

Molly M. Hughes

Updated January 13, 2025

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Academic Positions

West Virginia University
John Chambers College of Business and Economics
Assistant Professor

Morgantown, WV

August 2023 - Present

The Ohio State University
Fisher College of Business
Doctoral Research and Teaching Assistant

Columbus, OH

August 2018 - August 2023

Education

The Ohio State University
PhD in Logistics
Minor: Operations Management

Columbus, OH

August 2018 - August 2023

The Ohio State University
MA in Logistics

Columbus, OH

May 2021

The Ohio State University
BS in Logistics Management
BS in Marketing

Columbus, OH

August 2011

Research interests

My research follow three streams, supply chain risk, public policy and SCM, and the pharmaceutical supply chain. My research is motivated by my time in industry and the potential impact to society. Because of this focus and background my research tends to be empirical in nature. I have been trained in both quantitative and qualitative methods and believe the method chosen should be the one most appropriate for answering the research question at hand. I believe research should aid managers in making insightful decisions, aid in creating a better society, and push academic thought and understanding.

Publications

Journal Papers

Energizing Research at the Intersection of Public Policy and Supply Chain Resilience: A Systematic Review and Guiding Framework
Hughes, M.M., Croxton, K., and Knemeyer, A.K.
Accepted October 2024 at *Journal of Business Logistics*

Academic scholars and US political leaders have called for a better understanding of the connection between public policy and supply chain resilience. In this structured literature review we analyze and synthesize literature published in high-quality public policy and business journals at this intersection. We leverage existing frameworks in public policy and supply chain resilience to help analyze the relationships studied to date, resulting in a conceptual framework that elucidates the connections between public policy and resilience and leads to the development of a platform for future research inquiries. We encourage and provide guidance for future work in the space from both supply chain management and public policy scholars that can drive actionable results for policymakers, firm decision-makers, and the welfare of society.

Plastic Response to Disruptions: Significant Redesign of Supply Chains

Hughes, M.M., Zhou, Z., Zinn, W., and Knemeyer, A.K.

Accepted July 2022 at *Journal of Business Logistics*

A plastic response is a type of resilient response whereby a supply chain is significantly redesigned following a disruptive event. Plastic responses differ from the most common responses to disruption emphasized in the extant resilience literature, in which restoration of a supply chain to its pre-disruption state is typically the focus. Researching plastic responses is important because they differ greatly from restoring a supply chain. Redesigning a supply chain requires investments in new assets, relationships and/or new skills. Moreover, some of the existing assets or skills might become obsolete and need replacement. This research explores the concept of plastic response to disruption. We propose that it be characterized by four elements and offer eight propositions to serve as bases for further research. These propositions relate to two fundamental issues; when are plastic responses most likely to be exercised and how to enable plastic responses. The propositions were developed through qualitative data analysis and informed by change management theory. The data were collected from in-depth interviews with global corporations in a variety of industries. Theoretical contributions to the literature and managerial implications are offered at the end.

Public policy and operations management.

Helper, S., Gray, J.V., **Hughes, M.M.**, and Roman, A.V.

Accepted October 2021 at *Journal of Operations Management*

Operations management (OM) and public policy are intimately intertwined. The organizations that develop and implement public policy have processes to manage and improve, projects to execute, and products and services to procure. Private-sector operations managers face constraints and incentives from public policy. In spite of this interconnection, OM papers rarely focus explicitly on public policy. In this paper we identify three ways that OM research could improve public policy: 1) uncovering the impact of public policy on the operations and supply chains of organizations outside of the public sector, 2) using this understanding to make specific recommendations for public policy, and 3) evaluating the structure and management of the operations of agencies who make and implement public policy. We also call for more interaction between OM and public policy researchers, in two ways: we encourage OM researchers to draw on theoretical insights (especially about sources and uses of power) from the public policy literature, and we invite public policy scholars to consider JOM as a publishing avenue for OM-related, public policy research.

Selected Working Papers

Trucking deregulation and CO₂ emissions: Supply chain management and public policy lessons learned from Europe - working title
Hughes, M.M., Sternberg, H., and Overstreet, R.

We investigate how public policy changes impact the environmental sustainability of supply chain operations. Specifically, our research focuses on trucking deregulation within the European Union that allowed foreign drivers to operate within member countries with the goal of increasing environmental sustainability through improving the technical efficiency of supply chain distribution networks. We use a mixed-method approach consisting of a qualitative study in which we conducted in-depth interviews with industry stakeholders and a quantitative study in which we performed a scenario analysis using Optilogic in collaboration with a large-scale national retailer in Sweden. Our qualitative study resulted in five empirical observations identifying how the industry operates under the current policies. Our quantitative study yielded detailed supply chain network output for three periods: As-is, short-term, and long-term. We find that, paradoxically and contrary to the intention of the European Union, trucking deregulation had a negative effect on environmental sustainability. Our study contributes to the public policy and operations supply chain management literature by detailing how well-intentioned public policy did not result in the desired outcome because of supply chain vulnerabilities. Further, we contribute to practice by revealing a holistic view of deregulation's effect on network costs, and to public policy by showing the supply chain vulnerabilities that need to be considered by policymakers.

