

YANG PAN

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Education

Ph.D. in Business Administration - Marketing August 2014 - Present (Expected May 2019)
University of Iowa

Master of Science in Applied Economics - Finance June 2013
University of Science and Technology of China

Bachelor of Science in Statistics June 2011
University of Science and Technology of China

Dissertation

“Convenience Store Analytics: Analyzing Habitual and Situational Shopping Behavior Using Consumer Basket Data.” (Proposal defended May 9th, 2018. See Appendix for abstract)

Essay 1: “Convenience Store Analytics: Analyzing Habitual and Situational Shopping Behavior Using Consumer Basket Data.”

Essay 2: “Convenience Store Analytics: Predicting Habitual and Situational Shopping Behavior of a New Store in a Convenience Store Chain”

Chair: Gary J. Russell

Committee Members: Thomas Gruca, Ying Yang, Hyeong-Tak Lee, Hyunkeun Cho.

Research Interests

- **Marketing Analytics**
- **Retailing**
- Basket Analysis/Category Management
- Multi-Category Choice Models
- Spatial Analysis
- Marketing Finance Interface

Teaching Interests

- **Marketing Analytics**
- **Marketing Research**
- Retailing
- International Marketing
- Marketing Strategy
- Marketing Metrics

Publication and Working Papers

Yang Pan and Gary Russell, “Convenience Store Analytics: Analyzing Habitual and Situational Shopping Behavior Using Consumer Basket Data.”

*Submitted to Marketing Science Institute working paper series. To be submitted to **Journal of Marketing Research**. See Appendix for Abstract.*

Yang Pan, Thomas Gruca and Lopo Rego, “Pricing Power: Measures, Trends and Influences on Firm Value”.

*Submitted to Marketing Science Institute working paper series. To be submitted to **Journal of Marketing**. See Appendix for Abstract.*

Yang Pan and Xijun Cheng, “The optimal portfolio with modified matrix using clustering method”.
Journal of University of Science and Technology of China, 0253-2778(2013)12.

Work in Progress

Yang Pan and Gary Russell, “Predicting Habitual Shopping Segments of a New Store in a Convenience Store Chain” (Thesis Paper Two)

Defended proposed methodology, data collection in progress.

Yang Pan and Thomas Gruca, “The Impact of Offline WOM on Company’s Stock Performances”

Preliminary Results.

Presentations

“Modeling the Effect of Customer Satisfaction and Brand Equity on Company Level Price Elasticity”.
ISMS Marketing Science Conference 2015, Baltimore, Maryland, June 2015

“The Impact of Brand Equity on Companies’ Pricing Power”, ISMS Marketing Science Conference 2016,
Shanghai, China, June 2016

“Uncovering Goal Structure from Consumer Purchase Histories”, ISMS Marketing Science Conference
2017, Los Angeles, California, June 2017

“Identifying Habitual Shopping from Consumer Purchase Histories”, Haring Symposium, Bloomington,
Indiana, April 2018

“Convenience Store Analytics: Analyzing Habitual and Situational Shopping Behavior Using Consumer
Basket Data”, ISMS Marketing Science Conference 2017, Philadelphia, Pennsylvania, June 2018

Awards

- Fellow, AMA/Sheth Doctoral Consortium, 2018
- Fellow, Marketing Strategy Consortium, 2018
- Fellow, Mittelstaedt Symposium, 2018.
- Fellow, Haring Symposium, 2018.
- Graduate College Post Comprehensive Research Awards, University of Iowa, 2017.
- Ponder Summer Fellowship, University of Iowa, 2015 – present.
- Graduate Research Scholarship: University of Science and Technology of China, 2011 – 2013.
- Tang Zhongying Scholarship: University of Science and Technology of China, 2005 – 2007.

