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Education

2013 – Present	WASHINGTON UNIVERSITY IN ST LOUIS, OLIN BUSINESS SCHOOL, ST LOUIS, MO Ph.D. in Marketing
2006 – 2008	BRANDEIS UNIVERSITY, WALTHAM, MA M.A. in International Economics and Finance
2002 – 2006	NANKAI UNIVERSITY, TIANJIN, CHINA B.A. in Economics

Research Interest

Substantive: Consumer Finance, Behavioral Economics, Search Model, Loyalty Program

Methodological: Quantitative Marketing, Structural Empirical Modeling, Big Data Analytics

Working Papers

"Consumer Behavioral Bias and Its Consequences: Implication from Auto Loan Payment Bunching", *Job Market Paper*

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

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

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

Work in Progress

"Consumer Online Search and Purchase with Endogenous Channel Choice" (with Shuo Zhang and Hai Che)

"Auto Loan Interest Rate and Dealer Compensation Policy: Implication from Natural Experiments" (with Tat Chan and Naser Hamdi)

Teaching Experience

Instructor	Introduction to R Programming (Equifax Workforce Solution Analytics Team, St Louis, MO), 2018 Spring
Instructor	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
Teaching Assistant	Data Analysis for Brand Management, 2017 Spring
Teaching Assistant	Empirical Methods in Business I, 2016 Fall
Teaching Assistant	Honors Seminar, 2016-2017 Fall
Teaching Assistant	Customer Analytics Using Probability Models, 2016 Spring
Teaching Assistant	Empirical Methods in Business II, 2016 Spring, 2017 Fall
Teaching Assistant	Marketing Strategy, 2015 Fall
Teaching Assistant	Marketing Research, 2015 Spring
Teaching Assistant	Marketing Management, 2014 Fall
Teaching Assistant	Quantitative Techniques, 2007 Spring, Fall
Teaching Assistant	Fixed Income Securities, 2007 Summer

Industry Experience

2008 – 2013	BOSE CORPORATION, FRAMINGHAM, MA Consumer Research, Home Entertainment Marketing Customer Segmentation, Discrete Choice Modeling, Advertising Research, Customer Satisfaction, Focus Group

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

Conference Presentations

Marketing Dynamics Conference, Hong Kong, August 2017

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

Marketing Science Conference, Los Angeles, June 2017

- "Bonus Induced Durable Goods Consumption and Its Unintended Consequence: An Empirical Analysis of 23 million individuals", (with Tat Chan and Dennis Zhang)

Marketing Science Conference, Shanghai, June 2016

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

Computer Skills

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

Selected Coursework

Microeconomics I – Anqi Li, Jonathan Weinstein
Microeconomics II – Marcus Berliant, Brian Rogers
Applied Econometrics – Carl Sanders
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
Doctoral Seminar in Marketing I-IV – Chakravarthi Narasimhan, Seethu Seetharaman
Machine Learning – Marion Neumann
Bayesian Statistics – Nan Lin

Abstracts of Selected Papers

"Bunching and Bargaining in Auto Financing Market", *Job Market Paper*

Using 35 million auto loans from all banks and credit unions across the United States, I identify significant bunching of scheduled monthly payments at both $9 and $0 ending. In addition, there is systematic difference in loan characteristics for $9 and $0 ending loans in the opposite direction. In particular, $9 ending loans carry higher interest rate and $0 ending loans have lower interest rate. The unique compensation structure in indirect auto lending allows the payment distortion to happen. Auto dealers get compensated by discretionary interest rate mark up, and thus there is room for negotiation in the final monthly payment. I capture the essence of this process in a Nash bargaining framework. Incorporating perception bias with numbers from both consumers and finance managers in a bargaining framework can explain the distortion in the scheduled monthly payments. Results characterize the level of perception bias,

and how bargaining power correlates with observed consumer characteristics. Counterfactual analysis suggests that perception bias is actually beneficial – de-biased consumers end up paying higher monthly payments, especially for low bargaining power consumers. In addition, this paper sheds light on consumer welfare implication of auto dealer compensation policy. Low bargaining power consumers, such as Hispanic or African American consumers, would be better off under a fixed price compensation policy compared to the current interest rate markup compensation policy.

"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 Raphael Thomadsen and Yulia Nevskaya)

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.