U.S. or China, Who Benefited from the CHIPS Act? - working title
Zhou, Z., Li, W., Hughes, M.M., and Rogers, D.

The CHIPS for America Act, a.k.a., CHIPS Act, is designed to promote innovation, increase domestic production capabilities, and address supply chain vulnerabilities in the semiconductor industry. This research employs an event study approach to empirically investigate the impact of the CHIPS Act on the stock market reaction for semiconductor-related companies traded in the U.S. and China's stock market. We observe positive stock market reactions among both the U.S. and Chinese semiconductor companies listed on their respective domestic markets following the empirical events surrounding the formation of the Semiconductors in America Coalition (SIAC) and the legislation vote for the CHIPS Act. Furthermore, we conduct a detailed mechanism exploration based on U.S.-China supply chain relationships, as well as a nuanced propagation effect analysis for companies in the semiconductor supply chain upstream and downstream. Results indicate specific relationships and industrial sectors were affected, with the main impacts localized to U.S. and Chinese firms, without global spillover. The study highlights the significant impact of the CHIPS Act on stock market, offers theoretical advancements by challenging conventional assumptions, and provides novel implications for investors, supply chain practitioners, and public-policy makers.

Supply Chain Middlemen and Supply Chain Effectiveness: Pharmacy Benefit Managers and Drug Quality Risk- working title
Hughes, M.M., Gray, J.V., and Mukherjee, U.

Consumer Inefficacy in Meat Supply Chains- working title
Hughes, M.M. and Shahar, D.

Funded Research

FDA, Contract/BAA - \$1.7 million

Investigator *September 2019 - October 2021*
FDA quality management and pharmaceutical firm learning to reduce drug quality risks

Conference Abstracts

Logistics Service Quality in the Pharmaceutical Supply Chain

Molly Hughes

INFORMS Annual Meeting, 2023

Policymakers assume that generic drugs are a substitute for brand name drugs. The FDA states, “You can take a generic medicine as an equal substitute for its brand-name counterpart.” (FDA 2023). Something that is not taken into consideration is the logistics service quality (LSQ) behind these products. This research asks what risks come from the differentiation in LSQ and how LSQ compares brand and generic suppliers. Through comparison of logistics metrics from 283 brand drug suppliers and 199 generic drug suppliers it was found that brand suppliers outperformed generic suppliers in timeliness, order procedure, order discrepancy, and order quality, generic suppliers outperformed brand suppliers in order accuracy, information quality, and personal contact quality. This research has potential implications for policymakers, managers, and LSQ research.

The Effect of the Chips Act on Stock Market Reaction: An Event Study Analysis

Zenan Zhou, Dale S. Rogers, Wenting Li, Molly Hughes

INFORMS Annual Meeting, 2023

The United States Chips and Science Act (CHIPS Act) is designed to promote innovation, increase domestic production capabilities, and address supply chain vulnerabilities in the semiconductor industry. This empirical research employs an event study approach to investigate the impact of the CHIPS Act on the stock market reaction for semiconductor-related companies traded in China and the United States. To ensure validity and robustness, multiple statistical tests and various return models are employed. The study highlights the significance of the CHIPS Act, offers potential theoretical advancements by challenging conventional assumptions, and provides practical implications for investors, supply chain practitioners, and policymakers.

Sourcing's effect on risk to the public in the U.S. pharmaceutical supply chain

Hughes, Molly M.

Proceedings of 33rd Annual POMS-Conference, 2023

Pharmacy Benefits Managers make sourcing decisions on behalf of health plans. This study looks at one sourcing practice, removing drugs from insurance coverage, and its effect on public risk. This research focuses on a current FTC concern by expanding the boundaries of SC risk into the work of public policy.

Testing policy assumptions in the U.S. pharmaceutical supply chain

Hughes, Molly M.

Proceedings of 33rd Annual POMS-Conference, 2023

Public policies (e.g. the GDUFA laws and the ACA) are built off the assumption that generic and brand drugs are interchangeable. We test this assumption through exploration of each product types' risk regarding logistic service quality and highlight how differences in supply chain and logistics practices are impactful to policy.

Sourcing's effect on risk to the public in the U.S. pharmaceutical supply chain

Hughes, Molly M.

