Quantitative Research in Marketing
Course Syllabus, Spring 2019
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Spring 2019	3-213 Carlson
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Objective

Research in Marketing endeavors to explain consumer and firm behaviors and to guide managerial decision making. This course surveys quantitative research in marketing, with a focus on empirical models. The goal of the course is to a) raise students' awareness of this literature and b) stimulate new research interests. By the end of the course, students should be familiar with the key issues and approaches in quantitative marketing, the strengths of these research streams, and the opportunities to extend them.

Approach

The course meets each week for 3 hours. For each topic, I will list a number of papers. We will spend the first two and half hours reviewing three papers in depth. The last ½ hour will be spent integrating the days' readings. The class will be largely discussion oriented, though I will at times interject to give a brief lecture. These lectures will range from technical discussions to research taxonomies. For suggestions on reading these articles, please see the Appendix to this syllabus, provided by Vithala Rao at Cornell.

Course Requirements

Each student is expected to read the required reading to be discussed. In addition, they are expected to peruse additional optional readings as time permits to obtain a broader sense of research in the area. Every week, each student will be assigned to write a one-page summary of a specific paper for the edification of themselves and their peers. Each student is also expected to lead the discussion of the paper for which she/he writes the summary (slides can be used to facilitate the discussion, but not required). These summaries should be distributed to all persons in the class, and include: objective of the paper, its unique contribution, why it is important, hypotheses if any, assumptions in the model, key equations, key findings, key limitations, and opportunities to extend the work.

In addition, each person will be required to hand in a one-page summary of all the required readings for the week (how they inter-relate, what the key questions are, what issues have been resolved, and what issues remain open).

Finally, at the end of the year students will hand in a research proposal. This proposal should outline why the idea is important, how it is different from existing work, and present a model to

implement the idea. Around 2/3 into the semester, we will reserve one week for one-one meetings to discuss the proposals. Throughout the semester, you are welcome to make appointments with me to discuss your proposals.

Grading

Students will be graded using the following criteria: class participation (20%), paper summaries (20%), and the final project (60%).

Course Framework

Marketing models can be categorized along two dimensions – topics and approaches. The approaches used to model marketing phenomenon include empirical models (e.g., reduced-form models, structural models, machine learning, field experiments, etc.) and analytical models such as game theory and operations research. Topics can be categorized into "external to the firm" marketing environments (e.g., Industry Such as Internet, Pharmaceutical, etc., Competition, and Customers), and internal to the firm marketing policies (Price, Promotion, Advertising, Distribution and Product) used in those contexts. As research issues drive the tools used to solve them, we will organize the course by the topics as opposed to the approaches. Note that for some topics with extensive literature (e.g., advertising, pricing), we will focus on a few more recent studies. By no means it implies classical papers are out-of-date. In fact, I encourage you reach out to me for more classical references if you are interested in that specific topic.

Session Details

Specifically, the course will be organized as follows (* denotes required, all other readings are optional in case you would like more information or background on the topics):

Week 1 (1/25): Course overview and introduction of Choice Models

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

*Bucklin, Randolph E. and James M. Lattin (1991), "A Two-Stage Model of Purchase Incidence and Brand Choice," *Marketing Science*, 10 (Winter), 24-39.

*Dube, J.-P. (2004): "Multiple Discreteness and Product Differentiation: Demand for Carbonated Soft Drinks," Marketing Science, 23(1), 66–81.

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

Chapter 2, Train, Kenneth (2003), Discrete Choice Methods with Simulation, Cambridge University Press.

Jean-Pierre Dubé (2018), Microeconometric Models of Consumer Demand, Working paper

Week 2 (2/1?): Aggregate demand

* Berry, Steven T. "Estimating Discrete-Choice Models of Product Differentiation." The RAND Journal of Economics 25, no. 2 (1994): 242-62.

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

* Amil Petrin (2002), "Quantifying the Benefits of New Products: The Case of the Minivan," Journal of Political Economy, 110:705-729, 2002

* Crawford, G. S., Lee, R. S., Whinston, M. D. and Yurukoglu, A. (2018), "The Welfare Effects of Vertical Integration in Multichannel Television Markets". Econometrica, 86: 891-954

Berry, Steven, James Levinsohn and Ariel Pakes (1995) "Automobile Prices in Market Equilibrium," Econometrica, 63(4), 841-90.

