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NBER Economics of Digitization Graduate Student Tutorial

I am currently a third year student in the Quantitative Marketing Ph.D. program at Stanford Graduate School of Business. Previously, I received my Bachelor of Arts in Mathematics from Pomona College and a Master's in Statistics from Harvard University. While at Harvard, I RAed for Claudia Goldin at the NBER. I spent two years at the Federal Reserve Bank of New York in the Economics Research department. I pursued several projects and my main focus was working on GDP forecasting models.

During my first year in the Ph.D. program I followed a rigorous course of study. I took a year of microeconomic theory including game theory. I also took a year sequence in Econometrics including topics such as probability, IVs, and non-parametrics. Other classes I took during the first year of my Ph.D. included Behavioral Decision-Making, Scientific Python, Quantitative Research in Marketing and Advanced Empirical Methods which focused on discrete choice models. In my second year I took Advanced Econometrics, Bayesian Statistics, a full year sequence in Industrial Organization, Dynamic Discrete Choice Models, Statistical Learning and Causal Inference.

Throughout my Ph.D. I have also spent time pursuing research. I had several "directed reading" courses in which I met with faculty to discuss papers and research ideas. I covered topics such as ads as signaling, reward programs, text analysis using latent dirichlet models, and free-riding issues. My initial work was on switching costs and reward programs in the airline industry. I investigated the "lock-in" effect created by rewards programs.

Since then I have pursued other work on consumer habit and state dependence. I have been creating a structural model to identify when consumers have formed a "habit" with

respect to a particular good and if rewards programs are instilling habitual purchases in consumers. Rewards programs really only affect a marginal consumer. There are some who will never purchase, and others who would always purchase, but a rewards program tips the in between consumer over. Does it create habitual purchases as well? Do the effects last beyond the reward program? I have been setting up an experiment in order to identify habit in the field.

In addition, I have been working on a project on consumer search. To enhance the standard search model we have data in which we can see consumers search across correlated attributes for used vehicles. We model how consumers learn about the used cars overtime and how their update their beliefs with respect to these correlated attributes. To my knowledge, this has not been done in the literature. Modeling consumer beliefs across correlated variables of different types (discrete, continuous, non-ordinal) is quite difficult. We use statistical copulas to parse out the effects of the ordinal variables (such as mileage and price) conditioning on the non-ordinal variables (such as make an model of the car).

In addition to this we are modeling how the information ordering affects a consumers search path. Specifically we are interested in how information on the initial search results affects what products choose to search over and what information they choose to uncover further into the website. For example, just as in amazon, our platform has search results with some initial aspects of information such as mileage and price. If a consumer is then interested in the car they can click on the search result to take them to the vehicle description page. Here they can uncover further information in other links such as CarFax and detailed reports on the vehicle. How does the information that is posted upfront guide what a consumer further searches over and does this create inefficiencies that we can solve by altering that information for specific visitors to the site or specific cars? For example if a car with heavy mileage is posted upfront, consumers may not further search over it, but perhaps that car has a great history on other aspects.

Both of these projects, in particular the search project, are enhanced by digitization,

both in terms of data accessibility, but also in how consumers make decisions and purchase goods.

I would love to attend the Ph.D. tutorial at the NBER Digitization conference this upcoming year. I believe that it will be useful for me to see cutting edge research techniques and topics and help me with my research, particularly on my latest project on consumer search. Note: As I am already at Stanford I do not require any funding for hotel and living expenses.