Teaching Experience

University of Iowa, Sole Instructor

- Marketing Research, Online Course (Summer 2017)
 - Teaching Evaluations: 5.0/6.0 (Median over Tippie College of Business Core Questions)
- Marketing Analytics, (Spring 2017)
 - Teaching Evaluations: 5.6/6.0 (Median over Tippie Core Questions)

University of Iowa, Guest Lecturer

- Marketing Analytics, (MBA level, Spring 2017)
- Introduction to Marketing Strategy, (Topic: Global Marketing, Spring 2016)

University of Iowa, Co-Lecturer

- Introduction to Marketing Strategy (Weekly Discussion Section: Fall 2015 – Spring 2017)

University of Iowa, Teaching Assistant

- Marketing Metrics, SP17: Participate in course/assignment development.
- Professional Preparation in Marketing, F14/SP15
- Consumer Behavior, FA14
- Retail Strategies, FA14
- Sales Management, SP15-FA16
- Social Media Marketing, SP15
- Marketing Management, SP15
- Professional Selling, SP17

Doctoral Coursework

Marketing

Seminar in Consumer Behavior I	William Hedcock
Seminar in Consumer Behavior II	Dhananjay Nayakankuppam
Seminar in Marketing Models I	Gary Russell
Seminar in Marketing Models II	Gary Russell

Statistics

Bayesian Statistics	Kate Cowles
Bayesian Analysis	Joyee Ghosh
Computing in Statistics	Kate Cowles
Computer Intensive Statistics	Luke Tierney
Introductory Longitudinal Data Analysis	Jacob Oleson
Survival Data Analysis	Patrick Breheny
Measurement Theory and Methods	Ernest H. O'Boyle

Economics

Dynamic Programming	Rabah Amir
Econometrics I	Gabriel Picone
Economic Policy Analysis	Joseph DeSalvo
Game Theory	Rabah Amir
Industrial Organization	Rabah Amir
Macroeconomics I	Michael Loewy
Mathematical Economics I	Andrei Barbos
Mathematical Economics II	Murat Munkin
Microeconomics I	Bradley Kamp

Finance

Investments	Daniel Bradley
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Academic Workshops

Workshop on Quantitative Marketing and Structural Econometrics, Northwestern University, 2015
 Workshop on Quantitative Marketing and Structural Econometrics, Washington University in St. Louis, 2017

Appendix

Dissertation

Essay 1: “Convenience Store Analytics: Analyzing Habitual and Situational Shopping Behavior Using Consumer Basket Data.”

Abstract: Loyalty programs for convenience stores generate consumer shopping histories that are both large in size and sparse in content. Analyzing such data with a traditional basket model is both computationally difficult and rarely scalable to a large number of categories. In this research, we bridge the gap between big data analytics and traditional basket model analysis by developing a retail market basket modeling system that captures key elements of consumer shopping behavior in a computationally attractive manner.

The proposed market basket model has two key features. First, the model specification is designed to measure three key elements of consumer market basket purchase decisions: long-run behavior (habitual shopping behavior based upon intrinsic category preferences), short-run behavior (situational shopping from marketing mix effects), and short-run cross category demand relationships (complementarity and substitution relationship within each market basket). Second, model calibration is undertaken using a two-step procedure that minimizes computational complexity and allows the analyst to use "off-the shelf" statistical software (simple Poisson regression and latent class Poisson regression).

An application of the model to convenience store basket data yields excellent results. The key outputs of the model (segmentation structure, cross-category dependence, own and cross-category price elasticities) accord well with managerial intuition. Moreover, forecasts to a holdout sample of consumers provide strong supports for the predictive ability of the proposed approach.

This research not only develops a new methodology, but also provides insights into retail marketing strategy. First, our method creates profiles of consumers based on their long-run shopping behavior. These profiles provide information on consumer segmentation that can be used for product assortment decisions. Second, the profiles help the managers to identify the most profitable consumers, which can be used for customer relationship management. Third, our method helps managers understand consumer preference at the category level, thereby providing input to category management strategies. Finally, (and probably most importantly), our method can be used for counterfactual analysis. This provides managers with a tool for developing customized promotion policies designed to target consumers with different habitual and situational shopping behaviors.

Keywords: Sales Data Analytics, Retailing, Basket Analysis, Multivariate Logistic Model, Finite Mixture Poisson Model.

