Zhenling Jiang

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Education

Ph.D. in Quantitative Marketing, Washington University in St Louis, 2019 (expected)

Advisor: Tat Chan

M.A. in International Economics and Finance, Brandeis University, 2008

B.A. in Economics, Nankai University, 2006

Research Interests

Substantive: Consumer Finance, Search Model, Loyalty Program
Methodological: Empirical IO, Structural Modeling, Big Data Analytics

Working Papers

- An Empirical Bargaining Model with Digit Bias – A Study on Auto Loan Monthly Payments.
  Z. Jiang. *Job Market Paper.*
- Consumer Search and Purchase: An Empirical Investigation of the Search-Based Retargeting Policy.
  Z. Jiang, T. Chan, H. Che and Y. Wang. Revising for 2nd round review at *Marketing Science.*
- Can Non-Tiered Frequency Reward Programs be Profitable?
  A. Gopalakrishnan, Z. Jiang, Y. Nevskaya and R. Thomadsen. Revising to be resubmitted at *Marketing Science.*
- Effects of Bonus on the Demand for Auto Loans and the Long-Term Consequences.
  Z. Jiang, D. Zhang and T. Chan.

Work in Progress

- Auto Loan Interest Rate and Dealer Compensation Policy: Implication from Natural Experiments.
  Z. Jiang, T. Chan and N. Hamdi
- Consumer Online Search and Purchase with Endogenous Channel Choice.
  S. Zhang, Z. Jiang and H. Che

Conference Presentations and Invited Talks

Marketing Dynamics Conference, Dallas, TX, July 2018 (scheduled)

Boulder Summer Conference on Consumer Financial Decision Making (poster presentation), Boulder, CO, May 2018

Behavioral Industrial Organization and Marketing Symposium, Ann Arbor, MI, May 2018

Richard A. Chaifetz School of Business, Saint Louis University, March 2018

Marketing Dynamics Conference, Hong Kong, August 2017

Marketing Science Conference, Los Angeles, CA, June 2017

Marketing Science Conference, Shanghai, China, June 2016

Teaching Experience

Instructor

Introduction to R Programming (Equifax Workforce Solution Analytics Team, St Louis, MO), 2018 Spring

Introduction to R Programming (MS in Customer Analytics, MS in Quantitative Finance, Evaluation Median: 9/10), 2016 Summer

Teaching Assistant

Analytics Driven Brand Management, 2017 Spring
Data Analysis for Brand Management, 2017 Spring
Empirical Methods in Business I, 2016 Fall
Honors Seminar, 2016-2017 Fall
Customer Analytics Using Probability Models, 2016 Spring
Empirical Methods in Business II, 2016 Spring, 2017 Fall
Marketing Strategy, 2015 Fall
Marketing Research, 2015 Spring
Marketing Management, 2014 Fall
Quantitative Techniques, 2007 Spring, Fall
Fixed Income Securities, 2007 Summer

Industry Experience

Bose Corporation, Framingham, MA, 2008 – 2013

Consumer Research Specialist, Home Entertainment Product Marketing

Conducted analytics-driven research projects including new product design, customer segmentation, advertising research, and customer satisfaction.

Academic Awards and Honors

AMA-Sheth Foundation Consortium Student Fellow, 2017
Moog Scholar Award, Washington University, 2016
INFORMS Marketing Science Doctoral Consortium Fellow, 2016, 2017
Doctoral Fellowship, Washington University, 2013–2017
Merit-based Scholarship, Brandeis University, 2006–2008
Excellent Student Scholarship, Nankai University, 2002–2006

Computer Skills

R, C++, Matlab, Apache Impala, Stata, SPSS, AMPL

Selected Graduate Coursework

Microeconomics I – Anqi Li, Jonathan Weinstein
Microeconomics II – Marcus Berliant, Brian Rogers
Applied Econometrics – Carl Sanders
Quantitative Methods in Economics I – John Nachbar
Structural Microeconometrics – Juan Pantano
Empirical Methods in Business I & II – Tat Chan
Empirical Methods in Structural Modeling I – Seethu Seetharaman
Empirical Methods in Structural Modeling II – Yulia Nevskaya
Analytical Modeling in Marketing – Baojun Jiang
Seminar in Econometrics – Siddhartha Chib
Doctoral Seminar in Marketing I-IV – Chakravarthi Narasimhan, Seethu Seetharaman
Machine Learning – Marion Neumann
Bayesian Statistics – Nan Lin

References

Tat Chan (Advisor)
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Abstracts of Selected Papers

"An Empirical Bargaining Model with Digit Bias – A Study on Auto Loan Monthly Payments", *Job Market Paper.*

