Topics in Supply Chain Planning in Deterministic and Uncertain Environments

Aly Megahed

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Many countries and localities have the explicitly stated goal of increasing the fraction of their electrical power that is generated by wind turbines. This has led to a rapid growth in the manufacturing and installation of wind turbines. The effective planning of the wind turbine supply chain has a significant impact on the profitability of the turbine manufacturers. In this thesis, we study two realistic novel supply chain planning problems that appear in the wind turbines industry and present data driven quantitative tools that provide decision makers with solutions to these problems. The problems are inspired by the wind turbines supply chain planning of General Electric (the world's second biggest wind turbines manufacturers). General Electric sponsored part of this work, and provided us with some real data for our numerical results.

Our first problem is developing a mathematical-based tool that can help in planning wind turbine supply chains that are characterized by two special things not studied before in the literature. These are the very large late delivery penalties paid to customers (depending on how late the delay is) and the quantity discounts offered by suppliers that are based on the total annual purchased quantities from these suppliers. Our tool helps the decision makers answer questions of how much they should order from each component of the wind turbine, when should such orders be placed, from which suppliers, and how much should be kept in stock. This tool gives answers to the aforementioned questions while minimizing the total costs across the whole supply chain (transportation, purchasing, inventory, late delivery penalties, and resource utilization costs. We show numerical results that show the effectiveness and savings achieved when using our tool compared to the manual spreadsheet planning that the company used to do. It also shows that for the presented case study, including backorder penalties can have an impact of 12% reduction on the overall supply chain costs.

With today's global changing market place, it becomes essential to consider uncertainty in supply chain planning. In the second problem, we extend our previous work by including a new supplier uncertainty scheme, which is a combination of random supplier delivered quantities and random supplier delivery times. We develop another tool that includes such uncertainty and show numerical results comparing and studying when each of the two tools should be used. Our results show that for some cases, we might achieve an increase of up to 20% in total supply chain costs if we ignore uncertainty. Lastly, we found and explained cases for which it is cheaper to order more than the customer demand and keep the additional quantities in stock; so that we account for the aforementioned supplier uncertainty.

Aly Megahed

Summary of Qualifications
- Conducted supply chain and logistics research projects for over 8 companies in 3 countries
- Worked full time or part time in five universities teaching 25 different courses
- Professional experience in model solving, algorithmic design, and implementations
- Strong communication skills along with exemplary teamwork abilities

Education
Ph.D. in Industrial Engineering, Georgia Institute of Technology, Atlanta, GA   2014
M.S. in Industrial Engineering, Georgia Institute of Technology, Atlanta, GA   2010
M.S. in Industrial Engineering, Alexandria University, Alexandria, Egypt   2007
B.S. in Production Engineering, Alexandria University, Alexandria, Egypt   2004

Employment
Research – Georgia Tech and Alexandria University   2004 - Present
- Did research projects with GE, Rockwell Collins, S.P. Richards, and Golden State Foods
- Developed quantitative models to solve supply chain and logistics related problems
- Proposed tools that produced impacts and savings up to 20% of total costs in some projects
- Gave research talks at 8 conferences and 10 companies

Teaching – Georgia Tech, Emory University, SPSU, Brenau University,
**   American University in Cairo, and Alexandria University**   2004 - Present
- Instructor in record and adjunct faculty at the former 4 schools and a TA at the latter three
- Taught over 25 courses to students of 12 different majors and tens of cultural backgrounds
- Got consistent very high teaching evaluation records in all experiences.

Internships – GE Global Research, Niskayuna, NY,
**   Bremen University, Bremen, Germany**   Summer 2003, Summer 2011
- Developed a solution approach for a rail yard management research project at GE
- Participated in two experimental projects at Bremen University with *Audi*

Select Awards and Honors
Outstanding Graduate Instructor Award Finalist, Georgia Institute of Technology   2014
Thank a Teacher Award, nominated by students, Georgia Institute of Technology   2013
The Tannenbaum Institute Fellowship ($4,000 support per year)   2007, 2008
Excellence Award for highest grades among all Alexandria University graduates   2001 - 2004

Skills
Computer: C/C++, Matlab, Linux, Microsoft Office, Latex, Minitab, R, SPSS, SQL, CPLEX
Languages: English (Fluent) and Arabic (Fluent)

Select Publications
Megahed, A., Goetschalcks, M., 2013. Tactical Supply Chain Planning under Uncertainty: Formulation, Analysis, and Application in the Wind Turbines Industry, *Under Review*
Megahed, A., 2012. *Multi-commodity Multi-period Supply Chain Network Design.* Lambert Academic Publishing, Saarbrücken, Germany

Select Leadership
Egyptian Student Association in North America, President, Georgia Tech Chapter   2008-2013
Rotaract Pharaohs – Member (organizing charity activities and events)   2002-2003

Ms. Bahriye Cesaret

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Areas of Interest

- Behavioral Operations, Revenue Management, Mechanism Design, Optimization.

Education

The University of Texas at Dallas, Richardson, TX   (Expected) July 2015
Doctor of Philosophy in Operations Management

Koç University, Istanbul, Turkey   2010
Master of Science in Industrial Engineering

Istanbul Technical University, Istanbul, Turkey   2008
Bachelor of Science in Industrial Engineering

Published & Working Papers

- Bahriye Cesaret, Elena Katok, "*Behavior in Revenue Management Decision Making,*" Working Paper, 2014.

- Bahriye Cesaret, Milind Dawande, Tharanga Rajapakshe, "*Bi-Criteria Timeshare Exchanges with Member Participation,*" Working Paper, 2014.

- Bahriye Cesaret, Ceyda Oğuz, F. Sibel Salman, "A Tabu Search Algorithm for Order Acceptance and Scheduling," *Computers and Operations Research.* **39**(6), 1197–1205, 2012.

Conference Presentations

2013 Oct   INFORMS Annual Meeting, *Behavioral Tendencies in Revenue Management Decision Making.*

2013 June   Behavioral Operations Conference (Young Scholars Workshop), *Behavioral Tendencies in Revenue Management Decision Making.*

2013 May   POMS Annual Meeting, *Decentralized Bi-criteria Timeshare Exchanges.*

2012 Oct   INFORMS Annual Meeting, *A Decentralized Bi-criteria Timeshare Exchange Algorithm.*

2010 June   EURO Annual Meeting, *A Tabu Search Heuristic for Order Acceptance and Scheduling.*

References

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Three Essays on Operations Management

Bahriye Cesaret, bahriye.cesaret@utdallas.edu, The University of Texas at Dallas

My dissertation consists of three chapters, each studying a topic on Operations Management (OM). It utilizes both theoretical (Chapter 1) and experimental (Chapter 2 and 3) methods to analyze the OM problems.

First chapter focuses on the timeshare industry. Timeshare exchange refers to the trading of vacation timeshare weeks among owners, so that they can interchange their respective vacation homes. We consider two objectives to capture the notions of "efficiency" and "fairness" in an exchange solution. Our main contributions include (i) a structural analysis of the resulting bi-criteria timeshare exchange problem and (ii) a polynomial-time, decentralized algorithm for "good" bi-criteria solutions.

In second chapter, we study a basic Revenue Management (RM) problem (the single resource independent class problem). We aim to characterize behavioral biases that may or may not affect human decision-makers faced with a RM problem. We compare several ways of framing the problem to human subjects in order to establish which ways are more effective than others. We try to estimate the potential value from using automated RM systems by comparing the performance of human subjects to the performance of the optimal solution.

In third chapter, we focus on coordination issues in a supply chain. Specifically, we study a coordination problem between multiple suppliers each supplying a different component of the end product to a manufacturer. The end-product exhibits the "weakest-link" property, that is, if any of its components fails, the end-product fails. Each supplier needs to decide its investment effort in the production process of the component independently. Suppliers' investment efforts are not observable. Our setting results in multiple equilibria. We design an experimental environment to simulate the supply chain relationships. We try to address the question of how to improve the coordination between suppliers when they fail to coordinate. The last chapter is in progress.

Bernardo F. (Bernie) Quiroga

Ph.D. candidate, Business Administration, Penn State University   March 25, 2014

Contact Information: *Address*: 483-A Business Bldg., University Park, PA 16802
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Education:

- **Penn State University**: Ph.D. candidate (ABD, dissertation in progress), Business Administration: Supply Chain & Information Systems; M.S., Business Administration: Supply Chain & Information Systems (2012); M.A., Economics (2010).
- **Pontifical Catholic U. of Chile**: Magister (M.A.), Economics: Public Policy (2006); Commercial Engineer (professional degree), concentration in Economics (2005); Licentiate (B.S.), Economics and Management Sciences (2004).

Research:

- Topics: Procurement Auctions, Market Design, Nonmarket Competition, Strategic Decision-Making.
- Methods: Industrial Organization, Econometrics, Experimental Economics.

Peer Reviewed Journal Articles:

- "Family Ownership and Firm Performance: Evidence from Public Companies in Chile" (with J.I. Martínez and B.S. Stöhr). *Family Business Review*, 20(2): 83-94, June 2007
  (129 citations in Google Scholar as of March 25th 2014).

Working papers:

- "How to Compete Against a Behavioral Newsvendor" (with A. Ovchinnikov and B. Moritz). Revise and Resubmit at *Production & Operations Management*.
- "A Nonparametric Estimator for Score Auctions in Multi-attribute Procurement" (single author). Currently being finalized for submission to *Operations Research*.
- "Hedonic Estimation with Unobserved Characteristics: An Application to the Housing Market in Santiago, Chile." (single author). Currently being finalized for submission to *Urban Studies*.

Works in progress:

- "Overbidding, Complexity and Transparency in Sealed-Bid Multi-Attribute Procurement Mechanisms" (with B. Moritz and V.D.R. Guide).
- "Hedonic Valuation for Remanufactured and Refurbished Products in B2B Contexts" (with N.E. Coulson and V.D.R. Guide).
- "The Cost of Ignoring Competition in Inventory Procurement Decisions" (with A. Ovchinnikov and B. Moritz)
- "Investment Incentives in Multi-Attribute Procurement Auctions Bidding." (with S. Lee and B. Moritz)

Book chapter:

- "Maximum Likelihood Estimation" (single author, in Spanish). Chapter 10, pg. 199-206, in G. Edwards *Matemáticas y Estadística en Economía*, 2nd Edition, February 2006. Economics Institute, Pontificia Universidad Católica de Chile: Santiago, Chile.

Practice-oriented publications:

- "An Aging Society? Economic Impact of Demographic Change in Chile 1950-2050" (with J.M. Simian, in Spanish) *ESE Revista de Egresados*, 3: 30-36, December 2007.

- "Corporate Ethical Policies: Evidence from Large Firms in Chile." (with A.E. Pezoa) Document DT-07-14, ESE Graduate Business School, January 2007.

Teaching Experience:

- Pennsylvania State University, University Park, PA (2009-2014)
  - T.A. for Supply Chain Analytics (undergrad), Strategic Procurement (MBA), Microeconomics (undergrad), Econometrics (undergrad), Economic Growth and Development (undergrad).
  - Lab Manager, Laboratory for Economics, Management and Auctions
- University of the Andes, Santiago, Chile (2006-2008)
  - Research Professor, Industrial Engineering. Course taught: Advanced Topics in Econometrics (undergrad). Also supervised 1 thesis, and served as committee member for 3 others.
  - Researcher, ESE Graduate Business School.
- Pontifical Catholic University (PUC), Santiago, Chile (2005-2006)
  - Adjunct Instructor, Faculty of Economic and Management Sciences. Courses taught: Statistical Inference (undergrad), Summer Math Camp (M.A.), Econometrics and Optimization Methods (M.A.)
- Pontifical Catholic University (PUC), Santiago, Chile (2002-2005)
  - T.A. (only classes with weekly/bi-weekly classroom duties listed): Introductory Economics (undergrad), Probability and Statistics (undergrad), Statistical Inference (undergrad), Econometrics (undergrad), Econometric Theory (M.A./PhD), Applied Econometrics (M.A./PhD), Managerial Dec. Analysis (MBA), Data Analysis (MBA).
  - R.A. for Prof. Aristides Torche (poverty and income inequality), Prof. Raimundo Soto (analysis of impact of environmental regulation on employment, productivity and social welfare) and Prof. Fernando Suarez (Boston U. – ad-honorem aid on paper related to services and firm performance within the software industry)

Professional Service and Memberships:

- Academic journals service as reviewer:
  - Journal of Operations Management.
  - Economic Inquiry.
  - Real Estate Economics.
- Ad-honorem designer and webmaster for conference websites:
  - 7th Behavioral Operations Management Conference (U. of MD, 2012)
  - 1st Annual Symposium on Risk Management (Penn State, 2012)

- Professional Societies (current membership):
  - The Econometric Society.
  - Production and Operations Management Society (POMS).
  - Institute for Operations Research and the Management Sciences (INFORMS).
  - Decision Sciences Institute (DSI).
  - Western Economic Association International (WEAI)

Doctoral dissertation committee (references):

- V. Daniel R. Guide Jr., Mary J. & Frank P. Smeal Chair and Professor of Supply Chain Management and Operations Research, Penn State (dguide@psu.edu)
- Brent B. Moritz, Assistant Professor of Supply Chain Management, Penn State (bmoritz@psu.edu)
- N. Edward Coulson, Jeffrey & Cindy King Fellow and Professor of Economics and Real Estate, Penn State (fyj@psu.edu)
- Terry P. Harrison, Earl P. Strong Professor of Supply Chain Management, Penn State (tharrison@psu.edu)

<u>Thesis Title</u>: Complexity in Procurement Decision Making
(*Non-technical summary*)

Bernardo F. (Bernie) Quiroga, bernie@psu.edu, Penn State University

1   While the analytical solution to a procurement problem might be tractable, the decisions involved in
2   the process are far from trivial. For sellers participating in a procurement auction, there is a clear
3   difficulty in formulating an "optimal" bid, especially when price is not the only factor weighing in the
4   assignment criterion. The implications of bad decisions in these complex environments can have a huge
5   impact on the financial health and/or reputation of those actors involved. In this dissertation, we take
6   a close look at specific cases of decisions under complex procurement environments.

7   Consider a government who, concerned about price as well as other attributes, decides to procure
8   from a set of suppliers using a score reverse auction (i.e., an auction with a pre-committed scoring rule,
9   using sealed bids and second price. If the bidders have independently distributed costs, their optimal
10   bidding decision in scoring terms will be a function of their own costs structure, as well as the
11   distribution of the costs of the other competitors. Using historical data on score bids, game theoretical
12   results, and mild distributional assumptions, we propose a method that allows to estimate (non-
13   parametrically) the bidders' cost structures and its corresponding distribution from observed optimal
14   score bid submissions. With this, a bidder would have all necessary information to submit an optimal
15   bid after observing his/her own cost structure, and the scoring rule.

16   A natural follow-up question arises from the previous result: what would happen if bidding
17   decisions are not made optimally? The experimental literature has already explored the overbidding
18   bias present in sealed bid auctions that only consider prices. What would happen to bidders who now
19   have to consider more dimensions in their bidding decisions? That additional aggressiveness in bidding
20   behavior is what I have called a *complexity* effect in sealed-bid multi-attribute auctions with scoring
21   rules.

22   Furthermore, if we switch environments towards one where the pre-announcement of the bidding
23   rule disappears (what is called a version of a "beauty contest auction", where only the bid-taker knows
24   the scoring rule, and bidders only know the attributes, without knowing how they weigh in the score),
25   we observe an additional effect on bidding behavior, which I have called a *transparency* effect.

26   We quantify these different effects with a series of laboratory experiments, isolating each one at a
27   time. Specifically, using the estimation procedure described above, assuming that players are playing
28   *some* optimal equilibrium strategy (which itself can be a function of behavioral biases), we are able to
29   calculate the implied cost structure, and its corresponding probability distribution, that stems from
30   observed bidding behavior. For policy makers, these results allow to measure the effect in procurement
31   cost of moving from a non-transparent (beauty contest) to a transparent (pre-announced scoring rule)
32   procurement bid evaluation regime, and from a transparent regime with multiple attributes to an
33   equivalent price-only-plus-minimum standards mechanism.

Can Çelikbilek

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EDUCATION

Ph.D., Ohio University, Athens, USA   2011-2015(expected)
Major: *Mechanical & Systems Engineering*
Current GPA: 3.80/4.0

MS, Ohio University, Athens, USA   2009–2011
Major: *Industrial & Systems Engineering*
GPA: 3.86/4.0

B.S., Atilim University, Turkey   2004-2008
Major: *Industrial Engineering*
GPA: 3.49/4.0

PROFESSIONAL EXPERIENCE

Doctoral Student & Research Assistant,   *Aug'11-Current*
Dept. of Industrial & Systems Engineering, Ohio University, USA

- Research on Supply Chain Management, Sequencing & Scheduling, Transportation,
- Grading for sequencing & scheduling, genetic algorithms, inventory & production control, project management
  Tool – IBM ILOG OPL, LINGO, SPSS, MS Office,

Graduate & Research Assistant   *Sep'09-Aug'11*
Dept. of Industrial & Systems Engineering, Ohio University, USA

- Successfully designed and implemented a new cellular manufacturing problem solving algorithm using scheduling philosophy. Work involves optimal allocation of jobs to the machines and cells in production area and deciding the optimal selection of different transportation modes.
  Tool – IBM ILOG OPL, C#
- Grading for inventory & production control, sequencing & scheduling

Industrial Experience, MERITS, Ankara, TURKEY   *Oct'08-Jun'08*
Planning Manager

- Planning, scheduling and budgeting the activities related to health. Investigated, analyzed and forecast on newly developed healthcare products for marketing. Work involves marketing of innovative healthcare products to government hospitals in Turkey.
  Tool – *MS Office*

Industrial Internship, UNTES (HVAC), Ankara, Turkey   *Sep'07-Jun'0*

- Successfully involved in a cost estimation project for the most profitable product for one of the leading companies in Heating Ventilating and Air Conditioning (HVAC) sector in Turkey.
  Tools – MS Office, LINGO

Industrial Internship, Quattro Business Consulting, Kuwait   *Jun'07-Sep'07*

- Project member in BPR project. Tools – *MS Office, Primavera*

A JOINT MANUFACTURING AND DISTRIBUTION SYSTEM DESIGN AND OPTIMIZATION IN A SUPPLY CHAIN ENVIRONMENT

Can Çelikbilek, cc340609@ohio.edu, Ohio University

This dissertation aims to fulfill the gap of concurrent manufacturing system and distribution system network design in a supply chain environment. The dissertation problem is inspired from a real life company, a vinyl window manufacturer that operates in a midwest region of U.S. The design and optimization will cover new construction and replacement/remodeling sector for the vinyl window manufacturer. The main emphasis of this dissertation is to observe the supply chain design changes resulting from the difference of new construction and remodeling window demand volumes. Briefly, supply chain system design is conducted for all sector demand volumes and individual sector demand volumes. The dissertation has mainly four components; facility location/allocation decision, cellular manufacturing system design analysis and scheduling, network design and vehicle routing design. For the strategic level facility location and allocation decision, in order to capture the real life circumstances, stochastic nature of the model is considered. In cellular manufacturing system, probability theory is considered for the proposed design of layered cellular manufacturing design. The result of cellular manufacturing system design is used for designing the network. Stochastic models and heuristics are proposed for the network design component of the dissertation. Additionally, in order to grasp the operational aspects of the supply chain management, stochastic models and genetic algorithms are proposed for the vehicle routing problem.

This dissertation and research will be unique in the sense of considering both downstream and upstream portion of supply chain management in a jointly manner.

Rui (David) Chen

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EDUCATION

University of Minnesota, Minneapolis, MN, United States   2009 - 2015 (Expected)

- Ph.D., **Industrial & Systems Engineering** (Advisor: Prof. Saif Benjaafar)

Peking University, Beijing, China   2004 - 2008

- B.Sc., **Computational Mathematics**

RESARCH INTEREST

Stochastic modeling, applied probability, and game theory, with applications in supply chain management, manufacturing and service operations, and production and inventory systems

EXPERIENCES

Research Assistant   2009 - Present
Department of Industrial & Systems Engineering, University of Minnesota

Research Fellow   2010 - 2011
DHS National Center for Food Protection and Defense (NCFPD), University of Minnesota

Visiting Scholar   2012 - Present
Engineering Systems and Design, Singapore University of Technology and Design, Singapore

Teaching Assistant

IE 4521 Statistics, Quality and Reliability, University of Minnesota   2009

40.001 Probability, Singapore University of Technology and Design   2013

AWARDS and HONORS

First Place, 2013 INFORMS ENRE (Energy, Natural Resources, and the Environment Section) Student Paper Competition

Finalist, 2013 INFORMS Poster Interactive Prize Competition

Finalist, 2013 POMS-HK Best Student Paper Competition

Publication

Chen, D., Cooper, W., Benjaafar, S. (2014). On the Impact of Input Price Variability in Stochastic Inventory Systems. To be submitted.

Chen, D., Wang, R., Benjaafar, S. (2014). Stochastic Inventory Systems with Cumulative Ordering Capacity Constraints. To be submitted.

Essays on Stochastic Inventory Systems

David Chen, chen2213@umn.edu, University of Minnesota

In this thesis, I study two stochastic inventory control problems. In the first problem, we explore the impact of input price variability in the context of an inventory system with stochastic demand and stochastic input prices. For a general class of such systems, we show that the expected cost function is concave in the input price. This implies that higher input price variability always leads to lower expected cost. We show that this is true under a wide range of assumptions for price evolution, including cases with i.i.d. prices and cases where prices are correlated and evolve according to an AR(1) process or a geometric brownian motion. More significantly, we show that the result is true when prices evolve according to a Markovian martingale so that the expected price in the next period is equal to the realized price in the current period. This is perhaps surprising because one may attribute the results to a period-over-period effect whereby more (less) is ordered in one period because prices are expected to be lower (higher) in the next period. Although this temporal effect can be important, the result holds even if this temporal effect is absent and the problem is one of a single period. We also examine the impact of price correlation over time and across inputs. We find that expected cost is increasing in price correlation over time and decreasing in price correlation across components.

In the second problem, we consider a production-inventory system where the input material is scarce and its consumption is subject to an *allowance* (a limit) over a specified *compliance* period. Examples of such settings are many and include those where allowances are given on the harvesting of forest products, the hunting and fishing of wild life, and the mining of rare minerals and metals. Imposing such an allowance constraint introduces capacity dependencies across production periods, which is absent from traditional models where capacity constraints are imposed on individual periods. The objective of the system manager, in the face of stochastic demand, is to minimize the sum of inventory holding and shortage costs over the compliance period. We show that the problem gives rise to a stochastic dynamic program with two-dimensional state space, on-hand inventory and remaining allowance. We introduce a novel *extended state-space* analysis to reduce it into one that is single-dimensional and use it to characterize the structure of the optimal production policy. We examine the impact of the amount of the allowance and evaluate the performance of several simple schemes for allocating this allowance. We also analyze a version of the problem where the allowance amount is a decision variable, determined by the firm at the beginning of the compliance period.

Physician Preferences, Hospital Quality and Teamwork

David Dreyfus, dreyfus@bus.msu.edu, Michigan State University

In my research, I am studying the differences between clinical and administrative quality within hospitals and the strategies that support these efforts, as well as physician preferences and teamwork.

Overall, my dissertation focuses on hospital operating rooms, physician preference items and teamwork. The specifics are still in their infancy.

For the paper I am presenting at POMS 2014, we discover which hospital vendor strategies maximize Medicare payments and information system use within a hospital. It is found that clinical and administrative information system plans, top management support and other variables influence the outcomes. The implications of this research should affect the vendor strategies adopted by hospitals that want to increase the use of their information systems and receive more money from Medicare reimbursements.

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PROFESSIONAL SUMMARY

Supply chain management PhD student at Michigan State University with a research focus on healthcare operations, pharmaceutical supply chains, information sharing and risk. Six Sigma Green Belt and APICS certified. Expertise in forecasting, inventory control, project management, and process improvement. Diverse background and extensive experience with businesses in the United States, China, and Western Europe. Strategic thinker with a blend of integrity, resourcefulness, and strong leadership skills.

EDUCATION

ELI BROAD SCHOOL OF BUSINESS, Michigan State University   East Lansing, MI USA
Ph.D. Business Administration   Expected May 2015
Major: Operations and Sourcing Management
Minor: Management – Organizational Behavior

MOORE SCHOOL OF BUSINESS, University of South Carolina   Columbia, SC USA
International Master of Business Administration (IMBA).   May 2008

LEEDS SCHOOL OF BUSINESS, University of Colorado   Boulder, CO USA
Bachelor of Business Management. Operations (International, Environmental) May 2005

WORKING PAPERS

- "*When are Group Purchasing Organizations (GPOs) good for the healthcare industry?*" – with Steve Melnyk and Claudia Rosales
- "*Efficiency Analysis of Dialysis Facilities: Identification of Best Practices*" – with Srinivas Talluri and Anand Nair
- "*Best Practices Hospitals Should Follow When Pharmaceutical Shortages Occur*" – with Claudia Rosales and David Closs
- "*How Institutional Norms and Affective Forecasting Contribute to Pharmaceutical Shortages*" – with Ram Narasimham
- "*Information System Planning and Meaningful Use of Information Technology in Hospitals*" – with Anand Nair

ACADEMIC EXPERIENCE

MICHIGAN STATE UNIVERSITY   East Lansing, MI USA
INSTRUCTOR
- SCM372 – Manufacturing, Planning & Control   Fall 2012
- SCM303 – Introduction to Supply Chain Management   Summer 2012 & 2013

PROFESSIONAL
ORGANIZATIONS

American Production and Inventory Control Society (APICS): Active Member since 2007
Member of INFORMS, MSOM and POMS since 2011.

REFERRED PROCEEDINGS

Proceedings of the 2013 Decision Sciences Institute Annual Meeting   Baltimore, MD, November 2013
Proceedings of the 2013 Production and Operations Management Annual Meeting Denver, CO, May 2013
Proceedings of the 2012 Decision Sciences Institute Annual Meeting   San Francisco, CA, November 2012

INDUSTRY EXPERIENCE

VOLVO CONSTRUCTION EQUIPMENT – *Market Analyst*   Asheville, NC, 2008 – 2011
INDEPENDENT CONTRACTOR - *Consultant*   2007 – 2008
COLITE INTERNATIONAL, LTD – *Project Manager*   Wuxi, Jiangsu CHINA, 2007
DANYA INTERNATIONAL - *Communications Coordinator*   Silver Spring, MD, 2005 – 2006
DAVES STOVE-TOP POPCORN - *Founder, Owner and Operator*   Boulder, CO USA, 2002 – 2005

Design and Development of Closed-Loop Supply Chain Models in presence of Promotional Offers

Debabrata Das (debabrata.das@iitb.ac.in)
SJM School of Management, Indian Institute of Technology Bombay

In my thesis, I study how various promotional offers such as product exchange, financial incentives and discount offers influence the design, operation and performance of a closed-loop supply chain (CLSC). The research contributions of this study will be discussed in four phases:

The first phase focuses on developing a system dynamics framework for a CLSC by assuming consumer's inherent willingness to return the used products and study the impact of product exchange offer on recovery, bullwhip effect and profitability. Our results suggest that the inclusion of product exchange offer enhances the recovery process, reduces the bullwhip effect at both retailer and distributor level and increases the profitability of CLSC.

In the second phase, we relax the assumption of consumer's inherent willingness to return the used products and propose a financial incentive based recovery framework. This framework establishes a relationship between '*the amount of incentive offered to the consumers towards returning back the used products*' and '*the amount of used products returned back*'. Subsequently, the proposed framework is used to model the return function of used products and the demand function for fresh new products. Finally, the framework is integrated into a system dynamics model for a multi-period CLSC which investigates the system's performance both in terms of profitability and customer satisfaction in presence of incentive offer. The performance analysis of the developed simulation model indicates that the inclusion of incentive offer enhances the demand, recovery and re-manufacturing process yielding more profit and better fill rate for the entire CLSC.

The third phase proposes a novel concept of incorporating consumer behaviour to study the acceptance patterns of a promotional offer that encourages return of used products. Specifically, we develop a market-driven recovery framework which models '*consumer's willingness to return back the used product*' as a function of '*incentive amount offered to the consumer*'. Further, the proposed framework is used to derive an analytical expression which determines the optimum amount of incentive to be offered to the consumers so that the overall profit of the CLSC is maximized.

The fourth phase builds upon the third phase by adding real world supply chain constraints to develop a non-linear optimization model for a multi-period CLSC which maximizes the overall profit of the integrated system by determining the optimal incentive amount as well as optimal manufacturing, re-manufacturing and disposal quantity. The findings suggest that there is immense potential in leveraging the marketing-operations interface of a firm so as to improve the product acquisition, profitability, customer satisfaction and bullwhip effect.

Debabrata Das

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WORK EXPERIENCE

2008-2010: **Risk Analyst** at Citi Group Global Services Ltd (CGSL).

RESEARCH INTERESTS

Closed-Loop Supply Chain, Marketing-Operations Management Interface, Reverse Logistics, Optimization, Simulation, System Dynamics, Decision Making under Risk and Uncertainty.

JOURNALS / BOOK CHAPTER (PUBLISHED / UNDER REVIEW)

1. **Debabrata Das** and Pankaj Dutta (2013). A system dynamics framework for integrated reverse supply chain with three way recovery and product exchange policy. *Computers & Industrial Engineering*, *66*(4), 720-733.

2. **Debabrata Das** and Pankaj Dutta, Design and analysis of closed loop supply chain in presence of promotional offer, *International Journal of Production Research* (First Revision to be submitted soon).

3. **Debabrata Das** and Pankaj Dutta, A Closed-Loop Supply Chain Model with Incentive-dependent Demand and Return: A System Dynamics Approach, *International Journal of Computer Integrated Manufacturing* (Under Review).

4. **Debabrata Das** and Pankaj Dutta (2013). Simulation Study of an Integrated Reverse Logistics in Fuzzy Environment. *Lecture Notes in Electrical Engineering,* 186, 151-165.Springer publication.

WORKING PAPERS

1. **Debabrata Das** and Pankaj Dutta. "Optimization of a Closed-Loop Supply Chain in Presence of Incentive Offers".

2. **Debabrata Das** and Pankaj Dutta. "Design and Optimization of an Integrated Forward-Reverse Supply Chain under Uncertainty".

CONFERENCE PROCEEDINGS

1. **Debabrata Das** and Pankaj Dutta (2012). A System Dynamics Framework for an Integrated Forward-Reverse Supply Chain with Fuzzy Demand and Fuzzy Collection Rate under Possibility Constraints, *International Conference on Operations Research, HongKong*, March 14-16, 2012. (**Best Merit Paper Award**).

2. **Debabrata Das** and Pankaj Dutta (2013). A Comparative Study of Bullwhip Effect in a Multi-Echelon Forward-Reverse Supply Chain, *The Pyrenees International Workshop on Statistics, Probability and Operations Research, Jaca, Spain*, September 13-16, 2011.

AWARDS IN RESEARCH AND GRANTS

1. **Best Merit Paper Award**, ICOR-2012, IMECS, March 14-16, Hong Kong.
2. Received a **Grant of EURO 600** for presenting paper at SPO, 2011, Jaca, Spain.
3. Received a **Grant of URO 800** for attending International "Summer School on Game Theory and Models of Voting", 8-15 Sep 2012, Campione da'Italia, Como, Italy.

