Quantitative Marketing and Economics
2010 Conference Schedule

October 22-23, 2010
UCLA, Anderson School of Management

Sponsored by
James M. Kilts Center for Marketing, University of Chicago Booth School of Business
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Friday, October 22

12:00 pm – 12:45 pm  Lunch
12:45 pm – 1:00 pm  Welcome
1:00 pm – 2:00 pm  Session 1

Structural Equilibrium Analysis of Political Advertising
Brett R. Gordon (Columbia) and Wesley R. Hartmann (Stanford)

We present a structural model of political advertising in equilibrium. Candidates choose advertising across media markets in order to maximize the probability of winning the national election. The voter model takes the form of an aggregate random coefficients discrete choice model in which advertising affects a voter's incentive to vote for either candidate or not to vote at all. We estimate the model using detailed advertising and voting data from the 2000 and 2004 Presidential elections.

We use the model to conduct a counterfactual in which we eliminate the Electoral College, and consider a direct national vote. Changing the structure of the electoral process alters candidates' marginal incentives to advertise in a given market. This leads to a new equilibrium allocation of advertising and potentially a new voting outcome. Furthermore, our model could be used for other counterfactuals, such as considering the effects of 3rd-party candidates or certain campaign finance reforms, and could be applied or extended to races for other offices (e.g. house, senate or gubernatorial) or the primaries.

Discussant: Federico Rossi (North Carolina)

2:00 pm – 3:00 pm  Session 2

Can Brand Extension Signal Product Quality?
Sridhar Moorthy (Toronto)

This paper reexamines the question of whether brand extension can serve as a signal of product quality. Wernerfelt’s (1988) paper suggested it can, but he assumed that brand extension costs more than introducing a new brand. We ask to what extent his argument survives dropping this assumption. Even though his equilibrium can still exist as a perfect Bayesian equilibrium in the modified model, it is not the only one. We exhibit a pooling equilibrium in which brand extension does not signal product quality, and argue that on several criteria the pooling equilibrium is more compelling than Wernerfelt’s separating equilibrium. In particular, only the pooling equilibrium exists robustly under "empirically justified" off-
equilibrium beliefs. If introducing a new brand costs even infinitesimally more than brand extension, then brand extension can be a signal of product quality under empirical off-equilibrium beliefs if and only if old and new products’ qualities are correlated and consumers identify with brands and not the firm behind the brands. We conclude the paper with a discussion of how our results relate to the behavioral literature on brand extensions and managerial practice.

Discussant: Nanda Kumar (Chicago)

3:00 pm – 3:30 pm Break

3:30 pm – 4:30 pm Session 3

*Cellular Service Demand*
Michael D. Grubb (MIT) and Matthew Osborne (Bureau of Economic Analysis)

We estimate a model of consumer plan choice, usage, and learning in cellular-phone services on a detailed panel data set of individual bills. Our model allows consumers to learn about how much they value cellular services. We infer consumers' predictions of their future cellular usage from plan choices, and compare these predictions to actual usage. A consumer's value for cellular services contains a permanent consumer specific element and a monthly idiosyncratic element. We find that on average consumers underestimate their permanent type (mean bias), underestimate their own uncertainty about their permanent type (overconfidence), and underestimate the monthly variation (projection bias) in their taste for usage. Our paper also advances structural modeling of demand in situations where multipart tariffs induce marginal price uncertainty at the time consumers make consumption choices.

Discussant: S. Sriram (Michigan)

4:30 pm – 5:30 pm Session 4

*Diagnosing Consumer Confusion and Sub-Optimal Shopping Effort: Theory and Mortgage-Market Evidence*
Susan E. Woodward (Sand Hill Econometrics) and Robert E. Hall (Stanford)

Mortgage loans are leading examples of transactions where experts on one side of the market take advantage of consumers' lack of knowledge and experience. We study the compensation that borrowers pay to mortgage brokers for assistance from application to closing. Two findings support the conclusion that confused borrowers overpay for brokers' services: (1) A model of effective shopping shows that borrowers sacrifice at least $1,000 by shopping from too few brokers. (2) Borrowers who compensate their brokers with both cash and a commission from the lender pay twice as much as similar borrowers who pay no cash.

