Teaching Statement

April 25, 2017

I regularly teach undergraduate courses in Econometrics and Industrial Organization. These courses are designed to enrich students' understanding of economics issues and to develop skills useful for their future careers. At the graduate level, I teach both the first field course in Industrial Organization and the more advanced topics course for this field. When teaching these courses, I aim to develop students' understanding of the conceptual issues studied by the field, build up their methodological toolbox, and prepare them for independent research.

I have also served as the main or a secondary advisor for many graduate students pursuing Industrial Organization as a field. I have organized and participated in informal student reading groups where current research papers are discussed. The meetings are intended to be a forum where graduate students pursuing this field can stay abreast of the current research. I have presented my own work both to the undergraduate and graduate students as a part of a program by the department designed to expose students at both levels to the issues studied by various fields of economics.

My teaching experience at Johns Hopkins has been invaluable for my growth as an instructor and an advisor. I always strive to improve my teaching by asking my colleagues for advice and by seeking feedback from my students. Below I elaborate on my teaching philosophy and methods at both the undergraduate and graduate levels.

Undergraduate Teaching

Introduction to Econometrics. The goal of my undergraduate econometrics class is to teach students how to combine insights from economic models with statistical methods to recover the regularities of interest from the data. This class provides a solid foundation of skills that are valuable in many careers. Topics include linear regression models, estimation with instrumental variables, discrete choice models, and analysis of time series data.

I strive to keep balance between building a strong theoretical foundation, which is essential for understanding the applicability of different methods and for critical interpretation of the results, and providing ample opportunities for practical applications. I always begin the course by reviewing statistical concepts which underlie econometric methods such as the concept of random

variables, joint distribution of random variables, conditional expectation, and independence of random variables. While all students come to my class having completed at least one course in statistics and probability theory, many of them do not yet have a well-developed understanding of this conceptual framework. That is why I always use a lot of real-world economic examples to illustrate these concepts. I return to these examples repeatedly in order to reinforce intuition and to relate new concepts to those that are already well-understood. I carefully build the theoretical framework so that students develop deep a understanding of the methods' applicability as well as the ability to critically evaluate estimation results. Such exposition is supplemented with many examples borrowed from published economic studies in order to illustrate the methods and also to motivate students' efforts in mastering this material.

Part of my effort in teaching this class is to develop practical skills in data analysis. To this end, I include an empirical component which is based on real-world data in every problem set. At the beginning of the class the students are given a tutorial in STATA software which they use throughout the semester to complete the empirical components of homework assignments. By the end of the semester a majority of the students become highly skilled and thoughtful users of this software package.

The main challenges in teaching this class that I have had to address over the years are the size of the class and its diversity. This course usually attracts 60-70 students. These students usually come from very different backgrounds and have different levels of experience working with statistical concepts as well as different levels of comfort with mathematical concepts. As an instructor, I always have to stay connected to this large audience, constantly maintaining the necessary level of attention from the students of all levels. A device that I have found very useful is to ask multi-level questions which allows students who are still working on understanding the concept to think through the essential steps while keeping advanced students challenged. When introducing new material, I actively seek feedback from students in order to determine the right level which I should target.

Over the years I have found it very productive to give students the opportunity to apply the econometric tools they have learned in class to the empirical research of topics of their interests. I usually incorporate an empirical project based on real data and grounded in economic theory as one of the assignments. I encourage students to work in groups which allows them to learn from each other and brainstorm together. This assignment stimulates the students' interest in the subject and also focuses their attention on the aspects of econometric techniques which are necessary for productive analysis. Overall, teaching this class has been very rewarding. I feel that I make a real difference in the lives of these students. I am teaching them a very useful set of skills and also have an opportunity to stimulate their interest in empirical research.

Industrial Organization. This course targets advanced undergraduate students who are interested in learning about the operation of economic markets at a deeper level. In this course, my goal is to demonstrate how stylized models can be used to develop a conceptual understand-

ing of complex business strategies used by firms in the real world. I aim to explain how the modeling framework is developed in order to capture the salient features of the market that the researcher wants to analyze. We then work on understanding how the model can be solved. After that, we discuss the solution: what have learned, how to interpret the findings in terms of the implications for the operation of real life markets.