Quality Competition in Supply Chain Networks with Applications to Information Asymmetry, Product Differentiation, and Outsourcing

Dong "Michelle" Li, dongl@som.umass.edu, University of Massachusetts Amherst

In my dissertation, I contribute to the modeling and analysis of quality competition in supply chain networks under scenarios of information asymmetry, product differentiation, and under outsourcing. My goal is to provide computable supply chain network models, the associated analysis, and computational procedures, that enable decision-makers to evaluate the full complexity of supply chain networks. The emphasis is on product quality through the capture of decision-makers objective functions, along with the constraints.

Specifically, the dissertation addresses the following fundamental questions: (1). What are the equilibrium product quality levels of competing firms and how to compute their values? (2). How do these quality levels evolve over time until the equilibrium is achieved? (3). How stable are the equilibria? (4). What are the impacts on product quality, costs, and profits, of minimum quality regulations?

The first part of the dissertation formulates the quality and quantity competition among firms, each of which owns multiple manufacturing plants that produce and deliver product(s) under quality information asymmetry between firms and consumers. Specifically, when there is no differentiation by brands or labels, products from different firms are viewed as being homogeneous for consumers. Minimum quality standards are also considered.

In the second part of the dissertation, quality competition among firms is modeled under product differentiation with minimum quality standards. The cost of R&D activities is also considered in this model.

The third part of the dissertation concentrates on quality competition in supply chain networks with outsourcing, due to the increasing popularity of outsourcing and the quality issues associated with it. The make-or-buy and the contractor-selection decisions of the firms and the optimal/equilibrium in-house and outsourced quality levels are given. The impact of quality on the disrepute of the firms is also captured in the model.

In the final part of the dissertation, a supplier-manufacturer supply chain network model with quality competition is developed.

The models in my dissertation are not limited to a fixed number of firms or demand markets nor to functions of a specific form. In addition, in this dissertation, not only equilibrium models but also dynamic models in quality competition are developed.

Dong "Michelle" Li

Publications:

Pharmaceutical Supply Chain Networks with Outsourcing Under Price and Quality Competition (with A. Nagurney and L.S. Nagurney) (2013), *International Transactions in Operational Research* 20(6), 859-888.

A Network Economic Game Theory Model of a Service-Oriented Internet with Choices and Quality Competition (with A. Nagurney, T. Wolf, and S. Saberi) (2013), *Netnomics* 14(1-2), 1-25.

A Dynamic Network Economic Model of a Service-Oriented Internet with Price and Quality Competition (with A. Nagurney, S. Saberi, and T. Wolf) (2014), invited paper for *Network Models in Economics and Finance* conference volume, Athens, Greece, edited by Professors Bautin, Rassias, and Pardalos, Springer, Berlin, Germany, in press.

A Dynamic Network Oligopoly Model with Transportation Costs, Product Differentiation, and Quality Competition (with A. Nagurney) (2013), *Computational Economics*, in press.

Securing the Sustainability of Global Medical Nuclear Supply Chains Through Economic Cost Recovery, Risk Management, and Optimization (with A. Nagurney and L.S. Nagurney) (2012), *International Journal of Sustainable Transportation*, in press.

Teaching Experience:

Instructor, OIM 301: Introduction to Operations Management, Isenberg School of Management, University of Massachusetts Amherst, Fall 2012, Spring 2013, and Fall 2013.

Teaching Assistant, FINOPMGT 341: Transportation and Logistics (Instructor: Professor A. Nagurney), Isenberg School of Management, University of Massachusetts Amherst, Fall 2011.

Professional Activities:

Webmaster (2013-2014), *Treasurer* (2012-2013), *President* (2011-2012), UMass Amherst Student Chapter of INFORMS. The Chapter was honored by INFORMS with Magna Cum Laude Awards at the INFORMS Annual Meetings in Minneapolis, MN, October 6-9, 2013, in Phoenix, AZ, October 14-18, 2012, and in Charlotte, NC, November 13-16, 2011.

Session Chair, the 24th Annual POMS Conference, Denver, CO, May 3-6, 2013.

Volunteer, Northeast Regional INFORMS Conference, Amherst, MA, May 6-7, 2011.

Dongyuan Zhan

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Education

Ph.D. Business Adminstration, USC, expected May, 2015.

    Dissertation: Compensation and Staffing for Strategic Employees. Advisor: Amy R. Ward.

M.S. Operations Research, USC, 2010.

M.S. Control Science & Technology, Tsinghua University, 2008.

B.S. Automation, Tsinghua University, 2006.

Publications

Josh Reed, Amy R. Ward, and Dongyuan Zhan. 2013. On the Generalized Skorokhod Problem in One Dimension. Journal of Applied Probability50(1), 16-28.

Dongyuan Zhan and Amy R. Ward. 2013. Routing to Minimize Waiting and Callbacks in Large Call Centers. To appear in M&SOM.

Working Papers

Dongyuan Zhan and Amy R. Ward. Compensation and Staffing for Strategic Employees: How to Incentivize a Speed-Quality Trade-off in Call Centers.

Dongyuan Zhan and Gideon Weiss. Many Servers Scaling of the N-System Under FCFS-ALIS.

Talks

Routing to Minimize Waiting and Callbacks in Large Call Centers.
    M&SOM Service Operations SIG conference, Fontainebleau, July 28th, 2013.
    Southern California OM Day 2013, Irvine, May 24th, 2013.
    Trans-Atlantic Doctoral Conference 2013, London, May 10th , 2013.
    POMS Conference 2013, Denver, May 5th, 2013
    INFORMS International Beijing 2012, Beijing, Jun. 26th, 2012.
    School of Management, University of Science and Technology of China, Dec. 29th, 2011.
    School of Economics and Management, Tsinghua University, Dec.15th, 2011.

Teaching Experience

Lecturer for Operations Management (BUAD 311), Spring 2014.

Teaching Assistant for Operations Management (BUAD 311), Fall 2013.

Teaching Assistant for Quality Management for Engineers (ISE 527), Fall 2009, Spring 2010.

Professional Activities

Reviewer: *Operations Research, European Journal of Operational Research, Transactions on Mobile Computing, Manufacturing & Service Operations Management.*

Compensation and Staffing for Strategic Employees:
How to Incentivize a Speed-Quality Trade-off in a Large Service System

Dongyuan Zhan, thu.zdy@gmail.com, University of Southern California

In my thesis, I study the compensation and staffing of a large service system with strategic employees. Speed and quality are two key measures to evaluate the operational performance of a service provider. In general, these two measures are not independent. For example, when employees spend more time with customers, the volume of customers that can be served decreases; however, the customers are likely to rate the quality of service higher. Moreover, faster service may seem a tempting objective because it is easy to quantify its benefits in terms of shorter customer wait times and reduced staffing costs. However, the system manager must be careful when emphasizing speed as a performance metric for employee evaluation: Gans et al. (2003) shows a call center dataset in which employees were hanging up on customers. This provides evidence that when employees are rewarded too much for their speed, then service quality suffers. In other words, there is a trade-off between speed and quality. Our objective is to understand *how to staff and design employee compensation schemes to appropriately incentivize the trade-off between speed and quality.*

We study this compensation scheme in the context of a call center. The most basic call center model is the M/M/N+M queue. We assume that each employee chooses his/her service rate in response to the compensation scheme. The probability of service being low quality is a decreasing function of the service speed, and is known to the system manager (either because he has listened in on calls or through customer surveys). The scheduling is first-come-first-served and routing is longest-idle-server-first. We show that under mild conditions this non-cooperative game admits a symmetric Nash equilibrium service rate when the number of employees is large.

We find that the optimal number of servers to staff depends on the cost structure, and we see multiple regimes that arise. When the cost structure is purely linear, the optimum number of servers to staff is such that the system is critically loaded. However, if we change the assumption on how the employees value idle time from a linear function to a concave function, then the optimal number of servers to staff puts the system in a quality-driven regime. Next, we explore all different combinations of assumptions on the convexity and concavity of the abandonment cost, low quality service cost, and employee idle time valuation. Very interestingly, if the abandonment cost is convex in the abandonment rate and the employees value idle time in a concave manner, then the system manager staffs consistent with an efficiency-driven regime, but sometimes forces customers to wait and to abandon, so that the employees can still enjoy some idle time.

Green Production Networks:
Competitive Manufacturers Cooperating in Environmental Sustainability

Fang Tian, tianfang@usc.edu, University of Southern California

My thesis focuses on the cooperation in environmental sustainability among manufacturers who are also competitors in their primary markets. Complying with the Extended Producer Responsibility, manufacturers take the responsibility for products they bring to the market from two aspects: (1) manufacturers control the material release (of hazardous materials) and design products that are environmentally friendly (e.g. easy to disassemble, economic to reuse, etc.); and (2) manufacturers finance recycling of their products (including collection, separation, reverse logistics, disassembly, and recycling). Consequently, I discuss two types of cooperation: (a) manufacturers share green technology at the production stage; and (b) manufacturers share recycling facilities at the end-of-life stage. I use the game-theoretical methodology to analyze stable alliances of manufacturers in a competitive market. In addition, I design a series of experiments to analyze factors that affect manufacturers' cooperative decisions, such as means of communication, inner-relationship, changes in business environments, sequencing of events, etc.

For the cooperation at the production stage, I investigate how manufacturers can be motivated to share green technology. I explore the following: (1) does technology sharing increase individual manufacturers' payoffs? (2) if not, can manufacturers obtain higher payoffs through reallocation of the total payoff (that is, does technology sharing increase the total payoff)? (3) if not, can manufacturers expect higher payoffs in some stable alliances of manufacturers?

For the cooperation at the end-of-life stage, I study the following: (1) should governments take back consumer products, or should they legislate and have manufacturers to recycle? (2) if manufacturers are responsible for recycling, which products should be recycled together and which be separated (i.e. what are the stable recycling alliances)? We first study for products from two independent markets, e.g. laptops and refrigerators, and they are made by a small number of manufacturers. We discuss recycling at the firm level (i.e. regardless of product categories, jointly recycle products made by the same manufacturer) and at the market level (i.e. regardless of manufacturers, jointly recycle products within the same category). Then, we study for arbitrary number of manufacturers each making one product; the products are competing with some level of heterogeneity. We discuss the stability of recycling alliances in a dynamic sense.

At last, we compare theoretical results and empirical observations. We performed a series of lab experiments on 104 subjects, in which we gradually change experiment settings and observe the impact of communication means (face-to-face vs. online), player's relationship (meeting in advance or not knowing at all), impact of the environmental competitiveness (watching a movie with a cooperative/competitive message), relative payoffs (large/small gap between payoffs), sequencing of events/market evolution (cooperative/competitive theoretical outcomes), etc.

Fang Tian
Email: tianfang@usc.edu, Tel: (781) 308-3992

EDUCATION

– **Ph.D.** in Operations Management, Marshall School of Business   08/2009-05/2015 (Expected)
   University of Southern California, Los Angeles, CA (GPA 3.63/4.00)
   - **Thesis**: 'Green Production Networks: Competitive Manufacturers Cooperating in Environmental Sustainability'
– **B.S.** and **M.S.** in Automatic Control, School of Information Science and Technology   08/2001-07/2008
   Tsinghua University, Beijing, China (GPA 86.5/100.0)

RESEARCH INTERESTS

– Sustainable Operations   – Game Theory   – Supply Chain Management
– Economic Behavior   – Operations Research   – Data Analysis

RESEARCH AND TEACHING EXPERIENCE

– **Research Assistant**, University of Southern California, Los Angeles, CA   08/2009-present
   - Applied the Game Theory methodology in supply chain, balanced the competition and cooperation among manufacturers, optimized their cost structure by appropriately sharing technology and resources, and maximized manufacturers' farsighted stable payoff.
   - Designed and implemented an economic behavioral experiment on 104subjects, mimicked the competition and cooperation in supply chain, and diagnosed factors that impact subjects' cooperative behavior.
– **Instructor**, BUAD 311 Operations Management, University of Southern California   Fall 2012
   - 4 course credits, 28 lectures, for Business-major junior/senior students
   - Topics include: Process Analysis and Capacity Management, Waiting Line Management, Optimization and Linear Programming, Revenue Management, and Inventory Management and Supply Chain Coordination.
   - 72 students registered (class size 73), Evaluation 4.22/5.00
   - 2013 University of Southern California Award for Excellence in Teaching
– **Teaching Assistant**, BUAD 311 Operations Management, University of Southern California   Spring2012
   - Assisted 6 instructors for 10 sections of the course with 558 Business-major undergraduates.

SELECTED PUBLICATIONS AND WORKING PAPERS

– **F. Tian**, G. Sosic and L. Debo. Green Recycling Networks. Working Paper, 2013.
– **F. Tian**, G. Sosic and L. Debo. Manufacturers' Competition and Sustainable Cooperation: Cost Structure and Farsighted Stability Analyses. Working Paper, 2014.
– **F. Tian** and G. Sosic. Trade-off between Competition and Cooperation: an Experimental Study of Cooperative Behavior. Work in Progress.
– **F. Tian**, M. Slikker and G. Sosic. Cooperation for Sustainability: Sharing Technology to Improve Product Recyclability. Work in Progress.

CONFERENCE PRESENTATIONS

– **Presentation** (two presentations), 2013 INFORMS Annual Meeting, Minneapolis, MN   10/2013
– **Presentation**, 24th Annual POMS Conference, Denver, CO   05/2013
– **Presentation**, 2012 INFORMS Annual Meeting, Phoenix, CO   10/2012
– **Presentation**, 2012 Southern California OR/OM Conference, Los Angeles, CA   05/2012
– **Presentation**, 23rd Annual POMS Conference, Chicago, IL   04/2012
– **Presentation**, 2011 INFORMS Annual Meeting, Charlotte, NC   11/2011

ACADEMIC SERVICES

– **Reviewer**, Decision Sciences   09/2013
– **Reviewer**, Annual International System Dynamics Society Conference   2008-present
– **Session Chair** (two sessions on schedule), 25th Annual POMS Conference, Atlanta, GA   05/2014

AWARDS AND HONORS

– **Graduate Scholarship**, Marshall School of Business, University of Southern California   2009-present
– **Awards for Excellence in Teaching**, University of Southern California   2013
– **Graduate Scholarship**, School of Business, University of Connecticut   2008-2009

Felipe Aros-Vera, M.S.

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Rensselaer Polytechnic Institute felipe.aros@gmail.com
110 8th Street, JEC 4037, Troy, NY, USA 12180 Phone: (518) 588-7702

EDUCATION

2014 (exp) Ph.D. Transportation Engineering *Rensselaer Polytechnic Institute, USA*
2011 **M.S. Engineering Sciences** *Pontificia Universidad Católica de Chile,Chile*
2007 **B.S. Engineering Sciences** *Pontificia Universidad Católica de Chile,Chile*

ACADEMIC AWARDS

Graduated Summa Cum Laude. M.S. Engineering Sciences, Department of Industrial and Systems Enginering, Pontificia Universidad Católica,Chile

EMPLOYMENT

Jan 2010 – present **Research Assistant.** Department of Civil and Environmental Engineering. Rensselaer Polytechnic Institute, USA
Sep 2009 – Jan 2010 **Transportation Planning.** Buses Metropolitana, Santiago, Chile
Dec 2007 – Mar 2008 **Transportation Planning.** Research Group on Transport Systems, University of Cantabria, Santander, Spain
Jun 2005 – Dec 2007 **Part-Time Subway Train Driver**, Metro de Santiago, Santiago, Chile

RESEARCH PROJECTS

01/12–Present Collaborative CDI-Type II: Cyber Enabled Discovery System for Advanced Multidisciplinary Study of Humanitarian Logistics.
01/11–12/13 Integrative Freight Demand Management in the New York City Metropolitan Area, Rensselaer Polytechnic Institute
01/10–12/12 New York City Park and Ride Study, Rensselaer Polytechnic Institute

PUBLICATIONS

Holguin-Veras, J. and **F. Aros-Vera.** (2014) Self-Supported Freight Demand Management: Pricing and Incentives. *EURO Journal on Transportation and Logistics* (in print)

Holguin-Veras, J. and **F. Aros-Vera**. Geographically Focused Incentives to Foster Off-Hour Deliveries: Theory and Practice. *Transportation Research Record* (TRR) (in print)

Aros-Vera F., V. Marianov and J. Mitchell (2013). P-hub Approach for the Optimal Park-and-Ride Facility Location Problem. *European Journal of Operational Research*, 226 (2): 277-285

Holguin-Veras J., N. Perez, M. Jaller, L. van Wassenhove and **F. Aros-Vera** (2013). On the Appropriate Objective Function of Post-Disaster Humanitarian Logistics. *Journal of Operations Management*, 31(5): 262-280

Holguin-Veras J., W. Yushimito, **F. Aros-Vera**, and J. Reilly (2012). User Rationality and Optimal Park-and-Ride Location Under Potential Demand Maximization. *Transportation Research Part B: Methodological*, 46(8): 949-970

Holguin-Veras J., J. Reilly, **F. Aros-Vera**, W. Yushimito, and J. Isa (2012). Park-and-Ride facilities in New York City: Economic Analyses of Alternative Locations. *Transportation Research Record* (2276): 123-130

Optimal Access Restoration for Disaster Response with Explicit Consideration of Human Suffering

Felipe Aros-Vera, arosvm@rpi.edu, Rensselaer Polytechnic Institute

My dissertation develops a mathematical optimization model to help disaster responders determine access restoration (AR) priorities, i.e. the sequence of links (e.g. roads, bridges and tunnels) that need to be restored to minimize the impact on the affected population and optimize the delivery of aid and search for survivors. In practice, AR is carried out during the response stage shortly after the disaster. At this stage, time is pressing and resources scarce. The two most important activities during the response stage are search and rescue (S&R) and post-disaster humanitarian-logistics (PD-HL). These two activities require the coordination of people and supplies, and even more important, they require access to the impacted area. After a preliminary assessment of the conditions on the ground, personnel and equipment are deployed. Given the limited resources, responders have to prioritize the roads that need to be opened to reach important locations such as: hospitals, population centers (e.g. tent camps), ports, airports, and warehouses. Although normally overlooked and assumed as a given, the process of AR represents a big challenge for disaster responders which work under chaotic conditions.

The model's inputs include the assessment of the road network to determine restoration times and entry points, the locations inside the impacted area that need to be reached to help people and expedite the response, and the population affected by the catastrophe. Furthermore, time considerations play an important role given the urgency of response operations. This is particularly clear in the case of S&R activities where the likelihood of finding survivors decreases as time passes. A similar situation occurs in the case of the people who need medical attention and critical supplies such as water, food, and clothing. As time passes, the severity of the impact on people increases; illnesses and social chaos spread. This time dependency is incorporated into the model with the assistance of welfare economics; the branch of economics that evaluates well-being from the allocation of resources. Welfare economics considerations are taken into account using deprivation cost (DC) functions that capture the impact of the deprivation time on the population. In essence, DC functions represent the economic valuation of human suffering due to the lack of access to a good or service for a period of time. The addition of DC functions to the traditional private or logistic costs of delivery, inventory, and equipment, produces Social Costs models that capture in a more comprehensive manner the complexities and characteristics of disaster response. Finally, the model considers capacity constraints as well as future incoming resources. The latter captures the evolution of the response to the catastrophe.

Feng Mai
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EDUCATION
Ph.D. Business Administration, University of Cincinnati   2010-2015 (expected)
M.S. Statistics Miami University, Oxford, OH   May 2010
B.A. Mathematics, Wabash College, Crawfordsville, IN   May 2008

RESEARCH
Referred Journal Articles
- "Market Dynamics and User-Generated Content about Tablet Computers" (X. Wang, F. Mai, R. Chiang), *Marketing Science* (Article in Advance)
- "Insights from the Baldrige Award Item-Level Blinded Applicant Scoring Data" (J. Evans, F. Mai), *Quality Management Journal* (Accepted)

Working Papers
- "Model-based Capacitated Clustering via Posterior Regularization" (with M. Fry, J.Ohlmann and Y. Qin)
- "The Antecedents and Consequences of Plant Closing Announcement" (with A. Raturi)
- "Designing Vertically Restrictive Pricing Contracts for Bounded Rational Customers: Does the Supply Chain Equity Matter?"" (with F. Qin, M. Fry, A. Raturi)
- "Mining Consumer-Generated Product Reviews to Automate Market Structure Analyses" (R. Chiang, F. Mai, X. Wang), being revised for resubmission to *Journal of Marketing Research* (major revision)

TEACHING
Instructor, University of Cincinnati
- Decision Models, University of Cincinnati, Summer 2013
- Business Statistics, University of Cincinnati, Summer 2012
- Business Statistics, University of Cincinnati, Fall 2011

SERVICES
- Session Chair, 2014 POMS Annual Conference, Business Analytics, 2014 (Scheduled)
- Reviewer, Decision Sciences Journal
- Reviewer, Direct Marketing Educational Foundation Conference
- Invited Technical Reviewer, Packt Publishing
- Secretary, OMEGA RHO Honor Society of INFORMS University of Cincinnati Chapter

ORGANIZATIONS
- Production and Operations Management Society (POMS)
- Decision Sciences Institute (DSI)
- The Institute for Operations Research and the Management Sciences (INFORMS)

Essays on Applications of Machine Learning Methods in Operations and Marketing

Feng Mai, maifg@mail.uc.edu, University of Cincinnati

In the first essay I investigate how recent development in weakly-supervised machine learning methods can be used to solve capacitated clustering problems. The traditional clustering methods such k-means belong to the category of unsupervised learning, in which we have no information on assignment of observation to clusters and simply let the data dictate the best cluster to fall into. In many discrete optimization problem, however, there is requirement that total weights of points in a cluster not exceeding one or more resource constraint. For instance, in a capacitated vehicle routing problem (CVRP) problem the vehicles have a limit on how much goods they can carry. Traditionally this knowledge is incorporated in the algorithm in an ad-hoc way. For example, an algorithm could avoid merging two clusters or stop adding points to a cluster if such an operation would violate the capacity constraints. The problem with this approach is that points naturally close to each other may be prevented from being grouped together because of the capacity constraint, while points that are far away will be added to a same cluster. I propose a principled way of introducing the capacity constraints in expectation–maximization (EM) algorithm and show that the method can produce high quality feasible or nearly-feasible solutions. I seek to adapt the framework to several discrete optimization problems, namely capacitated p-median problem (CPMP), split delivery vehicle routing problem (SDVRP), and capacitated location-routing problem (CLRP).

In the second part of my thesis I investigate how user-generated content, in particular free-from online product reviews, can be used to support product design and positioning. The approach moves beyond the common data analyses of structured data provided by consumers through traditional channels or/and surveys. I develop an innovative text analytics method that integrates machine learning, computational linguistics and marketing theory to study the extent of competition among brands and products. To demonstrate the validity of the proposed method, I conduct empirical study by implementing a prototype system to analyze over 20,000 tablet PC reviews. The results show that the proposed method provides high validities for market structure analyses comparing with extant methods and is able to explain the market competition based on a multi-attribute approach. The method also offers additional insights such as product attribute hierarchy and common usage situations.

Georg Schorpp

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Department of Management Science & Engineering

Stanford University

Dissertation Topic: Essays on Supply Chain Contracting

Pricing and Inventory Management of Perishable Goods with Two Periods of Shelf Life

Inventory management for platelets is a challenging task due to an extremely short product life cycle, a high unit production cost, a limited pool of platelet donors, and a high demand uncertainty.

In this paper we study a supply chain for a perishable product with two-period life time. A buyer can purchase both old and young units, i.e. units where the remaining life time is either one or two periods, from the supplier. For the supplier we consider the situation where the supplier needs to decide on the pricing of the old units when receiving a certain number of old in each period.

We show for what parameter constellations a two-level order-up-to policy, i.e. a policy where we have an order-up-to level for old units as well as an order-up-to level for young units, is optimal for the buyer.

We then explore the supplier's problems given the structure of the buyer's ordering policy and provide a pricing heuristic that allows the supplier to set prices.

Supply Chain Management through Cascading

We consider a two-player supply chain where disruptions of random length can occur at the supplier. Both the buyer and the supplier have access to individual emergency sources and can reserve extra capacity from their respective emergency source before learning about the disruption length.

We investigate the inefficiency gap and the conditions under which the supply chain can be aligned such that the total capacity in the decentralized equals the capacity in the centralized supply chain.

For a given contract $C(k,s)$ we find a Pareto region such that $C(k',s') \geq C(k,s)$ and explore its properties.

EDUCATION

Stanford University   since 09/2010

PhD candidate in the Department of Management Science and Engineering (MS&E)

Karlsruhe Institute of Technology (KIT)   08/2010

Diplom (~ B.S. and M.S.) in Business Engineering

University of Massachusetts (UMass) – Amherst   02/2010

M.S. in Industrial Engineering and Operations Research

HONORS

- Gerhard Casper Fellowship
- Stanford Engineering Fellowship
- Exchange Program between KIT and UMass Amherst
- Baden-Württemberg Scholarship

WORK IN PROGRESS

1. Pricing and Inventory Management of Perishable Goods with Two Periods of Shelf Life
2. Supply Chain Management through Cascading

PROFESSIONAL EXPERIENCE

Supply Chain Controlling Intern   04/2010 – 07/2010

Robert Bosch GmbH, Karlsruhe, Germany

Production and Quality Control Intern   08/2006 – 09/2006

Styria Impormol S.A., Lisbon, Portugal

TEACHING ASSISTANCE

- Introduction to Operations Management
- Game Theory with Engineering Applications

COMPUTER SKILLS

MS Windows, MS Office, C++, C#, Java, JS, Jquery, HTML, VBA, Matlab, Mathematica, Latex, SAP

GREGGORY J. SCHELL

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EDUCATION

- Ph.D. in Industrial and Operations Engineering (Expected May 2015), University of Michigan
- M.A. in Statistics (Expected August 2014), University of Michigan
- M.S.E. in Industrial and Operations Engineering (2012), University of Michigan
- B.S.E. in Industrial Engineering (2010), University of Pittsburgh

PUBLICATIONS AND PAPERS

- Schell GJ, Lavieri MS, Helm JE, Liu X, Musch DC, Van Oyen MP, Stein JD. Using filtered forecasting techniques to determine personalized monitoring schedules for patients with open-angle glaucoma. *Ophthalmology* (accepted).
- Schell GJ, Lavieri MS, Stein JD, Musch DC. Filtering data from the collaborative initial glaucoma treatment study for improved identification of glaucoma progression. *BMC Medical Informatics and Decision Making* 13(1):137-145. 2013.
- Schell GJ, Lavieri MS, Li X, Toriello A, Martyn KK, Freed GL. Strategic modeling of the pediatric nurse practitioner workforce: how policy changes can yield self-sufficiency. Submitted to *Pediatrics.*
- Schell GJ, Lavieri MS, Wiitala WL, Sussman JB, Hayward RA. Modeling patient-specific treatment outcomes for improved coronary heart disease management. Submitted to *IIE Transactions.*
- Schell GJ, Lavieri MS, Sussman JB, Hayward RA. Optimal resource allocation across patient panels with constrained budgets. Working paper.

AWARDS

- 2013 Society for Medical Decision Making Lee Lusted Award for Quantitative Methods and Theoretical Developments, First Prize
- 2012 INFORMS Doing Good with Good OR, First Prize

TEACHING EXPERIENCE

- University of Michigan
  - Instructor for IOE 201: Economic Decision Making (Winter 2013)
  - Instructor for IOE 202: Operations Modeling (Winter 2013)
  - Teaching Assistant for IOE 201: Economic Decision Making (Fall 2012)
  - Teaching Assistant for IOE 202: Operations Modeling (Fall 2012)
- University of Pittsburgh
  - Teaching Assistant for IE 1055: Facility Layout (Spring 2010)
  - Teaching Assistant for ENGR 0020: Probability and Statistics for Engineers (Summer and Fall 2009)

Identification and Exploitation of Heterogeneity in Sequential Decision Making: Managing Chronic Disease

Greggory J Schell, schellg@umich.edu, University of Michigan

In my thesis, I study how heterogeneity amongst decision makers affects optimal sequential decision making. My research has been applied to improving patient outcomes in the healthcare field. In particular, my thesis is comprised of three works: (1) improving the identification of open-angle glaucoma progression by using Kalman filtered data; (2) modeling patient-specific treatment outcomes for improved coronary heart disease (CHD) management; and (3) determining the optimal allocation of constrained resources across a panel of patient.

The first work focuses on differentiating signal from process and measurement noise in glaucoma testing in order to improve the identification of glaucoma progression. The technique of Kalman filtering was used on longitudinal clinical trial data to model the dynamics of glaucoma progression. With Kalman filtered observations as data, I used generalized estimating equations to develop a logistic regression function to calculate the likelihood that a given glaucoma patient will experience disease progression at a particular physician visit. The Kalman filter logistic regression increased the sensitivity and specificity of disease progression identification over a regression model constructed using the original, noisy clinical trial data.

The second part of my thesis considers the impact of adherence to hypertension treatments in the derivation of optimal treatment policies. Adherence to treatment plays a key role in the control of blood pressure which is highly associated with a reduced risk of CHD events. Since every patient has his/her own level of adherence, I developed a dynamic programming model that uses conditional value at risk to account for this heterogeneity of adherence in the patient population. Furthermore, the model incorporates the patient's resource availability to personalize the dosage intensity of hypertension treatments at each physician visit over the patient's lifetime in order to minimize the patient's expected number of CHD events. I derived structural properties of the dynamic programming model to better understand how adherence and resource availability influence the optimal treatment policy. The results of the model were compared against the results of following the current U.S. guidelines for treating hypertension. The model obtained significant reductions in the number of CHD events and postponed the patients' first CHD events.

The third research project focuses on the long-term management of a large panel of patients by a central decision maker. The central decision maker is restricted by an annual budget and must allocate these limited resources across the patient panel in order to minimize the total number of CHD events over the planning horizon. I am currently developing a model which optimally allocates constrained prescription coverage across the patient panel without creating excessive inequity amongst the patients.

HEIDI CELEBI

The Robert H. Smith School of Business　　　　　　　　　　　　　*Telephone: (301) 633 4848*
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ACADEMIC AND INDUSTRY POSITIONS

2011-present	University of Maryland at College Park	*GA, Doctoral Student*
2006-2011	Mede Protez & Oped Systems, Izmir, Turkey	*Co-owner*
2004-2006 & 2001-2	CoStar Group, Bethesda, Maryland	*Research Analyst*
2002-2004	UN: FAO & UNICEF – Ankara, Turkey	*Finance, Procurement*
1991-2001	Medex International, Inc.	*Executive Assistant*

EDUCATION

2016	University of Maryland, College Park, MD	*Ph.D. Student*
	Major/Minor: Supply Chain Management/Management Science	

2009	Izmir University of Economics, Izmir, Turkey	*MA in SCM*
	Cambridge University	*CELTA*

2000	University of Maryland, College Park, MD	*BS Physical Sciences*
	Materials Engineering, Physics, and Math	

RESEARCH INTERESTS

Empirical OM: Central planning, transportation, facility location (EPZs)

PUBLISHED RESEARCH PAPERS

DE Cantor, H. Celebi, TM Corsi, CM Grimm (2013) "Do Owner-Operators Pose a Safety Risk on the Nation's Highways?", *Transportation Research Part E: Logistics and Transportation Review*, Vol. 59, p. 34-47. (Presented at Transportation Research Forum, Annapolis, MD, Spring 2013.)

