

# CLARKSON UNIVERSITY

## David D. Reh School of Business



## Faculty Achievements

Spring 2022



# Clarkson™

DAVID D. REH SCHOOL OF BUSINESS

# David D. Reh School of Business Faculty Research and Achievements

## Spring 2022

I am delighted to present the latest David D. Reh School of Business faculty achievements.

Reh School of Business faculty continue to produce cutting-edge scholarship that unearth critical findings in the world of business. Our faculty are being recognized as thought leaders in their fields; publishing in, and reviewing articles, for the best academic and practitioner journals; participating and presenting their research at academic conferences around the world; sharing their expertise in the media; and translating their knowledge in the classroom to enhance the learning experiences of our students.



The following are highlights of the achievements that the faculty accomplished during the Spring 2022 semester.

I invite you to visit the [Reh School of Business faculty website](#) to learn more about our faculty, their research and teaching interests, and their extraordinary engagements to improve lives.

A handwritten signature in black ink, appearing to read 'Bebonchu Atems, Ph.D.' with a stylized flourish at the end.

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## Refereed Journal Articles

**Brown, A., Lin, G.** (2022). "[Theoretical Investigation on the Optimal Contracting for Directors Holding Multiple Directorships.](#)" *Journal of Risk and Financial Management*, 15: 2-16.

**Abstract:** This paper is the first (to our knowledge) to analytically model the optimal contracting for a member of the board of directors who holds multiple directorships. Prior literature has found conflicting evidence on the overall effect of multiple directorships on shareholder welfare: busy board members are usually detrimental to firm operating performance due to the limited time and effort they are able to devote to each board; however, multiple directorships can be beneficial to firms if the board members gain knowledge and expertise through their multiple appointments. The objective of our study is to expand the research on the effects of multiple directorships on shareholder welfare by modeling the relationship between optimal incentives and the number of directorships. Modeling within the Linear–Exponential–Normal framework, and solving using Subgame-Perfect Nash Equilibrium, we find that this relationship is positive when efforts across directorships are either substitutive or complementary, which highlights another potential significant downside to multiple directorships: companies need to offer high incentive-based pay to compete for directors’ efforts, leading to high-risk premia and welfare loss to shareholders. Our results may be of interest to policymakers considering setting limits on the number of board seats that may be held by directors at public companies, as well as shareholders considering appointing directors with multiple appointments.



Jones S. L., **Cheon, O.**, Manzano, J. M., Park A. K., Lin, H.Y., Halm, J. K., Baek, J., Graviss, E. A., Nguyen, D. T., Kash, B. A., Phillips, R. A. (2022). "[Comparison of LACE and HOSPITAL Readmission Risk Scores for CMS Target and Nontarget Conditions.](#)" *American Journal of Medical Quality*, 37 (4): 299-306.

**Abstract:** This study evaluated the utility and performance of the LACE index and HOSPITAL score with consideration of the type of diagnoses and assessed the accuracy of these models for predicting readmission risks in patient cohorts from 2 large academic medical centers. Admissions to 2 hospitals from 2011 to 2015, derived from the Vizient Clinical Data Base and regional health information exchange, were included in this study (291,886 encounters). Models were assessed using Bayesian information criterion and area under the receiver operating characteristic curve. They were compared in CMS diagnosis-based cohorts and in 2 non-CMS cancer diagnosis-based cohorts. Overall, both models for readmission risk performed well, with LACE performing slightly better (area under the receiver operating characteristic curve 0.73 versus 0.69;  $P \leq 0.001$ ). HOSPITAL consistently outperformed LACE



among 4 CMS target diagnoses, lung cancer, and colon cancer. Both LACE and HOSPITAL predict readmission risks well in the overall population, but performance varies by salient, diagnosis-based risk factors.

**Lin, G.** (2022). "[Information versus Measurement School in the History of Accounting Thoughts.](#)" *International Journal of Business and Economics*, 7 (1): 145-152.



**Abstract:** What is the economics substance (or core) of accounting? What is the function and value of accounting and accountants in our society? With the development of accounting and scholarly accounting research, two schools of thought emerge and play an essential role in understanding the efficient functioning of accounting, namely the information school and the measurement school. This paper reviews the information and measurement school in the history of accounting thought. We propose a third integrated methodology. It might be helpful to paint a more complete picture of accounting subjects. In the end, some potential research directions are offered as well.