Berry, Steven, James Levinsohn, and Ariel Pakes. "Differentiated Products Demand Systems from a Combination of Micro and Macro Data: The New Car Market." *Journal of Political Economy*, 112, no. 1 (2004): 68-105

Week 3 (2/8): Heterogeneity

*Kamakura and Russell (1989), "A Probabilistic Choice Model for Market Segmentation and Elasticity Structure," Journal of Marketing Research, 26 (November), 379-90.

*Netzer, O., Lattin, J. M., & Srinivasan, V. (2008). A hidden Markov model of customer relationship dynamics. *Marketing science*, *27*(2), 185-204.

*Dew Ryan, Yang Li and Asim Ansari (2017) Dynamic Preference Heterogeneity, Working paper.

* Liu Liu and Daria Dzyabura (2017) Capturing Heterogeneity Among Consumers with Multi-taste Preferences.

Week 4 (2/15): Search

* Hong, H., & Shum, M. (2006). Using price distributions to estimate search costs. *The RAND Journal of Economics*, *37*(2), 257-275.

* Bronnenberg, Bart, Jun Kim and Carl Mela (2016), "Zooming in on Choice: How Do Consumers Search for Cameras Online?" *Marketing Science*, 35, 5 (September-October), 693-712.

* Honka and Chintagunta (2017), "Simultaneous or Sequential? Search Strategies in the U.S. Auto Insurance Industry", Marketing Science, 36(1), 21 – 42.

*Seiler, S. (2013). "The impact of search costs on consumer behavior: A dynamic approach". Quantitative Marketing and Economics, 11(2), 155-203.

De los Santos, Hortacsu, and Wildenbeest, "Testing models of consumer search using data on web browsing and purchasing behavior", American Economic Review, 102(6), 2012, 2955-80

Hortacsu and Syverson, "Product Differentiation, Search Costs and Competition in the Mutual Fund Industry: A Case Study of S&P 500 Index Funds", Quarterly Journal of Economics , v.119, May 2004, p.403-456.

Chen and Yao (2017), Sequential Search with Refinement: Model and Application with Click-Stream Data, *Management Science, 63(12), pp. 4345-4365, 2017*

Jun B. Kim, Paulo Albuquerque, and Bart J. Bronnenberg, "Online Demand Under Limited Consumer Search", Marketing Science 2010 29:6, 1001-1023

Weitzman, M. L. (1979). Optimal search for the best alternative. *Econometrica: Journal of the Econometric Society*, 641-654.

Week 5 (2/22): Learning

* Ching, Erdem, and Keane (2013), "Learning Models: An Assessment of Progress, Challenges, and New Developments", Marketing Science, 32(6), Pages 827-1011

* Zhang, Juanjuan (2010), "The Sound of Silence: Observational Learning in the U.S. Kidney Market", Marketing Science, 29(2)

* Erdem, T., & Keane, M. P. (1996). Decision-making under uncertainty: Capturing dynamic brand choice processes in turbulent consumer goods markets. *Marketing science*, *15*(1), 1-20.

* Sangwoo Shin, Sanjog Misra, and Dan Horsky(2012), "Disentangling Preferences and Learning in Brand Choice Models" Marketing Science, 31:1, 115-137

Erdem, Tulin, and Baohong Sun (2002) "An Empirical Investigation of the Spillover Effects of Advertising and Sales Promotions in Umbrella Branding." *Journal of Marketing Research* 39(4), 408-20.

Week 6 (3/1): Two-sided market and share economy

*Jessica Yu (2018), "Search, Selectivity, and Market Thickness in Two-Sided Markets", working paper

*Choi and Mela (2018), "Display Advertising Pricing in Exchange Markets", working paper

*Georgios Zervas, Davide Proserpio, and John W. Byers, "The Rise of the Sharing Economy: Estimating the Impact of Airbnb on the Hotel Industry", Journal of Marketing Research 2017 54:5, 687-705

Rochet, Jean-Charles, and Jean Tirole. "Two-Sided Markets: A Progress Report." The RAND Journal of Economics 37, no. 3 (2006): 645-67.

