjured by the alleged conduct.

In their rebuttal, the plaintiffs' expert showed that the defendants' expert's model yielded no result for approximately 10% of the class members, all of which had no purchases during the benchmark period; purchases in both periods was a requirement for the defendants' expert's model to provide an estimate.[13] This highlights the importance of determining what information provides a reliable basis from which to make an inference that small customers were impacted. It makes neither economic nor common sense to require that each customer rely solely on their own purchases to determine whether and by how much they were harmed by the alleged conduct—when reliable, aggregated data are available. Slicing and dicing the data into hundreds or thousands of small pieces distorts the signal provided by an analysis of all data.

Economic principles, endorsed by both the majority and the dissenting opinion, tell us that large customers have greater purchasing power and thus a greater ability to negotiate price, neither of which smaller customers enjoy.[14] In *Olean*, all analyses put forth by the experts showed that the largest purchasers, like Walmart, were injured. This finding thus supports the inference that the smaller customers, with little or no buying power, were harmed. In addition, 94% of all customers who could be tested using the defendants' expert's extreme interaction model showed a positive overcharge, and 80% had a statistically significant overcharge. The plaintiffs' expert also demonstrated that, when the test of significance is confined to those customers with sufficient data to detect significance with a reasonable level of statistical power, 98% were positively overcharged.[15] The plaintiffs' expert also conducted other econometric analyses, calculating price correlations showing that prices tended to move together, and other robustness checks that supported his conclusion that the harm was experienced classwide. This contrasts with the defendants' expert's analysis, which relied on relatively small subsets of the data, particularly for small class members, for which statistical tests have little power and are likely to produce false negatives—statistically finding no impact when in fact the class member was impacted. This unreliable slice-and-dice analysis accounts for the difference in the impact percentages found by the two experts. The plaintiffs' expert's application of the two-step method provides a more reliable assessment of classwide impact.

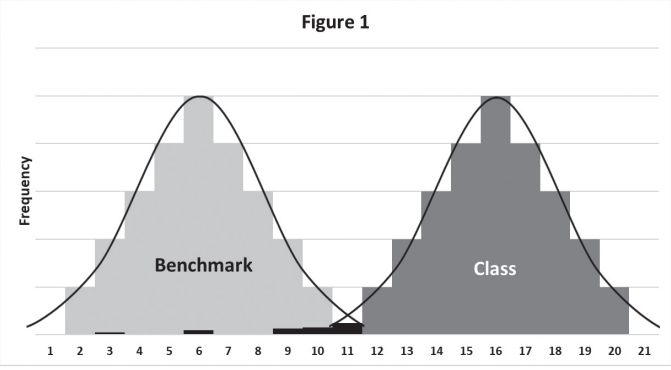
Whether or not a large customer bringing a direct action would need to rely on the two-step econometric method is not germane to the question of whether the two-step econometric method is applicable and relevant to every member of the class, including small class members with few purchases during the conduct period. A large customer may have sufficient data and documents pertaining to its purchases to establish harm resulting from the challenged

conduct by analyzing only its own purchases and related information. Even this customer, however, might choose to rely on data and documents from other customers to analyze the degree to which the challenged conduct impacted not only its purchases, but also a broader segment, or even the entire market, over which the conduct is alleged. The more salient point is that a two-step econometric analysis could be utilized by any individual direct action plaintiff, and likely would be used in the hypothetical event that a small class member would bring their own case.

Actual Harm to Statistically "Unharmed" Class Members

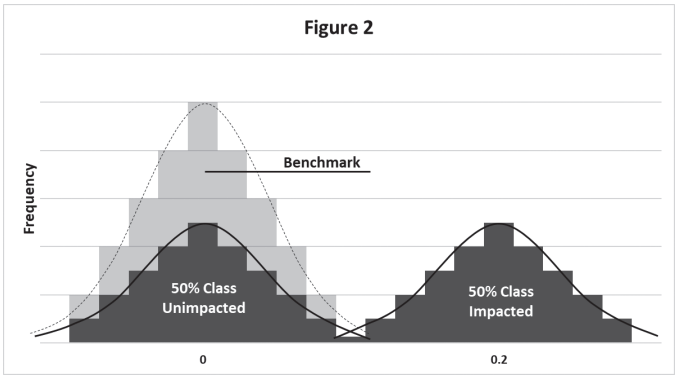
The plaintiff expert in *Olean* used all available data and the two-step method, among other analyses, to show that all or nearly all class members were impacted by the alleged conduct. What about the small portion of customers for whom the two-step method failed to find impact? Were they actually uninjured, or is it reasonable to infer that they too were injured by the conduct?

