

HYUNG SUP (ZACK) BHAN

Marketing Department
Kellogg School of Management
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EDUCATION

Ph.D., Marketing, June 2018 (Expected)
Kellogg School of Management, Northwestern University

M.B.A., Marketing, Managerial Economics, and Decision Sciences, June 2012
Kellogg School of Management, Northwestern University

B.B.A., Business Administration, February 2006
Korea University

RESEARCH INTERESTS

Customer Value, Social Influence, Online Reviews, Omni-channel Retailing, Marketing Strategy, Intra-household Interactions, Product Unavailability, Service Delay, Scale Usage Bias

JOB MARKET PAPER

“Small Networks: Intra-household Interactions in a Multichannel Environment” (dissertation)

A multi-person household is a small network, which raises the possibility that household members' actions are interrelated. Although many firms recognize that individuals within a household may have distinct preferences, the possibility that purchase behaviors may be related has received far less attention. I investigate these issues in the context of a major U.S. multichannel apparel retailer. I show household members' purchases are highly correlated; when a spouse purchases, the partner tends to purchase. I then show that whether household members coordinate their purchases is predictive of the future value of their spending. Furthermore, I develop an instrumental variables approach to tackle the problem of whether a causal relationship exists. I find that a 10% increase in spending by a female partner influences the male to increase spending by 1.9%. A similar increase in spending by males leads females to increase spending by 3%. In addition to this asymmetric effect among genders, I find evidence of channel asymmetry. In particular, the intra-household effect is strongest in the retail channel, followed by the catalog and internet channels. I also show how customer, household, and seasonal traits moderate the intra-household effect. Most notably, the baseline spending level of the customer who is being influenced by the partner's purchase positively moderates the intra-household effect. Lastly, through simulations I find that without the existence of intra-household effects, the customers' total spending would have been 23% lower. Overall, this research emphasizes the importance of intra-household interactions in

sustaining a customer's spending level and of firms marketing to a household not as a single unit but as a small network.

WORKING PAPER

“Decomposing the Long-Term Impacts of Backorder Delays: A Quasi-Experimental Approach,” with Eric Anderson (manuscript is available upon request)

Even though firms frequently use backorders to sell products when temporary stockouts occur, the long-term ramifications of these delays for the customers have been less investigated. We develop a quasi-experimental research design that takes advantage of plausible random events to measure the impacts of experiencing backorder delays on customers' future purchases. Conditioning on the identical product being sold on the same day to different customers, we find that temporary stockouts occur close to random, and customer traits are similar in the narrow window between those who normally purchased and backordered. We find that experiencing backorder decreases future purchases by 2% in the short term. While the magnitude slightly decreases, the effect persists throughout a long-term period of five years. Using the quoted and actual delivery dates as two reference points, we unpack this mechanism. Short-term negative effects are driven by the firm's failure to meet the promised or quoted delivery date. In the long term, the effects are driven by the lateness of the quoted date itself. In addition, we test the asymmetric effects of the backordered product arriving earlier or later than the quoted delivery date. We find evidence of loss aversion, but it is limited in the short term.

RESEARCH IN PROGRESS

“Scale Usage Bias in Online Reviews: The Large Consequences of Small Number of Ratings on Product Success,” with Eric Anderson and Blake McShane (data analysis stage)

Many studies have suggested why customers' online ratings might not reflect the true quality of a product. An area less explored in the context of customer reviews is scale usage bias, which may also lead to distortion in signaling a product's true quality. A major consequence of scale usage bias and quality distortion is that rankings and market outcomes can be altered. For example, even with a handful of reviews, if rating is inflated due to positive scale usage characteristics of reviewers, the product could still be a success. This has important implications, given that a majority of the products on online platforms garner very few reviews. In this research, we study scale usage bias in online reviews and its impact on product success using apparel firm data. We ask: (1) How large is the degree of scale usage heterogeneity in online customer reviews? (2) How large is the pervasiveness of scale usage bias among the products? (3) What are the consequences of scale usage bias on market outcomes? We find that there is significant heterogeneity in online reviewers' scale usage patterns, which predicts reviewers' future ratings. Product success is also adversely affected by this scale usage bias. For example, bias correction leads to changes in product rankings. Devising a quasi-experimental research design, we investigate the impact of a single review on unit sales. Even with a *single* high rating, monthly sales of a given product increase more significantly in the Internet channel than in the catalog or retail channels. We find that correcting for scale usage bias would lead to a lower level of total sales than that actually realized, indicating that the firm might have been experiencing the effects of positive scale usage bias.

“Product Unavailability and Estimating Lost Sales: Evidence from the Apparel Industry,”
with Eric Anderson (conceptualization and data analysis stage)

We use apparel firm data to estimate lost sales when products are not immediately available. The core endogeneity arises because although popular products are frequently unavailable (as they run out of stock), they sell in significantly greater quantities in general. Utilizing two key institutional features of the industry—category hierarchy and popularity—we address this endogeneity. We find that approximately 10% of customers walk away when the product is not available and that a required waiting signal moderates the effect.

“Social Influence among Online Customer Reviewers” (conceptualization and data analysis stage)

I investigate whether online reviewers influence each other in their reviewing behaviors. More specifically, I examine the effects of reviewer expertise, considering how the presence of expert reviewers affects the behavior of nonexpert reviewers. I predict that experts’ reviews will negatively influence nonexperts’ motivation to write reviews.