TEACHING

Fall 2013/Spring 2014	(Undergraduate) Tech. Apps. in SCM	*Instructor*

Fall 2011/Spring & Fall 2012-2013		*Teaching Assistant*

(MBA) The Political and Social Environment of the Multinational Firm; The Global Economic Environment; Emerging Economies, Government Policies,& International Trade (U*ndergraduate)* Introduction to Transportation; Supply Chain Fellows

ACADEMIC AND COMMITTEE SERVICE

2014-present	*Journal of Business Logistics*	*Reviewer*

2013-present	Graduate Student Government	*Business school representative*

Committee memberships: Budget & Finance; Course Evaluations; GRID (Graduate Research Interaction Day) Conference Logistics subcommittee

INVENTORY MANAGEMENT IN A CUSTOMER SWITCHING ENVIRONMENT

Heidi Celebi   Email: hcelebi@rhsmith.umd.edu   University of Maryland

In my thesis, I study how a retailer's inventory management decisions affect performance in a customer switching environment. A fully controlled simulation models heterogeneous customers who may be willing to switch to a secondary product if their primary preference is out of stock. In considering substitution in this manner, a retailer's decisions based on a forecasted demand interacts with a dynamic demand depending on customer arrival order and purchase preferences.

In theory, substitution is a form of risk pooling, where one product meets the unexpected demand of another product, essentially avoiding demand uncertainty with a more flexible availability. The proportion of customers willing to substitute is completely outside of the control of the retailer, and is a customer trait revealed only when the primary product is stocked out. Customers who face stockout of their primary demand lose goodwill towards the retailer, even if they are able to buy a substitute. With repeated instances of stockout it is possible that the retailer will permanently lose the customer who has learned to seek its primary demand elsewhere.

In practice, retailers respond to demand uncertainty with inventory management practices such as review policies and setting target service levels for products. Target service levels hedge against uncertainty by determining the amount of safety stock to hold to be able to meet a certain level of demand, while review policies reduce demand uncertainty by checking inventory position to track fulfilled demand. The periodic review policy, for example, checks inventory position at set intervals in consideration of holding, order and stockout costs. Here substitutive effects would be expected to have a greater role in fill rates than a continuous review policy, since reordering takes place less often and incoming (fulfilled) demand information is obtained after some delay. Likewise, a high target service level should result in greater fill rates by its very definition, since it involves holding a greater amount of inventory through safety stock. However, increased availability of a product could lead to more secondary demand fulfillment of that product, possibly at a cost to primary demand.

Substitution is not considered in either one of the retailer's inventory control tools studied in the simulation, and knowing more about its interacting effects would add to inventory management theory and lead to improved retailer performance fill rate.

Hise Gibson

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Tel (831)241-2379, hgibson@hbs.edu

EDUCATION

2012-Present Harvard Business School

   Doctoral Student, Technology and Operations Management

2011 – 2012 Air University

   M.A. in Military Operational Arts and Science

2005 – 2007 Naval Postgraduate School

   M.S. in Operations Research

1993 – 1997 United States Military Academy

   B.S. in Operations Research

EXPERIENCE

July 1997 – Present U.S. Army – *Army Aviator(UH-60 Blackhawk)*

   Has led large organizations in Asia, Europe and the Middle-East, focused on aviation operations, project-management, and organizational change.

July 2007 – 2009 United States Military Academy - Assistant Professor

   Taught mathematics at West Point, and engaged in research and student development.

ACTIVITIES

- INFORMS
- POMS
- MSOM
- AOM
- PhD Project

Personal/Skills

- STATA

References are available upon request

How Do Organizations Develop Resiliency in Project Outcomes

Hise Gibson, hgibson@hbs.edu, Harvard Business School

In my thesis, I study how organizations develop resiliency in project outcomes. I define resiliency as any unforeseen event that could induce a negative impact on productivity. For example, when a natural disaster destroys or causes a primary production center shutdown, or when a financial crisis influences decisions with respect to the management of the labor force required to maintain productivity levels. In order to explore this phenomenon, I use a larger government organization that is project based and operates outside the United States. This organization is required to conduct a large number of construction projects per year and has a fluid labor force. When the higher headquarters enforces a sweeping human resource policy, it causes the managers to quickly adjusts many on-going projects and causes friction on future staffing. The leads to a sub-question of what employee traits impact project outcomes the most? By leveraging the exogenous shock of the policy, I am interested in determining which traits are critical to organizational success in the face of the turbulence induced by turnover and can ensure productivity levels remain high. I am also interested in a subsequent question of how multiple team membership impacts project outcome. Although multiple team membership has been acknowledge in the literature, it has not been explored empirically. I am interested in the magnitude of its effect on performance. My research will contribute to the Behavioral Operations field and contribute to turnover and multiple team membership theory.

HYUN SEOK LEE

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Chapel Hill, NC 27599-3490   hyunseok.lee1@gmail.com

EDUCATION

Aug. 2012 - Present	**Ph.D., Kenan-Flagler Business School, University of North Carolina** • Major: Operations (Advisor: Prof. Saravanan Kesavan)	**Chapel Hill, NC**
Mar. 2010 - Feb. 2012	**M.S., LSOM, Korea University Business School** (G.P.A 4.44/4.5) • Major: Logistics, Service and Operations Management (LSOM)	**Seoul, Korea**
Mar. 2004 - Feb. 2010	**B.B.A., Korea University Business School** (G.P.A: 4.09/4.5, upper G.P.A: 4.33/4.5) • Concentration: Logistics, Service and Operations Management (LSOM)	**Seoul, Korea**

LANGUAGES & COMPUTER SKILLS

Languages	• Korean (Mother tongue) • Fluent in English - Language course, SME Training Center (Jan. 2010 - Feb. 2010)	**Cebu, the Philippines**
Computer Skills	• Mathematical Packages: LINDO, LINGO, EMS (Efficiency Measurement System) • Statistical Packages: Stata, SAS, Matlab, R, SPSS, Gauss, EViews	

WORK EXPERIENCES

Jul. 2009 - Aug. 2009	**International Intern, Pt. Pratama Abadi Industri** • Produced OEM shoes for *Nike* responsible for 18,000 employees • Applied Lean Production to Shoes factory in NOS (Nike Operation System) office • Final project entitled *Process Innovation for Improving the Efficiency of Stitching Line #14*	**Jakarta, Indonesia**
Jan. 2006 - Jan. 2008	**Logistical Specialist, Military Service in the 1st division of Korea Army** • Managed arms and ammunition; inventory management, order, replenishment, and fix	**Paju, Korea**

RESEARCH INTERESTS

Empirical Operations Management
- In-store flow management for retail store
- Determinants of excess inventory announcement
- Relationship between operational performance and financial performance
- Effect of electronic commerce on operational performance

RESEARCH EXPERIENCES

Master's Thesis: *"Analysis of Commonality Strategies in Product Line Design"*

Work in progress
- *"Impact of fitting room congestion on store performance"* with Prof. Saravanan Kesavan & Prof. Vinayak Deshpande
- *"Luck or Ability: Determinants of Excess Inventory Announcement and Market Response"* with Prof. Saravanan Kesavan
- *"Effect of Electronic Linkages and Information Technology on Inventory: An Empirical Analysis of the U.S. Manufacturing Supply Chains"*
- *"Impact of How to Finance Inventory on Operational Performance"*

Research Presentations

Oct. 2011	***"Analysis of Commonality Strategies in Product Line Design"*** • Presented at 2011 KORMS General Meeting and Fall Conference, Konkuk University • Korean Operations Research and Management Science Society (KORMS)	**Seoul, Korea**
Nov. 2009	***"How to Improve the Service of Hyundai Motors"*** • Presented the project to managers at the Headquarter of *Hyundai Motors* • Industry-University Cooperation with *Hyundai Motors*	**Seoul, Korea**
May. 2009	***"Current State and Future of 3PL (Third Party Logistics) in South Korea"*** • Presented at 2009 KOPOMS General Meeting and Spring Conference, Yonsei University • Korean Production and Operations Management Society (KOPOMS)	**Seoul, Korea**

AWARDS

Oct. 2008 - Jan. 2009	**3rd Prize, Technology & Management International Case Competition** (C40 cities summit Seoul '09) • Globally mixed teams from UIUC, HKUST, Korea University, and Seoul National University • Title: *Seoular; Solar Panel Project for Seoul City* (ex: bus stop with solar panel)	**Seoul, Korea**

Essay on Retail Operations

Hyun Seok Lee (Hyunseok_Lee@kenan-flagler.unc.edu)
Kenan-Flagler Business School, University of North Carolina at Chapel Hill

In my thesis, I study how to improve retail operations. In the first paper, I analyze the determinants of excess inventory and the market's reaction on them in the retail sector. Prior literature shows that excess inventory is a result of a bad luck such as demand shock. I examine if the firm's operational ability, as measured by firm level total factor productivity from the Cobb-Douglas production function, can explain the retailer's excess inventory announcement. Since market valuation of the firm is important, I also investigate whether the market reacts differently between two different drivers of excess inventory: bad luck or a lack of ability. I use combined dataset on excess inventory announcement, annual financial statement, and daily stock prices of US public retailers. My results show that high ability retailers have a lower probability of announcing excess inventory than low ability retailers. When it comes to market reaction, counter-intuitively, market penalizes more severely when high ability retailers announce excess inventory than when low ability retailers announce it. Moreover, additional information about the reason of excess inventory moderates the magnitude of stock market penalization. Announcing excess inventory with specific reasons significantly reduces the negative abnormal return for high ability retailers, but not for low ability retailers. Thus, I discover that 1) excess inventory in the retail sector is not only driven by a bad luck, but also determined by firm's operational ability, and 2) market reacts differently by who announces excess inventory.

I closely look at the in-store retail operations in my second paper. I examine the use of store labor in fitting rooms of a departmental store to increase conversion rate and overall sales. There are two main reasons why I believe that the labor intervention in the fitting room is effective. First, I expect fitting rooms to act as filters for browsers. Second, fitting room is a core pathway in the apparel retail store where consumers often conduct information search as well as evaluate alternatives before making their purchase decision. Third, customers who choose to purchase apparel might be open to trying out different accessories that go along with the apparel. Thus, retailers have an opportunity to influence customers through selective intervention at this stage and impact store performance. To examine the impact of labor on store performance, I use a queueing model with state-dependent arrival rate to theoretically motivate an inverted-U shape relationship between fitting room traffic and sales performance and the positive impact of fitting room associate on sales performance. Then, I develop an econometric framework that utilizes both point-of-sales (POS) data and traffic data to and within stores to estimate the impact of fitting room traffic on store performance. Finally, I run a field experiment at a retail store where we increase labor in the fitting room and observed the impact of store performance.

Işıl Alev

H. Milton Steward School of Industrial and Systems Engineering
Georgia Institute of Technology, Atlanta, GA
404-642-8884 | isilalev@gatech.edu

EDUCATION

Ph.D. in Industrial Engineering, Minor in Economics

Georgia Institute of Technology, Atlanta, GA **(expected) May'15**
· POMS, Sustainable Operations Dissertation Proposal Award, Winner.
· INFORMS, Daniel H. Wagner Prize for Excellence in OR Practice, Finalist.
· Johnson Fellowship.

M.S. in Industrial Engineering

Georgia Institute of Technology, Atlanta, GA **Dec'12**

B.S. in Industrial Engineering

Middle East Technical University, Ankara, Turkey **June'09**
· Ranked as the 1st among graduates of Industrial Engineering.
· 1st Prize in the Student Project Competition, 29th National Conference on OR&IE.

EXPERIENCE

Instructor

H. Milton Steward School of Industrial Engineering, Atlanta, GA **Jan'14-Present**
· ISyE 3103 Supply Chain Modeling - Logistics.

Graduate Research Assistant

H. Milton Steward School of Industrial Engineering, Atlanta, GA **Aug'10-Present**
· EPR: The Effect of Secondary Markets & Export Restrictions.
· EPR for Unused Pharmaceuticals.
· Georgia State Medical Preparedness.
· Designing Guest Flow and Operations Logistics for the Dolphin Tales.

Officer, *Turkish Student Organization at Georgia Tech* **Apr'10-Apr'13**
· President (2012-13), Secretary (Apr 2011-12), Treasurer (2010-11).

Graduate Teaching Assistant

H. Milton Steward School of Industrial Engineering, Atlanta, GA **Aug'09-Jan'11**
· ISyE 3044 Simulation Analysis & Design.

Intern, *Robert Bosch GmbH, Bursa, Turkey* **Aug'08**
· Decreasing Stock Level of Protective Caps.
· Kanban Card System in Big Aquarium.

Intern, *Groupe Danone, Kırklareli, Turkey* **July'08**
· Simulation Model for Division of Incubation Room.

Intern, *The Coca-Cola Company, Bursa, Turkey* **Aug'07**
· Bursa Factory 2006-2007 Performance Evaluation.

PUBLICATIONS

· *Extended Producer Responsibility: The Effect of Secondary Markets & Export Restrictions*, with V. Agrawal, A. Atasu. In Preparation.

· *Extended Producer Responsibility for Unused Pharmaceuticals*, with A. Atasu, Ö. Ergun, B. Toktay. In preparation.

· *Rail Yard Operations Planning*, with Bahar Cavdar et al. Journal of Industrial Engineering (Turkish Chamber of Mechanical Engineers), Volume 20, Issue 3, Pages 2-21, 2009.

OPERATIONAL PERSPECTIVES ON EXTENDED PRODUCER RESPONSIBILITY FOR DURABLE AND CONSUMABLE PRODUCTS

Işıl Alev

H. Milton Steward School of Industrial and Systems Engineering

Georgia Institute of Technology, Atlanta, GA

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In my thesis, I study the economic and environmental implications of Extended Producer Responsibility (EPR) legislation from an operational perspective. EPR legislation holds producers responsible for environmentally safe treatment of their end-of-life products by imposing collection and recycling obligations. The need for such legislation is associated with growing amounts of post-consumer waste and arising concerns about the environment and public health. EPR legislation has gained momentum all around the world, from the US to the EU, Japan, and China, and it has been implemented for a variety of product categories including electronics, packaging, paint, batteries, carpets, and pharmaceuticals. Motivated by this trend, I investigate the efficiency of EPR implementations for durable and consumable products by considering the electronics and pharmaceuticals, respectively. In the first essay in my thesis, I analyze how collection and recycling obligations of EPR affect the markets for the electronics. My analysis shows that EPR may give incentives to producers to interfere with the secondary markets. With these incentives, producers buy usable electronics from the secondary markets and prematurely recycle them instead of collecting and recycling end-of-life electronics. This leads to lower reuse and higher production levels, indicating unintended environmental consequences associated with EPR. In the second essay in my thesis, I investigate how international export regulations between developed and developing countries influence the secondary market strategies of electronic producers under EPR legislation. My work demonstrates that partial export restriction solely banning export of end-of-life electronics from developed countries to developing countries may actually lead to worse environmental outcomes than full or no export restrictions since it causes greater consumption and secondary market interference in the developed countries. In the third essay of my thesis, I focus on the most recent EPR debate in the US: EPR for pharmaceuticals, whose appropriateness has not been well-understood yet. My work provides input for this debate by analyzing the benefits of established EPR assumptions in the context of unused pharmaceuticals. My analysis shows that the complexity of interactions in the pharmaceutical chain and the consumable nature of pharmaceuticals can lead to different efficiency requirements for EPR implementations than conventional wisdom obtained from other product categories. Building on diverse fields, the essays in my thesis bring novel operational perspectives on EPR legislation by showing that accepted EPR approaches for durable and consumable products may fail. By this way, my thesis provides key insights regarding how to obtain economically and environmentally efficient EPR implementations contingent on the nature of the products and market dynamics.

JANAINA SIEGLER M. BATISTA

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OBJECTIVE

Position in a Faculty of Business in the United States

EDUCATION

Visiting Scholar (2013-Present)	Kelley School of Business, Indiana University at IUPUI Indianapolis, IN USA. Performing the thesis research. Major in Operations Management with focus in Behavioral Operations. Advisors: Prof. Barb Flynn and Prof. Mohan Tatikonda
Ph.D. (2011-Present)	Ph.D. Candidate at Business School of São Paulo, Getulio Vargas Foundation, FGV, SP, Brazil. Major: Operations Management. Advisor: Prof. Luiz Brito
Master (2007-2009)	Business School University of São Paulo in Ribeirão Preto - FEARP/USP, Brazil. Masters in Organizations Management
MBA (2006)	Human Resources and People Development UNITRI Uberlandia, MG, Brazil.
MBA (2006)	Teaching in Higher Education Level UNITRI Uberlandia, MG, Brazil
MBA (2001)	Finance and Management Account. UFU, Uberlândia, MG, Brazil
Bachelor (1992-1997)	Business Administration at Federal University of Uberlândia MG, Brazil (UFU) 1st placed on admission process among 720 candidates. Graduated with Honors

TEACHING AND RESEARCH EXPERIENCE

2011-Present	Research Assistant at Business School of São Paulo, FGV
2009-2011	Dean of Students and Management of Administration MBA and undergraduate course at UNIUBE, Uberlândia, MG, Brazil
2007- 2013	Assistant Professor of Operations Management in different MBA courses in business schools in Brazil such as FGV, UNIUBE, and ESAMC.
2007 - 2009	Research Assistant at University of São Paulo Business and Management School
1997-2007	Principal at a technical school of personal care and esthetics professional education
2003 – 2006	Lecturer at UNITRI, Uberlândia, MG, Brazil

PROFESSIONAL EXPERIENCE

2005 - 2012	Business Consulting (General Management, Small Business)
1992 - 2008	Entrepreneur (Small Business – US$ 1M/year 35 employees)

SELECTED PUBLICATIONS

Siegler, J.; Biazzin, C.; Fernandes, A. R. Fragmentation of scientific knowledge in Administration: a critical analysis. *RAE-Revista de Administração de Empresas*, v.54 (2), 2014. http://goo.gl/uOPY9n

Tavares, R. Villar, C., Siegler, J. Responsiveness in the supply chain: a possible decision-driver for location of new subsidiaries? *Journal of Operations and Supply Chain Management*. v. 6, p. 26-41, 2013 http://goo.gl/7YeIMm

Yen-Tsang, C.; Siegler, J.; Csillag, J. M. Theory of reasoned action for continuous improvement capabilities: a behavioral approach. *Revista de Administração de Empresas*, v. 52, p. 546-564, 2012. http://goo.gl/aybCwc

Two another journal publications under review. International Conference Publications: 25

FOREING LANGUAGES

Portuguese (native). English (advanced in speaking, reading, writing, and understanding). Spanish: (intermediate in speaking, reading, writing, and advanced in understanding).

UNDERSTANDING HOW BUYER-SUPPLIER RELATIONSHIPS EVOLVE AFTER MID-RANGE[1] CHANGES

Janaina Siegler, janaina.siegler@gmail.com
Ph.D. Candidate at Getulio Vargas Foundation, Brazil

In my thesis we aim to understand what is the buyer's role in more effectively implementing a new purchasing initiative (in response to mid-range changes). In order to achieve our goal, we will try to understand: i) what reactions by the buyer, beyond formal institutional policies, lead to better outcomes, ii) what heuristics and biases by the buyer lead to those reactions, and iii) how are the human biases, heuristics and locus of control related to purchasing reactions.

As practical motivation, we address that although buyer-supplier relationships are between firms, decisions are made by people. We take in consideration that people do not make their decisions based only on objective outcomes, and in many cases, there are psychological influences on how people evaluate and make decisions. There are evidences that the way buyers and suppliers deal with "mid-range changes" impact buyer-supplier relationships, value creation and appropriation, the buyer's competitive advantage, and even the entire industry (ex: fire in the Philips Factory and the response of Nokia vs. Ericsson). The uniqueness of our research relates to the fact that we are trying to understand the role that buyers' biases and heuristics, as well as the locus of control, play on mediating the purchasing company reaction just after mid-range changes.

As theoretical background we use Heuristics, Biases, and Locus of Control theory. Heuristics are considered "rules of thumbs" or cognitive shortcuts that people use to make decision when, time, and processing capacity are limited (Bingham & Eisenhardt, 2011; Newell & Simon, 1972, Gino & Pisano, 2008; Kahneman & Tversky, 1974). They are part of an intuitive and automatic thinking (Kahneman & Frederick, 2002; Kahneman et al., 1982), can be very useful, fast and frugal, but heuristics also can lead to systematic and repeated errors. Systematic and repeated errors are called biases, In this direction, we understand that heuristics lead to biases. Locus of Control theory states that people deal differently with external events, depending on whether their locus of control is internal or external. Those that have an internal locus of control take more precautions and rapidly respond to problems when they appear, because they believe that most of the results rely on themselves. Those that have an external locus of control do not take as many precautions, provide late responses and blame others when a problem occurs (eg: difference in deaths from tornados in Illinois vs. Alabama, Simons & Baumann, 2012). Locus of Control is a well-established theory in Psycology. Even though, still today several papers are published in important journals in correlated fields such as Marketing, Strategy and Economy, no study using Locus of Control Theory was found in the OM field.

We will use combined methodology. Initially, for the exploratory research, a series of case studies will be used to develop a more comprehensive understanding of what happens to the involved companies (buyers and suppliers), during times of mid-range changes. Following, a series of behavioral experiments will be conducted in order to isolate the core human biases and heuristics that influence buyer-supplier relationships in times of mid-range changes, and their influence on value creation and appropriation in a supply chain.

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[1] We define *mid-range* changes as any changes that are seen as important to one firm or the other (the buyer or the supplier). Ex: there is a change in the director or key person in a buyer-supplier relationship, one of the companies is acquired by another company, there are technological changes (e.g.: RFID or EDI), legal changes, or any other changes that the firms may judge significant. They are mid-range because they are not disastrous to either firm nor are they day-to-day tactical changes.

JELLE DE VRIES

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RESEARCH INTERESTS

Behavioral Operations Management, Experimental Research, Warehousing, Occupational Safety

EDUCATION

Rotterdam School of Management, Erasmus University, the Netherlands
Ph.D. **2012 - Current**
Dissertation working title: "Behavioral Aspects of Warehousing".

Rotterdam School of Management, Erasmus University, the Netherlands
Master of Philosophy in Business Research **2010 - 2012**
Thesis: "Managerial Regulatory Focus and Occupational Safety:
Safety Does Not Happen By Accident"

University of California, San Diego (UCSD), La Jolla, California
Exchange Program **2009**

University College Utrecht, Utrecht University, the Netherlands
B.A. Honors in Liberal Arts and Sciences, Cum Laude **2007 - 2010**
Majors: Economics, Psychology. Minor: Statistics.

AWARDS

Dutch Logistics Master Thesis Award 2013 **2013**
Best Master thesis on a logistics-related topic in the Netherlands.

TEACHING EXPERIENCE

Rotterdam School of Management, Erasmus University, the Netherlands
Co-supervisor of approximately 10 MSc Thesis projects **2012-current**
Guiding the students through the entire thesis process.

PUBLICATIONS UNDER REVIEW

With R. De Koster & D. Stam: "Safety Does Not Happen By Accident: **2014**
"How to Manage a Safe Warehouse?"

With R. De Koster & D. Stam: Making the Right Pick: Aligning Order
Picking Methods, Incentive Systems, and Regulatory Focus to Increase **2014**
Picking Performance.

CONFERENCES

CEMS Research Seminar on Supply Chain Management 2013 &
2014, Riezlern.

<p align="center">1   Behavioral Aspects of Warehousing</p>

2   Jelle de Vries, jvries@rsm.nl, Rotterdam School of Management, Erasmus University.

3   In my thesis, I study how behavioral aspects influence various warehouse processes and
4   performance outcomes. Warehousing is a vital link in the supply chain and a dynamic
5   environment that boasts plenty of research opportunities. In the research on warehousing, the
6   role of human behavior has been largely underrepresented. Most research in this field finds its
7   origins in the field of Operations Management (OM), employing rigorous methods approaches
8   such as mathematical modeling and normative models of decision making. This has proven
9   extremely beneficial, but it is also vital that OM allows itself to depart from the assumption that
10   all agents participating in operating systems or processes – ranging from decision making
11   managers to workers – are fully rational or at least act that way (Gino and Pisano 2008).
12   Recently the field of behavioral operations management (BOM), which focuses on the impact of
13   human behavior and cognition on operating systems and processes, has emerged as an
14   established area within the discipline of OM (Croson et al. 2013). This has paved the way for
15   employing behavioral models in the warehousing environment. The first topic that will be dealt
16   with within the scope of this project is order picking. Even though an extensive body of literature
17   on this topic exists, the role of the human factor in order picking has been largely neglected
18   while this area provides ample opportunity for research. We study behavioral factors in the
19   context of order picking using a large-scale experimental setup in a real warehouse environment,
20   especially erected for this study. The results of the experiment do not only have direct practical
21   implications regarding the optimal implementation of picking tools and methods and regarding
22   the selection and motivation of order pickers, but should apply to the broader context of
23   repetitive labor. The second topic that will be dealt with is occupational safety in warehouses.
24   Unfortunately, occupational accidents in warehouses occur quite common and companies invest
25   substantial amounts of money in physical measures and tools to reduce accidents. We investigate
26   the role of the manager and his or her leadership style (specifically, Safety-Specific
27   Transformational Leadership) in fostering occupational safety, and aim to find out if and how
28   companies use leadership to make a substantial difference in the context of safety. A third study
29   is still being planned. With so many largely unexplored directions and topics to choose from
30   within BOM, it is important to carefully consult the existing body of literature to identify
31   research opportunities and to effectively position the studies forthcoming from this project.

PROFILE

JENNIFER BEALT
BRUNEL UNIVERSITY, KINGSTON LANE, UXBRIDGE, UB8 3PH

Jennifer.bealt@brunel.ac.uk

Currently at the beginning of my academic career, I have found my niche in the humanitarian sector and am presently working towards my PhD in humanitarian logistics. Whilst at Brunel I have taught on a number of undergraduate courses and am also working on a joint publication in my field. Some of my previous research has been utilized by the International Non-Governmental Organization Merlin in their disaster risk reduction strategy in Nepal.

EDUCATION

BRUNEL UNIVERSITY, UK
PHD 2012-

Having obtained a full scholarship at Brunel University I am currently undertaking my doctoral research at Brunel Business School with association with OASIS (Operations and Supply Chain Systems Group) research centre. My research focuses on supply chains and logistics in humanitarian emergencies, paying particular attention to early recovery in post-earthquake contexts.

UNIVERSITY OF LIVERPOOL; LIVERPOOL SCHOOL OF TROPICAL MEDICINE, UK
MSC 2011-2012
This Master of Science in Humanitarian Studies was undertaken over a year and included a 3 month research project in Nepal on disaster risk reduction and mental health provisions in the face of Nepal's imminent earthquake. I was awarded a distinction and this research was utilised by my host organization Merlin in their disaster risk reduction strategy for 2012- 2015.

UNIVERSITY OF MANCHESTER, UK
MHIST 2007-2011
The MHist is a Master of History. A four year undergraduate history degree which included a BA and third year dissertation. My classification is an upper second-class with honours; 2:1.

REFERENCES

DR AFSHIN MANSOURI, BRUNEL UNIVERSITY
Senior Lecturer in Operations Management
Afshin.Mansouri@brunel.ac.uk

DR STEVE SMITH, ABRUNEL UNIVERSITY
Senior Lecturer in Organisational Behaviour
Stephen.smith@brunel.ac.uk

Collaborative Aid Networks (CANs) as Drivers of Efficient and Effective Early Recovery Operations Post-Earthquake.

Jennifer Bealt, Jennifer.bealt@brunel.ac.uk, Brunel University UK

The frequency and severity of disasters has risen and due to various social, political and economic factors, disasters have become progressively more complex; often hitting highly vulnerable populations and fragile states. Humanitarian operations are inherently complex, subsequently leading to coordination and collaboration issues amongst a variety of actors. It is becoming increasingly more apparent that there is an integral need to find partnerships in affected communities through existing social and religious networks (Holguin-Veras et al, 2012; Kovacs et al, 2010). In supporting such partnerships in the transitional phase from immediate impact to early recovery, a sense of national ownership can be achieved; a process which is described as the key to 'successful and sustainable recovery and development' (Tabung, 2011).

In recent years, earthquakes have been responsible for some of the most costly disasters globally, in terms of lives lost and economic damages. This research is centred on the seminal work of Holguin-Veras (2012) which focused on the contribution of collaborative aid networks (CANs) on supply chain efficiency in the relief stage of the Haiti Earthquake. CANs are defined as 'a completely local effort that exist (typically, for another purpose) and cannot be replicated'. This research will extend this theory in order to address logistical challenges associated with early recovery and the ways in which these could be mitigated by collaborating with CANs.

The research aims to reveal a novel, culturally relevant and geographically diverse resource which may be able to support the supply chains processes of this complex and neglected phase. In doing so, this enquiry aims to aid in the efficient and effective delivery of early recovery operations with a view to supporting the lives and livelihoods of communities affected by earthquakes.

Personal information

Name	Jennifer FIRMENICH
Year of birth	1983

Education

2014	**Ph.D.** (ETH Zurich (CH)) *Rational risk allocation and risk-bearing capacity testing for PPP building projects*
2007	**M.Sc. "Business Engineering"** (University of Karlsruhe (D))
2002	**University-entrance diploma** (Bad Dürkheim (D))

Work experience

since 08.2009	**Institute of Constr. and Infrastructure Mgmt.** (ETH Zurich) Scientific Assistant • *Lecturer, lecture assistance and supervision of theses* • *Preparation of symposia, support in preparation of publications and presentations, management of the group's student assistants*
08.2008 – 07.2009	**Bilfinger Berger AG** (Mannheim, Germany) Central Group Controlling – Reporting • *Order and performance summary (monthly reporting)* • *Major projects summary, claim summary and overdue receivables (quarterly reporting)* • *Support of foreign units with reporting matters*
thereof 4 months	**Bilfinger Berger Project Investments** (Toronto, Canada) PPP Project Development • *Bid management pre-qualification*

Miscellaneous

Scholarships	07.2006 – 12.2007	**German National Academic Foundation** (Studienstiftung des deutschen Volkes)
	06.2004 – 12.2007	„**Student Development Program**" Haniel foundation
Awards	03.2013	**Best Paper Award** PPP Conference 2013, Preston (UK)
	03.2006	1st team at the „**12ème Tournoi Européen de Gestion des Experts-Comptables**" Corporate planning simulation, Strasbourg (F)

Rational risk allocation and risk-bearing capacity testing
for PPP building projects

Jennifer Firmenich, firmenich@ibi.baug.ethz.ch, ETH Zurich

The aim to develop a rational risk allocation and risk-bearing capacity model for PPP building projects could be achieved. First, the state of research and state of practice were analyzed for Switzerland, Germany and the UK. Second, the according comparison allowed for the identification of the research gap, which is a practical tool that allows for a rational risk allocation. This tool is supposed to improve the state of the art. At the moment the risk allocation is chosen according to intuition, habit or even opportunistic behavior.

