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# Statistical Analysis And Class Actions: Part 1

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This is the first of three pieces discussing statistical analysis of class certification topics in wage-and-hour class and collective actions. In part one, below, I review problems associated with relying on overall averages in addressing class certification. In part two, I will discuss rigorous analysis and statistical testing of whether common patterns are present in a proposed class. Finally, in part three, I will discuss the use of sampling in analysis of class certification.

**Getting Past Reliance on Overall Averages in Wage-and-Hour Class and Collective Actions**

Recent court decisions and legal commentary follow a growing trend in courts requiring greater scrutiny of class certification topics earlier in the judicial proceedings. Under Federal Rule of Civil Procedure 23, courts now hesitate to presume commonality within a proposed class based on a summary result of aggregate effects. Presumptions have instead been replaced by rigorous analysis of the alleged harm. And, since Rule 23 requirements are analogous to the Fair Labor Standards Act's "similarly situated" thresholds, it is unremarkable to see more in-depth analysis of motions to decertify collective actions.[1]

Going forward, analyses advanced in support of certification in wage-and-hour class and collective actions that rely on overall average measures and fail to examine the commonality question in a statistically rigorous manner will have a lower probability of success.

**Overall Averages May Mask Important Underlying Variability**

In any statistical analysis the overriding objective is to answer a research question. In some cases answering the research question may require summarizing complicated and voluminous information into a more easily understood effect measure like an average, but it is critical to not be misled by averages that may mask important underlying variability. The ability to calculate an average does not make that average, by itself, an adequate measure capable of answering the research question.[2]

This fact holds true when studying data in wage-and-hour class action litigation. Take, as an example, a wage-and-hour complaint alleging that delivery drivers employed by ACME Delivery work several hours

per week off-the-clock. The data underlying this claim could involve thousands of employee shifts, worked at different points over several years, in many different locations. The hours allegedly worked off-the-clock might vary based on some or all of these dimensions, and an average calculated across all of them could therefore be misleading. A simple average cannot necessarily shed light on the experience of any given subset of the employees analyzed. Assuming an average applies equally throughout the data would be wrong.

Extending the example, assume data was available from the tablets ACME drivers use to log their scheduled pickups and drop-offs, which could be used to reconstruct their work day. Suppose an initial review of this data suggested an average of 10 hours per week worked off-the-clock for the proposed class of 100 delivery drivers. However, a closer look at the data shows the data for 50 of the drivers reveals 20 hours per week worked off-the-clock and the data for the other 50 indicates zero hours worked off-the-clock. The overall average of 10 hours per week is clearly not an adequate measure of actual time worked off-the-clock since it misses the mark entirely for both the 20-hour and the zero-hour per week group.

**Assessing the Extent of Underlying Variability**

This underlying variation should always be quantified to statistically describe the "spread" or "dispersion" in the data. A common measure of dispersion is the standard deviation. Viewed relative to an average, a large standard deviation measure indicates wide variance. In the example above, with an average of 10 hours based on half the population reporting zero and half the population reporting 20, the standard deviation is also 10. This very large relative value indicates the wide spread, or dispersion, in the actual observations underlying the overall average.

There are other useful ways to quantify the extent of variation in a set of data. A common approach is to compare values of a particular measure at different percentiles. Using the same example, the 10th percentile value for off-the-clock time would be zero hours, compared with the 90th percentile value of 10 hours. These values are obviously quite different but one could imagine examples where they were more similar or even the same. If the values are more similar between the 10th and 90th percentiles then the data exhibit less variability and, if these two percentiles are wildly different, the data exhibit more variability.[3]

Data may also be shown through charts to illustrate the spread or dispersion of the data. These visual representations of the data may be helpful in contextualizing the statistical calculations. In the example above, an average of 10 with a standard deviation of 10 may not jump off the page for all readers, but a visual depiction of the two very different (and narrow) distributions at zero and 20 certainly would. Among other options, and depending on the analysis, scatter plots, box and whisker and stacked bar graphs can be helpful in in this regard. These graphical demonstrations of the data complement the statistical measures and express how spread out or dispersed some observations (e.g., employees, shifts, jobs, locations etc.) are relative to the average calculated over all of a proposed class.

**Implications for Answering the Research Question**

Recall that that the ultimate goal of the analysis is to answer a research question. Using the ACME Delivery driver example, once company management becomes aware of a possible wage-and-hour concern, its research question is: What is the source of the problem?

ACME, and most other companies, would want to know whether the potential concern stemmed from a

particular location, job or department or with a policy shift of some kind or if the potential concern was associated with the high season for the company's business. For ACME delivery drivers, perhaps the 20-hour group were all based out of Location A, while all of the zero-hour group were based out of Location B. Knowing the overall average without studying the underlying cause is not helpful for ACME Delivery or any actual company looking to address possible wage-and-hour problems.

Knowing the overall average is no more useful or helpful to the trier of fact. Focusing on underlying factors contributing to variation has always been an important component when studying wage-and-hour issues, but this kind of analysis is now regularly required under the FLSA and Rule 23 in order to assess whether a proposed class is "similarly situated" or exhibits sufficient "commonality" to support class treatment. In other words, the research question before the court is whether the variability within a proposed class is so large it precludes certification. Simple averages therefore have little probative value.

In the next piece I extend this discussion to rigorous analysis and statistical testing of whether common patterns are present in a proposed class.

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[1] See Westbrook, Geoffrey, "Class and Collective Actions in A Post-Dukes World," Law360, April 22, 2015 for a helpful recent synopsis.

[2] This is true whether the average is a simple arithmetic mean (the sum of a set of observations divided by the number of observations) or a more sophisticated average effect estimated after accounting for other factors.

[3] A similar contrast of the 25th and 75th percentiles describes the middle half of the data and is often referred to as a measure of the "interquartile range." The same idea applies here: If the spread between the 25th and 75th percentiles is large it means the data exhibit wide variation, even in the middle half of the distribution.

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