Discussant: Raphael Thomadsen (UCLA)

5:30 pm Dick Wittink Award Korn Hall
6:00 pm Reception/Dinner Gold Hall, rooms B.208 & B.210

*Saturday, October 23rd – Korn Hall*
8:00 am – 9:00 am  Breakfast

9:00 am – 10:00 am  Session 1

**Constrained Optimization Approaches to Estimation of Structural Models**  
Che-Lin Su (Chicago) and Kenneth L. Judd (Hoover Institution)

Estimation of structural models is often viewed as computationally difficult. This impression is partly due to a focus on the Nested Fixed-Point (NFXP) approach. We present a direct optimization approach to the general problem and show that it is significantly faster than the NFXP approach when applied to the canonical Zurcher bus repair model. The nested-type of approach is inappropriate for estimating games with multiple equilibria since it requires finding all Nash equilibria of a game for each parameter vector considered in order to calculate the likelihood value at that given parameter vector. Even if one can solve for all the equilibria for every guess of structural parameters, the resulting likelihood function can be nonsmooth or even discontinuous, which makes the outer-loop optimization problem extremely difficult. We formulate the estimation of games as a constrained optimization problem that is qualitatively no more difficult to solve than standard maximum likelihood problems. The direct optimization approach is also applicable to other structural estimation methods such as the methods of moments, and also allows one to use computationally intensive bootstrap methods to calculate inference.

Discussant: Andrew Ching (Toronto)

10:00 am – 11:00 am  Session 2

**Choice Set Heterogeneity and the Role of Advertising: An Analysis with Micro and Macro Data**  
Michaela Draganska (Stanford) and Daniel Klapper (Goethe)

We show how to use micro-level survey data from a tracking study on brand awareness in conjunction with data on sales and advertising expenditures to improve the specification, estimation, and interpretation of aggregate discrete choice models of demand. In a departure from the commonly made full information assumption, we incorporate limited information in the form of choice sets to reflect the fact that consumers may not be aware of all available brands at purchase time. We derive theoretically and show empirically that both the estimated brand constants and the price coefficient are biased downward when consumer heterogeneity in choice sets is ignored. These biased estimates lead to costly mistakes in firms' price setting.

In addition, the tracking data allow us to identify separately two processes by which advertising influences market shares. We find that advertising has a direct effect on brand awareness (inclusion in choice set) in addition to its effect on consumer preferences (increase in utility). This improved understanding of how advertising works enhances our ability to make policy recommendations.

Discussant: Paul Ellickson (Rochester)

11:00 am – 11:30 am  Break

11:30 am – 12:30 pm  Session 3

**The Interaction of Observed and Unobserved Factors in Discrete Choice Demand Models**  
Amit Gandhi (Wisconsin), Kyoo il Kim (Minnesota) and Amil Petrin (Minnesota)
Many papers estimate demand in discrete choice settings using the inversion from Berry (1994) to control for unobserved product quality and its correlation with price. This approach requires utility to be additively separable in the unobserved factor, a restriction hard to motivate theoretically. We develop an estimator for a model with interactions between observed and unobserved product attributes. We show that the standard conditional moment restrictions do not generally suffice for identification. We supplement these moments with new “control function” moments using price controls originally proposed in Petrin and Train (2010) and Kim and Petrin (2010a), and provide conditions under which the demand parameters are identified. A major advantage of our setup is it does not require the strong control function conditions used in Bajari and Benkard (2003) and Kim and Petrin (2010a), who require the controls to be one-to-one functions with unobserved factors and fully independent of observed factors. We run several monte carlos that show the approach works when the standard IV approaches fail because of non-separability. We also test and reject additive separability in the original Berry, Levinsohn, and Pakes (1995) automobile data, and we show that demand becomes significantly more elastic when the correction is applied.