The model to provide a practical risk allocation tool is built up three-dimensional under consideration of the PPP tasks, the PPP players and the PPP phases. Furthermore, the model consists of two sub models. The main sub-model treats the decision making itself. Additionally, another sub-model part proposes what information is needed for decision making and how the information can be acquired rationally. The information acquisition sub-model's set up reflects the usual risk management steps: risk identification, risk assessment, risk classification and risk mitigation. The decision-making sub model consists of the following modules: risk allocation, risk load simulation, risk coverage derivation and risk bearing capacity testing.

The decision-making sub model proposes a practical scheme for a rational risk allocation that considers insurability, quantifiability and influence ability of the identified risks. The combination of the criteria leads to nine cases for which risk transfer proposals are made. The risk allocation results in a certain risk load for the private joint venture. This risk load is calculated probabilistically with a modified Monte Carlo Simulation (MCS). The MCS represents an aggregation from single risk perspective to project risk perspective. In particular, the time aspect of risks is considered. After applying confidence levels to the simulation results it can be concluded for each simulated period what risk cost can be expected with a given probability. The results are time and player specific risk load scenarios.

Risk coverage scenarios are derived based on the planned cash flow of the PPP project. For a risk-bearing capacity test, the risk load scenarios and the risk coverage scenarios will be compared. This allows for control whether the risk load that can be expected with a certain probability can be compensated with risk coverage. The risk-bearing capacity test is conducted for the main joint venture members (SPV, contractor and operator) and the project as a whole. Is the risk-bearing capacity violated for a certain confidence level and a certain point of time, two action alternatives are available: (1) the risk transfer to the risk recipient and therefore his risk load will be reduced or (2) the fee for taking the risks (risk premium) and therefore the price paid by the risk sender will be increased.

Jianing (Jenny) Zhi

Culverhouse College of Commerce, The University of Alabama

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Education

PhD, Operations Management   (expected) May 2015
University of Alabama, Tuscaloosa, AL.   GPA: 3.88/4.0
Advisor: Dr. Burcu B. Keskin

Master of Science in Operations Management   Aug 2009 - Dec 2011
University of Alabama, Tuscaloosa, AL.   GPA: 3.84/4.0

Bachelor of Management in Logistics Management   Sep 2005 - June 2009
Dongbei University of Finance and Economics (DUFE), Dalian, China.   GPA: 3.32/4.0

Exchange Program   Aug 2008- May 2009
Managing Processes and People in a Global Enterprise Program
Portland State University, Portland, OR.   GPA: 3.76/4.0

Research Interests

- Supply chain management, network design, inventory management, resource allocation, mixed integer programming.

Publications

- J. Zhi, B. B. Keskin, and S. H. Melouk, *"Two Multi-Period Dynamic Location Planning Models for Emergency Response: Models, Formulations, and Insight,"* to be submitted spring 2014 to *European Journal of Operational Research.*
- J. Zhi and B. B. Keskin, *"Simulated Annealing and GRASP Approaches for A Multi-product Production/Distribution System Design Problem,"* to be submitted spring 2014 to *Computers & Operations Research*
- J. Zhi and B. B. Keskin, *"Integrated warehouse location and inventory decisions in a Multi-location Newsboy Problem: Models and Motivations,"* in preparation.
- J. Zhi and B. B. Keskin, *"Selective Newsvendor Problem with Dependent Lead time and Joint Marketing Decisions,"* in preparation.

Conference Presentations

- 2012 POMS Annual Conference: J. Zhi, B. B. Keskin, and S. H. Melouk, *"A Multi-Period Dynamic Location Planning Model for Emergency Response,"* Chicago, IL.
- 2012 INFORMS Annual Conference: J. Zhi, B. B. Keskin, and S. H. Melouk, *"Network Design for Emergency Response,"* Phoenix, AZ.
- 2013 INFORMS Annual Conference: J. Zhi, B. B. Keskin, and S. H. Melouk, *"Two Multi-Period Dynamic Location Planning Models for Emergency Response: Models, Formulations, and Insights,"* Minneapolis, MN.

Teaching Experience

- Instructor – OM300 Introduction to OM   Summer 2013
- Teaching Assistant – OM 500 Management Science I   Fall 2012, 2013
- Teaching Assistant – OM 506 MBA Operations Research   Spring 2013, 2014

Awards

- Outstanding Operations Management Graduate Teaching Assistant   2012, 2013

Integrated Supply Chain Models and Analysis

Jianing Zhi, jzhi@crimson.ua.edu, The University of Alabama

In my thesis, I study the coordination of integrated supply chain based on the joint inventory decision analysis. The thesis contains two research directions both focus on the extension of newsvendor problem: (i) integrated warehouse location and inventory decisions in a multi-location newsvendor problem, and (ii) selective newsvendor problem with dependent lead time and joint marketing decisions.

The first part of the thesis focuses on the joint inventory location problem. A supplier considers centralizing a single product ordering for a number of retailers whose demand fluctuates randomly. Each one of the retailers operates in a newsvendor environment. In the decentralized system, the retailers are responsible of order replenishment and stock keeping so that they satisfy customer demand in the most cost effective way and maximize their profit. On the other hand, the supplier is responsible of transporting the ordered quantity to the retailers before the beginning of the sales period. In the centralized system, the main aim is to coordinate and consolidate the orders from the retailers through a distribution center, whose location is unknown, to utilize risk-pooling advantages and save from economies-of-scale in the transportation costs. Both centralized and decentralized models are analyzed under different transportation cost structures. We question and identify (i) the effect of centralization using a distribution center, (ii) the impact of the location of the distribution center on the expected pay-offs obtained from both systems and (iii) the conditions that will impact the expected pay-offs of all the parties in the supply chain.

The second part of the thesis focuses on the coordination between operations management and marketing. In this part, we consider a company that procures a product from a distant supplier to serve geographically distributed customers in a single selling season. Different from typical multi-customer newsvendor problem, it is not guaranteed that the company will secure the customer orders. Within its sales force and the limited capacity of supplier, the company may not be able to meet all of the orders. Additionally, the lead time from the external supplier is dependent on the order quantity. Hence, the firm may lose some of its customers or have to pay penalties for long waiting times due to quantity-dependent lead time. For this problem, we combine the market strategy of assigning customers to each salesman and inventory procurement policy together to maximize the total expected profit. We build a mixed integer nonlinear programming by considering linear-quantity-dependent lead time and customer priorities. We experiment with different factors such as demands, lead time, capacity of salesmen, and waiting time of customers to estimate their impact on total expected profit, ordering policies and marketing strategies.

JIHO YOON
Ph.D., Candidate
Department of Supply Chain Management
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Education

- Ph.D., Supply Chain Management (Operations & Sourcing Management), Michigan State University, East Lansing, Fall 2010-present (expected completion- Summer 2015)
Dissertation Topic: Essays on Risk Management in Supply Chains, (Advisor: Dr. Sri Talluri).

- MS, Industrial & Operations Engineering (Operations Research), University of Michigan, Ann Arbor, 2010

- BS, Industrial Engineering, Myongji Universiry, South Korea, 2008

Research Interests

Supply Chain Risk, Strategic Sourcing, Supply Chain Network Design

Publications

- Talluri, S., Kull, T. J., Yildiz, H., & Yoon, J. (2013). Assessing the Efficiency of Risk Mitigation Strategies in Supply Chains. *Journal of Business Logistics*, 34(4), 253-269.

Journal Articles Under Review

- Yildiz, H., Yoon, J., & Talluri, S. Reliable Supply Chain Network Design. Under review in *Decision Sciences* (submitted in February 2014).

Research-In-Progress

- Yoon, J., Talluri, S., & Yildiz, H. Models for Supplier Selection and Risk Mitigation (target journal: *Production and Operations Management Journal*).

- Yoon, J., Talluri, S., & Yildiz, H. Efficacy of Capacity Based Risk Mitigation Strategies in 3PL Operations (target journal: *Journal of Business Logistics*).

- Yoon, J., Talluri, S., & Claudia, R. Optimal Sourcing Strategy and Information Sharing under Multi-tier Disruption Risk (target journal: *Decision Sciences*).

- Narasimhan, R., Yoon, J., & Kim, M. Optimal Sourcing Decisions under Anticipation of Supply Interruption and Consumer's Prior Experience (target journal: *Management Science*).

Teaching Experience

- SCM 371 – Procurement & Supply Management, Michigan State University, scheduled for Summer 2014.

- SCM 372 – Manufacturing Planning & Control, Michigan State University, Summer 2013 and Spring 2013.

- SCM 303 – Introduction to Supply Chain Management, Michigan State University, Summer 2013.

Essays on Risk Management in Supply Chains

Jiho Yoon, yoon@bus.msu.edu, Michigan State University

In both academia and practice supply chain risk management (SCRM) is receiving increased attention recently due to the impact of unexpected disruptions (e.g., 2011 Tsunami in Japan, 2011 flooding in Thailand, etc.) and delays. However, managing risks in supply chains is a difficult task because of the inherent complexity of the global supply chain networks. This dissertation investigates SCRM at strategic, tactical, and operational levels.

In essay 1, the focus is on "building a reliable supply chain". This can be considered as a strategic level SCRM issue, since network design has implications on long-term decision making. More specifically, in this paper, we analyze the reliability and robustness of the supply chain by effectively considering the compounding effects of various risks associated with nodes and arcs in the network. We investigate the tradeoffs between network reliability and cost efficiency in deriving optimal designs over a number of scenarios. We provide managerial implications on designing reliable networks based on customer requirements.

In essay 2, we consider a decision environment that focuses on supplier selection and risk mitigation faced by a focal firm. While the extant literature has focused on a variety of supplier selection approaches, simultaneous integration of cost and risk based measures in evaluating and selecting suppliers is sparse. Our tactical level decision making approach in this context also considers the selection of optimal risk mitigation strategies in conjunction with supplier selection, contract consideration, and order quantity allocations. We investigate the tradeoffs between cost and risk within this context.

Essay 3 studies the optimal sourcing decisions under multi-tier supply disruptions coupled with downstream demand variability. In this operational level decision environment, we focus on identifying optimal sourcing decisions for the manufacturer and a first-tier supplier under a given network structure and policies. We emphasize the importance of understanding upstream and downstream members' behavior under various risks in undertaking optimal decisions. Our analysis also demonstrates the value of information sharing between entities in the network in order to achieve higher levels of supply chain efficiency.

Finally, essay 4 considers a 3PL provider's decisions under conditions of risk. In general, most of the extant literature on supply chain risk focuses on a supplier, manufacturer, and/or retailer's standpoint. However, increased interest in 3PL providers and related risk plays an important role in supply chain decisions. To this end, we consider a tactical/operational level environment in investigating the efficacy of four capacity management strategies available for a 3PL provider as possible options for curtailing risk in responding to shipper's orders. We derive the optimal ranges for the strategies and demonstrate the conditions under which each strategy is preferred.

Juan Pablo Madiedo M.

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Education

- PhD. Management. IE Business School, Spain. 2010 – To date.
- M.Sc. - MBA. Universidad de los Andes, Colombia. 2008.
- BSc. Industrial Engineering, Universidad Industrial de Santander, Colombia. 2004.

Research Interests

- Modular systems management, innovation management, quality and process management.

Academic Positions

- IE Business School, Madrid, Spain.
  - PhD. Candidate, October 2010 – To date.

- Universidad de los Andes, School of Management, Bogotá, Colombia.
  - Graduate Assistant, August 2008 – September 2010.

- Universidad Central, Industrial Engineering Department, Bogotá, Colombia.
  - Lecturer, January 2006 – August 2008.

Publications

Book Chapters

1. Open innovation in family firms: A matter of socioemotional wealth. In "Managing Emerging Technologies for Socio-Economic Impact". Edited by D. Assimakopoulos, I. Oshri, K. Pandza. *Edward Elgar Publishing*, UK (Forthcoming).

2. Green Logistics: Global practices and their implementation in emerging markets. In "Green Finance and Sustainability: Environmentally-Aware Business Models and Technologies". Edited by Z. Luo. *IGI Global*; Hershey, PA, USA. 2011. With M. Thiell, J.P Soto and B. Van Hoof

Working Papers

- Solution's architecture modularity and project performance: A conditional process analysis. With F. Salvador.

- Projects staffing decisions and manager-worker interaction for improving performance: The effects of customer and functional domain experience. With F. Salvador and A. Chandrasekaran.

- Deploying flexible resources to realize a mass customization capability: Moderation effects of customer involvement and information technology. With F. Salvador and M. Rungtusanatham.

Modular Systems Management: Solutions, Work Arrangements and Workforce Experience

Juan Pablo Madiedo M. – jpmadiedo.phd2014@student.ie.edu – IE Business School

Multinational organizations with globally dispersed facilities, commonly, rely on product modularity as a principle for facilitating the distribution of work across their locations. Notwithstanding their widespread adoption, there is still no clear picture of the actual relationship between modular solutions and distributed work arrangements; neither of the way in which they come together to affect firm performance. Furthermore, little is known about how these firms decide on the allocation of responsibilities to specific workers in each of their facilities and how such decision impacts individual and organizational output. My coauthors and I have developed two studies that aim to shed light on both these issues.

In the first study we hypothesize and find evidence that the degree of modularity of a solution's architecture has an effect on the work arrangement the company sets in place to design, manufacture and assemble a product. More importantly, we show that this effect is only significant when the manager in charge of the operation has limited experience working with the components of the solution. Furthermore, we find that the degree of modularity of the solution affects the company's performance and that this association is contingent on the level of experience of the manager and is also partially mediated by the degree to which the work arrangement that the organization sets up to complete the tasks, related to a specific product, is deemed more distributed or integrated.

The second study initiates from the basic observation that the allocation of skilled workforce resources to projects for serving heterogeneous customers is a complex matter of the daily management of multinational companies. Faced with constrained pools of resources, managers are expected to configure work arrangements that facilitate increasing levels of productivity of the workers. We study, then, how the characteristics of the tasks that comprise a project and the accumulated levels of experience of workers and managers, regarding a particular customer and a particular functional domain, affect the staffing decisions and the individual and organizational performance. While still on the early stages of the work, preliminary analysis carried out on the dataset show that highly experienced managers tend to favor the inclusion of inexperienced workers on their project teams and that an inverted U shaped relationship exists between the worker's and the manager's accumulated level experience and individual performance.

Supply Chains: Essays on Risk Management and Productivity
Juan Camilo Serpa, juan.serpa@sauder.ubc.ca, University of British Columbia

My research contributes to two areas of the literature: (i) *Risk management in supply chains* and; (ii) *Supply chain productivity*. Below, I highlight my contributions to both areas.

Supply Chain Risk Management: Supply chain risk management involves the coordination of the efforts of multiple firms. While the literature has made great strides in understanding optimal strategies to coordinate these efforts, the influence of third-party institutions (e.g. governments, insurance providers) has not received much attention. I examine, through stylized theoretical models, how these institutions affect risk management efforts in the supply chain.

I study, for example, how the availability of insurance markets affects risk sharing in the supply chain. I find that firms may strategically purchase insurance to avoid other firms from free riding on their efforts. As a result, insurance coverage balances out the provision of risk mitigation efforts, and improves total welfare in the supply chain.

I also study the role of public policy on risk management, in industries where there is the potential for harm to third parties due to an operational accident (e.g. an oil spill). I determine whether public policies should influence: (i) the safety efforts exerted by the supply chain or; (ii) the level of punishment faced by the firms in the event of an accident. I show that in a supply chain characterized by low levels of competition, or a high potential for harm, it is more efficient to influence the safety efforts (and, in the converse scenarios, the level of punishment).

Supply Chain Productivity: The role that supply chains have in influencing firm-level productivity has not received much attention. However, there are reasons to believe that supply chain partners affect a firm's productivity. This is because these firms often collaborate, communicate and influence each other's processes.

I investigate the extent to which a firm's productivity is influenced by the characteristics of its supply chain partners (e.g. their inventory or debt levels). These effects are known as *productivity spillovers*. Empirically estimating these effects is a difficult task, mainly because supply chains are comprised by firms that share geographic and technologic environments. Therefore, if the productivity of two firms is correlated, it is difficult to determine if this occurs because of spillover effects, or because the firms are subject to the same external environment.

To solve this problem I develop a statistical methodology to capture the spillover effects, and isolate them from the "environmental" effects. I find that the productivity of a firm is positively affected when its supply chain peers are large firms with high inventory turnover, low levels of debt and also when they are geographically diverse.

My research aids firms in developing better supply chain practices, both to improve their risk management efforts and also their total factor productivity.

Juan Camilo Serpa

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391 Vancouver, BC, V6T1Z4
Canada
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Education	University of British Columbia, Vancouver, Canada	
	2010-	Ph.D in Management Science, Sauder School of Business (supervisor: Harish Krishnan)
	2009-2010	Master of Arts in Economics
	Trent University, Peterborough, ON.	
	2005-2009	Bachelor of Science in Mathematical Economics
		Top graduating average in the economics department
		Top 5 graduating average in the university

Research Interests

Supply chain Productivity; Supply chain risk management.

Research Papers

The Impact of Supply Chains on Firm-Level Productivity (with Harish Krishnan)
To be submitted to *American Economic Review* (target submission date: April 5/14)
The Impact of Supply Chains on Firm-Level Productivity (with Harish Krishnan)
Under Review at *Management Science*
Policy Incentives to Mitigate the Impact of Operational Tort Liability (with Harish Krishnan)
Under Review at *Production and Operations Management*

Research-in-progress

• Does Market Competition Increase the Value of Dual Sourcing? Theory and Evidence.
• Supply Chain Transparency: The Impact of Firm Coalitions.

Service

• Session co-chair: POMS Annual Meeting 2014, Atlanta, USA (scheduled)
• Journal referee: *Operations Research Letters (x2)*

Talks/Presentations

MSOM (2012, 2013, 2014*) • Informs (2013, 2014*) • POMS (2014*) • Empirical Economics Seminar, UBC (2014) • Canadian Operations Research Society Meeting (2014*)
*scheduled

Teaching

Course instructor: Introduction to Operations and Logistics (2012, 2014-scheduled).

Awards	2014	Paul Chwelos Award for Excellence in teaching, Sauder School of Business, UBC (institution-wide award)
	2010-2014	UBC Four Year Fellowship
	2010-2012	Dean Earle D. MacPhee Memorial Fellowship.
	2010	Leslie G.J Wong Fellowship.
	2009	UBC Department of Economics Fellowship (full funding package for M.A.)
	2009	Finalist for the Governor's General Medal (highest academic recognition among students in Canada)
	2005-2009	Trent University Global Citizen Scholarship, (full funding package for B.Sc.)
	2005	Top 100 list in national standardized examinations in Colombia (among +50,000 students)

Information sharing behavior under supply uncertainty

Jud Kenney, jud.kenney@mail.mcgill.ca, McGill University

In my thesis, I study how information sharing between upstream and downstream parties behave differently in industries that are dominated by supply uncertainty as opposed to demand uncertainty. One of the common assumptions when modeling forecast sharing between a buyer and his suppliers is that uncertainty originates from the demand side (Cachon & Lariviere 2001, Özer et al. 2011). However, certain industries, e.g., aerospace, behave differently. Products like airplanes and military vehicles require significant investments to develop and manufacture and they are produced in low quantities. In order to reduce the associated financial risk, significant advance ordering has become a standard business practice in these industries. So, effectively there is little demand uncertainty as evidenced by the fact that aerospace companies only monitor the backlog of (confirmed) orders.

However, the above does not mean that these industries are immune to operations-related risks. Many of these products are complicated and involve numerous components and subassemblies. So, the assembler (e.g., Boeing) has to deal with a large number of suppliers. For example, Boeing 787 has 45 major Tier-1 suppliers. So, these systems face considerable *risks on the supply side* because of problems in terms of delays, disruptions, cancellations, changes in costs, etc. (refer to Nolan and Kotha 2005, and Greising & Johnsson 2007 for details). In such scenarios, it is the assembler who is in touch with all suppliers and has the most up-to-date information about system-wide supply side risks; the suppliers individually only know about their own problems. It is then up to the assembler to decide how to share this private information with the suppliers and the suppliers then decide what to do with this information.

I study this behavior in two behavioral experiments. The first models a buyer-supplier relationship as a single period, two-stage game. It tests the effects of framing and anchoring on the buyer's information sharing behavior about uncertainty with a particular supplier and the supplier's decision about capacity-building for the buyer. We find that suppliers build significantly more capacity when facing supply versus demand uncertainty. Moreover, buyers significantly reduce information distortion (of the shared information) when they believe the suppliers will follow their messages. The second (ongoing) study models the relationship between a buyer and several suppliers as a three-stage, repeated minimum game. It tests the power of financial incentives and of buyer's information sharing to coordinate toward Pareto-maximizing outcomes. We are investigating if supply chain coordination improves if supplier's individual delivery information is shared with peer suppliers with or without being filtered by the buyer.

Information sharing behavior under supply uncertainty

Jud Kenney, jud.kenney@mail.mcgill.ca, McGill University

EDUCATION

Doctor of Philosophy, Operations Management, McGill University, Montreal, Canada 2015 (expected)

Master of Manufacturing Management, McGill University, Montreal, Canada   2001

Master of Science, Mechanical Engineering, University of Illinois, Urbana-Champaign   1994

Bachelor of Science, Mechanical Engineering, University of Illinois, Urbana-Champaign   1993

FELLOWSHIPS

Walter John Stenason Fellowship   2014
Rio Tinto – Richard Evans Graduate Fellowship   2013

RESEARCH INTERESTS

Broadly categorized as supply chain management. Specific interest using behavioral experiments to study buyer-supplier behaviors and relationships in industries that are dominated by supply uncertainty, such as aerospace.

TEACHING INTERESTS

Operations and supply chain management: operations strategy, strategic procurement, supply chain coordination, and inventory management.

RELEVANT PUBLICATIONS & PRESENTATIONS

P. Judson Kenney, Saibal Ray and Jim Engle-Warnick. Information sharing behavior under supply uncertainty. POMS (2014).

P. Judson Kenney, Saibal Ray and Jim Engle-Warnick. Framing and anchoring effects in forecast sharing. INFORMS (2013).

P. Judson Kenney. Supply Chain Bargaining Theory. Semi-finalist at INFORMS Interactive Session Poster competition (2013).

WORKING EXPERIENCE

Pratt & Whitney, A United Technologies Company, Montreal, Canada   1997 – 2010

     Director of Materials and Logistics (2007 – 2010)

Naval Undersea Warfare Center Division, Newport, Rhode Island   1994 – 1997

JULIANA CELESTINI
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ACADEMIC / DEGREE
2010 – 2014 PhD candidate in Business Administration (ABD)
Universidade do Vale do Rio dos Sinos, UNISINOS, São Leopoldo, Brazil
With doctoral internship,University of Texas Pan American, UTPA, Edinburg, Texas, USA.
Leader: Hale Kaynak Ph.D.
Title: The Relationship of Social Capital and Operational Performance.
Area: Operations Managements
Leader: Iuri Gavronski Ph.D.
2004 - 2006 Master in Business Administration.
Universidade do Vale do Rio dos Sinos, UNISINOS, São Leopoldo, Brazil
Title: The final agreement on textiles and clothing and the Brazilian textile industry competitiveness.
Leader: André Filipe Zago de Azevedo Ph.D.
2001 - 2002 Administration Specialization in Marketing Area.
Universidade Regional Integrada do Alto Uruguai e das Missões, URI, Erechim, Brazil
Title: Actions undertaken by Carbonelli Relationship with their retail customers
Leader: Verner Luis Antoni Ph.D.
1996 - 2001 Degree in Business Administration.
Universidade de Caxias do Sul, UCS, Caxias Do Sul, Brazil
Title: New Business Development: Proposed Implementation of a Language Centre
Leader: Dionise Magna Juchen Ph.D.

WORK IN PROGRESS
Professor – Undergraduate Program in Management – UCS Universidade de Caxias do Sul, 2014.
Professor – Undergraduate Program in Accounting – UCS Universidade de Caxias do Sul, 2014.
Coordination – Post-graduation Specialization Course – MBA in Strategic Human Resources Management – UCS Universidade de Caxias do Sul, 2014.
Coordination – Post-graduation Specialization Course – MBA in Strategic Management of Production – UCS Universidade de Caxias do Sul, 2014.
Coordination – Post-graduation Specialization Course – Specialization in Financial Management – UCS Universidade de Caxias do Sul, 2014.
Post-graduation Specialization Course – Specialization in Lean Production – UCS Universidade de Caxias do Sul, 2014.
Coordination – UCS Junior Company – Business Advisory – UCS Universidade de Caxias do Sul, 2014.

The relationship between Social Capital and Operational Performance

Juliana Celestini, julicelestini@gmail.com, Universidade do Vale do Rio dos Sinos.

In the thesis, we have studied how each one of the three dimensions of social capital (relational, cognitive and structural) relate with the operational performance (cost, quality, delivery, flexibility and innovativeness) of the buyer company, in textile and Brazilian manufactured sector. We sampled plants in the textile industry and Brazilian manufactured. Each company was contacted by telephone and we collected 503 valid direct e-mail addresses of managers involved directly with suppliers. We used a similar method to that proposed by Dillmann (2002), and guided a survey. We obtained 117 valid answers, 102 of them were valid. We verified that the buyer's operational performance measures relate differently to each dimension of social capital. After statistical analysis, we identified support for eight research hypotheses. First, the results indicate that the buyer must seek alignment between his vision and values and the vision and values of the supplier in order to work toward a common goal, because, as actions regarding the sharing of the vision and values (cognitive dimension) increase, the operational performance in delivery and flexibility enhances. As a second question to be observed, the buyer must prioritize the cooperative relationships that give the opportunity to participate in the evaluation of the supplier performance, i.e., that enable complaints and compliments and inform the buyer about the arrangements, because as the actions regarding the performance evaluation (structural dimension) increase, the operational performance in cost grows. As a third point to note, the buyer must know the supplier's productive practices, in order to assist in the search of better results, because as because as the actions regarding the supplier (structural dimension) increase, the operational performance in innovativeness grows. In a fourth moment, the buyer must invest in actions that involve communication, to exchange important information that may affect one another, because as the information sharing increases (structural dimension), the operational performance in innovativeness also grows. In fifth and final measure, the buyer must prioritize the cooperative relationships developed in an environment that can be used in another environment, i.e., that cause positive effects by the association of those involved in the present and future relationships, because as appropriability increases (structural dimension) the operational performance in cost, quality and innovativeness also increase. In short, the research shows that the buyer companies can leverage the buyer-seller relationship to improve their operational performance, if the appropriate dimensions of the social capital are encouraged.

Karthik Murali

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Education

University of Illinois, Urbana-Champaign
Ph.D. in Business Administration   2010 -
Advisors: Dr. Nicholas C. Petruzzi, Dr. Michael K. Lim

University of Pennsylvania
M.S. in Materials Science and Engineering   2008-2010

National Institute of Technology, Karnataka, India
B.Tech. in Metallurgical Engineering and Materials Science   2004-2008

Research/Teaching Interests

- Sustainable Operations Management
- Product Design and Industrial Organization

Research in Progress

- *"Municipal Groundwater Management: Optimal allocation and control of a renewable natural resource" (with Nicholas Petruzzi and Michael Lim). (under review)*
- *"Is Competition or Collaboration the Key to Driving Sustainability in Supply Chains?" (withAnupam Agrawal).*
- *"Green Product Line Design with Imperfect Ecolabeling when Consumers Exhibit Reference Dependent Preferences" (with Nicholas Petruzzi and Michael Lim).*

- **Teaching Experience:**
    - Instructor – BADM 375 "Business Process management"   Spring 2013
    - Instructor – Graduate workshop on Probability and Statistics   Summer 2011, 12
- **Presentations:**
    - "Municipal Groundwater Management"   INFORMS 2012, 13

Three Essays on Green Product Design and Sustainable Operations Management

Karthik Murali, kmurali4@illinois.edu, University of Illinois Urbana-Champaign

My research interests lie broadly within the domain of Sustainable Operations Management. The first essay in my thesis considers the problem of groundwater management for a welfare-maximizing municipality when there exist water reallocation opportunities through water markets or inter-municipality trading agreements. We formulate this problem in a deterministic control framework, and determine the optimal extraction and import/export policies for the municipality. In addition, we address the growing trend of privatization by considering the profit-maximizing management of the municipal water supply. The overarching perspective we employ in this essay is that of the Triple Bottom Line (3BL), where a policy maker is concerned not only with the economic implications but also the societal and environmental impacts of the different water management paradigms studied here. We define context specific metrics to measure the societal and environmental performance of these management paradigms, and derive policy implications to determine the conditions under which water reallocation mechanisms and privatization may be desirable from a 3BL perspective.

The second essay attempts to uncover the motivation for pre-competitive R&D collaborationamong firms at different levels of the supply chain to promote and standardize sustainability within an industry. There is a growing number of industry roundtables and consortia (for example, The Sustainable Apparel Coalition) that address specific sustainability goals with an aim to stimulate consumer demand for green products and cut costs of sustainable production and procurement. We consider 1) Vertical collaboration between partnering firms within a supply chain, and 2) Horizontal collaboration between competing firms. In a stylized model integrating green product design and supply chain collaboration, we assess the performance of four collaborative configurations between two retailer-supplier dyads to identify the value of horizontal and vertical pre-competitive collaboration and their impacts on sustainability.

The third essay studies the impact of ecolabels on green product line design strategies for competing firms. This essay combines the firm's problem of designing and credibly signaling inherently invisible green product attributes to consumers who exhibit choice-set dependent preferences when there are competing products to choose from. Consumer preferences are reference dependent when the utility derived from consuming a product depends not only on the attributes of the product being considered, but also on the attributes of the available alternatives. We derive the optimal product line design strategies for competing firms and also adopt the perspective of policy makers by studying the effectiveness of standard-setting and credibility enhancing approaches to stimulate green product development.

Lima Zhao

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Education

2011 - 2014	**WHU - Otto Beisheim School of Management**, Vallendar (Germany) Doctoral Student, Supply Chain Management (Prof. Dr. Arnd Huchzermeier) Dissertation: The Interface of Operations and Finance in Global Supply Chains
2012	**Kellogg School of Management, Northwestern University**, Evanston (USA) Visiting Scholar, MEDS Department
2009 - 2011	**University of Duisburg Essen**, Duisburg (Germany) Master of Science Specialization: Logistics Engineering
2004 - 2008	**Tianjin Foreign Studies University**, Tianjin (China) Bachelor in Management Specialization: Management Information System

Professional Experience

2010 - 2011	**Fraunhofer Institute for Material Flow and Logistics (IML),** Dortmund (Germany), 6 months Logistics/Transportation: Project Assistant, innovative material flow systems
2010	**HTL Transport & Logistik UG,** Oberhausen (Germany), 2 months Logistics/Transportation: Internship, database development and logistics processes
2008	**Tianjin Zhongtai Import and Export Co., Ltd,** Tianjin (China), 3 months Logistics/Transportation: Internship, marketing strategy and IT

Additional Information

Languages:	Chinese (Mandarin) (native), English (fluent), German (advanced)
IT Skills:	MS Access, MS SQL Server, Adobe Dreamweaver, C- Language, Java, SQL, HTML, Palisade @RISK, MATLAB, VBA, Sybase PowerBuilder, Rockwell Arena, Dosmis3, Auto CAD
Scholarships:	2.Class scholarship (Tianjin Foreign Studies University, 2007), 3.Class scholarship (Tianjin Foreign Studies University, 2006)
Activities:	Volunteer, SOS Children's Village, 2006, Tianjin (China)
Interests:	Table tennis, web design, roller skating

Publications

Elhasia, T., B. Noche, L. Zhao. 2013. Simulation of a Sustainable Cement Supply Chain; Proposal Model Review. *WASET*. 75. 562-570.