**Lin, G.** (2022). "[Macroeconomics News and Management Forecasts.](#)" *International Journal of Accounting & Finance Review*, 10 (1): 76-82.

**Abstract:** Are companies whose earnings move more with the macroeconomy more likely or less likely to offer management forecasts? This paper documents the following findings: (1) there is a significantly positive relationship between the extent to which a company's earnings move in concert with GDP and the likelihood of issuing management forecasts. The explanation is that, if a firm's earnings move in concert with GDP, then the cost of missing management forecasts is lower as managers could blame this on the wrong forecasts of macro news, instead of firm-specific forecasts. It contributes to the burgeoning literature on macro-accounting by first documenting this channel. Also, on top of R-square, which has been used in the literature on macro-accounting, this paper suggests that the coefficient and p-value from the regressions of firms' earnings on GDP, is useful in helping identify bellwether firms (firms with high macroeconomic information content or firms connected to many other firms in the economy).

**Madraki, G., Mousavian, S.** (2022). "[Simultaneously Updating Multiple Performance Measures for Manufacturing Systems after Scheduling Perturbations.](#)" *IFAC-PapersOnLine*, forthcoming.



**Abstract:** We simultaneously update multiple performance measures of manufacturing systems after several scheduling perturbations through a single pass without calculating from scratch. Our approach reuses information from the schedule before the perturbations. It utilizes Max-Plus algebra and system matrix to calculate changes propagated from initially perturbed operations to their affected successors. Then, by using these changes, it evaluates new measures for affected operations. Previous algorithms either need to calculate multiple performance measures from scratch by disregarding information before perturbations; or calculate only a single performance measure at a time while reusing system information before perturbations. Our approach addresses both issues.



**Mette, J. and Lin, G. (2022)** "[Wind Energy Utilization and Consumer Food Prices: Evidence from the U.S. and China Energy Policy Shift.](#)" *Oil, Gas and Energy Quarterly*, forthcoming.

**Abstract:** The Energy Act of 2005 and the Energy Independence Act of 2007 consolidated the United States' orientation toward renewable energy sources. During the surge of wind energy utilization by a factor of 15 in less than 20 years, several food prices noticeably increased as well. Despite the abundant research on the link between food prices and other expanding renewable energy sources, especially biofuels, the impact of wind energy utilization has remained largely unexplored. This paper provides evidence that wind energy consumption shocks may have played a significant role in real food price surges since 2005. Consumers and policymakers can be impacted as wind energy utilization rises in the coming years.



Salari, M., **Milne, R. J.**, Delcea, C., Cotfas, L. (2022). "[Social Distancing in Airplane Seat Assignments for Passenger Groups.](#)" *Transportmetrica B: Transport Dynamics*, 10 (1): 1070-1098.

**Abstract:** We provide a mixed-integer programming model (MIP) to assign airplane passengers to seats while preserving two types of social distancing: the distance from the passengers' seats to the aisle and the distance among groups of passengers who are not travelling together. The method assigns passengers travelling within a family group to seats near others of the same group. We present a heuristic algorithm to solve the proposed MIP. This algorithm is warm started with an initial seat assignment. Stochastic simulation experiments using the new method confirm that more passengers can be assigned safely to the seats when family groups are considered. For a certain load of passengers, as the percentage of family groups compared to singleton passengers increases, the model can practice social distancing among more passengers from different groups. The proposed model provides a superior seating assignment compared to an airline policy of blocking all middle-seats.



**Milne, R. J.,** Cotfas, L.A., Delcea, C. (2022). "[Minimizing Health Risks as a Function of the Number of Airplane Boarding Groups](#)" *Transportmetrica B: Transport Dynamics*, 10 (1): 901-922.

**Abstract:** Airlines and researchers have been working to reduce the health risk to passengers from the novel coronavirus SARS-CoV2. Recent literature indicates that the Reverse Pyramid boarding method provides a lower health risk than other boarding methods using a limited number of boarding groups, while keeping the middle seats empty. With a primary objective of minimizing health risks, we determine the number of passengers to include in each boarding group when using the Reverse Pyramid method. We examine how the optimal performance varies with the volume of carry-on luggage, the social distance maintained between passengers walking down the aisle, and the number of boarding groups. An increased quantity of luggage increases health risk, while changing the aisle social distance from 1m to 2m brings provides negligible health value to seated passengers. Increasing the number of boarding groups decreases the risk to passenger health while increasing the time to complete boarding.