Yao, Song and Carl F. Mela (2011), "A Dynamic Model of Sponsored Search Advertising," *Marketing Science*, 30 (3), pp. 447-468

Yao, Song and Carl F. Mela (2008), "Online Auction Demand," *Marketing Science*, 27 (5), pp. 861–885.

Week 7 (3/8?): WOM/Social interactions

* Davide Proserpio and Georgios Zervas (2017), "Online reputation management: Estimating the impact of management responses on consumer reviews", Marketing Science, 36(5), 645-812

* Michael Luca and Georgios Zervas (2016), "Fake it Till You Make it: Reputation, Competition, and Yelp Review Fraud", Management Science, 62(12), 3393-3672

* Shiyang Gong, Juanjuan Zhang, Ping Zhao, and Xuping Jiang, "Tweeting as a Marketing Tool— Field Experiment in the TV Industry", *Journal of Marketing Research*, 2017, 54(6), 833-850

Seiler, Stephan, Song Yao, and Wenbo Wang (2017), "Does Online Word-of-Mouth Increase Demand? (and How?) Evidence from a Natural Experiment," *Marketing Science*, 36(6), pp. 838–861.

Mayzlin, Dina, Yaniv Dover, and Judy Chevalier (2014), "Promotional Reviews: An Empirical Investigation of Online Review Manipulation," American Economic Review, 104 (8), 2421-55.

Godes, David and Dina Mayzlin (2004), "Using Online Conversations to Study Word of Mouth Communication," Marketing Science, 23 (4), 545-560.

Week 8 (3/15): Social interactions

* Harikesh Nair, Puneet Manchanda, and Tulikaa Bhatia (2010). "Asymmetric Social Interactions in Physician Prescription Behavior: The Role of Opinion Leaders," Journal of Marketing Research, Vol. XLVII (Oct), pp. 883-895.

* Yanhao Wei, Pinar Yildirim, Christophe Van den Bulte, Chrysanthos Dellarocas, "Credit Scoring with Social Network Data" (2016) , Marketing Science, 35(2), 234-258

* Zhang, Xiaoquan (Michael), and Feng Zhu (2011). "Group Size and Incentives to Contribute: A Natural Experiment at Chinese Wikipedia." American Economic Review, 101 (4): 1601-15.

* Shriver, Scott, Harikesh Nair and Reto Hofstetter (2013), "User-Generated Content and Social Ties: Evidence from an Online Social Network," Management Science, 59 (6), 1425- 1443.

Hartmann, W.R. (2010) " Demand Estimation with Social Interactions and the Implications for Targeted Marketing", *Marketing Science*, 29(4), 2010.

Bryan Bollinger and Kenneth Gillingham (2012), "Peer Effects in the Diffusion of Solar Photovoltaic Panels", Marketing Science, 31(6): 900-912

Week 9 (3/29): No meeting

This week is reserved for individual meetings to discuss students' proposals

Week 10 (4/5): Advertising

* Wes Hartmann and Daniel Klapper (2018), "Superbowl Ads" , *Marketing Science*, 37(1), 2018.

* Brad, Shapiro, "Positive Spillovers and Free Riding in Advertising of Prescription Pharmaceuticals: The Case of Antidepressants," *Journal of Political Economy,* 126(1), pp 381-437, 2018.

* Günter Hitsch, Brad Shapiro, Anna Tuchman (2018) "Generalizable and Robust TV Ad Effects," working paper

* Garrett A. Johnson, Randall A. Lewis, and Elmar I. Nubbemeyer (*2017*) "Ghost Ads: Improving the Economics of Measuring Online Ad Effectiveness". Journal of Marketing Research, Vol. 54, No. 6, pp. 867-884.

Seiler, Stephan, and Song Yao (2017), "The Impact of Advertising along the Conversion Funnel," *Quantitative Marketing and Economics*, 15(3), pp. 241-278.