The Interface of Operations and Finance in Global Supply Chains

Lima Zhao

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My first paper reviews the literature on integrated operational hedging and financial flexibility. A closed-loop view of two supply—demand matching processes under uncertainty is introduced to link operations and finance. A roadmap to integrated risk management including categorizations of operational strategies and financial instruments is proposed. Linking the relationship analysis (complements/substitutes) and approach choice (centralization/decentralization), it is shown that: (i) Zero interaction effects (separation) of operations and finance lead to decentralization. (ii) Operational hedging and financial flexibility should be centralized even if they are partial substitutes.

The second paper considers a risk-averse multinational corporation that manages exchange rate risk and supply—demand mismatches via capacity investment and financial hedging and backup production and switching options. Our mean-conditional value-at-risk (CVaR) analysis establishes three main results. First, backup production and switching options are complements (resp., substitutes) when used to fulfill foreign (resp., domestic) demand. Operational flexibility and financial hedging are substitutes for reducing risk, but for enhancing profit they are complements only if financial hedging enlarges the feasible set of capacity portfolios by relaxing the CVaR constraint. Second, given operational flexibility, financial hedging is viable only under rare and extreme exchange rates; otherwise, real options are relatively more successful at generating above-target expected profits. Third, switching options and financial hedging are more effective at reducing risk in exchange rate volatility than in demand volatility, though the risk reduction effect of hedging is decreasing in both types of volatility.

My third paper examines a supply chain consisting of one retailer and two suppliers, where both the retailer and the offshore supplier may be capital-constrained. To manage supplier financial distress and supply—demand mismatch risk, the retailer chooses among three strategies: purchase order finance (POF), advance payment discount (APD), and dual sourcing via a backup supplier. When both POF and APD are employed, there is a "pecking order" as regards pre-shipment finance: the retailer first uses internal capital to fund APD and then may adopt POF to finance the offshore supplier under certain conditions. For the retailer, pre-shipment finance and capacity hedging (via a backup supplier) are partial substitutes.

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EDUCATION

Georgia Institute of Technology, Atlanta, GA
    Ph.D. in Operations Management – (2010 – Present)
    M.S. in Industrial & Systems Engineering – 2010

University of New Mexico, Albuquerque, NM
    B.S. in Mechanical Engineering – 2006

RESEARCH AND PROFESSIONAL EXPERIENCE

Supply Chain Management; Empirical Operations Management; Supply Chains and Innovation; Risk Management and Mitigation; Inter-organizational Networks

PUBLISHED/ACCEPTED RESEARCH PAPERS

Basole, R.C. and M.A. Bellamy, "Supply Network Structure, Visibility, and Risk Diffusion: A Computational Approach," forthcoming in *Decision Sciences Journal*.

Bellamy, M.A. and R.C. Basole. 2013. " Network Analysis of Supply Chain Systems: A Systematic Review and Future Research." *Systems Engineering*, 16(2), 235–249.

CURRENT WORKING PAPERS OR PAPERS UNDER REVIEW

Bellamy, M.A., Ghosh, S., and Hora, H. "The influence of supply network structure on firm innovation," in the second round revision with the *Journal of Operations Management*.

- Awarded the 2013 Academy of Management (AOM) Operations Management Division Best Student Paper Award
- Awarded the 2013 International Decision Sciences Institute (DSI) and Asia Pacific DSI Best Paper Award in Application of Theory

Bellamy, M.A., Ghosh, S., and Hora, H. "The Joint Effect of Supply Network Relationship Strength and Structure on Firm Performance: A Multilevel Empirical Analysis," in preparation.

TEACHING EXPERIENCE

- Operations Management (MGT 3501). Core course, Spring 2014 – Full Instructor
- **Fulbright Scholar** (Madrid, Spain), 2006 – 2007 – Teacher, Researcher

SERVICE AND PROFESSIONAL AFFILIATIONS

Ad Hoc Reviewer
- *Decision Sciences Journal (2012-2013), Journal of Supply Chain Management (JSCM) (2012), Academy of Management (AOM) Conference (2013 and 2014)*

Managing and Structuring Supply Networks: Implications on Firm Performance and Innovation

Marcus A. Bellamy, marcus.bellamy@scheller.gatech.edu, Scheller College of Business, Georgia Institute of Technology

Conventional assessments of supply chain relationships as linear or dyadic structures, rather than as a network, limit academician and managerial approaches to overcome challenges to effectively manage supply chains. In contrast to the conventional approach, the network approach focuses on the structural elements of the firm and its inter-organizational network partners. In my thesis, I thus focus on how a firm's management and structure of its supply network influences its performance as well as its innovation output. I adopt the definition of a supply network as an inter-linked network of firms consisting of manufacturers, suppliers, customers, third party service providers, and alliance partners that interact to execute the supply chain activities of the firm.

In my main study, we investigate supply networks as potential sources of innovation. The study builds on the conceptualization presented in extant research and empirically examines the association between the structure of a firm's supply network—via two structural characteristics, supply network accessibility and supply network interconnectedness—and its innovation output as well as the moderating role that a firm's absorptive capacity and its supply network partner innovativeness plays in this association. Our findings suggest that supply network accessibility has a significant association with a firm's innovation output. The results also indicate that interconnected supply networks strengthen the association between supply network accessibility and innovation output. Moreover, while the structural characteristics of a supply network facilitate knowledge and information flows between partners, we find support that both knowledge availability in the network and the capability to combine the knowledge can enable firms to translate the benefits of high levels of supply network accessibility and supply network interconnectedness into higher innovation output.

In my subsequent studies, we account for the realization that not all relationships are valued equally. The proportion of the firm's business that each partner is responsible for varies in both degree and purpose. We empirically examine this using supply chain relationship and financial data for firms in the automotive, drug, and electronics industries. Our joint focus on relationship strength, through the use of a multilevel mixed-effects model, and supply network structure, through the use of social network analysis, helps address the call for future research that advances existing theories on supply networks and firm performance.

My thesis work contributes to current at the interface of supply networks and innovation. It also extends current research findings by bringing a more holistic assessment of firm's that are embedded in a supply network, helping address the need for deeper structural analysis and consideration of relationship value.

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EDUCATION

- ♦ Ph.D. Candidate, Supply Chain & Operations Management   expected Aug 2017
  College of Business and Behavioral Science, Clemson University, SC
  - Research Interests: Service operations management
- ♦ M.S., Marketing   Aug 2010
  College of Business and Behavioral Science, Clemson University, SC
  - Thesis Title: The effects of web site metrics on consumer purchase intention
- ♦ B.A., Economics   Feb 2009
  School of Management, Kangwon National University, South Korea

WORK EXPERIENCE

- ♦ Fulltime employee – Logistic coordinator   Dec 2010 – Apr 2012
  Metal Source America, Inc. Lagrange, GA

RESEARCH PAPERS

- ♦ Min Kyung Lee, Rohit Verma, Aleda Roth. Customer usage and preferences for technology-based innovations. Work in progress.
- ♦ Min Kyung Lee, Michael Dixon, Rohit Verma, Aleda Roth. Technology-based innovations in service encounters: evaluation of customer preferences over time. Work in progress.

TEACHING EXPERIENCE

- ♦ Instructor, Clemson University   Aug 2013- present
  - Course Title: MGT 2180 Management Personal Computer Application
  - Main Responsibilities:
    - Managed 700 undergraduate students
    - Full responsibility for course planning and grading
- ♦ Teaching assistant, Clemson University   Aug 2012- Aug 2013
  - Course Title:
    - MGT 3170 Logistics Management
    - MGT 4120 Supplier Management

PRESENTATIONS

- ♦ Customer usage and preferences for technology-based innovations
  - DSI Annual Conference, Baltimore, MD   2013
- ♦ Technology-based innovations in service encounters: evaluation of customer preferences over time
  - POMS Annual Conference, Atlanta, GA   2014

PROFESSIONAL REFERENCE

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Customer usage and preferences for technology-based innovations

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This paper is mainly focused on the technology innovations used in the service industry, especially the settings of restaurant. The purpose of this study is to explore the use of technology for restaurant customers. Although the benefits of using technologies have been acknowledged many in the field of marketing and information systems, little has been studied customers' perspectives of the technology in terms of its utility and ease of use. The service concept consists of two main contents of service design, "how" and "what" (Goldstein *et al.*, 2002). "How" reflects the perspective of operations management such as organization's strategic intent, and "what" reflects the perspective of marketing focusing on customers needs (Goldstein *et al.*, 2002). In other words, we will examine the innovative technology used by customers, while exploring how this technology can be mediated between customer's needs and organizations strategic purpose.

While the benefits of technology innovations in service organizations are obvious, understanding of customers' usage and preferences of new technologies is critical. When service operators decide which types of technologies they should adopt to increase customer satisfaction and employee efficiency, they must consider not only the costs and benefits of that technology, but also customers' reactions to the changes accompanying the new technology (Walker *et al.*, 2002). If not very many people seem to be interested in a new technology that was just introduced to market, it would have to go through a disaster of failure. For example, the HTC First, also known as the Facebook phone, failed less than a month after its introduction, because very few people wanted to have Facebook at the heart of their phones (Worstall, 2013). HTC failed to predict what customers want with their smart phone. Thus, it is very important for service providers to determine a way that how technology should be adopted to be preferred or rejected by customers (Walker et al., 2002). Once customers' preferences are understood, another challenge for service industry is to prioritize those preferences to maximize the value for customers (Victorino *et al.*, 2005).

Mitigating Decentralization in Public Health Logistics Systems
Luke Muggy, lmuggy@ksu.edu, Kansas State University

Humanitarian and public health logistics systems are often characterized by decentralized decision makers optimizing individual objectives within sections of a system, but whose strategies affect the system as a whole. Unfortunately, decentralized systems frequently perform poorly when compared with their centralized counterparts. The research in this thesis quantifies the cost of decentralization on the parts of relief agencies and beneficiaries alike. In addition, this thesis introduces mechanisms under which decentralized agents make decisions that are optimal or near-optimal for the entire system.

Humanitarian logistics systems have a great impact on society. However, choices made by both agencies and beneficiaries affect the performance of these systems. Decentralization arises due to damaged communication infrastructure, inter-agency incompatibility and the urgency of many response efforts. In addition, beneficiaries are not assigned to aid facilities, but decide where to seek relief based on individual preferences. The impact of this decentralization and opportunities for its mitigation are not well understood. This thesis makes three contributions:

- Analyze the cost of decentralization, the amount of lost beneficiary access attributed to a lack of coordination between relief agencies responding to a disaster.
- Apply game theory to model and predict decisions on the part beneficiaries seeking aid.
- Identify mechanisms under which decentralized agents make centrally optimal decisions.

First, the author quantifies the cost of decentralization through the application of robust optimization. A centralized benchmark generates optimized, robust facility location strategy that maximizes beneficiary access while considering two practical sources of uncertainty. Specifically, the author investigates the effects of beneficiaries' abilities to travel and facilities' varying capacities on system performance. A computational study compares beneficiary access between the decentralized response and the robust solution using actual data. The results are expected to illustrate the value of agency coordination when forming response strategies.

Next, the author models beneficiary decisions through a congestion game where players' utility functions reflect individual preferences. The thesis research seeks new algorithms for predicting the actions of beneficiaries seeking aid and identifying equilibria: solutions from which no player has incentive to deviate from his chosen strategy. The analysis will identify bounds on performance in terms of the price of stability and the price of anarchy: the ratios of the least and most costly equilibria, respectively, to the central optimum. Finally, the research derives mechanisms that guide beneficiary decisions toward what is centrally optimal.

Luke Muggy

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EDUCATION

Doctor of Philosophy in Industrial Engineering   12/2011-12/2014(expected)
>   Kansas State University, Manhattan, Kansas
>   Dissertation: *Mitigating Decentralization in Public Health Logistics Systems*
>   Advisor: Dr. Jessica Heier Stamm

Master of Science in Operations Research   8/2009-12/2011
>   Kansas State University, Manhattan, Kansas
>   Thesis: *The SMART Scheduler: A Revolutionary Scheduling System for Secondary Schools*
>   Advisor: Dr. Todd Easton

Bachelor of Science in Mathematics   8/2002-12/2006
>   University of Nebraska, Lincoln, Nebraska

WORK EXPERIENCE

Graduate Research Assistant   12/2009-12/2014
University Course Instructor   1/2014-5/2014
>   Kansas State University, Manhattan, KS
>   Course: IMSE 660 – Operations Research 2

Grading Assistant   8/2013-12/2013
Secondary Mathematics Teacher
>   Lincoln High School, Lincoln, NE   8/2008-6/2009
>   Westside High School, Omaha, NE   7/2007-6/2008

PUBLICATIONS

Accepted

>   **Muggy L.**, Heier Stamm, J.L. (2014) Game Theory Applications in Humanitarian Operations: A Review, *Journal of Humanitarian Logistics and Supply Chain Management*

>   **Muggy L.**, Easton, T. (2014) Westside High School Course Schedule-Spring 2009 Dataset, *The Benchmarking Project for High School Timetabling*, Centre for Telematics and Information Technology, University of Twente, The Netherlands

Submitted

>   **Muggy L.**, Easton, T. (2014) Generating Class Schedules within a Complex Modular Environment with Application to Secondary Schools

In Preparation

>   **Muggy L.**, Heier Stamm, J.L. (2014) Quantifying the Impact of Decentralization through Robust Optimization

FUNDING

Private contract (2010), Master's degree funded by Westside High School of Omaha, NE who utilizes a uniquely complicated scheduling system, $18,000, Primary contact.

HONORS AND AWARDS

Travel Award from the Graduate Student Council, Kansas State University   10/2012, 3/2014
Alexander Christian Foundation Scholarship   8/2003

SERVICE

President, Industrial Engineering Department Graduate Student Council   8/2010-2011
Poster presentation on operations research, "What would you take to the moon?" at the
Kansas State University Open House   2/24/2010

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I. EDUCATION

2010 – Present	Georgia Institute of Technology, Atlanta, GA PhD in Operations Management
2009	XLRI, Jamshedpur, India MBA in General Management
2001	National Institute of Technology, Jaipur, India BE in Mechanical Engineering

II. EMPLOYMENT

2010 – Present	Georgia Institute of Technology, Atlanta, GA Graduate Research Assistant
2001 – 2008	Defense Research and Development Organization, India Scientist

III. RESEARCH AND TEACHING INTERESTS

Supply Chain Management, Sustainability, Closed-Loop Supply Chains, Contract Theory, New Product Development

IV. RESEARCH PAPERS

1. Singh, N., R. Subramanian, and K. Ramachandran, "Inter-temporal Product Line Strategies under Refurbishing with Strategic Consumers"

2. Singh, N., S. Kavadias, and R. Subramanian, "Product Quality in Decentralized Supply Chain under Information Asymmetry"

V. TEACHING EXPERIENCE (Instructor)

- Management Science (MGT 2251). Core undergraduate course.

  Fall 2013- Enrollment 48, Evaluation 4.87/5.0;

  Fall 2013- Enrollment 17, Evaluation 4.87/5.0;

  Spring 2013- Enrollment 45, Evaluation 3.6/5.0.

Product Line and Quality Decisions in Supply Chains

Narendra Singh, narendra.singh@scheller.gatech.edu,

Scheller College of Business, Georgia Tech

This dissertation focuses on the managerial challenges associated with designing products and product lines in the face of supply-chain complexities that have not been addressed in prior work. I summarize the first two dissertation essays below:

The first essay studies the problem of an OEM designing a product in the supply chain where the supplier is powerful enough to dictate contract terms, and OEM has an alternative source for manufacturing the product. We study how decentralization and the competitiveness of the OEM's backup source affect the OEM's choice of product quality and supply chain profit. Our results show that when the competitiveness of the OEM is high, the OEM is better off designing the product with lower quality. We also investigate the impact of information asymmetry regarding the OEM's cost structure. Our analysis shows that in order to extract information rent, the OEM designs the product with higher quality under information asymmetry as compared to the scenario of complete information. Moreover, and counterintuitively, the analysis also shows that information asymmetry may not only be desirable for the OEM and but may also result in greater profit for the supplier. In other words, information asymmetry could surprisingly be a win-win situation for the supply chain players.

The second essay studies a firm's product line decision in the face of commercial product returns. In many industries, commercial returns are substantial and growing steadily. Firms often see these returns as a necessary evil and a costly component of doing business. Firms can recover value from these returns by remarketing them as refurbished products. However, the consumers' strategic nature and the firm's incentives may complicate product line decisions involving refurbishing of commercial returns. In the absence of credible commitment by the firm to not lower the price of new product in the future, strategic consumers have a lower willingness-to-pay for the new product offered today. We show that for low return rates, the firm offers only the new product to avoid cannibalization by the refurbished product in the second period. However, for sufficiently high return rates, the firm not only offers the refurbished product alone to avoid cannibalization by the new product in the second period, but also refurbishes all the returns. Our results show that contrary to popular belief, consumer returns could have a muted impact – and sometimes, even a positive impact – on firm profit when strategic behavior by consumers is considered. The reason is that returns help a firm credibly commit to its future product strategy. A novel contribution of our work is the recognition of product returns as a commitment device, which can mitigate their more-obvious negative impact.

Necati ERTEKIN   **March 2014**

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Education

2011~2015 ***Mays Business School, Texas A&M University***   *College Station, TX, USA*
   Ph.D. Major: Operations & Supply Chain Management

2007~2008 ***Naval Postgraduate School***   *Monterey, CA, USA*
   MBA. Major: Logistics Management

2006~2008 ***Naval Postgraduate School***   *Monterey, CA, USA*
   MS. Major: Systems Engineering

1999~2003 ***Turkish Naval Academy***   *Istanbul, TURKEY*
   BS. Major: Industrial Engineering

Research Interests

Topics: Consumer Returns in Retail Operations; Business Analytics; Closed Loop Supply Chains; Value of Information.

Working Papers

Ertekin, N., M. Ketzenberg., R. Metters. 2014. *Dynamic versus Static Inventory Routing with Unknown Demand* (Under Review at POM).

Ertekin, N., M. Ketzenberg, R. Metters. 2014. *Value of Information for Managing Inventory and Routing with Emergency Pickups* (Under Review at POM).

Ertekin, N., M. Ketzenberg, G. Heim. 2014. *Key Drivers of Consumer Returns and Effective Return Processing: A Study from Customers' Perspective.*

Ertekin, N., M. Ketzenberg, G. Heim. 2014. *Reducing Consumer Returns: A Field Study in the Jewelry Industry.*

Ertekin, N., M. Ketzenberg. 2014. *The Impact of Open-Box and Closed-Box Returns on Pricing, Return Policy, and Order Decisions.*

Ertekin, N., M. Ketzenberg. 2014. *Consumer Returns Policies for a Price-Setting Retailer.*

Honors and Awards

2014   ***Outstanding Teaching Award by a Doctoral Student*** by Mays Business School, Texas A&M University, College Station, TX

2013   ***Heep Fellowship*** by Texas A&M Institute for Advanced Studies (TIAS), CS, TX

2011   ***PhD Excellence Fellowship*** by Texas A&M University, College Station, TX

2011   ***Mays Doctoral Fellowship*** by Mays Business School, College Station, TX

2008   ***MBA Faculty Outstanding International Student Award*** by Graduate School of Business and Public Policy, Naval Postgraduate School, Monterey, CA

CONSUMER RETURNS IN RETAILING

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The annual value of consumer returns in the U.S. reached to $267.3 billion in 2013, an increase of 41.5% ($78.4 billion) since 2007 (National Retail Federation, 2007, 2013). Obviously, there are opportunities for retailers to increase their profits by better managing return. In my thesis, I study how a retailer should effectively manage consumer returns. Most companies invest largely to handle returns after they occur and relatively little to proactively prevent returns. In contrast, I suggest that effective and efficient return management should involve both proactive and reactive approaches.

From the proactive perspective, I define a 3-step guideline for retailers: (1) understand the key drivers of returns, (2) identify and implement the best practices to reduce returns, and (3) integrate returns in decision making since returns cannot be eliminated. First, using a unique data set – that consists of roughly 77,000 customer satisfaction survey responses completed after a purchase event and 57 million transactions over a five-year period – from a National Jewelry Retailer, I identify the key factors that influence returns during a purchase event. The data gives us a unique opportunity to tie customers' perceptions through surveys to actual events and behaviors. Next, doing a field study with 280 jewelry retailer stores over a total of 10 months, I conduct a multi-phase research to empirically identify and implement best practices to prevent returns. The field study provides the opportunity to test the impact of several treatments implemented in the stores on returns. Finally, I derive an analytical model to determine optimal operational decisions for a retailer that offers customers both open-box/closed-box returns and new products side by side as is very common in practice.

From the reactive perspective, retailers can influence customer satisfaction at the point of return to ensure that customer loyalty is enhanced. From a service perspective, I view a return event as a service failure. Therefore, a return event provides an opportunity of service recovery for retailers since customers are not satisfied with their initial purchases. Using a data set that consists of roughly 4,000 customer satisfaction survey responses completed after a return event and 57 million transactions over a five-year period, I identify the underlying factors of a successful service recovery during a return event. Moreover, I also identify how a return event in a physical store influences future repurchase behavior.

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EDUCATION

Year	Degree	Institute	GPA
Exp-2015	Ph.D. in Industrial & Systems Engineering	Georgia Institute of Technology, Atlanta, GA	3.8/4.0
2011	M.S. in Industrial Engineering	Georgia Institute of Technology, Atlanta, GA	3.7/4.0
2010	B.S. in Production and Industrial Engineering	Indian Institute of Technology Delhi, India	8.2/10.0

EMPLOYEMENT

- **Corporate Experience**

  Operations Research Intern, **CSX Transportation**, Jacksonville, FL   (May, 2012 – Aug, 2012)
  - Developed a time-space network model to determine the optimal routing & demand allocations of their unit trains
  - Implemented the model in *C#* using *Microsoft SQL Server* for data management and *Gurobi* for optimization

  Revenue Management Intern, **US Airways**, Phoenix, AZ   (Jun, 2011 – Aug, 2011)
  - Designed a new algorithm to estimate the overbooking levels and achieved an ***improvement of 12.9%*** in cost
  - Worked in a team of 3 to develop a heuristic for pushing up the observed bookings to negate the pull-down effect

  Production Planning Intern, **Mercedes–Benz**, Maharashtra, India   (May, 2008 - July, 2008)
  - Designed the *process layouts* for their new plant and did the *ISO 14001*: Environment management system review
  - The fabricated designs were ***implemented*** in the assembly line, body shop and finish line of the new plant

- **Graduate Research Assistant, Georgia Institute of Technology, Atlanta, GA**

  AMP-IT-UP Grant: **NSF**   (Jan, 2013 – Present)
  - Developed a framework to model the K-12 education system in US using agent-based modeling
  - Working in a *cross-disciplinary team* of education, public policy and industrial engineering researchers

  Robust Material Handling System Design   (Aug, 2012 – Present)
  - Developed a mixed integer non-linear program for the design of material handling systems under uncertainty
  - Received the ***Integrated Systems and Controls Honor*** scholarship by the Material Handling Education Foundation

  Supply Chain Design: **Lockheed Martin**   (Aug, 2010 – May, 2011)
  - Developed a strategic level, robust global supply chain model for the *F-35* supply chain
  - Implemented the model in *C#* using *MS Access* for data management and *CPLEX* for optimization

- **Teaching Experience, Georgia Institute of Technology, Atlanta, GA**

  Instructor, ISyE 3104: Introduction to Supply Chain Modeling   (May, 2013 – Aug, 2013)
  - Co-taught this course with another professor to a class of about 60 undergraduate students
  - Covered the following concepts: Inventory models, facility location models and push/pull manufacturing systems

AWARDS & HONORS

- **Tech to Teaching award,** Georgia Institute of Technology, US   (Mar, 2014)
- **Scholarship to attend the New England Complex System Institute's Winter Session,** MIT, US   (Nov, 2013)
- **Integrated Systems & Controls Honor Scholarship,** Material Handling Education Foundation, US   (May, 2013)

PUBLICATIONS

- P. Mital, E. Huang, and M. Goetschalckx. "**Robust material handling system design with different risk measures**." *International Journal of Production Economics* (Submitted 2014)
- P. Mital, R. Moore, and D. Llewellyn. "**Analyzing K-12 Education as a complex system**." *Procedia Computer Science* 28 (2014): 370-379
- M. Goetschalckx, E. Huang, and P. Mital. "**Trading off supply chain risk and efficiency through supply chain design**." *Procedia Computer Science* 16 (2013): 658-667
- D. Llewellyn, M. Usselman, D. Edwards, R. Moore and P. Mital. "**Analyzing K-12 education as a complex system**." *ASEE Annual Conference and Exposition* (2013)
- M. Goetschalckx, E. Huang, and P. Mital. "**Robust global supply network design**." *Information, Knowledge, Systems Management* 11.1 (2012): 119-130
- M. Goetschalckx, E. Huang, and P. Mital. "**Robust material handling system design based on the risk versus cost tradeoff**." *Progress in Material Handling Research* (2012)

A Modeling Framework for Analyzing the Education System as a Complex System

Pratik Mital, pratik_mital@gatech.edu, Georgia Institute of Technology

Schools and school districts are complex, dynamic systems affected by numerous factors, from individuals' attributes to federal policies. In this thesis a modeling framework has been developed that can be used to build models to analyze education system interventions. The framework is rooted in techniques from industrial & systems engineering, operations research, and management science to model the complex school intervention system. The framework is particularly suited to be applied to study federal level interventions in K-12 schools in US which are initiated through agencies like National Science Foundation and Department of Education. Insights, both qualitative and quantitative, for a successful implementation of the intervention will be gained from the model built for studying the specific intervention in the particular school environment. The framework uses an agent-based modeling strategy such that the users may better understand the attributes and relationships that may cause an intervention to succeed or fail. Social network analysis techniques are embedded in the agent-based modeling framework to model change in the attributes and relationships of the agents involved in the intervention.

Application of the framework facilitates collaboration across researchers from public policy, educational research, industrial and systems engineering, as well as practitioners of the school intervention. Collaboration across these disciplines is very important for building a useful and valid model of the education system intervention. The framework developed has been applied to model an 'Engineers Without Borders' high school intervention and insights were gained for a successful implementation of this intervention. The key factors determined for a successful implementation of this intervention were the relationships between the principal and community, teacher and community, teacher and school's partner university, and the support for intervention of the principal and teacher. The next step is to apply the framework to model larger and comprehensive case studies.

Qiao-Chu He

Contact Information	Industrial Engineering & Operations Research Email:heqc0425@berkeley.edu University of California Tel:(510)610-5308 Berkeley, CA 94720-1777 https://sites.google.com/site/tonyheqiaochu/

Education

University of California, Berkeley, CA   Aug. 2011 - Jun. 2015 (expected)
Ph.D. in Operations Research
Thesis: Service operations with incentive and information externalities
Committee: Ying-Ju Chen, Zuo-Jun Shen, Terry Taylor, Philip Kaminsky

Tsinghua University, Beijing, China   Aug. 2007 - Jun. 2011
B.Eng. at School of Mechanical Engineering

Teaching

Graduate Student Instructor   IEOR, University of California Berkeley, CA
- IEOR 252 Service Operation Management   Spring 2014, 2013
- IEOR 268 Applied Dynamic Programming   Fall 2013
- IEOR 241 Data Analysis and Risk Management   Fall 2012

Journal Publications and Working Papers

- He, Q.-C., Chen Y.-J., Revenue-maximizing pricing and scheduling strategies in service systems with flexible customers, submitted.
    - Katta G. Murty Best Paper Award in Optimization, 2013.
    - Best Student Paper Award, first prize, POMS Hong Kong, 2014.
- He, Q.-C., Chen Y.-J., Dynamic pricing of digital products with consumer reviews, to be submitted.
- He, Q.-C., Chen Y.-J., Two-sided market for virtual items in multiplayer online games, to be submitted.
- He, Q.-C., Chen Y.-J., Biased learning with projection in service systems with unobservable quality, working paper.
- Zhang, Z., Yang, D., Zhang, T., He, Q., & Lian, X. (2013). A study on the method for cleaning and repairing the probe vehicle data. *Intelligent Transportation Systems, IEEE Transactions on,* 14(1), 419-427.
- Yang, Y., He, Q.-C. and Hu, X. L. (2012). A compact neural network for training support vector machines, *Neurocomputing*, 85: 193-198.

Other Publications

- Under actuated bionic finger device with parallel coupling wedge shifting circuit. Jul, 14 2010: CN 201010110313. (patent)
- Electromagnetic direct driven robot finger apparatus. Jul, 22 2009: CN 200910009475. (patent)

Other Experience

- Research Intern, Schlumberger-Doll Research   May. 2014 - Aug. 2014
  Uncertainty, Risk and Optimization   Cambridge, MA
- Volunteer, National Swimming Center   Jun. 2008 - Aug. 2008
  29th *Summer Olympics*   Beijing, China

Service Operations with Incentive and Information Externalities

Qiaochu He, heqc0425@berkeley.edu, University of California, Berkeley

Management of services is fundamentally determined by how one customer's behavior is influenced by another. This is due to either incentive or information externalities in the service systems. In my thesis, I study the design of service systems under such social externalities.

Firstly, this dissertation studies the design of service systems with negative incentive externalities, i.e., congestions. Motivated by the presence of bilingual customers in the call centers, I investigate a service system with both flexible and dedicated customers. A single service provider, who operates two queues, attempts to maximize revenue through jointly optimal pricing and scheduling policies. I analyze the system performances under different information structures and discriminatory service mechanisms, and illustrate the impacts of information asymmetry on the interplay between the flexible customers and the dedicated ones. The results identify new roles of strategic service delays in the flexible system context.

Secondly, this dissertation starts with the social networks with both positive and negative incentive externalities. Motivated by the virtual item trades in online games, I explore the design and operational strategies of two-sided markets. Game players derive utilities both from social interactions, and selling virtual items to the dealers via the gaming platform. I analyze different reward mechanisms to incentivize the players' adhesiveness, and illustrate the interplay between value matching effects and network synergy effects. I extend the stylized framework to incorporate revenue from taxing transactions, as well as multi-player games.

Next, this dissertation explores the social networks with information externalities. I investigate the optimal pricing strategies for an online platform facing a chain-structured social network, in which customers sequentially learn about product quality from their predecessors via historical reviews. I illustrate how the platform could use dynamic pricing strategies to make the trade-off between myopic revenue and long-term reputation value. I extend the basic model to incorporate persuasive marketing, quality controls, and duopoly pricing strategies, which turns out to be a flexible framework to support both operational and strategic decision-making.

