Class location and time: 329 Wilbur O. and Ann Powers Hall, Tuesday 3:30–5:00pm and Thursday 4:00–5:00pm
Office: 320A Wilbur O. and Ann Powers Hall
Office hours: By appointment
Email: pww@clemson.edu
WWW: https://pww.people.clemson.edu

Required text:
There is no required textbook for this course; readings will be from working papers, journal articles, etc. Additional course materials can be accessed by going to my home page (see above), clicking on the link entitled “course materials for students,” and following the obvious links.

Course Objectives:
This course develops analytical and econometric techniques, both parametric and non-parametric, for benchmarking performances of firms and other decision-making units. The course will begin with a discussion of microeconomic theory of the firm, where producers combine inputs to produce outputs while constrained by a feasible set of input-output combinations. Various notions of efficiency will be introduced, and important features of the economic model will be identified. However, measures of efficiency and other features of interest must typically be estimated from observed data. Various statistical models will be examined by adding probabilistic structures to the economic model; within the context of each statistical model, various estimators of efficiency and other features of interest will be discussed. Special attention will be given to statistical inference and hypothesis testing.

Benchmarking has become a wildly popular idea in management, finance, economics, education, public policy, and other arenas; Google Scholar returned approximately 1,170,000 hits for the keywords “performance” and “benchmarking” on 3 December 2020. The Oxford English Dictionary defines benchmarking as “the action or practice of comparing something to a benchmark; evaluation against an established standard,” suggesting that while an established standard is important for benchmarking, there may be more than one such standard. Benchmarking may involve detailed evaluation and comparison of a particular unit’s operating procedures with those of a competitor, perhaps using standard accounting ratios such as return-on-assets or other measures. Efficiency analysis is a more formal approach, wherein a statistical model of a production process with a well-defined benchmark for purposes of comparison is specified and then estimated, allowing possibilities for statistical inference.

The performance of firms and other decision-making units in terms of technical efficiency, as well as allocative, cost, and other efficiencies, has received widespread attention in the economics, statistics, management science, and related literature. In the case of private firms, estimates of inefficiency have been used to explain insolvency rates and merger activities, the effects of changes in regulatory environments, and overall industry performance. In the case of public and non-profit entities, estimates of inefficiency are intrinsically interesting because these entities do not face a market test, and inefficiency estimates often provide the only
objective criteria for gaging performance. Measuring the performance of public entities may be important for allocating scarce public resources, for deciding which to eliminate during periods of consolidation, etc. In particular, identifying inefficient entities is a critical first step in any attempt to improve performance.

**Intended Audience:**

This is a graduate-level course for Ph.D. students in economics, statistics, management science, operations research, and perhaps other areas who are interested in benchmarking in a production context. Students should have a working knowledge of statistics and probability at the level of ECON 8060 (Econometrics I), and linear estimation at the level of ECON 8070 (Econometrics II). Some knowledge of maximum likelihood estimation would be helpful but is not essential.

**Course Grade Determination:**

Students will write a paper using some of the methods from the class. If the enrollment is sufficiently small, I will have students make a presentation, analyzing a paper from the literature. In this case, 25 percent of students’ grades will depend on the presentation and 75 percent on the paper. If enrollment is too large to make presentations feasible, the paper will account for 100 percent of students’ grades.

I anticipate that students may not complete their papers by the end of the class, and am prepared to give “Incompletes” which will be converted to a grade upon submission of a paper. Hopefully, papers that students write can eventually become dissertation chapters and journal submissions.

Class attendance is not mandatory in the sense that I will not check the class roster in each class. However, it is not possible to pass this class (or any other serious graduate-level class) without attending and actively engaging in the intellectual exercises that take place in class. Shirking will result in (perhaps severely) reduced grades.

Reading assignments will be made in class. Students should review material from the previous class as well as any reading assignments before each class.

**Office Hours:**

I will not hold formal office hours due to the ongoing pandemic, but I will be happy to meet and discuss with you. A good approach is to ask me about an appointment after class or send me an email. Meetings can be either in person (if it is safe to do so) or via Zoom.