If the impact is classwide and relatively similar throughout the class period, the distribution of customer overcharges should be unimodal, similar to the distribution of the differences between actual and but-for prices during the benchmark period but moved to the right, as demonstrated in Figure 1. Even in this situation, however, a small portion of customers may appear unharmed. More specifically, customers whose purchases are solely in the leftmost tail of the class member distribution may appear to be unharmed. Figure 2 highlights these purchasers (black bars) to demonstrate where they appear in the distribution of transaction overcharges. We might conservatively conclude that this small number of customers that do not econometrically demonstrate injury are potentially uninjured. If the court were to so decide and deem it necessary, these customers can be identified and excluded from the class.[16] If, however, these are customers with few transactions accounting for a small percentage of class revenue, a reasonable inference may be that these customers were likely also impacted. Such an inference recognizes not only the tiny minority of putative class members that these customers represent, but also the lower buying power of small customers and the lower statistical power of detecting impact with small numbers of transactions.



If, however, impact varies significantly among different larger groups of class members, the customer-specific overcharges would expose the difference in the form of a multi-modal distribution. For example, suppose some subset of class members was unimpacted by the conspiracy. This means that the true overcharge across the class consists of two distinct components: the zero overcharge for the unimpacted portion and the positive overcharge for the impacted portion. To illustrate, assume that half of the class was impacted, and half was not impacted (with equal numbers of transactions in each half of the class). The resulting estimated aggregate overcharge from the multiple regression model using all transactions would be an aggregation of unimpacted and impacted class members' overcharges equal to an unbiased estimate of one-half of the overcharge experienced by the impacted half of the class.

When the aggregate overcharge is unpacked in step two, the customer overcharges for the unimpacted subset will be distributed around zero. The distribution will be similar to that of the benchmark. The impacted class members' overcharges will be distributed around twice the classwide aggregate overcharge estimate that was deflated by the inclusion of unimpacted customers in the calculation. For example, if the aggregate overcharge estimate were 0.1 (implying an approximate 10% overcharge in a logarithmic price model), but half the potential class members were unimpacted, the distribution of individual class member's overcharges would cluster around two different values: around 0 for the unimpacted subset, and around 0.2 (approximate 20% overcharge) for the impacted subset. The bimodal distribution of proposed class members would appear as shown in Figure 3.



Identification of the members of each subset may include an investigation to determine whether they share some common property. For example, unimpacted customers might have purchased different products, or been of a certain customer type, or might have made their purchases in a different geographic area than impacted customers. Tests of statistical significance for the difference between the means of the two subsets can be conducted to confirm that the putative class was over-inclusive.

The important point is that the two-step methodology can distinguish between the case in which a significant

portion of the proposed class is unimpacted and the case in which only a relatively few small customers are identified as uninjured. In the latter case, the extensive impact across the remainder of the class provides a basis to infer that these small customers were also impacted.

Conclusion

A two-step econometric method is capable of determining both the existence and amount of antitrust overcharge, as well as whether the conduct impacted all or nearly all potential class members. Many courts have accepted this method in certifying classes.[17] While the method reports an estimated aggregate overcharge, that overcharge is the aggregation of all transactions' individual overcharge estimates during the class period, and thus reflects the individualized contribution of each transaction. This mathematical construct provides a natural method to determine the impact of the conduct on each class member included in the analysis. This construct is particularly powerful for small class members for whom data is sparse. The two-step method utilizes relevant economic information from all class members to yield the most reliable estimate of overcharges. The two-step econometric method also distinguishes between large groups of potentially unimpacted class members and small class members for whom insufficient statistical power exists to detect impact with statistical significance. ■

[1] While the concepts discussed in this article also apply to monopsony allegations involving potentially suppressed wages, we will use "prices."

[2] *Olean Wholesale Grocery Coop., Inc. v. Bumble Bee Foods LLC*, 31 F.4th 651 (9th Cir. 2022) (en banc).

[3] We focus herein on dummy variable models in which one or more indicator variables measure any difference in prices between the benchmark and class periods after accounting for the price effects of competitive factors. The dummy variable method uses data from both periods to estimate the relationships between price and competitive factors that influence price. This can be extended to allow for different relationships between price and the explanatory variables during the benchmark and class periods by specifying an "interacted" model. See, e.g. McCrary J and Rubinfeld D. Measuring Benchmark Damages in Antitrust Litigation. *Journal of Econometric Methods*. 2014; 3(1): 63-74. The methodologies for assessing impact described herein are also applicable to an interacted model.