Finally, this dissertation further studies service systems with both incentive and information externalities. I propose a stylized queueing model, in which customers make joining decisions facing unknown service quality, based on the observable queue lengths. Long queue indicates severe congestions, but also signals good service qualities. I investigate how psychological projection effects impact service systems performance. The results suggest that, the service provider should expect longest queue when the impatient customers overestimate their uniqueness, while the patient customers underestimate their uniqueness.

Optimal policies for hepatocellular carcinoma surveillance

Qiushi Chen, chenqiushi0812@gatech.edu, Georgia Institute of Technology

In my thesis, I study hepatocellular carcinoma (HCC) surveillance problem for patients infected with chronic hepatitis C (HCV). Management of HCC has become an important public health problem worldwide, especially in the United States (US). Studies have shown that the incidence of HCC has tripled between 1975 and 2009 in the US; HCC-related mortality rate has increased by 40% in the past two decades. Moreover, HCC is also associated with a very high disease burden, which is estimated to be $1 billion in the US each year. Thus, better HCC management strategies are strongly desired to improve clinical outcomes and also to improve their cost-effectiveness for the entire society.

One approach is the HCC surveillance for high-risk patients. HCC usually progresses silently, and rarely produces clinical symptoms until advanced stage, at which point the patient has a very limited life expectancy and is too late to be eligible for any curative treatment. Although clinical studies have shown the efficacy of surveillance in the early detection of HCC, no consensus exists on the optimal HCC surveillance policies from the societal perspective. There is an obvious trade-off in choosing the cost-effective screening strategies. On one hand, if an aggressive surveillance policy is implemented, the improvement in survival outcomes could be marginal, and the increasing cost burden may not pay off this marginal survival improvement. On the other hand, if patients do not have sufficient screenings, patients with HCC may fail to be detected in early stages. There is no clear answer to this question. In the HCC management guidelines by several preeminent liver disease associations, different screening intervals are recommended. In the literature, existing modeling studies in HCC surveillance for HCV patients were also limited in several aspects, such as limited number of policies, simple policies with the same fixed screening intervals for all patients, and missing certain patient group at risks.

In this study, we take societal perspective and model the surveillance problem as a sequential medical decision making problem. Our contributions are twofold. From the modeling methodology viewpoint, we propose a novel mathematical modeling framework for surveillance problems, in which disease states are a mix of fully observable and unobservable states, but the intervention decisions only depend on fully observable states. In addition, the modeling framework also allows flexible design of different strategies of changing screening intervals. Moreover, to address the uncertainty of model parameters, we combine robust optimization techniques with our sequential decision model with complicated constraints.

From the application view point, we address the limitations of prior modeling studies for the HCC surveillance policies. We calibrate our model based on detailed parameter estimations. The findings from the analytical and numerical results provide important policy implications. In particular, our results suggest that surveillance with a single fixed interval is not cost-effective; patients with more severe liver disease or in younger ages should have more aggressive screenings.

Qiushi CHEN

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Phone:404-731-2232, Email: chenqiushi0812@gatech.edu

EDUCATION

- **PhD student** (4th year) 2010.8 – present. Industrial and Systems Engineering, Georgia Institute of Technology
- **B.S.**, 2006.9 – 2010.7. Industrial Engineering, Tsinghua University, Beijing, China

EXPERIENCE

Research assistant, Georgia Tech, Atlanta, GA   *2013.1-present*
Research intern, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, PA   *2013 summer*
Advisor: Dr. Turgay Ayer and Dr. Jagpreet Chhatwal

- Modeled the hepatocellular carcinoma surveillance problem for patients with chronic hepatitis C.
- Analyzed the most cost-effective surveillance strategies and compared with routine policies in the guidelines.

Research assistant, Georgia Tech and Emory University, Atlanta, GA   *2011.1-present*
Advisor: Dr. Turgay Ayer and Dr. Christopher R. Flowers (Emory University)

- Calibrated natural history simulation models for follicular lymphoma.
- Developed models to determine the optimal starting time and treatment sequences for follicular lymphoma.
- Developed risk prediction models with clinical factors for diffuse-large B cell lymphoma (DLBCL) patients of different races based on SEER registry data and clinical dataset collected from two hospitals.
- Proposed new risk stratification model for black patients and compared the performance with the existing International Prognostic Index model.
- Performed cost-effectiveness analysis of maintenance and consolidation therapy following the first-line induction therapy for follicular lymphoma patients.

Teaching assistant, Georgia Tech, Atlanta, GA   *2010.8 – 2013.5*

- (ISyE 3044) Simulation analysis (Spring 2011)
- (ISyE 6644) Simulation analysis (Summer 2011)
- (ISyE 2027) Probability with applications (Spring 2012, Spring 2013)
- (ISyE 6000) Introduction to healthcare delivery (Spring 2013, Spring 2014)

PUBLICATIONS

Published or Accepted Papers in Peer-Reviewed Journals
[1] **Q. Chen**, T. Ayer, L. J. Nastoupil, R. Sinha, H. Zhang, C. R. Flowers (2012). Initial management strategies for follicular lymphoma. *International Journal of Hematologic Oncology*, 1(1), 35-45
[2] T. Ayer, **Q. Chen**, & E. S., Burnside (2013). Artificial Neural Networks in Mammography Interpretation and Diagnostic Decision Making. *Computational and mathematical methods in medicine*, *2013*.

Poster Presentations with Published Abstracts
[1] **Q. Chen**, T. Ayer, A. C. Rose, L. J. Nastoupil, C. R. Flowers. Comparing the cost-effectiveness of rituximab maintenance (MR) and radioimmunotherapy (RIT) consolidation therapy following first-line chemo /immunochemotherapies for follicular lymphoma. The 55th American Society of Hematology Meeting. 2013.
[2] **Q. Chen**, T. Ayer, L. J. Nastoupil, C. R. Flowers. Racial disparities in prediction Of 5-year overall survival for diffuse large B-cell lymphoma (DLBCL) patients. The 55th American Society of Hematology Meeting. 2013.

Papers in Progress
[1] **Q. Chen**, T. Ayer, J. Chhatwal. Optimal policies for hepatocellular carcinoma surveillance. 2014.

AWARDS

- **George Fellowship,** Georgia Institute of Technology   *2012-2013*
- **Kiplinger Fellowship,** Georgia Institute of Technology   *2010-2012*
- **Overall Excellence Scholarship, 1st prize,** Tsinghua University   *2009*

COMPUTER SKILLS

C++, Matlab, R, CPLEX, TreeAge.

An Empirical Investigation on E-procurement Continuance in Indian Industries

Ramkumar Maria Arputham, Ph.D Candidate, iitramkumar@gmail.com
Department of Industrial & Systems Engineering
Indian Institute of Technology Kharagpur, India

Extant literature reveals that most of the studies on e-procurement adoption are pertaining to the study of initial acceptance of these enterprise systems. Most prior e-procurement adoption studies have not articulated the differences in user perception between the initial adoption and the continued usage. Where there is considerable research is studying the continuance of hedonic systems, there is little research to empirically test the continuance in enterprise systems context. There have been a couple of approaches to empirically test the continuance of accepted e-procurement systems in organisations: (1) employing existing theoretical perspectives of initial acceptance/ adoption (e.g., Theory of Reasoned Action, Innovation Diffusion Theory, Technology Acceptance Model, Theory of Planned Behaviour) to explore the continued usage behaviour; and (2) building/ extending a new perspective (Expectation-Confirmation Model, Expectation Disconfirmation Model) to explain continued e-procurement usage behaviour. Although these attempts have shed light on the differences between adoption and post-adoption (i.e., continued usage) in IS research, there has been no empirical effort either to compare the different theoretical perspectives in terms of their relative utility for understanding continued E-procurement usage behaviour or to empirically test the extended theory of e-procurement continuance by confirmatory statistical approaches.

Through my research, I seek to inform our understanding on effective usage/ continuance behaviour of e-procurement tools in Indian industries. Through empirical analysis (both comparison of different theoretical perspectives and confirmatory statistical approach of integrated e-procurement continuance model, I will explore and provide insight to important, but unexplored reality of e-procurement continuance in Indian industries. The objective for my research is of threefold. The first objective of is to understand, "Among the different theoretical perspectives of continued IT usage models, which model is most effective in predicting users' continued usage behaviour of accepted e-procurement systems."This study compares the explanatory power of five models (Technology Acceptance Model (TAM), Expectation Confirmation Model (ECM), DeLone and McLean model (D&M), TAM-ECM, TAM-ECM-D&M) in the context of continuance of third party e-procurement systems. This study is one of the first attempts to compare the utility of these prospective continued IT usage models. The second objective of this study is to develop and empirically investigate the expanded model of IT continuance by considering technology-task fit and perceived risk with hybrid TAM-ECM model. The third objective of this study is to empirically investigate the e-procurement adoption success by extending D&M IS success model with Technology-Task fit model.

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Indian Institute of Technology Kharagpur
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Objective

Aspire to be a world renowned academician cum researcher in the field of Management Information Systems.

Research Interests

1) Technology adoption and diffusion
2) Enterprise systems adoption and usage
3) Technology risk, performance and sustainability assessment
4) E-Procurement adoption studies
5) Multiple criteria decision making (ANP, DANP, TOPSIS, VIKOR)
6) Post adoption behavior studies
7) Empirical research with structural modeling approaches

Achievements:

Awards Received: *Received Lelio Raffa Bursary award in 22nd Annual IPSERA Conference, Nantes, France for the paper titled "Sustainable supplier selection through e-procurement – A hybrid MCDM model based on DANP"*

Journal Papers Published:

➢ Ramkumar, M., and Jenamani, M. 2012. "E-Procurement service provider selection – an analytic network process (ANP) based group decision making approach" ***Accepted for publication in Service Science, INFORMS.***

Journal Papers under revision:

➢ Ramkumar, M., and Jenamani, M. "Sustainability in Supply Chain through E-Procurement – An Assessment Framework Based on DANP and Liberatore Score" ***Second round revision in IEEE Systems Journal***.

➢ Ramkumar, M., Schoenherr, T., and Jenamani, M. "Risk Assessment of Outsourcing E-Procurement Services: Integrating SWOT Analysis with a Modified ANP Based Fuzzy Inference System" ***Second round revision in Decision Support Systems, Elsevier.***

Journal Papers under preparation:

➢ "Assimilation of E-Procurement Systems in Firms: The Critical role of Institutional Pressures, Top Management and IT Capability" ***Targeting for Decision Sciences***.

➢ "The Role of Trust and perceived Benefits in E-Procurement Assimilation – An Empirical investigation" ***Targeting for Service Science, INFORMS***

Conference Papers Published:

➢ Ramkumar, M., and Jenamani, M. 2011. "E-Procurement service provider selection – an ANP based approach" accepted for the proceedings of International Conference on Advances in Supply Chain and Manufacturing Management, Kharagpur**.**

➢ Ramkumar, M. 2011. "Barriers in adoption of e-procurement in Indian industries – an interpretive structural modeling (ISM) based approach" Accepted for the proceedings of Fifteenth International Conference of Society of Operations Management, Kolkata.

➢ Ramkumar, M., and Jenamani, M. 2012. "Risk assessment of e-procurement systems adoption - a fuzzy based approach" Accepted for the proceedings of IIE Asian conference, Singapore.

➢ Ramkumar, M., and Jenamani M. 2013. "Sustainable supplier selection through e-procurement – A hybrid MCDM model based on DANP" Accepted for the proceedings of IPSERA conference, Nantes, France.

➢ Ramkumar, M. 2013. " Acceptance of e-procurement in Indian Industries with special reference to third party systems" Accepted for presentation in IPSERA Doctoral Workshop, Nantes, France

Teaching Experiance:

- Lecturer in Srinivas School of Business, Mangalore: 6Months.
- Teaching Assistant for the course Industrial Management, E-Business, Information Systems Laboratory, Computational Laboratory at IIT Kharagpur.

Other Professional Activities:

Reviewer

- Information systems journal, Wiley.
- European journal of operational research, Elsevier.
- Behavior and Information technology, Taylor and Francis.
- ICIMTR2012 conference, Malaysia.
- Academy of Management Annual Conference 2013 and 2014.
- Journal of Enterprise Transformation, Taylor & Francis
- Technovation, Elsevier
- Journal of Electronic Commerce Research

Professional affiliation:

- Association for information systems (AIS) - Special Interest Group on Adoption and Diffusion of Information Technology (SIGADIT), USA.
- Member of Production and operation management society (POMS), USA.
- Member of international society on multiple criteria decision making, USA.

Place: Kharagpur.   **(M. Ramkumar)**

Reut Noham - Curriculum Vitae

Personal:

Address: 12 Kosovski st. Tel-Aviv, Israel.

Year of birth: 1982

E-mail address: reutbons@post.tau.ac.il

Education:

2011-present: **Ph.D. student**, Industrial Engineering, Tel-Aviv University. Fields of interest: Humanitarian logistics, Supply chain management. Advisor: Prof. Michal Tzur

2008-2011: **M.Sc. in Industrial Engineering**, Tel-Aviv University. Summa Cum Laude. Thesis topic: The Single and Multi-Item Transshipment Problem with Fixed Transshipment Costs, under the guidance of Prof. Michal Tzur.

2005-2009**: B.Sc. in Industrial Engineering**, Tel-Aviv University. Summa Cum Laude.

Teaching Experience:

Department of Industrial Engineering, Tel-Aviv University

2009-present   Lecturer in the course: Data structures

                Teaching assistant (tutor) in the courses:

                Analysis of production systems, Introduction to probability, Introduction to Industrial Engineering, Statistical analysis of data, Simulation

                Teaching assistant in the courses:

                Analysis of logistic systems, Applied optimization for engineers

Academic Distinctions, Awards and Scholarships:

- Dean's excellence award : 2007, 2008, 2009
- Ziegler's Scholarship for excellence achievements (undergraduate studies): 2008
- Rector's excellence teaching award for 2009
- Scholarship for excellence achievements (graduate studies): 2010
- Faculty excellence teaching award for 2010, 2011, 2012

Experience and Military Service:

2007-2009: Pre-graduate Industrial Engineer in Hoshen Synergy - Consulting Company, operating in the Israeli finance market, offering consulting services to organizations in the finance sector.

2000-2005: Serving in the Israeli Air Force as a Human resource officer.

Submitted Journal Papers:

Noham, R. and Tzur, M, 2014. The single and multi-item transshipment problem with fixed transshipment costs. Submitted to *Naval Research Logistics*, under revision.

Active participation in scientific meetings

- 16th Industrial Engineering and Management conference, Israel (2010)
- Operations Research Society of Israel (ORSIS) conference, Israel (2010)
- Manufacturing and Service Operations Management (MSOM) conference, Israel (2010)
- 5th National Industrial Engineering and Management research meeting, Israel (2011)
- Operations Research Society of Israel (ORSIS) conference, Israel (2012)
- Operational Research Peripatetic Postgraduate Program (ORP[3]) Austria, (2012)
- 2nd Workshop of the Turkish and Israeli Operations Research Societies (WITOR2), Israel (2013)

Realistic Pre Disaster Planning in Humanitarian Supply Chains

Reut Noham, reutbons@post.tau.ac.il, Tel-Aviv University

In my PhD research, I study the field of humanitarian supply chains. This field deals with the management of logistic operations and supply chains in an environment of natural disasters and other humanitarian crises. Problems in this field are different from "standard" problems in commercial logistics and supply chain management due to the unique characteristics of the environment in which they operate and their special objectives. The environment is characterized by high uncertainty and unreliable or missing information, thus making the problem very complex. In addition, the presence of multiple players with different perspectives results in conflicting objectives. The challenge in this field is to manage and allocate limited resources, as efficiently as possible, so that well defined humanitarian objectives are achieved. The goal is to minimize death and human suffering and recover from a disaster as quickly as possible. To achieve these goals it is necessary to prepare for disasters and efficiently react to them once they occur.

This research focuses on optimizing network design decisions and inventory allocation decisions that are made during the pre-disaster and the disaster stages. A new and unique modeling approach sets out to optimize these decisions by incorporating realistic decisions implemented by the aid providers that are responsible for the rescue operations and by the aid recipients, i.e., the affected population. Incorporating realistic decisions is an essential practical approach since it is observed that in practice these decisions are often made greedily and not according to the results of a global optimal solution. Furthermore, a global optimal solution may be impossible to implement when several decision makers (humanitarian organizations) are operating independently, each with its own vision, resources, and goals.

We develop a mathematical optimization model, which includes special constraints denoted as "*humanitarian constraints*", based on actions observed in practice. These constraints represent the aid providers' behavior and the aid recipients' behavior. Our analysis demonstrates that including realistic decisions in the model may significantly improve the performance of the humanitarian supply chain and therefore it is clearly important to consider them when preparing for a disaster.

Through this research we hope to provide a practical and useful tool and help improving the performance of humanitarian relief operations.

Modeling Pharmaceutical Risk-sharing Agreements

Reza Mahjoub, rmahjoub@ivey.ca, Ivey Business School, Western University

Many new and expensive drugs have been introduced in the past 10 years. However, at the time of introduction, the effectiveness of these drugs outside of clinical trials is often unknown. This creates a risk to third-party payers, as the outcome of these drugs in real-world practice is uncertain at the time of introduction. A pay-for-performance risk-sharing agreement is a type of contract that shares part of this risk with the manufacturer by linking the performance of a drug to the manufacturer's revenue. This dissertation consists of three essays to examine the performance of two types of pharmaceutical pay-for-performance risk-sharing agreements.

In my first essay I examine the performance of a pay-for-performance risk-sharing agreement in which patients are assessed at some evaluation time to determine their response to the drug. The manufacturer rebates to the payer a proportion of the sales from all patients excluding the sales from those responding at the evaluation time. I model disease progression using a continuous time Markov chain with uncertain transition rates. I address the following questions regarding the performance of this agreement: What is the optimum evaluation time and under what conditions will the manufacturer make a profit? What is the distribution of the manufacturer's profit resulting from different sources of uncertainty?

In the second essay I extend the model developed in the first essay to calculate the net monetary benefits of the payer and identify the conditions under which both parties have incentives to introduce the new drug.

The third essay focuses on the analysis of a risk-sharing agreement in which patients are prescribed a drug only if their probability of response lies within a range of success probabilities. The payer determines this range such that the use of the drug is cost-effective. I generalize from the existing literature by allowing the rebate to be different from the price of the drug and incorporating two types of administrative costs. I seek to answer two important policy questions: First, under what conditions does the payer benefit from the agreement? Second, under what conditions does the agreement become welfare-improving?

Curriculum Vitae

Name: Reza Mahjoub

Post-secondary   Western University, London, Ontario, Canada
Education and   2008-2014 Ph.D., Management Science
Degrees:
                       Sharif University of Technology, Tehran, Iran
                       1993-1996 M.Sc., Industrial Management

                       Shiraz University, Shiraz, Iran
                       1979-1986 B.Sc., Electrical & Electronics Engineering

Related Work   Lecturer
Experience   Western University, 2011

                       Teaching Assistant
                       Western University, 2009-2010

Publications:

Mahjoub R, Odegaard F, Zaric GS, Health-based pharmaceutical pay-for-performance risk-sharing agreements, In Press (Published Online, Sep. 11, 2013), *Journal of the Operational Research Society (JORS)*

Zaric GS, Zhang H, **Mahjoub R**, Pharmaceutical risk-sharing agreements and patient access schemes: A review of literature and future directions, *Operations Research and Health Policy*, Springer

Conference Presentations:

1. Health Economic Evaluation of a Pay-for-performance Risk-sharing Agreement, ORAHS, Istanbul, Turkey, July 2013

2. Pharmaceutical Risk-Sharing Contracts, CORS Seminar, Niagara Falls, CA, June 2012.

3. Modeling a Pay-for-Performance Risk-Sharing Agreement. INFORMS Healthcare Seminar, Montreal, CA, June 2011.

4. Modeling a Pay-for-Performance Risk-Sharing Agreement. INFORMS 2010 Seminar. Austin, Texas, USA. Nov. 2010.

5. Modeling a Pay-for-Performance Risk-Sharing Agreement. MITACS/CORS 2010 Seminar. Edmonton, Alberta, CA, May 2010.

6. The AMD Tele-screening Project: Impact on Wait Times and Health Care Costs. CORS-INFORMS Seminar. Toronto, CA. June 2009.

Ruomeng Cui

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EDUCATION

Kellogg School of Management, Northwestern University, Evanston, IL
  Ph.D., **Operations Management**   Sep. 2009 – Jun. 2014 (Expected)
    Advisor: Jan Van Mieghem
    Dissertation: Information Sharing in Supply Chains
  M.Sc, **Operations Management**   Sep. 2009 – Mar. 2013
    Graduate Fellowship, Kellogg School of Management, Sep. 2009 – Jun. 2014

Tsinghua University, Beijing, China
  B.Sc, **Industrial Engineering**   Sep. 2005 – Jul. 2009
    Cumulative GPA: 3.8 / 4.0; Major GPA: 3.9/ 4.0
    Ranked 1st / 66, Department of Industrial Engineering

RESEARCH INTEREST

- Supply Chains, Information Sharing, Forecasting, Empirical Studies in Operations, Inventory Management, Social Media Data in Operations

RESEARCH EXPERIENCE

- Information sharing in supply chains: An empirical and theoretical valuation, under review at Management Science, with G. Allon, A. Bassamboo and J. Van Mieghem.

  - Presented at Stanford Graduate School of Business 2014, INSEAD 2014, HKUST 2013, Wharton Empirical Workshop in Operations Management 2013, MSOM Conference 2013, INFORMS Conference 2013.

- Sharing aggregate inventory information with customers, with H. Shin. Not yet submitted for review.

  - Presented at INFORMS Conference 2013, POMS Conference 2012, INFORMS Conference 2011.

- ConDOI replenishment policy under MMFE demand, with G. Allon, A. Bassamboo and J. Van Mieghem.
- The value of social media data in supply chains: An empirical study, with S.Gallino, A. Moreno-Garcia and D. Zhang.

Professional EXPERIENCE

PepsiCo Inc., Chicago, IL
Consultant, Demand Forecasting Team,   Jun. 2011 – Sep. 2011
- Improved the forecast accuracy of beverage demand by 23% using retailers' operations information – point of sales data and inventory replenishment rules
- The proposed method reduced the inventory cost by millions of dollars and increased the service level

TEACHING EXPERIENCE

Kellogg School of Management, Northwestern University, Evanston, IL
Teaching Assistant
- MBA Core Course, Designing and Managing Business Processes, 2010-2013
- MBA Elective Course, Operations Strategy, 2012-2013
- Ph.D. Course, Foundation of Operations Management, 2011-present

Information Sharing in Supply Chains

Ruomeng Cui, r-cui@kellogg.northwestern.edu, Kellogg School of Management

In my dissertation, the first paper, "Information sharing in supply chains: An empirical and theoretical valuation", empirically assesses the value of sharing downstream sales information in a two-stage supply chain and develop a new theoretical framework that is supported by a real data set. Using the data set collected from a CPG company, I empirically forecast the retailer's orders to the supplier with and without retailers' sales information. Even though the theoretical model in the literature suggests that the value of information sharing should be zero for over half of our studied products, I find that the improvement in the mean squared forecast error ranges from 7.1% to 81.1% across all products. To reconcile the gap between the literature and the empirical observations, I develop a new theoretical model that allows for "decision deviations." While the literature assumes that the decision maker strictly adheres to a given inventory policy, my model allows him to deviate from the policy because of private information that is not observed by the econometrician. Using my new theoretical model, I prove that the decision deviations lead to information losses in demand propagation, resulting in a strictly positive value of downstream information sharing.

The second paper, "Sharing aggregate inventory information with customers", studies a firm that sells vertically-differentiated products in a store and credibly discloses the inventory information either completely or partially. For example, when Apple released the iPad 2, an Apple store shared with customers before they visited the store the total inventory of all iPad 2 devices that the store stocked, but not the inventory of a particular model. This paper explores firms' underlying strategic motivation of this inventory information sharing behavior. Firms face rational customers who have different preferences for various products. The inventory composition of the different products is privy to sellers, but not to customers. By withholding detailed inventory information, sellers could entice more consumers to visit the store in the hope that they might find their desired product in stock. Even if a customer's desired product is sold out, sellers will encourage customers to purchase a less-preferred alternative product. In this manner, sellers can strategically employ inventory information disclosure to attract more customers to their stores and cross-sell their products.

The third paper, "the value of social media data in supply chains: An empirical study", explore how social media information helps sales forecasting. Using (1) daily sales data from an online apparel startup company that primarily advertises on Facebook, and (2) publicly available Facebook posts and the users' comments and likes data, we find a statistically significant improvement in sales forecast accuracy. Our findings also support the observations in the literature that the attention effect and the word-of-mouth effect influence sales differently.

Ana Ruth Beer

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EDUCATION

University of Michigan, Ann Arbor, MI   Expected 05/2015
     PhD Candidate, Technology & Operations, Stephen M. Ross School of Business
Universidad Torcuato Di Tella, **Buenos Aires, Argentina**   2007
     MBA (Specialization in General Management)
Universidad de Buenos Aires, Buenos Aires, Argentina   2004
     B.S.E. and M.S.E Industrial Engineering, School of Engineering

RESEARCH

Research Interests: Behavioral OM, Experimental Design, Collaboration in Supply Chains, Buyer-Supplier Relations, Game Theory.

- "Can Trustworthiness in a Supply Chain be Signaled?", with Hyun-Soo Ahn and Stephen Leider; [1st round R&R at Management Science].
- "The Signaling and Incentive Effects of Supplier Awards", with Hyun-Soo Ahn and Stephen Leider.
- "Sharing the Benefits of Cost Reduction Investments in Long-Term Supplier Relations", with Hyun-Soo Ahn and Stephen Leider.

TEACHING

Stephen M. Ross School of Business, University of Michigan   2012 -2014
- Primary Instructor, OMS 311: Operations Management (Teaching Evaluations 4.7/5.0). Core undergraduate operations management course, 78 students. Taught twice a week; designed activities and material; guided projects; held office hours.
- Teaching Assistant MBA Courses: Business Statistics, Applied Business Analytics.

School of Engineering, University of Buenos Aires   2003 – 2006
- Primary Instructor, Economical Engineering I (Undergraduate course in Accounting and Costs for Engineers)

CONFERENCE PRESENTATIONS

INFORMS Annual Meeting, November 2011. Charlotte, NC.; ***Behavioral Operations Conference***, June 2012. University of Maryland. Washington D.C.; ***MSOM Conference***, June 2012. Columbia University. New York, NY.; ***INFORMS*** *Annual Meeting*, October 2012. Phoenix, AZ.; ***MSOM Conference***, July 2013. INSEAD. Fontainebleau, France.; ***INFORMS*** *Annual Meeting*, October 2013. Minneapolis, MN.

Collaboration in Supply Chains: Design and Effects of Non-Contractual Mechanisms

Ruth Beer - ruthbeer@umich.edu - **University of Michigan, Ross School of Business**

As many companies and organizations gain global presence, buyer-supplier relationships become a very important topic in Operations Management. From both buyers' and suppliers' perspectives, the success of a supply chain relies on how well these relationships are managed. Contracts and mechanisms which are based on non-cooperative game theoretic models (e.g., zero-sum games), often result in poor outcomes such as poor quality and non-conformance, and hurt buyers and suppliers instead of helping them.

Building on game-theoretic frameworks, earlier work in this area has focused mostly on designing contracts that can achieve coordination of the supply chain. In practice, however, not all important aspects of a relationship can be contemplated in a contract. For example, desired quality or service level may be hard to specify. The supplier's expected reaction in the case of an unforeseen event, like a natural disaster, may also be hard to predetermine in advance. It is particularly in these cases when the nature and continuity of a relationship matter the most. My research focuses on non-contractual aspects of buyer-supplier relationships. I develop behavioral models to analyze industry practices that enhance collaboration in a supply chain, and then test the theoretical models with laboratory experiments.

The three chapters of my dissertation identify actions that can be taken by buyers and suppliers to improve the relationship and promote a more efficient supply chain. My three studies answer questions that are important in understanding and designing successful buyer-supplier relationships: How can a buyer identify trustworthy suppliers? How should the buyer reward good suppliers? In which cases should the company invest in developing a long-term relationship with suppliers? I show that higher profits and efficiency can be obtained when 1) suppliers make an upfront buyer-specific investment to signal that they are trustworthy, 2) when buyers reward good suppliers with private symbolic awards, and 3) when suppliers share the benefits of cost reduction investments with long-term partners.

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Education

Ph.D. (2013-Present): Operations Management, University of Alberta, Alberta, Canada

M.Sc. (2009-2011): Industrial Engineering, Tehran Polytechnic, Tehran, Iran

B.Sc. (2004-2008): Industrial Engineering, Isfahan University of Technology, Isfahan, Iran

Research Interests

- Sequencing & Scheduling
- Healthcare systems optimization
- Business analytics
- Operations research: Mathematical programming, Approximation algorithms, Algorithm design, Heuristic algorithms

Publications

Text Books:
- Translation of "Scheduling – Theory, Algorithms, and Systems" By Michael L. Pinedo, with Professor M.H. Fazel Zarandi, Amirkabir University of Technology Publication, 2012

Journal Papers:
- S. Abolfazl Soltani, Behrooz Karimi, "Cyclic hybrid flow shop scheduling problem with limited buffers and machine eligibility constraints", (Submitted to International Journal of Advanced Manufacturing Technology)

Conference Presentations:
- S. Abolfazl Soltani, Amir Kamali, S.M.T. Fatemi Ghomi, "Maximizing the net present value of a single machine scheduling problem with earliness and tardiness penalties", 22nd Int. Conf. on Flexible Automation and Intelligent Manufacturing (FAIM2012), Helsinki-Finland, June 2012

- S. Abolfazl Soltani, Behrooz Karimi, "Cyclic hybrid flow shop scheduling problem with limited buffers and machine eligibility constraints", (Accepted and will be presented in 25th Production and Operation Management Society Conf. (POMS2014), Atlanta, GA, USA, May 2014)

Pattern-driven optimization approach for service industries

S. Abolfazl (Mohamad) Soltani, soltani@ualberta.ca, University of Alberta

In my thesis, I will focus on finding optimal solution or an approximation of this for problems in various service industries. My approach will be based on surveying some patterns in available data or exploring some expected patterns in optimal solution. Finding such pattern will help us to reduce the search space in one direction, and in another way will make it easier to apply such pattern-based solution in the application.

This thesis may include three different service sectors. The first one, which I am currently working on, is health care appointment scheduling. The second one, which is finalized, but in its initial phases yet is Intensive Care Units' (ICU) capacity planning. And the final one, which is currently just an idea would be something related to airport and airline industries.

Here is some introduction to the first section of my thesis. This part includes the problem of scheduling appointments in outpatient clinics. The performance of an appointment scheduling policy is negatively affected by the presence of no-shows, which lead to a low utilization of the provider. To overcome this problem, clinics affected by no-shows adopt overbooking, which consists of scheduling more patients than the capacity would allow. However, overbooking may lead to patient waiting time and provider overtime.