Alharbi, E. A., Abdel-Malek, L. L., **Milne, R. J.,** Wali, A.M., (2022). "[Analytical Model for Enhancing the Adoptability of Continuous Descent Approach at Airports](#)." *Applied Sciences* 12(3): 1506.

**Abstract:** Continuous Descent Approach (CDA) is the flight technique for aircraft to continuously descend from cruise altitude with an idle thrust setting and without level-offs, contrary to the staircase-like Step-down Descent Approach (SDA). Important for air transportation sustainability, using CDA reduces noise, fuel consumption, and pollution. Nevertheless, CDA has been limited to low traffic levels at airports, often at night, because it requires more separation distance between aircraft arrivals and, thus, could decrease throughput. Insufficient attention has been given to helping air traffic controllers decide when CDA may be used. In this paper, we calculate the probability that an aircraft arriving during a particular brief period of time (e.g., 15 min) will need to revert to SDA when the controller tentatively plans to permit CDA for all aircrafts arriving during that time period. If this probability is low enough, the controller may plan to permit CDA during that time period. We utilize an analytical approach and queueing theory framework that considers factors such traffic and weather conditions to estimate the probability. We also provide the number of aircrafts that can be accommodated within the airport's stacking space using CDA. This number provides insight into whether a particular aircraft may use CDA.

Delcea, C., Cotfas, L. A., **Milne, R. J.,** Xie, N., Mierzwiak, R. (2022). "[Grey Clustering of the Variations in the Back-to-front Airplane Boarding Method Considering COVID-19 Flying Restrictions](#)." *Grey Systems: Theory and Application* 12(1): 25-59.

**Purpose:** The airline industry has been significantly hit by the occurrence of the new coronavirus SARS-CoV-2, facing one of its worst crises in history. In this context, the present paper analyses one of the well-known boarding methods used in practice by the airlines before and during the

coronavirus outbreak, namely back-to-front and suggests which variations of this method to use when three passenger boarding groups are considered and a jet bridge connects the airport terminal with the airplane.

*Design/methodology/approach:* Based on the importance accorded by the airlines to operational performance, health risks, and passengers' comfort, the variations in three passenger groups back-to-front boarding are divided into three clusters using the grey clustering approach offered by the grey systems theory.

*Findings:* Having the clusters based on the selected metrics and considering the social distance among the passengers, airlines can better understand how the variations in back-to-front perform in the new conditions imposed by the novel coronavirus and choose the boarding approach that better fits its policy and goals.

*Originality/value:* The paper combines the advantages offered by grey clustering and agent-based modelling for offering to determine which are the best configurations that offer a reduced boarding time, while accounting for reduced passengers' health risk, measured through three indicators: aisle risk, seat risk and type-3 seat interferences and for an increased comfort for the passengers manifested through a continuous walking flow while boarding.

**Paul, I., Parker, J., Dommer, S. (2022).** [“Role Integration Increases the Fungibility of Mentally-accounted Funds.”](#) *Journal of Marketing Research*, forthcoming.



*Abstract:* Bridging the gap between the mental accounting and identities/roles literatures, the present research examines how the extent to which an individual's life roles (e.g., “employee” and “spouse”) are integrated (i.e., have more flexible and permeable psychological boundaries between them) moderates the fungibility of mentally-accounted funds. Specifically, individuals with more integrated roles are more able to circumvent the constraints typically imposed by mental budgeting and earmarking and are therefore more likely to use funds allocated or budgeted for the purposes of one role to service the needs/wants of another role. This holds regardless of whether funds have been (i) allocated to a broader, role-specific mental account for future expenditures or (ii) earmarked for a specific purchase. Evidence is found that the effect of role integration arises because those with more integrated roles feel that making purchases for one role using funds allocated or budgeted for the other role is more justifiable.

Diehl, A., Stephenson, A., Dzubinski, L. (2022). "[Research: How Bias Against Women Persists in Female-Dominated Workplaces](#)" *Harvard Business Review Digital Articles*, forthcoming.



