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## MARKETING MODELING

Period: a.y. 2023/24 – II sem.

Class times: TBD

**Instructor:**

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### Course Objectives:

In this course, we examine the use of quantitative models in addressing problems of interest to academic researchers in marketing. The primary objectives are: 1) to familiarize students with advanced theories and techniques used in current marketing research; and 2) to provide students with empirical skills drawn from statistics/ econometrics, microeconomics and industrial organization to develop the models and apply them to interesting marketing problems.

This course is intended primarily for doctoral students concentrating on a marketing track. A good understanding of microeconomics, statistics and econometrics will help the students gain a more insightful understanding of the course material.

### Course Format:

Each session involves a combination of lectures, discussions and hands-on exercises (using actual and simulated data). The first week's session is largely lecture-based (with no need for pre-class readings) with a strong emphasis on real-time problem solving including analytical exercises on the whiteboard and numerical investigations using Excel. For later weeks, pre-class reading material will be distributed in advance to the class via e-mail. It is expected that students will be fully prepared with the reading material and actively participate in discussions.

In Session 5, students are required to submit a critique of each assigned research paper and present it in class. The presentation should be structured as follows: 1) research questions; 2) why the questions may/ may not be interesting; 3) summary of data and empirical methods; 4) results; and 5) key contributions and limitations of the paper.

### Assessment:

In-class participation (30%)

Assignments (30%):

Submissions of estimation exercise output  
One written critique

Final presentation (40%)

\* More detailed information on the assignments and the final presentation will be provided during the first session.

## Session Schedule:

### Session 1.

#### Topic: Probability Models in Marketing

- 1.1. Modelling Discrete-Time Duration Data
- 1.2. Modelling Continuous-Time Duration Data
- 1.3. Estimation Using the Method of Maximum Likelihood

#### References (Post-class readings):

Morrison, Donald G. and David C. Schmittlein (1980), "Jobs, Strikes, and Wars: Probability Models for Duration," *Organizational Behavior and Human Performance*, 25 (April), 224-251.

Fader, Peter S. and Bruce G. S. Hardie (2007), "How to Project Customer Retention," *Journal of Interactive Marketing*, 21 (Winter), 76-90.

Fader, Peter S. and Bruce G. S. Hardie (2007), "How Not to Project Customer Retention." <http://brucehardie.com/notes/016/>

Fader, Peter S. and Bruce G. S. Hardie (2010), "Customer-Base Valuation in a Contractual Setting: The Perils of Ignoring Heterogeneity," *Marketing Science*, 29 (January), 85-93.

Fader, Peter S., Bruce G. S. Hardie and Jen Shang (2010), "Customer-Base Analysis in a Discrete-Time Noncontractual Setting," *Marketing Science*, 29 (November), 1086-1108.

### Session 2.

#### Topic: Structural Demand Modelling in Marketing

- 2.1. Review of Econometrics (The Method of Moments, GMM)
- 2.2. Consumer Choice Models: Logit Models
- 2.3. Estimation Practices

#### References (\*Pre-class readings):

\*Chintagunta, Pradeep K., Tulin Erdem, Peter E. Rossi and Michel Wedel (2006), "Structural Modeling in Marketing: Review and Assessment," *Marketing Science*, 25 (6), 604-616.

\*Reiss, Peter C. (2011), "Descriptive, Structural, and Experimental Empirical Methods in Marketing Research," *Marketing Science*, 30 (6), 950-964.

\*Chintagunta, Pradeep K. and Harikesh S. Nair (2011), "Discrete-Choice Models of Consumer Demand in Marketing," *Marketing Science*, 30 (6), 977-996.

\*McFadden, Daniel (1980), "Econometric Models for Probabilistic Choice Among Products," *The Journal of Business*, 53 (3).

Guadagni, Peter M. and John D. Little (1983), "A Logit Model of Brand Choice Calibrated on Scanner Data," *Marketing Science*, 2 (3), 203-238.

Kannan, P. K., and Gordon P. Wright (1991), "Modeling and Testing Structured Markets: A Nested Logit Approach," *Marketing Science*, 10 (1), 58-82.



### **Session 3.**

#### **Topic: Consumer Choice Models Using Aggregate Data**

- 3.1. Adding Consumer Heterogeneity
- 3.2. BLP
- 3.3. Estimation Algorithm

#### **References (\*Pre-class readings):**

\*Chintagunta, Pradeep K. Dipak C. Jain and Naufel J. Vilcassim (1991), "Investigating Heterogeneity in Brand Preferences in Logit Models for Panel Data," *Journal of Marketing Research*, 28 (4), 417-428.

\*Berry, S., J. Levinsohn and A. Pakes (1995), "Automobile Prices in Market Equilibrium," *Econometrica*, 63 (4), 841-890.

\*Nevo, Aviv (2000), "A Practitioner's Guide to Estimation of Random-Coefficient Logit Models of Demand," *Journal of Economics and Management Strategy*, 9 (4), 513-548

### **Session 4.**

#### **Topic: Consumer Choice Models Using Individual-Level Data**

- 4.1. Bayesian Econometrics
- 4.2. Consumer Choice Models Using Individual-Level Data: Probit Model
- 4.3. Estimation Algorithm

#### **References (\*Pre-class readings):**

\*Rossi, Peter E. and Greg M. Allenby (2003), "Bayesian Statistics and Marketing," *Marketing Science*, 22 (3), 304-328.

\*Manchanda, Puneet, Asim Ansari and Sunil Gupta (1999), "The Shopping Basket: A Model for Multicategory Purchase Incidence Decisions," *Marketing Science*, 18 (2), 95-114.

Hong, Sungtak, Kanishka Misra and Naufel J. Vilcassim (2016), "The Perils of Category Management: The Effect of Product Assortment on Multicategory Purchase Incidence," *Journal of Marketing*, 80 (5), 34-52.

### **Session 5.**

#### **Topic: Difference-in-Difference to Identify Causal Effects**

- 5.1. Difference-in-Difference
- 5.2. Estimation Practice

#### **References (\*Pre-class readings):**

\*Lechner (2010), "The Estimation of Causal Effects by Difference-in-Difference Methods," *Foundations and Trends in Economics*, 4 (3), 165-224.

\*Bertrand, Duflo and Mullainathan (2004), "How Much Should We Trust Difference-in-Difference Estimates," *Quarterly Journal of Economics*, February, 249-75.

Goldfarb, A. and C. Tucker (2011), "Search Engine Advertising: Channel Substitution When Pricing Ads to Context," *Management Science*, 57 (3), 458-470.

\*Manchanda, P., G. Packard and A. Pattabhiramaiah (2015), "Social Dollars: The Economic Impact of Consumer Participation in a Firm-Sponsored Brand Community," *Marketing Science*, 34 (3), 367 -387.

**Session 6.**  
**Final Presentations**

\* Detailed information will be provided during the first session.