Most existing works in appointment scheduling focus on one server system with deterministic service time, which is usually equal to the slot length. In this thesis, we are considering multiple server system with stochastic service times. The difference between the already studied problem and this one explicitly shows how hard would be to find the optimal solution for this case. Therefore, besides introducing some new mathematical formulation for this problem which will cover all its sophisticated specification we will focus on finding some properties for the optimal solution. These properties would be based on the pattern we would see in our data for small instances, and also finding some other helpful tricks that can help us to make the search space smaller. We will tackle this problem using analytical and optimization techniques.

Şafak Yücel

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Education

The Fuqua School of Business, **Duke University**

Ph.D. in Operations Management   2011-Present
- Advisors: A. Gürhan Kök, Kevin H. Shang
- The Fuqua School of Business Doctoral Student Fellowship

Boğaziçi University, İstanbul, Turkey

B.S. in Industrial Engineering   2006-2011
- Dean's High Honor List
- Ranked 55th out of 1.6 *million* students in the University Entrance Exam

Research Interests

Renewable Energy
Sustainable Operations
Supply Chain Management

Working Papers

Kök, G., K. Shang, Ş. Yücel. 2013. Impact of electricity pricing policy on renewable energy investments.

Chen, L., K. Zhu, Ş. Yücel. 2013. Improving DVD-by-mail operations with accurate forecasts.

Work Experience

National Renewable Energy Laboratory, CO, USA

Global Energy Challenges Graduate Intern   May 2013-August 2013
- Analyzed the impact of electricity rate design on renewable energy investments of the utility firms

Teaching Experience

Duke University

Supply Chain Management (Instructor)
- MEM Program, Spring 2014

Operations Management (Teaching Asistant)
- MMS Program, Spring 2012, 2013 (Instructor: Kevin Shang)
- TA Evaluation 4.95/5.00 (N=21)

Supply Chain Management (Teaching Assistant)
- MBA, MEM Programs, Fall 2013, Spring 2013 (Instructor: Li Chen)

References

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Impact of Electricity Pricing Policy on Renewable Energy Investments

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Policymakers have been actively using various promotion policies to increase renewable energy investments. More recently, two emerging trends influence investments in renewable energy: the new entrants of investors due to market restructuring and the transition from flat pricing to peak pricing for residential customers. In this thesis, I investigate the impact of pricing policy on renewable energy investments from the perspectives of different investors: traditional utility firms, independent power producers (IPPs) and distributed generators (DGs). For each scenario, I characterize the conditions under which either flat pricing or peak pricing leads to a higher investment level. The results suggest that, flat pricing leads to a higher level of renewable energy investment when the investment is undertaken by the utility firm or the IPP. This result is driven by the characteristics of the generation pattern and intermittency of renewable energy in relation to the electricity demand pattern throughout the day. Moreover, carbon emissions related to electricity generation is lower under flat pricing. I verify these results by using electricity generation and demand data from the state of Texas. I also explore the effect of direct (e.g., tax credit) and indirect (e.g., carbon tax) subsidies on the investment level and carbon emissions. I show that both types of subsidies will reduce the emission level but indirect subsidies may discourage renewable energy investments.

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EDUCATION:

- **PhD, Industrial and Systems Engineering, Texas A&M University, College Station**
  <u>Expected Completion Date :</u> August 2014
  <u>Research Area:</u> Stochastic Programming Algorithms for Integer Problems, Large Scale Optimization
  <u>Domain:</u> Supply Chain Management and Air Traffic Flow Management

- MS, Industrial and Systems Engineering, Texas A&M University, College Station   May'03
  (Focus Area: SCM, OR, Statistical Modeling, Inventory Control)

- BE, Production Engineering, PSG College of Technology, India   May'98

WORK EXPERIENCE
(Nine Years of Industry Work Experience) :

- Functional Consultant, **JDA Software**. (SCM, Logistics, Pricing and Revenue Management).
- Operations Research Analyst, **Hewlett Packard**. (Consumer Support and Repair Centers planning).
- OR Consultant, **Tech Mahindra**. (Air Traffic and SCM).

PUBLICATIONS:

1. Beier E., **Venkatachalam S.**, Leon J., Ntaimo L., "Nodal Decomposition-Coordination for Stochastic Programs with Private Information Restrictions," *IIE Transactions, under second review.*

2. Beier E., **Venkatachalam S.**, Ntaimo L., and Corolli L., "Stage- and Scenario-Wise Fenchel Decomposition for Stochastic Mixed 0-1 Programs with Special Structure," *European Journal of Operational Research, Submitted.*

3. Corolli L., Lulli G., Ntaimo L, and **Venkatachalam S.**, "A Two-Stage Stochastic Integer Programming Model for Air Traffic Flow Management," *IMA Journal of Management Mathematics, Submitted.*

4. **Venkatachalam S.**, Wong F and Uyar E., "Advertisement Placement Optimization in Radio Broadcasting," *Submitted.*

5. **Venkatachalam S.**, Narayanan A., Lawrence B., and Nepal B., "Efficient Heuristic for Auto-Carrier Loading Problem," *Working Paper, Target Submission Date: June'14*.

6. **Venkatachalam S.**, Narayanan A., "Effective Heuristics for Multi-Item Single Source ordering problem with Transportation Cost," *Working Paper, Target Submission Date: Aug'14*.

ACADEMIC CONFERENCE PRESENTATIONS: Nine Conference Presentations.

ALGORITHMS FOR STOCHASTIC INTEGER PROGRAMS USING FENCHEL CUTTING PLANES

Saravanan Venkatachalam, saravanan@entc.tamu.edu, Texas A&M University

In my thesis, I study and develop algorithms for solving stochastic programing models with applications in supply chain management and logistics operations. Globalization has reduced the cost of operations for companies; however it has brought in more uncertainty in terms of performance and coordination. Advancements of mathematical modeling algorithms with the advent of good computing power have made decision making under uncertainty an important asset for the decision makers. Many applications in operations (like supply chain management, telecommunications, air traffic flow management, consumers support etc) can be modeled effectively as integer stochastic models to include uncertainties in decision making. However, scalability of integer programs in stochastic setup often prove prohibitive. My research aspiration is to develop scalable algorithms in the field of stochastic integer models for operations management. Handling randomness by samples and requirement of integer decisions necessitates the use of decomposition procedures even for a problem instance of moderate size. My research work involves developing algorithms for stochastic integer problems with binary first-stage ('here and now') and integer second-stage recourse decisions. The application of the algorithm include (which are my working papers) 'Tactical Supply Chain Planning during New Product Introduction,' and 'A Two-Stage Stochastic Integer Programming Model for Air Traffic Flow Management,' based on our work for Milan Airport. In the first part, we study the use of stochastic integer programming model for tactical planning for inventory and supplier management during new product introduction phase. Products in certain market exhibit high uncertainty in demand before their launch into the market (products like electronic, cosmetics), however inventory for repair centers and customer support centers are to be planned before the launch date. I study the use of stochastic integer programming models in such instances, where samples are generated to speculate and observe the randomness in the product's demand and further used in decision making process. Also, we study the use of stochastic integer programming models for air-crafts operations planning based on the uncertainties in capacities for sector, departure and arrival airports. We used real time data from Milan airport for our study. Apart from these I also study the use of stochastic integer programming for transportation decisions.

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Education

Ph.D. Candidate in Supply Chain and Operations Management, McCombs School of Business, The University of Texas at Austin, US, 2010-Present.

M.Phil. in Operations Management, Stern School of Business, New York University, US, 2007-2009.

M.S. in Operations Management, Universidad de Chile, Chile, 2005 (graduated with Highest Honors).

B.S. in Industrial Engineering, Universidad de Chile, Chile, 2003 (graduated with Highest Honors).

Published Papers

"Solving a Real Life Technician Dispatch Problem using Branch and Price and Constraint Programming" with Cristián E. Cortes, Michel Gendreau, Louis M Rousseau and Andres Weintraub. Forthcoming. European Journal of Operational Research.

"A Robust Optimization Approach to Dispatching Technicians under Stochastic Service Times" with Fernando Ordóñez, Cristián E. Cortes and Andrés Weintraub (2012). Optimization Letters 7 (2013), 1549-1568.

"Scheduling the Chilean Soccer League by Integer Programming" with Guillermo Durán, Mario Guajardo, Jaime Miranda, Denis Sauré and Andrés Weintraub. Interfaces 37 (2007), 539-552.

"Branch-and-cut for a real-life highly constrained soccer tournament scheduling problem" Thiago F. Noronha, Celso C. Ribeiro, Guillermo Duran, and Andrés Weintraub. Lecture Notes in Computer Science 3867 (2007), 174-186.

Working Papers

"Diffusion Networks of Residential Solar Panels" with Varun Rai.

"Scheduling Ads in Television Programming" with Sridhar Seshadri and Sriram Subramanian.

"A Robust Optimization Approach to Scheduling Ads in Television Programming" with Sridhar Seshadri and Sriram Subramanian.

"Locomotive Assignment Problem" with Anant Balakrishnan and Kevin Crook.

Other Publications

"A Robust Optimization Approach to Dispatching Technicians Under Stochastic Service Times" with Fernando Ordóñez, Cristián E. Cortés and Andrés Weintraub. Proceedings of TRISTAN IV, 2007.

"Branch-and-cut for a Real-life Highly Constrained Soccer Tournament Scheduling Problem" with Guillermo Durán, Thiago F. Noronha, Celso C. Ribeiro, Andrés Weintraub. Proceedings of PATAT, 2006.

Three essays in Optimization and Statistical Inference

Sebastian Souyris, ssouyris@utexas.edu, The University of Texas at Austin

Locomotive Assignment Problem: One of the most important operational decisions that freight railroad companies make is how to assign locomotives to weekly train schedules such that operational costs and schedule changes are minimized. This problem is NP-Hard, and even though the operations research literature is rich in mathematical formulations and solutions methods, it is still a challenging problem to solve. In this essay, I use math programming techniques to solve the locomotive assignment problem faced by one of the largest freight railroad networks in North America. The main contributions are that my model and algorithms allow explicit delays, include new operational constraints, and solve near to optimality real world instances in short time.

A Robust Optimization Approach to Scheduling Ads in Television Programming: In this essay, I address a revenue optimization problem faced by a cable television network with nationwide viewership in the United States. A major source of revenue for the network is through placement of advertisements, or *ads*, within their programming. I develop a robust optimization model that produce ads schedules that make the best use of the stochastic viewership. The robust solutions provide to the network a significant revenue increase in comparison to the nominal model solutions obtained by using point forecast of the viewership.

Diffusion Networks of Residential Solar Panels: Installations of PV systems in the United States have grown rapidly in the last few years, thanks mainly to federal and state/local level incentives. Government support for PV diffusion is on the decline, though. Simultaneously, lower electricity prices in several parts of the U.S. owing to low natural gas prices have further pressured the continued penetration of PV. On the other hand, PV installation costs have come down dramatically (%50 in the last 5 years). How do these policy shifts and price dynamics impact the diffusion of PV? In particular, amidst these shifts how should utilities rethink their solar programs and how should solar companies re-orient their marketing strategies to achieve maximum solar diffusion under budgetary constraints? A better understanding of these issues may be used to design solar programs that are tailored to target specific segments of the population, and to direct customer acquisition efforts of the developers. To address these questions, I study the Texas residential PV market, which has one of the highest untapped growth potentials in the U.S. I present a spatial-temporally resolved dynamic model that permits the exploration of the joint effects of policy and markets shifts on the diffusion of PV. Specifically, I propose a novel *point-process approach* that characterizes the most influential factors in PV diffusion at a consumer disaggregated level.

Resume:

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Education:

- ❖ PhD in Industrial Engineering, Iowa State University, Ames, IA, USA   08/2012- present
- ❖ MS in Industrial Engineering, Sharif University of Technology, Tehran, Iran, 07/2012
- ❖ BS in Industrial Engineering, AmirKabir University of technology, Tehran, Iran, 09/2009

Journal Publications:

Published papers

1. M.H. Fazel Zarandi, A. Haddad Sisakht, S. Davari, (2011), "Design of a Closed Loop Supply Chain (CLSC) model using an interactive fuzzy goal programming.", *International Journal of Advanced Manufacturing Technology* Vol. 56 (5-8), 809-821
2. M.H. Fazel Zarandi, S. Davari ,S. A. Haddad Sisakht, (2011), "The Large Scale Maximal Covering Location Problem", Scientia Iranica, Transactions E: Industrial Engineering, doi: 10.1016/j.scient.2011.11.008
3. M.H. Fazel Zarandi, S. Davari , A. Haddad Sisakht (2011), "Design of a reliable hub-and-spoke network using an interactive fuzzy goal programming" IEEE International conference on fuzzy System. 2955 – 2959
4. M.H. Fazel Zarandi, S. Davari ,S. A. Haddad Sisakht (2011) "The Q-coverage multiple allocation hub covering problem with mandatory dispersion" Scientia Iranica
5. M.H. Fazel Zarandi, S. Davari ,S. A. Haddad Sisakht (2011) "The large-scale dynamic maximal covering location problem", Mathematical and Computer Modeling,

Under Review

1. M.H. Fazel Zarandi, S. Davari ,S. A. Haddad Sisakht (2011) "Simulated annealing for the hierarchical single allocation hub median location problem", Applied Soft Computing.

Working Papers

1. S. Haddad Sisakht, S. Ryan, "Design of a closed-loop supply chain network for multiperiod uncertain demands and qualities of returns"
2. S. Haddad Sisakht, S. Ryan, "Robust Optimization for closed-loop supply chain under periodic demand and carbon tax uncertainties"
3. S. Haddad Sisakht, H. Shavandi, "A dynamic model for reliable inventory systems with multiple types of remanufacturable products"

Professional Experience

- Research Assistantship in Iowa State University, Ames, IA, USA   08/2012 - Present
- Researcher in Iranian Research Organization for Science and Technology (IROST) (Tehran-Iran)   11/2010-11/2011
- Strategic planning for Institut Pasteur of Iran, Tehran, Iran   2/2012- 5/2011

Robust optimization for closed-loop supply chain under periodic demand and carbon tax uncertainties

SeyyedAli HaddadSisakht, alihadad@iastate.edu, Iowa State University

In my thesis, we design a closed-loop supply chain (CLSC) network that encompasses periodic flows and activities in both directions forward and reverse flow. The design is subject to uncertainty in demands for both new and returned products. We also studied a model structure that accommodates carbon tax policy as an environmental regulation over carbon emissions for which the resulting solution is robust to the uncertain carbon tax rates. Moreover, the main contribution includes deciding on the number of unit transportation modes while considering adjustability in decision variables for using past information and implementing less conservative model. Adjustability of transport capacity to uncertain tax rates is reasonable since different modes have various gas emission rates.

To reduce the negative environmental consequences from supply chains, legislation and social positions have been motivating companies and managers to plan their structures and find ways to handle both forward and reverse product flows. The back flows include the recycling or manufacturing of returned products that occur due to commercial and consumer returns, and etc.

With concern over global climate change, regulations over carbon emission resulting from industries such as transportation and power generation in different nations have been developed by policy-makers. If the US is going to reduce its emissions of GHG, most environmental policy analysts agree it must use market-based environmental mechanisms that provide incentives for emission reduction; for example, by putting a price on GHG emissions. The two main market-based options are a carbon tax and a cap-and-trade system of tradable permits for emissions. The market-based approach has been proven effective in controlling sulphur dioxide in the US and, elsewhere, to reduce the carbon emissions.

According to a survey 28 percent of CO_2 emissions have been generated by transportation activities in 2011. International trade liberalization contributes to significantly larger transportation of products in supply chain globally. These trades include different modes of transportation where among them road transportations have much higher proportion of GHG emissions. One approach to mitigate the inverse environmental effects of freight transportation, particularly CO_2 emissions would be decisions concerning the choice of modes with variable emission rates, capacities, and costs. Finding out how historical emission rates would affect the choice of modes and product flows while minimizing the overall cost is worth inspecting. Considering that, we assume the choice of modes is linearly dependent on the carbon tax in our network design.

Shaokuan Chen

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Jindal School of Management (SM 30), The University of Texas at Dallas

Education

Jindal School of Management, The University of Texas at Dallas, Richardson, TX   2011–Present
Doctoral Studies in Operations Management

School of Mathematical Science, Fudan University, Shanghai, China   June 2010
Ph.D., Mathematics

School of Mathematics and System Science, Shandong University, Jinan, China   June 2005
B.S., Mathematics

Research

Published Papers

- Feedback Stackelberg Solutions of Infinite-Horizon Stochastic Differential Games, (with A. Bensoussan and S. P. Sethi), *Models and Methods in Economics and Management Sciences*, Fouad El Ouardighi and Konstantin Kogan (Eds.), Series 6161, Vol. 198, pp. 3–15, 2014.

Paper under review

- The Maximum Principle for Global Solutions of Stochastic Stackelberg Differential Games, (with A. Bensoussan and S. P. Sethi), submitted to *SIAM Journal on Control and Optimization.*

Working Papers

- Optimal Policies for Assembly Systems: Completing Rosling's Characterization, (with A. Muharremoglu, W. T. Huh and G. Janakiraman).

ESSAYS IN OPERATIONS MANAGEMENT

Shaokuan Chen, shaokuan.chen@utdallas.edu, The University of Texas at Dallas

Below I briefly summarize two current papers in my thesis.

1. *Optimal Policies for Assembly Systems*: We consider an assembly system, where multiple components are assembled into a final product. The assembly process may involve several steps and may involve subassemblies. Rosling (1989) studies the problem of finding an inventory policy that minimizes the expected discounted sum of holding and shortage costs over an infinite horizon. The optimal policy is characterized as a balanced echelon base stock policy, assuming that the initial state of the system possesses a certain property referred to as "long-run balance". Rosling achieves this by showing that when the initial state of the system is in long-run balance, the assembly system can essentially be converted to a serial system. If the long-run balance assumption is not satisfied, this equivalency result does not hold, as shown in Schmidt and Nahmias (1985) for a two-stage assembly system with only two components.

   We characterize the optimal policy starting with any arbitrary initial state, thereby completing the optimal policy description of Rosling (1989). The optimal policy is a balanced echelon base stock policy again, but with dynamically evolving echelon base stock levels. The approach utilized here is first decomposing of the assembly system into a series of single-kit problems, and then constructing the aggregated policy for the overall system if we optimally operate all the kits. The results in Rosling (1989) and Schmidt and Nahmias (1985) are also recovered.

2. *Stochastic Stackelberg Differential Games*: For stochastic Stackelberg differential games played by a leader and a follower, there are several solution concepts in terms of the players' information sets: feedback, open-loop, closed-loop memoryless, and closed-loop information patterns. For feedback Stackelberg equilibria, we derive the necessary and sufficient condition via dynamic programming, which gives rise to a system of elliptic partial differential equations involving a static Stackelberg game at the level of Hamiltonian. For solutions under the adapted closed-loop memoryless information structure, we derive the maximum principle based on the recent development in the theory of controlled forward-backward stochastic differential equations. As special cases, we study linear quadratic Stackelberg games under both adapted open-loop and adapted closed-loop memoryless information structures, as well as the resulting Riccati equations.

Inventory Management in Humanitarian Operations

Tezar Saputra, t.y.saputra@vu.nl, VU University Amsterdam, The Netherlands

There are more than seven thousand disasters, between the years 1999 and 2008, occurred with over 2.6 billion people reported to be affected by these disasters and almost half of this number was reported to have lost their life. In the future, the occurrence and impact of disasters are expected to increase around fivefold. Humanitarian organizations have to perform effective disaster relief to reduce the impact of these disasters. Therefore, it is crucial for humanitarian organizations to establish effective logistics systems.

The effectiveness of humanitarian organizations to establish effective logistics systems is highly dependent on their ability to manage inventories successfully. Inventory management in humanitarian operations can be defined as the overseeing and controlling of the ordering, storage and use of emergency supplies. By having relevant emergency supplies in their stock when a disaster strikes, humanitarian organizations can respond immediately to aid people made vulnerable due to the disaster. In the other words, it can be an effective mechanism for minimizing human suffering due to lack of supplies by improving emergency supplies availability.

The focus of my research is to develop inventory policies and decision support tools that integrate the aspects related to inventory management in inventory management in humanitarian operations. According to my preliminary research, there are at least six relevant aspects that will be highlighted in my research to improve the operations performances (e.g., increasing operations service level and decreasing total operational cost): (1) the effect of funding systems to inventory management in humanitarian practice, (2) managing inventory of items to run different humanitarian programs (i.e., disaster relief and development aid programs) at the same time, (3) multiple stages of disaster management (mitigation, preparedness, response, and recovery), (4) shared and coordinated inventory, (5) choice of transport modality, and (6) the end-of-shelf life policy (e.g.., disposal and donation).

A system dynamics and simulation approach is used, in order to describe and analyze the impact of the aforementioned aspects to the inventory management for humanitarian operations. The results of these approaches are expected to improve the performance of humanitarian operations by identifying proper inventory policies that incorporating the related aspects. Next to these approaches, I will design decision support tools in spreadsheet platform to provide and illustrate the information related to the inventory policies in humanitarian aid operations to humanitarian actors. The objective of this tool is to better support humanitarian practice.

Tianqin Shi

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Education

- Ph.D., Process Management, University of Illinois at Urbana-Champaign (UIUC), expected June 2015.
  - Research Interests: Product Design and Sustainable Operations
- M.S., Management Science and Engineering, Shanghai Jiao Tong University (SJTU), March 2010.
  - Thesis: Product Line Design and Pricing Considering Consumer Preferences and Perception
- B.S., Mathematics and Applied Mathematics, SJTU, July 2007.

Current Projects

- Tianqin Shi, Wenjun Gu, Dilip Chhajed and Nicholas C. Petruzzi (2013). "Effects of Remanufacturable Product Design on Market Segmentation and the Environment", *Decision Sciences*. Accepted.
- Tianqin Shi, Dilip Chhajed and Zhixi Wan (2014). "Manufacturing-Remanufacturing Operations and Inter-Divisional Coordination in a Closed-Loop Supply Chain". Working paper.
- Tianqin Shi and Dilip Chhajed (2014). "Joint control of production and inventory for remanufactured products and components". In preparation.

Research Assistant

- "Price Change and Price Dispersion in Crop Markets in India" funded by ADM Institute for the Prevention of Postharvest Loss, UIUC (current), with Dilip Chhajed.
- "The Sourcing Hub And Upstream Supplier Networks" (2011), with Anupam Agrawal
- "Happiness from Busyness" (2008), with Christopher K. Hsee

Teaching Assistant

- BADM 335 Supply Chain Management Basics
- BADM 375 Business Process Management
- BADM 567 Process Management
- BADM 572 Statistics for Management Decision Making

Award

- UIUC Conference Travel Awards for Graduate Students, Fall 2012; Fall 2013
- IPC Financial Award, INFORMS Conference on Business Analytics and Operations Research 2012
- Academic Scholarship of SJTU: 2008, 2009
- Excellent Academic Scholarship of SJTU: 2005, 2006

Three Essays on Remanufacturing Operations: Market Segmentation and the Environment, Production and Inventory Management, and Inter-Divisional Coordination

Tianqin Shi, tshi3@illinois.edu, University of Illinois at Urbana-Champaign

1   In my thesis, I study how market segmentation, inventory control and inter-divisional
2   coordination interact with remanufacturable product design. In the first essay, I analyze the
3   effect of remanufacturable product design on market segmentation and trade-in prices by
4   studying a two-stage profit-maximization problem in which a price-setting manufacturer can
5   choose whether or not to open a remanufactured-goods market for its product. By identifying
6   the condition under which it is optimal for a manufacturer to design a remanufacturable
7   product, I find that entering a remanufactured-goods market in and of itself does not
8   necessarily translate into environmental friendliness. Meanwhile, external restrictions imposed
9   on total greenhouse gas emissions draw criticism in their own right because they risk stifling
10 growth or reducing overall consumer welfare. Given these trade-offs, I therefore develop and
11 compare several measures of environmental efficiency and conclude that emissions per
12 revenue can serve as the best proxy for emissions as a metric for measuring overall
13 environmental stewardship. In the second essay, I study the optimal control of inventory when
14 a remanufacturer faces lead-time sensitive customer demand for both finished remanufactured
15 goods and remanufactured components. Stochastic customer demands can be fulfilled by
16 either remanufacturing returned goods at a low cost or purchasing new components from
17 outside suppliers at a high cost. In particular, the unit profit of an individual remanufactured
18 component is much larger percent-wise than that of a completed remanufactured product.
19 Given this, the remanufacturer maximizes its profit by determining the optimal inventory level,
20 sales quantity of remanufactured goods and components, and purchase quantity from external
21 suppliers in each period. In the last essay, I investigate the consequences of decentralization of
22 manufacturing and remanufacturing operations within a firm and how to achieve firm
23 coordination through inter-divisional incentive mechanism. Specifically, I consider a supply
24 chain with a firm consisting of two divisions and a retailer. Within the firm, one division is
25 responsible for designing and manufacturing new products while the other division is
26 responsible for remanufacturing operation. I study the impact of decentralization on product
27 design, pricing, and profitability and show that decentralization and divisional conflict not only
28 results in less firm profit and product sales but also creates hurdle on remanufacturable
29 product design. Thus, I suggest an inter-divisional incentive mechanism to facilitate
30 coordination between two profit-maximizing divisions. I demonstrate that through the two-part
31 coordination scheme (transfer price and a fixed lump sum), a decentralized firm can achieve
32 first-best total profit and product quantity; additionally, the manufacturing division has more
33 incentive to design new products to be remanufacturable.

Control and Optimization of Biomanufacturing Systems

Tugce Martagan (martagan@wisc.edu), Industrial and Systems Engineering, University of Wisconsin-Madison

In my dissertation, I develop stochastic models to improve manufacturing efficiencies, reduce lead times and lower costs in the biomanufacturing industry. Biomanufacturing operations use live systems, such as bacteria or mammalian cells, to manufacture the products of interest (i.e., typically proteins and antibodies for cancer treatment). Use of live systems makes modeling and optimization of biomanufacturing operations extremely challenging. At each step of the process, yield, throughput and quality of the individual production runs are subject to significant variability, and stochastic failures occur due to process uncertainty and quality constraints. In my research work, we collaborate with several biomanufacturing companies to understand their operational challenges, and develop stochastic models/decision support systems to improve their operations. Our approach integrates (i) the uncertain characteristics of the live systems used in biomanufacturing processes, (ii) the engineering knowledge about manufacturing systems and scheduling, and (iii) the mathematical foundations of stochastic control and optimization.

Biomanufacturing typically consists of two major steps: upstream processes where cell cultures secrete proteins, and downstream operations to purify these proteins. My dissertation consists of three chapters, studying upstream operations, downstream operations, and storage/transportation decisions in the biomanufacturing industry. In particular, I develop models based on Markov decision processes to evaluate trade-offs related to random batch quality and stochastic yield in a cost-minimizing framework. A key characteristic of these models is that they combine stochastic models for cell-level dynamics with optimization models to improve operational decisions. These operational decisions involve optimum condition-based maintenance and replacement policies to minimize the total operating costs (Chapter 1), optimum selection and scheduling of purification equipments to minimize total costs (Chapter 2), and optimum storage and transportation decisions when the batch yield and quality are uncertain (Chapter 3). Using data from our industrial partners, we compare the performance of these optimal policies with the current practice. Our analysis shows that biomanufacturing facilities could improve their profitability by 20% through our proposed framework. Feedback from our industrial partners suggests that our insights are likely to transform biomanufacturing practice.

Attending the Doctoral Colloquium will provide me a unique opportunity in exchanging ideas with academicians. Their invaluable insights will provide me a beneficial roadmap for a smoother transition from being a doctoral student to becoming an academician. I am looking forward to participating in the colloquium .Thank you for your time in reviewing my application.

Tugce G. Martagan

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Education

2010 - Present **University of Wisconsin-Madison**

Ph.D. Candidate in Industrial and Systems Engineering

Dissertation: *Control and Optimization of Biomanufacturing Systems*

2008 - 2010 **Mississippi State University**

M.Sc., Industrial and Systems Engineering (with specialization in Operations Research)

Thesis: Game Theoretic Analysis of an Inventory Problem with Product Substitution, Random Yield and Stochastic Demand

2003 - 2008 **Sabanci University,** Istanbul, Turkey

B.Sc., Manufacturing Systems Engineering

Publications

Martagan, T., Eksioglu, B. 2013. Game Theoretic Analysis of an Inventory Problem with Product Substitution, Random Yield and Stochastic Demand. *International Journal of Inventory Research*, Vol. 2, pp.27-43.

Martagan, T., Krishnamurthy, A., Maravelias, C. 2013. Optimal Condition-Based Harvesting Policies for Biomanufacturing Operations with Failure Risks. *Submitted*.

Martagan, T., Krishnamurthy, A., Leland, P. 2014. Optimal Protein Purification Strategies based on Quality-Yield Tradeoffs in Biomanufacturing. *Submitted*.

Martagan, T., Krishnamurthy, A., Leland, P., Maravelias, C. Dynamic Allocation of the Limited Refrigerator Space for Small Scale Biomanufacturing Companies. *Article in Preparation*.

Industrial Projects

- Fiskars Inc., Cost Models to Support Reshoring and Manufacturing Initiatives in the U.S. (Spring 2014).
- John Deere, Improving Production and Material Flow in the Fabrication Department (Spring 2013).
- Hy-Vee Inc., Strategic Implications and Business Case for Warehouse Automation (2010-2012).
- Toshiba Corporation, Life Cycle Assessment Project. Internship at Kawasaki, Japan (Summer 2007).

Honors & Accomplishments

- 1st Prize in Ratner Project Competition, University of Wisconsin-Madison, Spring 2011 and Spring 2013.
- Outstanding Master of Science Student Award, Mississippi State University, 2010.

Media Citations

- Madison Biotech Supplier Goes Lean to Stave Off Foreign Competitors. Published at Xconomy (2014).
- Company Feature: Aldevron. Published by the Wisconsin Economic Development Corporation (2014).

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EDUCATION

Ph.D. in Business Administration, University of Minnesota   Expected, 2015
>   Concentration: Supply Chain and Operations
>   Advisor: Kingshuk K Sinha

Master of Science, University of Minnesota   Expected, 2014
>   Major: Statistics

RESEARCH

Interests
- Product Design and Architectures
- New Technology Development and Adoption
- Technology Trends and Convergence

Working Papers
- "Innovation Failure in the Context of Medical Devices: Trends and Sources", with K. K. Sinha
- "Predicting Innovation Failures in Medical Devices: Application of predictive analytics on *Big Data",* with K. K. Sinha
- "Critical and Complex Technological Capability Development for Health Care Delivery: Multi-year Field Study of a Surgical (da Vinci) Robot in a Multi-Specialty Hospital", with K. K. Sinha, Shoubhik Sinha, and Scott Bosch
- "Sequential Innovation and Product Architecture Choice", with K. K. Sinha and Mili Mehrotra
- "Strategic Linkages of Product Architectures", with K. K. Sinha

TEACHING

>   **Instructor, SCO 3001:** Introduction to Operations Management, Carlson School of Management, UMN, Spring 2014. (108 Students)

HONORS AND AWARDS

>   Kristi Cua Doctoral Student Excellence Award and Fellowship (2012); Juran Dissertation Fellowship (2013); Doctoral Dissertation Fellowship, CSOM, UMN (2014); and SOBACO Research Grant for Predictive Analytics (2013)

REFERENCE

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New Technology Innovation Failure: Analysis of Sources, Prediction and Learning

Ujjal Kumar Mukherjee, mukh0067@umn.edu, Carlson School of Management, UMN

In my thesis I study critical issue of strategic management of high technology product innovation. The empirical context of this dissertation is the medical device industry which is key enabler of high quality and effective healthcare delivery.