Discussant: Rosa Matzkin (UCLA)

12:30 pm – 1:30 pm   Lunch

1:30 pm – 2:30 pm   Session 4

The Evolution of Brand Preferences Evidence from Consumer Migration
Bart J. Bronnenberg (Tilburg), Jean-Pierre Dubé (Chicago) and Matthew Gentzkow (Chicago)

We study the long-run evolution of brand preferences, using new data on consumers’ life histories and purchases of consumer packaged goods. Variation in where consumers have lived in the past allows us to isolate the causal effect of past experiences on current purchases, holding constant contemporaneous supply-side factors such as availability, prices, and advertising. Heterogeneity in brand preferences explains 40 percent of geographic variation in market shares. These preferences develop endogenously as a function of consumers’ life histories and are highly persistent once formed, with experiences 50 years in the past still exerting a significant effect on current consumption. Counterfactuals suggest that brand preferences create large entry barriers and durable advantages for incumbent firms, and can explain persistence of early-mover advantage over long periods. Variation across product categories shows that the persistence of brand preferences is related in an intuitive way to both advertising levels and the social visibility of consumption.

Discussant: Sergio Meza (Toronto)

2:30 pm – 3:30 pm   Session 5

Nonparametric Estimation of Marketing-Mix Effects Using a Regression Discontinuity Design
Wesley Hartmann (Stanford), Harikesh S. Nair (Stanford) and Sridhar Narayanan (Stanford)

We discuss how regression discontinuity designs arise naturally in settings where firms target marketing activity at consumers, and discuss how this aspect may be exploited for econometric inference of causal effects of marketing effort. Our main insight is to use commonly observed discreteness and kinks in the heuristics by which firms target such marketing activity to consumers for nonparametric identification. Such kinks, along with continuity restrictions that are typically satisfied in marketing and industrial organization applications, are sufficient for identification of local treatment effects. We review the theory of regression discontinuity estimation in the context of targeting, and explore its applicability to several marketing settings. We discuss identifiability of causal marketing effects using the design, and illustrate...
theoretically the conditions under which the RD estimator may be valid. Specifically, we argue that consideration of an underlying model of strategic consumer behavior reveals how identification hinges on model features such as the specification and value of structural parameters as well as belief structures. We present two empirical applications: the first, to measuring the effect of casino e-mail promotions targeted to customers based on ranges of their expected profitability; and the second, to measuring the effect of direct mail targeted by a B2C company to zip-codes based on thresholds of expected response. In both cases, we illustrate that exploiting the regression discontinuity design reveals negative effects of the marketing campaigns that would not have been uncovered using other approaches. Our results are nonparameteric, easy to compute, and fully control for the endogeneity induced by the targeting rule.

Discussant: Florian Zettelmeyer (Northwestern)

3:30 pm – 4:00 pm Break

4:00 pm – 5:00 pm Session 6

Gas Prices, Fuel Efficiency, and Endogenous Product Choice in the U.S. Automobile Industry
Jacob Gramlich (Georgetown)

I develop and estimate a model of the U.S. automobile industry in which firms choose the fuel efficiency of their new vehicles. Previous models held characteristics fixed. Allowing for endogenous characteristic choice enables me to predict fuel efficiency of the domestic fleets for any level of after-tax gas price. I use the model to analyze the 2008 gas price increase, and to compute the ‘gas-tax equivalent’ of the 35 miles-per-gallon (mpg) CAFE standards. Firms face technological tradeoffs between providing fuel efficiency and other quality, and the gas price shifts incentives to locate along this frontier. Demand is nested logit, supply is differentiated products oligopoly. The model is estimated using data from the US automobile market from 1971-2007. The model (out of sample) matches the summer 2008 purchase patterns well, predicts mpg improvements that would have obtained if the high gasoline prices had persisted, and suggests that the after-tax gasoline price that would achieve 35 mpg (the new CAFE standard) is $4.55/gallon. Contributions to previous work include modeling product choice, relaxing restrictive identifying assumptions in demand estimation, obtaining more realistic estimates of fuel efficiency preference, and enabling prediction of fuel efficiency at any after-tax gasoline price.

Discussant: Dmitri Kuksov (Washington University)