Dissertation

Essay 2: “Convenience Store Analytics: Predicting Habitual and Situational Shopping Behavior of a New Store in a Convenience Store Chain”

(Defended proposed methodology, data collection in progress)

Tens of thousands of new stores were opened among big chains (with 50+ stores) in 2017 (Buzek and Holman, 2017). When opening a new store, given a potential combination of location, size and products provided, managers want to know who the consumers would be and what their demands would look like. Therefore, the problem that arises here, in a marketing context, is to predict consumer choices from a spatial location.

Even though spatial models are well developed in marketing context, most of them are applied to forecast sales in existing stores. The few existing methods on predicting sales on new store/market are solely based on consumer demographics and other external environment of the new store's location (Bai et al. 2012), or only predict demand at brand level (Bronneberg and Sismeiro 2002). However, for a new store opened by any big chain, it is useful to predict potential category preferences, given only spatial coordinates.

In this research, we identify the spatial pattern in a Midwest convenience store chain with a Two-Step procedure. First, we use the long-run basket data to identify habitual shopping patterns in the whole chain and infer the relative sizes of consumer segments in different stores. Second, we use a spatial lag Dirichlet model to identify the spatial patterns of the segment sizes across all stores. With this information, we predict the basket sales model in the new store. The model contains three key elements of consumer market basket purchase decisions: long-run behavior (habitual shopping behavior based upon intrinsic category preferences), short-run behavior (situational shopping from marketing mix effects), and short-run cross category demand relationships (complementarity and substitution relationship within each market basket). Comparisons to alternative spatial location models are used to illustrate the advantages of the new methodology.

Keywords: Sales Data Analytics, Retailing, Spatial Analysis, Basket Analysis, Multivariate Logistic Model, Finite Mixture Poisson Model.

Appendix

Working Paper

“Pricing Power: Measures, Trends and Influences on Firm Value”.

Abstract: Do you have a very good business or a terrible business? According to famed investor Warren Buffet, it all comes down to your company’s pricing power. Unfortunately, little is actually known about pricing power. Authors disagree on how to define pricing power and no objective measures have been studied to date.

In this study, we examine pricing power, a business trait highly desired by investors, CEOs and marketing managers. We identify two crucial aspects of firms with pricing power: the ability of a firm to charge prices above marginal cost and the ability to raise price without losing business. The first aspect of pricing power is measured using the industry-adjusted Lerner Index while the second is measured using a new firm-level measure of price elasticity. These two measures of pricing power are evaluated in two large-scale longitudinal empirical studies.

The first study estimates the two measures of pricing power for a sample of more than 20,000 publicly traded firms for the years 1976-2016. The resulting distribution of firm-level elasticity estimates is consistent with meta-analytic studies of price elasticity conducted using product-market level data. Industry-level variations in price elasticity are consistent with expectations: the average price elasticity for firms in the pharmaceutical/medical manufacturing industry is much lower than the overall average of manufacturers of non-durable products. Over time, the average Lerner Index is generally increasing over time, implying a continuous increase in pricing power for public firms over time. In contrast, the average price elasticity fell (implying a general increase in pricing power) from the mid 1970’s until the middle 1980’s. From that point on, the average price elasticity increased, implying a steady decrease in pricing power.

In the second study, we examine the ability of these two measures of pricing power to shape cash flow growth and variability – key determinants of firm value. In a sample of 3980 public companies from 1987-2016, both measures of pricing power have significant favorable impacts on future cash flows and cash flow variability. These findings suggest that these measures of pricing power are important contributors to shareholder value.

Managerially, our paper provides two alternative value-relevant metrics for managers to incorporate into their strategic dashboards. These metrics can be used to benchmark rivals, evaluate potential merger partners, and track one’s standing over time. Finally, executives will know whether, in Warren Buffet’s opinion, they have a great business or a terrible one.

Keywords: Pricing Power, Price Elasticity, Market Power, Shareholder Value, Cash flow growth, Cash flow variability, Multi-Level Model.