In Study I, we relate the *technology life cycle* to *product design (hardware and software), parts supply and manufacturing* for the purpose of identifying sources of technological innovation failures. In product innovation, apart from the stage in the life-cycle of the underlying technology, product design, parts supply and manufacturing are a critical determinant of the quality performance of the final product, and represent different level of *structure* within the NPD process. We posit that the maturity of the underlying technology would have a differential impact on product design, parts supply and manufacturing of a product. A key insight obtained from the study is that technology innovation performance has an inverted-U shaped relationship with the maturity of the underlying technology.

Study II is aimed at building a predictive model that can ex *ante* estimate the hazard of innovation failure under different product and market conditions. Based on the empirical analysis to date, we conclude that the primary predictor of innovation failure is market failures (i.e., adverse incidents during product usage). Hence, the basic research question that motivates this study: *Can episodic market failures predict innovation failures?* The primary dataset we are using for this study is the "Manufacturer and User facility Device Experience (MAUDE)" database -- a database for medical devices containing data generated through reports of adverse incidents involving the usage of medical devices. Apart from being high volume, the data is unstructured representing high variety. Using advanced machine learning based predictive analytic techniques; we demonstrate that it is possible to predict innovation failures with sufficient degree of precision in the context of medical devices. We also demonstrate empirically that firms do exhibit certain bias in detecting failure signals from the market. We analyze the factors that lead to the bias. To our knowledge this is the very first study in the operations and supply chain management discipline to rigorously apply predictive analytics to analyze large unstructured datasets. This study's primary contribution is enabling the prediction of failure risks of new technology products in a timely manner so that the negative impact of the failure can be avoided or contained.

In study III we are studying issues related to adoption, usage and learnings related to surgical robotics. For this we are collaborating with a large multi-specialty hospital in the United States as well as a surgical robot manufacturer with a global footprint. We are estimating the relationship between the surgery-process time variation and experience of the doctors measured by the cumulative number of robot-assisted surgeries performed by a doctor. The model estimation results indicate that doctors' learning is significant with respect to cumulative experience. However, what is even more insightful is that the heterogeneity in doctors' learning is negligible. This is a significant finding in that healthcare delivery technology innovation in the form of a surgical robot substitutes human skill based performance in performing specific types of urological and OB/GYN surgeries. More generally, this implies that it is possible to minimize or eliminate the downside risks associated with human skill based healthcare delivery (e.g., hand tremors of surgeons and fatigue) and make healthcare delivery more reliable over a prolonged period of time, thereby increasing the healthcare delivery capacity.

WEI CHEN
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Jindal School of Management (SM 30), The University of Texas at Dallas
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EDUCATION

The University of Texas at Dallas, Richardson, TX   2010–Present
Doctoral Studies in Operations Management, GPA 3.96/4

Institute of Software, Chinese Academy of Sciences, Beijing, China   July 2010
Doctor of Philosophy, Computer Science
Dissertation Title: Problems in Satisfiability Solving and Applications in Model Checking

University of Science and Technology of China, Hefei, China   July 2004
Bachelor of Science, Computer Science

RESEARCH

PUBLISHED PAPERS

- Wei Chen, Milind Dawande, Ganesh Janakiraman, "*Integrality in Stochastic Inventory Models*," *To appear*, **Production and Operations Management**.

- Wei Chen, Milind Dawande, Ganesh Janakiraman, "*Fixed-Dimensional Stochastic Dynamic Programs: An Approximation Scheme and an Inventory Application*," *To appear*, **Operations Research**.

PAPER IN THE REVIEW PROCESS

- Wei Chen, Milind Dawande, Shivam Gupta, Ganesh Janakiraman, "*Generalized Reverse-Japanese Auctions: Simple and Optimal Mechanisms for Procurement under Operational Constraints*," *Under first round of review in* **Manufacturing & Service Operations Management**.

WORKING PAPERS

- Wei Chen, Milind Dawande, Ganesh Janakiraman, "*Optimal Procurement Auction with Simutaneous Supplier Qualification*," *work in progress*.

- Wei Chen, Milind Dawande, Ganesh Janakiraman, "*A Descending Optimal Auction for Procuring Bases of a Matroid*," *work in progress*.

ESSAYS IN OPERATIONS MANAGEMENT

WEI CHEN

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Jindal School of Management (SM 30), The University of Texas at Dallas

Below I briefly summarize the three main papers in my thesis.

1. *Integrality in Stochastic Inventory Models*: We study several dynamic, stochastic inventory control models with integer demands: the newsvendor model, its multi-period extension and a single-product, multi-echelon assembly model. Equivalent linear programs are formulated for the corresponding stochastic dynamic programs, and integrality results are derived based on the total unimodularity of the constraint matrices. Specifically, for all these models, starting with integer inventory levels, we show that there exist optimal policies that are integral. For the most general single-product, multi-echelon assembly system model, integrality results are also derived for a practical alternative to stochastic dynamic programming, namely *rolling-horizon optimization* by a similar argument.

2. *Fixed-Dimensional Stochastic Dynamic Programs: An Approximation Scheme and an Inventory Application*: We study fixed-dimensional stochastic dynamic programs in a discrete setting over a finite horizon. Under the primary assumption that the cost-to-go functions are discrete $L^\natural$-convex, we propose a pseudo-polynomial time approximation scheme that solves this problem to within an arbitrary pre-specified additive error of $\varepsilon > 0$. The proposed approximation algorithm is a generalization of the explicit-enumeration algorithm and offers us full control in the tradeoff between accuracy and running time.

   The main technique we develop for obtaining our scheme is approximation of a fixed-dimensional $L^\natural$-convex function on a bounded rectangular set, using only a selected number of points in its domain. Furthermore, we prove that the approximation function preserves $L^\natural$-convexity. Finally, to apply the approximate functions in a dynamic program, we bound the error propagation of the approximation. Our approximation scheme is illustrated on a well-known problem in inventory theory, namely the single-product problem with lost sales and lead times. We demonstrate the practical value of our scheme by implementing our approximation scheme and the explicit-enumeration algorithm on instances of this inventory problem.

3. *Optimal Procurement Auction with Simutaneous Supplier Qualification*: A firm is soliciting price bids from N suppliers for a sourcing contract. The contract can only be awarded to a supplier who passes multiple rounds of qualification/testing, which must be performed simultaneously in each round. We obtain the optimal mechanism for the buyer and show that it is based on non-uniform reserve prices. Our result, in the context of supplier qualification, naturally generalizes Myerson's optimal auction for a single indivisible unit. A descending-meter implementation is also presented.

Yabing Zhao

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yabingzh@buffalo.edu

Education

Ph.D. Candidate, Operations Management, The State University of New York at Buffalo, NY	05/2015 (expected)
B.S., Supply Chain Management, TongJi University, Shanghai, China	2007
Exchange Study, Copenhagen Business School, Copenhagen, Denmark	2006

Working Papers

- Chuang, C. H., C. X. Wang and Y. Zhao, "Closed-Loop Supply Chain Models for a High-Tech Product under Alternative Reverse Channel and Collection Cost Structures." under 2nd round review in International Journal of Production Economics.
- Zhao, Y., C. X. Wang and F. Gu, "Association Between Supplier and Buyer Performance: Implications for Supply Chain Partner Selection."
- Zhao, Y., C. X. Wang and F. Gu, "Sole Sourcing vs. Multiple Sourcing: An Empirical Investigation of Dyadic Supply Chains."
- Zhao, Y., C. X. Wang and F. Gu, "Information Disclosure and Supply Chain Performance."
- Wang, C. X., J. Ru, Y. Zhao and J. Zhuang, "Retail Inventory Transshipment under Demand Disruption."
- Chuang, C. H., Y. Zhao and N. C. Suresh, "Decentralized Reverse Supply Chains with Remanufacturing: Reverse Supply Chain & Business Performance."
- Kao, T. W., N. C. Suresh and Y. Zhao, "An Investigation of Substitutability, Stochastic Lead Time, and Random Shelf Life on Performance of Perishable Product Supply Chains."

Conference Presentations & Proceedings

- Transshipment between Two Retailers under Demand Disruption Risk, *Production and Operations Management Society*, May 2014, Atlanta, GA
- An Investigation of Substitutability, Stochastic Lead Time, and Random Shelf Life on Performance of Perishable Product Supply Chains, *Decision Science Institution*, November 2013, Baltimore, MD
- Retail Inventory Management under Extreme Events, *Decision Science Institution*, November 2013, Baltimore, MD
- Closed-Loop Supply Chain Models for a High-Tech Product Under Alternative Reverse Channel and Collection Cost Structures, *Decision Science Institution*, November 2012, San Francisco, CA & *Production and Operations Management Society*, May 2013, Denver, CO (*invited*)
- Decentralized Reverse Supply Chains with Remanufacturing: Reverse Supply Chain & Business Performance, *Decision Science Institution*, November 2011, Boston, MA
- Analytic Hierarchy Process Based Decision Making Analysis for Small and Medium Third Party Logistics Enterprises, *The 11th West Lake International Conference on Small & Medium business,* 2009, Hangzhou, China
- The Application of Backpropagation Neural Network Model in Logistics Service Evaluation, *INFORMS International Conference on Service Science*, 2009, Hongkong, China

Teaching Experience

- Instructor: MGO 302, Production and Operations Management, Summer 2012, Summer 2013, and Summer 2014
- Guest Lecturer: MGQ221, Business Statistics I, Daemen College, Spring 2014

Industry Experience

- Supply Chain Executive, L'Oreal China Co., Ltd, Shanghai, China
- Senior Coordinator, A.P. Moller Global Logistics Co., Ltd (Maersk Group), Shanghai, China
- Interns, Kohler (China) Investment Co., Ltd, COSCO LOGISTICS & CTS International Transportation Co., Ltd

Three Essays on Supply Chain Relationships: Empirical Investigations of Supply Chain Partner Selections, Sourcing Strategies, and Supply Chain Risks

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School of Management, The State University of New York at Buffalo

The importance of supply chain management has been widely recognized and intensively studied in the past few decades. Supply chains are generally viewed as complex networks, and there is abundantly evidence that firms need to look outside their organizations for opportunities to collaborate with their supply chain partners to ensure that the supply chains are efficient and responsive to dynamic market needs and challenges. In addition, researchers and practitioners agree that excellent supply chain relationships lead to better supply chain performance. Yet most previous research on supply chain relationships is either conceptual or based upon case/survey studies. There is a lack of empirical research on supply chain relationships based upon firm-level secondary data. The primary objective of this dissertation is to contribute to the extant literature by studying supply chain relationships based upon the firm-level supply chain data we collected.

First, we empirically test how a supply chain firm's financial and operational performance will affect the financial and operational performance of its supply chain partners. We provide more in-depth and detailed insights on supply chain partner selections. Second, sourcing strategy is crucial to the buyers in supply chains. Sole sourcing is more common to buyers who require more supply chain efficiency and a long-term relationship, while multiple sourcing is more common to buyers who require more supply chain flexibility and a short-term relationship. We investigate how sole sourcing and multiple sourcing impact the buyer's performance, and offer more in-depth and detailed implications of supply chain sourcing strategies for buyers. Third, we attempt to explore how a firm's financial or supply chain risks will influence its supply chain partner's performance.

In summary, in this dissertation, we aim to investigate the impacts of (1) supply chain partner selection, (2) sourcing strategies, and (3) supply chain risks on firm and supply chain performance. The results of our empirical studies will enhance our knowledge of the importance of supply chain relationships and provide insights to supply chain members for strategic partner selections, sourcing decisions, and supply chain risk mitigations.

Ying Xu

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Education

Tepper School of Business, Carnegie Mellon University

Ph.D. in Operations Management (Joint program with Robotics Institute)   *2009~2015(expected)*

M.S. in Industrial Administration   *2009~2011*

Hong Kong University of Science and Technology

Mphil. in Industrial Engineering and Logistics Management   *2006~2008*

Zhejiang University

B.E. in Control Science and Engineering   *2002~2006*

Research Interests

Methodologies: queueing theory, game theory, mechanism design

Applications: service operations, ethical supply chains, and energy demand side management

Referred Journal Publications and Working Papers

- The Benefit of Introducing Variability in Quality Based Service Domains (with A. Scheller-Wolf and K. Sycara). Under 3rd round review at *Operations Research*
- Combating Child Labor: Incentives and Information Transparency in Supply Chains (with SH. Cho and S. Tayur). Working paper
- Contract Design for Multi-Sourcing Service (with A. Scheller-Wolf). Work in progress
- Demand Side Energy Management via Multiagent Coordination in Consumer Cooperative (with A. Veit, R. Zheng, N. Chakraborty and K. Sycara). Invited resubmission to *Journal of Artificial Intelligence Research*

Selected Refereed Conference Proceedings

- Multi-Agent Coordination for Demand Management with Energy Generation and Storage (with R. Zheng, N. Chakraborty and K. Sycara). *Proceedings of the 13th conference autonomous agents and multiagent systems*, Paris, France, 2014.
- Multi-Agent Coordination for Energy Consumption Scheduling in Consumer Cooperatives (with A. Veit, R. Zheng, N. Chakraborty and K. Sycara). *Proceedings of the 27th AAAI Conference on Artificial Intelligence*, Washington, USA, 2013.
- A Mechanism Design Model in Multi-Robot Service Queues with Strategic Operators and Asymmetric Information (with T. Dai, K. Sycara, M. Lewis). *Decision and Control (CDC), 2012 IEEE 51st Annual Conference on*, pp. 6113-6119. IEEE, 2012.
- Service Level Differentiation in Multi-Robots Control (with T. Dai, K. Sycara, M. Lewis). *Intelligent Robots and Systems (IROS), 2010 IEEE/RSJ International Conference on*, pp. 2224-2230. IEEE, 2010.

Conference Presentations

- Combating Child Labor: Incentives and Information Transparency in Supply Chains
  - INFORMS Annual Conference, Minneapolis, MN, 2013
  - INFORMS Annual Conference, Charlotte, NC, 2011
- The Benefit of Introducing Variability in Quality-Based Service Domains
  - MSOM Service Management SIG, Fontainebleau, France, 2013
  - INFORMS Annual Conference, Phoenix, AZ, 2012

Essays on Management in Service Operations, Ethical Supply Chains and Energy Consumer Communities

Ying Xu, yingx1@andrew.cmu.edu, Carnegie Mellon University

As a Ph.D. student at the joint program of the Tepper School of Business and the Robotics Institute, my research spans three areas: service operations, ethical supply chain management, and energy demand side management, with a focus on addressing intellectually stimulating or practically challenging problems raised in these areas.

Service Operations Management. My first project in this area finds that it is beneficial to provide differentiated services to homogeneous customers in a queueing system. Conventional wisdom in queueing theory tells that increasing service time variance lengthens waiting; I, however, prove that if the operator processes the same type of service requests at different speeds, independent of system state, the total waiting may be reduced. I further extend this idea to a general quality-based service setting, and propose a service differentiation policy which improves the system performance as much as 5% without extra capacity. This work is now under the third round review at *Operations Research*.

My second project relates to the management of a service multi-sourcing system in which a client outsources its service to multiple service providers, each of whom makes individual decisions on service capacity. In this in-progress research, I aim to investigate how the client can ensure fast and high quality service by coordinating the competitive service providers.

Ethical Supply Chain Management. In this area I address the child labor issue in global supply chains. Using equilibrium analysis, I study how a firm affects its supplier's use of child labor through a decentralized supply chain when the firm faces public measure (i.e., punitive pressure and supply chain transparency campaigns). I identify conditions under which the public measures can effectively reduce the use of child labor. Surprisingly, I find that the supply chain transparency campaigns, marked by the California Transparency in Supply Chains ACT of 2010, may inadvertently lead to more child labor, despite its purpose to promote firms' efforts to eliminate child labor.

Energy Consumer Community. An energy consumer community consists of a group of consumers whose electricity demand is supplied by a community-owned renewable energy generator, as well as the electricity market. Examples of such communities include industrial/technology parks, commercial estates, and large residential complexes. Aiming to enhance the penetration of renewable energy in the community energy consumption, I design a multi-agent coordination algorithm, which instructs self-interested consumers to adapt their demand to the intermittent renewable supply in a centralized manner, but doesn't require consumers to share their private consumption constraints and preferences with others. This work has been invited to resubmit to the *Journal of Artificial Intelligence Research*.

Yingshuai Zhao

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E-mail: zhao-ys08@mails.tsinghua.edu.cn
Major: Management Science and Engineering
Topic: The Value of Information in Inventory Management

Education

- ✦ 2008 ~   Ph.D. Candidate, **Tsinghua University**, China
- ✦ 2011 ~ 2012   Visiting Ph.D. Student, **University of Cambridge**, UK
- ✦ 2004 ~ 2008   Bachelor of Science, **Beijing Jiaotong University**, China

Skills

- ✦ Fluent English
- ✦ Knowledge in Supply Chain Management, Game Theory, Behavioral Operations Management, Experiment Design, Quantitative Analysis
- ✦ Teaching Experience in Supply Chain Management

Social Activities

- ✦ Committee member of Winter Doctoral Conference 2011 in Judge Business School , Cambridge University, UK (10/2011 ~ 12/2011)
- ✦ Lecturer of Ph.D. Lecture Team, Tsinghua University (2010 ~ 2011)
- ✦ International program assistant in I.E. Department, Tsinghua University (2010 ~)
- ✦ Academic president of Graduates Council in I.E. Department, Tsinghua University (2008~2009)

Academic Activities

- ✦ Experimental research on decision biases of two competing newsvendors (in progress).
- ✦ Experimental research on learning process in a single-echelon inventory system with censored demand (submitted to MSOM, under review).
- ✦ Experimental research on cooperation biases in a multi-echelon inventory system with full information (submitted to IJPE, under review).
- ✦ Fieldwork on the discharge process in Addenbrooke's Hospital, Cambridge, UK (11/2011~04/2012).

Career Plan   Focus on academia. Now I am searching for a lecturer position, a post-doctoral position, or a research assistant position.

Hobby   Reading (history, sociology and logic), Sports (badminton, swimming and jogging), and Painting (watercolor)

The Value of Information in Inventory Management

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In the classical operations research, we usually believe that more information could make the final decision better, or at least does not make it worse. This conclusion holds in mathematical models. When it applies in practice, it may hold (and only hold) when decision makers are as rational as the robots which do not have subjective emotions or heterogeneous personal-experience.

Take shopping for example. If there is only one product matching your requirement, it is very easy to make a decision. If there are many like products, you will probably spend a long time doing comparison, even though you know which one is the best.

Until a decision is carried out, the outcome is always uncertain (e.g., you do not know the quality of any product for sure until you buy it and use it). More information cannot certainly diminish the uncertainty. Sometimes, it increases the uncertainty (e.g., like products change your confidence in the best product). Human decision makers may have unexpected perceptions of information, different from theoretical assumptions and depending on contexts.

Hence, we want to explore the influence of information on the decision process in operations management, especially in inventory management. Inventory management mainly focuses on ordering decisions. Theoretically, orders are decided by profit/cost parameters, market size, and inventory. In a single-echelon inventory system (i.e., newsvendor problem), we try to describe the ordering process when no necessary information is provided. In a competing newsvendors system, we try to find out how a decision maker's decisions are influenced by his/her competitor. In a multi-echelon inventory system, we try to verify whether the decision makers make better decisions when we provide every echelon with other echelons' operations information.

Most of the results in the above researches are counterintuitive. In other words, they do not follow the theoretical predictions. Such results imply that considering the behavioral factors in human decision process, information does not always play a positive effect. It does not mean that theoretical models are wrong. Theoretical models usually focus on proposing optimal decisions or analyzing a problem's sensitivity to parameters. Behavioral research has more interest to know the decision process and analyze decision biases, which may reflect human decision makers' real concerns on a problem.

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EDUCATION

University of Florida, Gainesville, FL   August 2015 (expected)
Ph.D. in Business Administration

University of Florida, Gainesville, FL   December 2010
Master of Science in Industrial Engineering

Tongji University, Shanghai, China   August 2009
Bachelor of Engineering in Logistics Engineering, Summa Cum Laude

AREAS OF INTEREST

Research: Supply Chain Management, Interface between Operation Management & Information system, Business Analytics, Information Economics

Teaching: Operations Management, Supply Chain Management, Information Systems and Operations Strategy, Managerial Statistics, Quantitative Methods.

RESEARCH

PAPERS UNDER REVIEW

Anuj Kumar, Yinliang Tan, "*Demand Effects of Joint Product Advertising in Online Videos*", Invited for *third round* revision at **Management Science**.

> **Research Grant Awardees**, Innovative Approaches to Measuring Advertising Effectiveness Wharton Customer Analytics Initiative, University of Pennsylvania

Anand Paul, Yinliang Tan, Asoo Vakharia, "*Inventory Planning for a Modular Product Family*", Under review at **Production and Operations Management**.

Yinliang Tan, Janice Carrillo, "*The Agency Model for Digital Goods: Strategic Analysis of the Dual Channels in the Electronic Publishing Industry*", Under review at **Production and Operations Management**.

Yinliang Tan, Janice Carrillo, Hsing (Kenny) Cheng "*The Agency Model for Digital Goods*", Under review at **Decision Science Journal**.

Brent Kitchens, Tawnya Means, Yinliang Tan (*Equal Authorship) "*Building Blocks for Active Learning: Teaching Methods, Content Delivery, Environment, Technology, and Incentive Alignment*", Under review at **Academy of Management Learning & Education**.

> **Finalist & Honorable Mention**, 2013 Instructional Innovation Award Competition, Decision Science Institute

Yinliang Tan, Qi Deng, Anand Paul, Arunava Banerjee "*Reduce the "Inventory Waste": a Simulation-based Algorithm to Determine the Optimal Order-up-to Level with Service Level Agreements*"

PUBLICATIONS

Nazli Turken, Yinliang Tan, Asoo J. Vakharia, Lan Wang, Ruoxuan Wang, Arda Yenipazarli, 2012. "*The Multi-product Newsvendor Problem: Review, Extensions, and Directions for Future Research,*" **Handbook of Newsvendor Problems, International Series in Operations Research & Management Science**

Yinliang Tan, Janice Carrillo 2014. "*The Agency Model for Digital Goods: Strategic Analysis of Dual Channels in Electronic Publishing Industry,*" **Proceedings of 2014 Portland International Conference on Management of Engineering and Technology (PICMET) Conference**

TEACHING EXPERIENCE

Instructor, ISM 4330 - Information System & Operation Management Strategy, Fall 2013 Warrington College of Business Administration, University of Florida.

Teaching Evaluation: 4.82/5.00 (22 out of 25), Fall 2013, ISOM Doctoral Student Teaching Award

Instructor, QMB 4702 - Managerial Operations Analysis 2, Fall 2011, Fall 2012, Spring 2013, Warrington College of Business Administration, University of Florida.

Teaching Evaluation: 4.59/5.00 (27 out of 30), Fall 2011

Teaching Evaluation: 4.83/5.00 (29 out of 31), Fall 2012, ISOM Doctoral Student Teaching Award & Honorable Mention for UF Graduate Teaching Assistant Awards

Teaching Evaluation: 4.46/5.00 (26 out of 30), Spring 2013

Teaching Assistant, Fall 2010 – Present, Warrington College of Business Administration, University of Florida

AWARDS AND HONORS (A SELECTED LIST)

2013 Finalist & Honorable Mention, Instructional Innovation Award Competition, Decision Sciences Institute.

2013 Honorable Mention, UF Graduate Teaching Assistant Awards.

2013 ISOM Doctoral Student Teaching Award, Department of Info. Systems & Operations Management.

2012 ISOM Doctoral Student Teaching Award, Department of Info. Systems & Operations Management.

2011 Ray M. Greenly Scholarships, National Retail Federation (NRF) Foundation.

2011 Sixth International Doctoral Consortium Meeting, Purdue University.

2010 Outstanding International Student, University of Florida.

2009 Achievement Award for New Engineering Graduate Student, University of Florida

2009 Outstanding Graduate Student, Tongji Unviersity (Top 1%)

2008 Baosteel Group Scholarship (a Fortune 500 Company Scholarship)

2008 First-Class Scholarship, Tongji University (Top 1%)

Three Essays in Operations Management

Yinliang (Ricky) Tan, tanyinliang@ufl.edu, University of Florida

In general, my research interest is around the interface between the operation management and information system and/or marketing. Specifically I have two research papers addressing the channel coordination issues in the digital goods market. The first paper, entitled as "Strategic Analysis of the Dual Channels in the Electronic Publishing Industry" (with Janice Carrillo), compare and contrasts three prevalent pricing schemes, Agency Model, Wholesale Model, and Fixed Price Model in the digital goods market. In this study, we consider the setting of one publisher and one retailer who can both distribute printed book as well as the e-books. We find that the Agency Model (i.e. the publisher declares the sales price of e-book and the retailer retains a fixed proportion α of the e-book revenue as a sales agent) can alleviate the double marginalization effect as well as improve the consumers' surplus compared with the Wholesale Model and Fixed Price Model.

The second paper along this research line, entitled as "The Agency Model for Digital Goods" (with Janice Carrillo and Hsing K. Cheng), extends the first study by incorporating the competition between the retailers. We find that the Agency Model can coordinate the digital goods supply chain with competing retailers for any pre-negotiated revenue sharing proportion. This result is in sharp contrast to the traditional revenue sharing contract in physical goods where it cannot coordinate the competitive retailers in general. Further, we also identify there exists a Pareto improving region of revenue sharing proportions such that both the publisher and the retailers prefer the agency model to the wholesale model.

My third paper focus on the inventory planning of the Modular Product Family (with Anand Paul and Asoo Vakharia). This research is motivated by observing that more and more firms are offering modular products assembled with multiple option choices for the consumer. We find that more precise estimates of market preferences for various modular options constitute valuable information that goes beyond the usefulness of forecasts of aggregate market demand. From a practical perspective, this might be indicative of another classic marketing-operations trade-off. Offering more options for consumers would be preferred by marketing managers since this would reach more consumers and hence, enhance product sales. On the other hand, the ability to obtaining greater forecast accuracy would decline when the number of options increases. Hence, from an operational perspective, it would be preferred to limit option choices.

YUNSIK CHOI

EDUCATION

Ph.D., Operations Management   Clemson University 2012 – (in progress)

M.S., Marketing   Clemson University 2012

M.A. Small business/venture retailing   Soongsil University, 2009

B.A., Small and Medium Entrepreneurship   Soongsil University, 2007

RESEARCH AND PULICATION

REFEREED JOURNAL PUBLICATION

Choi, Jayoung, Yunsik Choi, Youngho Kim, and Yongbum Kim (2011), "The Effect of Valence of e-WOM (Electeric Word of Mouth) on Product Evaluation: Moderating Effects of Self-regulatory and Brand Awareness," *Korean Society for Consumer Advertising Psychology*, 12(4), 683-711.

Choi, Jayoung and Yunsik Choi (2011), "Effects of Cause-Related Marketing Message on Product Evaluation: Moderating effects of Ad Appeals and Product Type", *Korean Society for Consumer Advertising Psychology*, 22(3), 115-138.

Choi, Jayoung, Yunsik Choi, and Eun-young Jang (2011), "The Moderating Effect of Self-Regulatory Resources on the Relationship between the Online Word-of-Mouth and Product Attitude," *Korean Society for Consumer Advertising Psychology*, 12(3), 499-524.

Choi, Jayoung and Yunsik Choi (2011), "Effects of Cause-Related Marketing Message on Product Evaluation: Moderating effects of Ad Appeals and Regulatory Focus", *Korean Society for Consumer Advertising Psychology*, 12(1), 1-25.

Choi, Jayoung and Yunsik Choi (2009), "Analysis of Competitive Effects of Attitudes toward PB (Private Brand) and NB (National Brand) on Purchase Intentions," *Korean Society for Consumer Advertising Psychology*, 27(4), 69-80.

BEST PAPER AWARDS

Choi, yunsik, Jennifer Christie Siemens, and Jayoung Choi, "Donation Intentions and Competitive Altruism: A Comparison of East Asian and American Consumers". Global & Cross-Cultural Marketing Best Paper Award, Annual Meeting of Society for Marketing Advances, Orlando, FL, October 31-November 3, 2012.

WORKING PAPERS

Choi, Yunsik, Lawrence D. Fredendall, Aleda Roth, John Whitcomb, Rosanna Fierro, Dorothy Y. Hung, Lori Pelletier, and Jack Bowhan, "Extent of Lean Operations Implementation in Hospitals." Target: Journal of Operations Management.

Choi, Yunsik, Lawrence D. Fredendall, and Sue Bethel, "Adaptation of Best Practices, Middle Manager Behavior and Psychological Safety on Organizational Problem-Solving Capability." Target: Journal of Operations Management.

Choi, Yunsik, Lawrence D. Fredendall, Kevin Taaffe, Joel Greenstein, Nathan Huynh, and Jose Vidal "Using Concept Engineering to Develop Mobile Application for Perioperative Staff." Target: Journal of Operations Management.

SCHOLARSHIP

The Edward Fellowship by Clemson University (www.clemson.edu)   2012-2013

-granted $7,000 for completing the Ph.D. degree in USA

TEACHING

Clemson University - MGT 3900 – **Operations Management** for undergraduate business majors.

Extent of Lean Operations Implementation in Hospitals

Yunsik Choi, Yunsikc@g.clemson.edu, Clemson University

I am studying how lean operations affect organizational problem solving capabilities and patient satisfaction. We defined a lean healthcare system as one which aligns the goals of employee teams throughout the hospital to seek improvement in patient satisfaction by using the scientific method to reduce process variances. I developed a survey instrument to measure leanness based on prior literature, plus we did extensive item to construct mapping as a first validation step. This instrument was designed to measure the extent to which hospitals have adopted organization change techniques that are often classified as lean operations. I had a pilot test at Akron Children's Hospital in Ohio since they started to implement lean in first quarter of 2008.

Currently, practitioners do not fully understand how to implement lean and how to measure the benefits of implementing it. Various lean tools have been implemented by different hospitals during the last 20 years, but there are limited empirical studies about the effectiveness of lean in healthcare. Some hospitals are adopting lean techniques to address their need to reduce costs while simultaneously improving the quality of care, patient safety and reducing caregiver fatigue. While there are multiple case studies and anecdotal stories of how lean improved healthcare, there are no independent evaluations of whether lean interventions to date have successfully improved quality and decreased costs in healthcare. To further study the effectiveness of lean in healthcare, this survey instrument is being developed. To our knowledge, there are no existing survey instruments that measure the "leanness" of the healthcare organization.

A distinguishing feature of this survey instrument is that it measures the degree to which multiple lean tools are implemented. It also measures the degree of goal alignment, since organization leanness is achievable only when the goal alignment is high throughout the organization. A second feature of this survey is that it measures whether some lean tools are more effective than others in improving service quality and patient satisfaction.