Gordon, Brett, and Florian Zettelmeyer, Neha Bhargava, Dan Chapsky, 2018. "A Comparison of Approaches to Advertising Measurement: Evidence from Big Field Experiments at Facebook", Marketing Science, forthcoming

Anna Tuchman (2018), "Advertising and Demand for Addictive Goods: The Effects of E-Cigarette Advertising", working paper

Brett R. Gordon and Wesley R. Hartmann (2013), "Advertising Effects in Presidential Elections", Marketing Science 2013 32:1, 19-35

Week 11 (4/12): Pricing

Dube and Misra (2017), "Scalable Price Targeting", working paper

Misra, Schwartz and Abernethy (2018), "Dynamic Online Pricing with Incomplete Information Using Multi-Armed Bandit Experiments", Marketing Science, Forthcoming

Stephan Seiler, Anna Tuchman, and Song Yao (2018), "The Impact of Soda Taxes: Pass-through, Tax Avoidance, and Nutritional Effects", working paper

Week 12 (4/19): New Tools

* Olivier Toubia and Oded Netzer, "Idea Generation, Creativity, and Prototypicality", Marketing Science 2017 36:1, 1-20

* Artem Timoshenko (2018) "Identifying Customer Needs from User-Generated Content", working paper

* Liu Liu, Daria Dzyabura and Natalie V. Mizik (2018), "Visual Listening In: Extracting Brand Image Portrayed on Social Media," working paper

* Rafieian, Omid, and Yoganarasimhan, Hema, (2018) "Targeting and Privacy in Mobile Advertising", working paper
Dzyabura, Daria, and Yoganarasimhan, Hema (2018), "Machine Learning and Marketing." Handbook of Marketing Analytics: Methods and Applications in Marketing, Public Policy, and Litigation Support, Book chapter.

Week 13 (4/26): Marketing Camp

We will have no meeting this week due to the annual Marketing Camp. You may use this week to prepare your presentation and schedule meetings with me to discuss the final details of your proposal.

Week 14 (5/3): Proposal presentations

Each student needs to prepare a 45-minute presentation of her/his proposal, and 15-minute Q&A and discussion about the proposal.

Appendix: A Suggested Guide for "Reading" Journal Articles, by Vithala Rao, Cornell

Allow enough time to read the article at least twice. In the first reading, which may be quite superficial, try to get a general idea of the subject matter examined, uniqueness of the approach, and significant results. In the second reading, try to be critical of the concepts, assumptions, models, and application. If necessary, look over the article for a third time to seek a sharper understanding of the article and to evaluate where else the results and models can be applied.

While reading the article try and answer the questions indicated below for yourself. Doing so should significantly enhance your understanding of the research reported and your ability to critique the work.

Note that some published articles may not fit this format.

A. What aspect(s) of the business system is (are) being studied by the author? (E.g., relationship between a firm and competitor, consumer choices over time.)

B. What are some significant research issues addressed in the paper? Reflect upon why they are significant.

C. What specific managerial decisions can be addressed by the results reported in the paper? Are these decisions made better when the recommendations from this research are adopted?

D1. What is (are) the microunit(s) whose "behavior" is (are) being addressed in the paper?

D2. State the basic model of the behavior of the microunit in words or as a flow chart. State the premises and assumptions of the model. Identify major constructs.

D3. State the basic model of the behavior of the microunit in a mathematical form and identify the variables (predictor or criterion) and the parameters (unknown) of the model.

E. Does the paper deal with aggregation of the model across various microunits or segments? If so, how is this aggregation accomplished? If aggregation is not considered, what are the effects of the assumption of homogeneity?

F. How are the variables of the model measured? Are these measures appropriate? What are the sources of data? How reliable are these measures? What are some alternative ways of measuring the variables?

G. How are the parameters of the model estimated? Are the properties of the estimates discussed? (For example, are they unbiased and/or consistent?)

H. Is the empirical application discussed in the papers appropriate? Are the results validated? (This aspect may not be relevant for some articles.)

I. Are the results interpreted well? Are there any alternative explanations of the results?

J. Identify one or two other applications of the basic model?

K. What general conclusions can be drawn? In what ways does this article contribute to (or extend) our understanding of marketing science in the substantive area(s) examined by the article?