Proceedings of Decision Science Institute Conference, 2022

The Pharmacy Business Managers (PBMs) make major sourcing decisions on behalf of commercial health plans, self-insured employers, and public agencies such as Medicare and Medicaid. The Federal Trade Commission has announced an investigation of the business practices of these middlemen. This study looks at one of the business practices, exclusion of drugs from the formulary, and its effect on public risk. This research also expands the boundaries of supply chain risk into the work of public policy through consideration of social welfare. There are implications for both public policy and private-sector managers.

Dissertation

Public Policy and Risk Management in the U.S. Pharmaceutical Supply Chain

Committee: Dr. Keeley Croxton (*co-chair*), Dr. Terry Esper, Dr. John Gray, Dr. Mike Knemeyer (*co-chair*)

A three-essay formatted dissertation, the first essay focuses on how supply chain risk and public policy overlap in the extant literature in each field. A structured literature review is conducted including journals the SCM list. There is a call for more overlap between public policy and SCM (Gray et al. 2021; Tokar and Swink 2019; Spring et al. 2017) and an increased interest in supply chain resilience from the white house. This paper is focused precisely this topic (the overlap of public policy and supply chain risk management) to explore how risk is understood in each domain and how collaboration can occur. The next essay focuses on a player in the support supply chain (Cater et al. 2015) and asks how the practices of these firms, the pharmacy business managers (PBMs), affect public health. This is accomplished through an interrupted time series analysis to detect the effect of the PBMs removing drugs from insurance coverage on adverse events to the public. This analysis required data collection from three unique sources (the FDA Adverse Event Reporting System, Annual Formulary Removal documents from the largest PBM, and Medicaid data) and has implications for academia, public policy, and industry. The third essay builds on the previous two, focusing on the risk exposition of generic vs brand

name drugs and the risk attitude of the buyer. The third essay is motivated by the FDA statement that brand and generic drugs are "equal substitutes" by testing the logistics service quality behind brand and generic drugs and linking that service quality to risk. I discuss how these metrics relate to supply chain risk vulnerabilities and supply chain risk management capabilities and what the substitution could mean for consumers (social welfare). Data were collected from a large player in the middle of the supply chain on 283 of their brand suppliers and 199 generic suppliers. The metrics collected were tied to pre-established constructs from three different models and are compared, assessing expectations and deviations. The discussion considers implications for industry managers, public-policy makers, and end consumers.

Teaching experience

Tenure-track, West Virginia University

Fall 2023 - present

GSCM 350: Sourcing and Supply Management

Upon successful completion of this course, students will be able to (1) Describe the purchasing process and its organization, and discuss ways to improve them. (2) Apply supplier evaluation, selection, measurement, and development tools. (3) Describe, discuss, and apply cost analysis techniques. (4) Explain the fundamentals of contracting and the major legal considerations in purchasing. (5) Identify and discuss supply chain information systems and electronic commerce. (6) Develop a purchasing performance measurement system.

GSCM 355: Logistics/Distribution Management

Upon successful completion of this course, students will be able to Upon successful completion of this course, students will be able to: (1) Analyze the basic structure and processes associated with logistics activities; (2) Evaluate comparatively (a) the traditional logistics activity with (b) the logistics activity utilized in the modern electronic economy; (3) Calculate simple demand forecasts for demand management; (4) Evaluate the role of order management in logistics; (5) Analyze warehousing management scenarios in logistics; (6) Manage inventories in their relationship to logistics; (7) Calculate and setup parameters for simple inventory systems; (8) Analyze the role of transportation in logistics; (9) Analyze the organization's relationship with Third-Party Logistics (3PL) providers; (10) Determine facility locations optimally, including using simple heuristics to solve strategic location problems; and, (11) Analyze the financial impacts of decisions made in logistics.

Instructor of Record, West Virginia University

Spring 2023

HMBA 693C (Essentials): Supply Chain Issues in Healthcare

Walk through the concept of supply chain management and supply chain risk management and how these concepts relate to resilient supply chains. Tie these concepts to the pharmaceutical supply chain and discuss the differences between supply chains of brand and generic drugs. Introduce how metrics of each firm affect decisions and ultimately affect outcomes to the end consumer.

Instructor of Record, The Ohio State University Fall 2019, Summer 2020

BUSML 3380: Logistics Management

Concepts and methods used to plan and manage logistics activities in a business environment. Understanding of the components of logistics management and trade-offs required to manage the integrated flow of goods through the supply chain.

BUSML 4380: Advanced Logistics Management

Advanced coverage of the concepts and methods used to plan and manage logistics activities in a business environment; in-depth understanding of the components of logistics management and trade-offs required to manage the integrated flow of goods. Responsibilities included lecturing, developing in-class activities, leading discussions, developing and administering the quizzes, homework and case-studies.