[4] These comparisons of but-for and actual prices, whether at the aggregate or individual level, can be shown to be unbiased estimates of the corresponding overcharge under certain standard technical assumptions underlying the multiple regression model.

[5] "When a study with low power fails to show a significant effect, the results may therefore be more fairly described as inconclusive than negative. The proof is weak because power is low." Hall R. and Lazear V. Reference Guide on Damages. *Reference Manual on Scientific Evidence*, 3rd Edition, Federal Judicial Center. 2011; 254-255.

[6] Andrade C. HARKing, Cherry-Picking, P-Hacking, Fishing Expeditions, and Data Dredging and Mining as Questionable Research Practices. *Journal of Clinical Psychiatry. 2021;* 82:1.

[7] *Olean Wholesale Grocery Coop., Inc.*, 31 F.4th 651 at 689 (citations omitted).

[8] "[Plaintiffs' expert's] use of pooled data, [defendants' expert] alleged, masked these individual differences among class members. Thus, [defendants' expert] claimed, [plaintiffs' expert's] conclusion that the conspiracy had a class-wide impact based on a uniform overcharge did not reflect the real world." *Olean Wholesale Grocery Coop., Inc.*, 31 F.4th 651 at 673.

[9] In some cases, EOC may represent a reliable, and even conservatively low, estimate of an individual class member's overcharge. For example, small customers with little or no bargaining power are likely to have suffered more economic damage than customers with significant bargaining power (the "Walmarts" referenced in *Olean*). For those customers, the aggregate EOC is likely to be a conservative estimate of their antitrust harm.

[10] The customers with more transactions contribute more transaction data to the aggregate overcharge estimate. As a result, larger customer's transactions influence the aggregate overcharge estimate to a greater degree than smaller customers with fewer transactions. Since the larger customers are more likely to abate, or even escape, injury on some transactions, the aggregate overcharge estimate is likely to be conservatively low when compared to the actual overcharges experienced by smaller customers with less purchasing power.

[11] *Olean Wholesale Grocery Coop., Inc.*, 31 F.4th 651 at 673-75, 86-91.

[12] While the defendants' expert's model in *Olean* estimated the supply and demand variables using all the customer data, the overcharge estimates relied only on a single customer's information and ignored information from any other customer in the market.

[13] *Olean Wholesale Grocery Coop., Inc.*, 31 F.4th 651 at 674.

[14] *Olean Wholesale Grocery Coop., Inc.*, 31 F.4th 651 at 689-90.

[15] Plaintiffs-Appellees' Supplemental En Banc Brief, *Olean Wholesale Grocery Coop., Inc. v. Bumble Bee Foods LLC,* 2021 WL4256601, at 13*,* (9th Cir. 2021).

[16] The damage estimate using the aggregate overcharge already accounts for these potentially uninjured customers. The damages are not overstated by including them in the model to determine aggregate class damages. In fact, if their transactions were excluded from the calculation, the aggregate overcharge estimate would increase.

[17] *In re Air Cargo Shipping Services Antitrust Litigation*, 2014 WL 7882100 (E.D.N.Y., 2014); *In re Korean Ramen Antitrust Litigation*, 2017 WL 235052 (N.D.Cal., 2017); *In re Capacitors Antitrust Litigation* (No. III), 2018 WL 5980139 (N.D.Cal., 2018); *In re Packaged Seafood Antitrust Litigation*, 332 F.R.D. 308 (S.D.Cal., 2019); *In re Disposable Contact Lens Antitrust*, 329 F.R.D. 336 (M.D.Fla., 2018); *In re Peanut Farmers Antitrust Litigation*, Case No. 2:19-cv-00463-RAJ-LRL (E.D.Vir., 2020); *Wortman v. Air New Zealand*, 326 F.R.D. 549 (N.D.Cal., 2018); *In re Broiler Chicken Antitrust Litigation*, 2022 WL 1720468 (N.D. Ill., 2022); *In re Pork Antitrust Litigation*, Civil No. 18-1776 (JRT/JFD), MDL No. 21-2998 (MN, 2023); *In re Turkey Antitrust Litigation*, Civil No. 19 C 8318 (SRH), (N.D.Il, 2024); *In re HDD Suspension Assembly Antitrust Litigation*, Civil No. 19-md-02918-MMC (N.D. Cal., 2024).