The course is built around several important business-world phenomena such as mergers, vertical integration, pricing of durable products, price discrimination, and collusion. The models are illustrated by means of published economic papers or case studies.

The main challenge with this class is that the distribution of students attracted to this class is highly bi-modal. I usually attract, in equal measure, those students who are interested in economic or applied mathematical research and those who plan a career in consulting or a similar field. The students crucially differ in their level of preparation as well as in their comfort with mathematical concepts. To make things even more difficult, the second group tends to include students in their senior year who are actively seeking employment and are often absent from class (or fail to submit their assignments) for this reason. This contributes to the group disparity. My teaching method thus aims to keep both groups of students engaged and challenged. To achieve this I organize class discussions so that everybody can contribute at his own level by either interpreting real world observations in terms of the concepts developed in class or proposing model modifications that can be used to analyze a specific issue. I also make extensive use of bonus questions which are designed to challenge advanced students.

Graduate Teaching

The goal of my graduate level teaching is to prepare students for independent research by developing in them an understanding of various conceptual issues studied by the field, providing them with a solid methodological foundation, as well introducing them to the frontier research. During my time at Johns Hopkins University I have taught the first field course (Econ671) which also attracts students from other fields and from the School of Public Health. I have also taught a topics course (Econ672) for those students who are interested in Industrial Organization as their future field. Both courses emphasize methodology as well as substantive questions. In the introductory course, conceptual and methodological foundation take the forefront, whereas the topic class emphasizes cutting-edge research.

In the first course, I introduce students to the estimation of static models of oligopolistic competition, the direct estimation of production and cost functions as well as the estimation of demand models for differentiated products. After that I focus on several topics that have been at the focus of intensive research interest in the recent years. Over the years the topics have changed. Some of those I have discussed include but are not limited to the analysis of market participation with the extension to the estimation of models with multiple equilibria in general, the analysis of markets where network effects are present, the analysis of matching markets

and markets where prices are determined through bargaining and the analysis of markets where the pricing is implemented through auctions. Even when discussing classical methodological topics I always spend some time outlining how methods have been extended to accommodate more complicated settings and to indicate how the frontier of the research has advanced. I usually incorporate three types of course requirements. The first type of assignment aims at developing the implementation skills. It usually involves an estimation assignment based on real data. The second type aims to develop conceptual understanding and the ability to critically evaluate research findings. The assignment usually involves writing hypothetical referee reports on working papers which are in circulation at the time. The third type of assignment aims to develop presentation skills as the students are asked to present a cutting-edge research paper to their classmates. Such assignments also contribute to developing an ability to understand contemporaneous research.

The second course is specifically tailored towards preparing students to transition to independent research. It is constructed around several topics which are currently at the research frontier and is centered around individual research papers which are either recently published or are currently circulating as working papers. Of course, we also study older papers in order to build a foundation for discussion of the current research. The main assignment for the course is to prepare a viable research proposal. I emphasize that the proposal has to include a research question which is of interest given the current research frontier. The question has to be well motivated both conceptually but also on the basis of the current literature. The student is also expected to develop a framework for the analysis which would enable him to answer the research question. The framework includes an economic model which would provide foundation for the analysis, description of a realistic dataset that could be used in the analysis, and a description of estimation methodology. The students are expected to work on this proposal throughout the semester and deliver the final product during the exam period. To facilitate the work I usually meet with students individually on a regular basis but especially often in the beginning of the class when they are actively searching for a topic. Additionally, I assign problem sets which emphasize the understanding of conceptual issues and of methodological choices made by various researchers. I also require students to present a current working paper on their topic of interest.

I believe this class is generally successful in stimulating interest in Industrial Organization as well as in preparing students for independent research. Last year, however, due to some departmental scheduling issues, the set of students enrolled in the class consisted mostly of the first year graduate students who have not yet taken the first field course. I had to somewhat modify the material as well as class objectives. Unfortunately, I also had a second year student for whom the original framework seemed most beneficial. I have chosen an approach where I worked more with him on an individual basis pursuing the regular research proposal objective. With the rest of the class I emphasized an understanding of the research objectives pursued by the field in the recent years.