Average student rating: 4.76/5 (class of 25 students); 4.38/5 (class of 45 students); class of 17 student NA

Professional Service

Diversity Sub-Committee

August 2023 - present

Work with the WVU-GSCM Advisory Counsel members to target recruitment and sustained involvement of minority students.

Recruitment and Study Abroad

August 2023 - present

Engage with the Chambers student body through fairs, presenting in classes, college events to educate them on the GSCM major and opportunities to study abroad. We recruited at least one new student into the major and recruited 12 students to sign up for the India study abroad trip.

Health and Personal Care Logistics Conference

August 2019 - present

Work on the educational board for this industry conference. Promote the WVU brand to influential industry professionals from top pharmaceutical (Pfizer, Merck, Eli Lilly, Bristol-Myers Squibb, etc.) and logistics companies (DHL, FedEx, United Cargo, Air Emirates, etc.) while foraging relationships that could lead to future research or involvement with the university. One such example is United Cargo will be joining the "women in Supply Chain Management" panel in April, 2024.

Closed-Door Session for New Professors

September 2024

Lead a panel discussion to current Assistant Professors from associate professors that are successful in top programs in L&SCM domain. Questions focused on best practices and lessons learned on managing teaching, service, and research in the first years of being an assistant professor.

Keeping it Real: A Closed-Door Session with Assistant Professors

September 2024

I sat on a panel to present to current Ph.D. students from top programs in L&SCM domain on the transition from a PhD Candidate into an Assistant Professor.

Surviving the Dissertation

October 2023

Present to current Ph.D. students from top programs in L&SCM domain on lessons learned and my experience while proposing, writing, defending and, finalizing my dissertation.

Managing the Dissertation Project

March 2023

Invited to the 18th Logistics Doctoral Symposium at the University of North Texas as a panelist alongside colleagues from Arizona State University, University of Arkansas, and The Ohio State University. This conference is catered directly to PhD students at top logistics and supply chain management programs and the faculty at their institutions.

The Logistics Association - Student Organization

October 2021 -

December 2022

Assist the faculty advisor in managing the student association

PhD Student Panel

Spring 2022

Talk to Fisher College of Business MBA students about getting a Ph.D. in L&SCM

PhD Student Panel

August 2022

Welcome new Fisher College of Business PhD students and answer questions

Invited Professional Presentations

Sourcing's effect on risk to the public in the U.S. pharmaceutical supply chain

October 2022

Proceedings of Decision Science Institute Conference, 2022

John Chambers College of Business and Economics, West Virginia University

Risk to the public in the U.S. pharmaceutical supply chain

June 2022

European Logistics Association PhD Workshop, *Copenhagen, DK*

Supply Chain Plasticity

December 2021

Co-Authors: Zenan Zhou, Walter Zinn, A. Michael Knemeyer

Brown Bag Presentation, The Ohio State University

Loss of Exclusivity and Drug Quality Risk

November 2020

Co-Authors: Rhoda Eniafe, John Gray, and Ujjal Mukherjee

Brown Bag Presentation with University of Maryland and The Ohio State University faculty and PhD students

Skills

Statistics

Proficient in: R

Familiar with: SPSS, SAS

Industry experience

Red Oak Sourcing

Foxboro, MA

Senior Manager, Sourcing Operations

September 2017 - August 2018

Communicate the needs and concerns of CVS Health and Cardinal Health

(a Fortune 7 and 15 company, respectively) to Red Oak Sourcing

Monetize and maintain stocking initiatives

Manage the launch of generic pharmaceuticals into the wholesale/retail market

Lead discussions on current industry trends

Cardinal Health

Dublin, OH

Manager

March 2015 – September 2017

Strategic Global Sourcing Branded Pharmaceuticals

Negotiate, review, and interpret contractual obligations

Manage \$17.2B with 40+ Branded Pharmaceutical suppliers

Analyze, interpret, and act on current and historical data reports

Foster team support and communication with external and internal partners

Advisor

August 2013 – March 2015

Strategic Sourcing Branded Pharmaceuticals

Support 40+ Cardinal Health Branded Pharmaceutical suppliers

Build and maintain healthy relationships with our business partners

Negotiate and maintain contractual obligations

Analyze, interpret, and act on current and historical data reports

Senior Specialist, Customer Analytics QRA

August 2012 – August 2013

Analyze purchase and dispensing data

Maintain relationships with sales force to understand and serve customers

Understand DEA regulations and Cardinal Health's stance on customer risk

Intern, Operations Support

June 2012 – August 2012

Implement lean design concepts into distribution centers

Analyze and identify space constraints in 20 distribution centers

Construct business continuity plans

**Professional
Memberships**

Council of Supply Chain Management Professionals
Health and Personal Care Logistics Conference

2018 – Present

2019 – Present