This paper studies price bargaining when both parties are subject to perception biases with numbers. The empirical analysis focuses on the auto finance market in the U.S., using a large data set of 35 million auto loans. I observe that the scheduled monthly payments of auto loans bunch at \$9- and \$0-ending digits, especially over \$100 marks. The number of loans also increases from \$1- to \$8-ending digits. It is especially intriguing that \$9-ending loans carry a higher interest rate and \$0-ending loans have a lower interest rate than loans ended at other digits. Motivated by these observations, I develop and estimate a Nash bargaining model that allows for digit bias from both consumers and finance managers of auto dealers. Results suggest that both parties perceive a discontinuity between payments ending at \$99 and \$00, and a steeper slope for larger ending digits, in their payoff functions. Low income and minority consumers have a lower bargaining power than the others. This model can explain the phenomena of payments bunching and differential interest rates for loans with different ending digits. I use counterfactual to show that, counter-intuitively, having digit bias is beneficial in a bargaining setting. Consumers' payments are reduced by \$203 million in total and the aggregate payments of finance managers increased by \$102 million because of own digit bias. Another counterfactual quantifies the economic impact of imposing non-discretionary markup compensation policies. I find that the payments of African American consumers will be lowered by \$452-473 million and that of Hispanic consumers by \$275-300 million in total.

"Consumer Search and Purchase: An Empirical Investigation of the Search-Based Retargeting Policy" (with Tat Chan, Hai Che and Youwei Wang)

We develop a dynamic search model to study how consumers search and make purchase decisions. Using data from an online retail platform, we observe three robust behavioral patterns: 1) Within a consumer's search set, the first sampled option as well as the last one are more likely to be purchased than the ones in the middle. 2) The conversion rate is convex increasing with the number of options sampled. 3) The click-through rate and conversion rate of sellers are only weakly correlated. It is hard to rationalize these behavioral patterns with traditional search models; therefore, we modify Weitzman's sequential search model and incorporate new behavioral factors that are shown to

increase consumer valuation for the focal product. Our model also allows a consumer's expected value of buying from a seller before search to be systematically different from the realized value after search. Model estimation shows that the proposed model can generate the observed behavioral patterns and outperform other search models. Based on the results, we investigate how an online retail platform can perform searched based retargeting by making use of consumers search history. Two retargeting strategies are examined, targeted advertising that reveals sellers' hidden information, as well as targeted coupon that can be used on the focal product. We show that the online retail platform, sellers as well as consumers all benefit from such searched based retargeting strategies.

"Can Non-Tiered Frequency Reward Programs be Profitable?" (with Arun Gopalakrishnan, Yulia Nevskaya and Raphael Thomadsen)

We examine the effectiveness of a customer loyalty program with a non-tiered reward structure. These programs are often thought to have low rates of return. We use a unique data set consisting of all transactions at a chain of hair salons from both before and after the implementation of the loyalty program, which allows us to control for selection effects about which customers become members. We quantify three components of customer behaviors change with loyalty program: spending, frequency of visit and retention. Overall the loyalty program leads to an approximately 16 – 18% increase in customer lifetime value, even after accounting for the cost of the program, meaning that the program has a significant net benefit to the firm. The increase in customer lifetime value comes largely from reducing the attrition rate, which decreases by 15 – 17%, compared to the 3 – 5% increase in frequency and the very small change in spending. Our findings on frequency and spending are consistent with those in the previous literature, which generally has focused on those two measures, but because we also account for retention, our estimated total value of the non-tiered loyalty program is much larger than that found in the previous literature.

"Effects of Bonus on the Demand for Auto Loans and the Long-Term Consequences" (with Tat Chan and Dennis Zhang)

Using a large panel dataset with more than 23 million individuals in the U.S., we study consumers' durable goods consumption response with bonus payment. We find that customers are more likely to originate an auto loan around the month when they receive a bonus. Contrary to the prediction from the economics theory of permanent income

hypothesis, we identify a significant and economically meaningful increase in auto loan origination even when the bonus recurs every year and is likely to be anticipated. Moreover, bonus-induced loan origination also happens for individuals with high income (i.e., annual income >= $100k) or a tiny bonus (i.e., bonus amount <= $500), which suggests that liquidity constraints cannot fully explain our findings. Our results, however, are consistent with the behavioral explanations from mental accounting and windfall theory from the psychology literature. While receiving bonuses increase customers' auto loan origination, this origination effect has an unintended consequence: auto loans originated right around the bonus month have a higher delinquency rate than loans originated at other times. The increase in delinquency primarily comes from consumers with low income or subprime credit score. Our findings have strong managerial implications for financial institutions to identify consumers who have needs for auto loans and those who are more likely to go delinquent in the future.

Last updated: September 4th, 2018