DISSERTATION

“Empirical Research Topics on Online Reviews, Social Interactions, and Customer Value”

Chair: Eric Anderson

Committee: Brett Gordon, Blakeley McShane, and Michael Mazzeo
(Proposal defended August 25, 2015)

HONORS AND AWARDS

INFORMS Doctoral Consortium Fellow, University of Southern California, 2017
Haring Symposium Fellow, Indiana University, 2017
Graduate Fellowship and Full Tuition Scholarship, Northwestern University, 2012 - present
Dean’s List, Northwestern University, 2011
Zell Scholarship, Northwestern University, 2010 - 2011
Best Honors Scholarships, Visiting Students Program, Griffith University, 2004 - 2005
High Honors, Korea University, 2003 - 2005

PRESENTATIONS (* presenter)

Bhan, Hyung Sup (Zack)*, Eric Anderson, “Decomposing the Long-Term Impacts of Backorder Delays: A Quasi-Experimental Approach,” Marketing Science Conference, June 2017

Bhan, Hyung Sup (Zack)*, “Small Networks: Intra-household Interactions in a Multichannel Environment,” Kellogg Marketing Department Speaker Series, May 2017

Bhan, Hyung Sup (Zack)* (Discussant), Discussed Paper: Xu Zhang, “Meet Me Halfway: The Value of Bargaining,” Haring Symposium, April 2017

Bhan, Hyung Sup (Zack)*, “Intra-household Spillover Effects among Family Members,”
Northwestern-Duke Causal Inference Workshop, August 2016

TEACHING INTEREST

Retail Analytics, Digital Marketing Analytics, Customer Analytics, Data Analytics, Marketing Research, Introduction to Marketing, Marketing Management, Marketing Strategy

TEACHING EXPERIENCE

Instructor for Review Sessions, Kellogg School of Management, Northwestern University
Retail Analytics, MBA Class, Prof. Eric Anderson, Fall 2016 (Evaluation: 5.5/6.0)
2 hours per week – in class and online session
Digital Marketing Analytics, MBA Class, Prof. Ulf Bockenholt, Fall 2013
1 hour per week – in class session

Teaching Assistant, Kellogg School of Management, Northwestern University
Retail Analytics, MBA Class, Prof. Eric Anderson, Fall 2016
Retail Analytics, MBA Class, Prof. Eric Anderson, Winter 2016
Customer Analytics, MBA Class, Prof. Florian Zettelmeyer, Fall 2015
Customer Analytics, MBA Class, Prof. Song Yao, Spring 2015
Customer Analytics, MBA Class, Prof. Florian Zettelmeyer, Winter 2015
Customer Analytics, MBA Class, Prof. Florian Zettelmeyer, Fall 2014
Research Methods in Marketing, MBA Class, Prof. Qian & Prof. Goldsmith, Spring 2014
Customer Analytics, MBA Class, Prof. Florian Zettelmeyer, Winter 2014
Digital Marketing Analytics, MBA Class, Prof. Ulf Bockenholt, Fall 2013
Accounting for Decision Making, MBA Class, Prof. Swaminathan Sridharan, Fall 2011

TEACHING EDUCATION

Teaching Certificate Program, Searle Center, Northwestern University, 2016 - 2017

DOCTORAL COURSEWORK

Marketing

Quantitative Models in Marketing	Eric Anderson
Marketing Strategy	Gregory Carpenter
Behavioral Decision Making	Alexander Chernev
Advanced Marketing Models	Pradeep Chintagunta
Analytical Models in Marketing	Anne Coughlan
Consumer Culture Theory	Kent Grayson
Information Processing	Angela Lee
Judgment and Emotion	Neal Roese
Psychological Theory in Consumer Behavior	Miguel Brendl

Economics

Microeconomics I
Microeconomics III
Introduction to Econometrics I
Introduction to Econometrics III
Econometrics II
Applied Econometrics I
Applied Econometrics II
Applied Econometrics III
Industrial Organization I
Industrial Organization II
Industrial Organization III

Eddie Dekel
Jeffrey Ely
Charles Manski
Elie Tamer
Elie Tamer
Yi Qian
Song Yao
Bernard Black
William Rogerson
Robert Porter
Igal Hendel

Statistics & Methodology

Bayesian Methods and Computation
Quasi-Experimental Design
Linear Models
Research Philosophies in Science

Blakeley McShane
Thomas Cook
Yanna Krupnikov
Bobby Calder

RESEARCH SKILLS

Econometrics Analysis in R, STATA, SAS, Matlab
Bayesian Statistics in R and WinBUGS

WORKSHOP PARTICIPATION

Northwestern-Duke Causal Inference Workshop, August 2016
Quantitative Marketing and Structural Econometrics Workshop, August 2015
Northwestern-Duke Causal Inference Workshop, August 2013

PROFESSIONAL EXPERIENCE

The Export-Import Bank of Korea (official export credit agency of South Korea), 2006–2010
Researcher, Overseas Economic Research Institute, 2009–2010

- Conducted research on macroeconomic situations of developing countries
- Served as member of government delegation to OECD Country Risk Experts Meeting

Associate, Small and Medium Enterprises Finance Department, 2007–2008

- Performed customer acquisition, corporate valuations, and financings

Associate, International Finance Department, 2006–2007

- Implemented bond issuances, swap transactions, and asset management

Macquarie Securities, Seoul Branch, 2005
Intern, Corporate Finance Team

SERVICE

Service to Profession

Session Chair, “CRM: Customer Loyalty II,” *INFORMS Marketing Science Conference*, Los Angeles, CA, June 2017

Service to School (Kellogg School of Management, Northwestern University)

Class Liaison for Models of Consumer Behavior, Fall 2011

Class Liaison for Marketing Management, Winter 2011

Class Liaison for Power in Organization, Winter 2011

Class Liaison for Research Methods in Marketing, Spring 2011

Class Liaison for Information and Technology Based Marketing, Spring 2011

Service to Community

Sergeant, Republic of Korea Army, August 2000 - October 2002

REFERENCES

Eric T. Anderson (Advisor)

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