**Abstract:** New research examines gender bias within four industries with more female than male workers — law, higher education, faith-based nonprofits, and health care. Having balanced or even greater numbers of women in an organization is not, by itself, changing women’s experiences of bias. Bias is built into the system and continues to operate even when more women than men are present. Leaders can use these findings to create gender-equitable practices and environments, which reduce bias. First, replace competition with cooperation. Second, measure success by goals, not by time spent in the office or online. Third, implement equitable reward structures, and provide remote and flexible work with autonomy. Finally, increase transparency in decision-making.

**Stephenson, A., Sullivan, E., Hoffman, A. (2022).** "[Primary Care Physician Leaders' Perspectives on Opportunities and Challenges in Health Care Leadership: A Qualitative Study](#)" *BMJ Leader*, forthcoming.

**Background:** There is an increasing demand for physicians to assume leadership roles in hospitals, health systems, clinics, and community settings, given the documented positive outcomes of physician leadership and the systemic shifts towards value-based care. The purpose of this study is to examine how primary care physicians (PCPs) perceive and experience leadership roles. Better understanding how PCPs perceive leadership affords the opportunity to influence changes in primary care training in order to more adequately prepare and support physicians for current and future leadership roles.

**Methods:** This study used qualitative interviews, conducted from January through May 2020. The participants included 27 PCPs, recruited via the Harvard Medical School Center for Primary Care newsletters and through snowball sampling techniques. Participants worked in 22 different organizations, including major urban health systems, corporate pharmacy, public health departments, and academic medical centers.

**Results:** Using content analysis and qualitative comparative analysis methodologies, three major themes and seven sub-themes emerged from the interviews. The primary themes included the importance of PCPs in leadership positions, the lack of leadership training and development, and disincentives to leading.

**Conclusions:** While PCPs perceive primary care to hold a unique position that would incline them towards leadership, the lack of training and other noted disincentives are barriers to leadership. Therefore, health organizations should seek to invest in, better train, and promote PCPs in leadership.



Wang, W., Wang, Q., **Wu, W.** (2022). "[Short Selling Surrounding Data Breach Announcements.](#)" *Finance Research Letters*, 47, 102690.



**Abstract:** This study examines whether short sellers detect firm-level data breaches. Using proprietary daily lending data and unique data breach announcements, we investigate whether short selling anticipates prior to corporate data breaches and how it behaves in time leading up to announcements. Using a unique experimental setting of data breaches, an abnormal level of short-selling costs around data breach announcements indicates that short sellers exploit prior knowledge of data breaches. On a cross-sectional basis, we find that short-selling activities strongly correlate with negative cumulative abnormal returns (CARs). Furthermore, we provide evidence that short-selling activities play a positive role in the capital market.

## Faculty Research Grants

**Atems, B.** (2022). "[The Impact of Technology Shocks on Entrepreneurial Job Creation: U.S. and International Evidence.](#)" 2021-2022 Reh Family Endowed Chair in Entrepreneurial Leadership Research Grant. The David D. Reh School of Business, Clarkson University.



**Project Summary:** What impact does the introduction of new technology have on existing jobs and establishments that operate on older, perhaps obsolete, technologies? Hesitancy and resistance among workers to new technology can sometimes result from fear of a new technology replacing or eliminating jobs. However, technological innovations can create new jobs and establishments through *creative destruction*, and promote job reallocation. Creative destruction posits that newly created, high productive jobs displace old technologically obsolete jobs, and ultimately lead to productivity growth. This project intends to study the impact of an unanticipated technology shock on macroeconomic variables and on job gains, losses, and reallocation among private, goods and service sectors in the US and internationally.

**Crichton, R.** (2022). "[Uncovering the Responsible Leader in the New Green Hydrogen Economy: An African context.](#)" Reh School of Business Sustainable Development Research Grant. The David D. Reh School of Business, Clarkson University.



**Project Summary:** How can responsible leadership develop a stronger sustainable organizational culture and develop the necessary organizational best practices to accelerate the transition to the new green hydrogen economy in Africa. I employ

a case study methodology to answer this question. Specifically, I aim to identify the best components of responsible leadership – competencies, acts, practices, policies, culture etc. that are already evident in the Green Hydrogen Economy in each illustrated organization in Africa. It will include analysis of executive interviews (semi structured), the examination of in-house documentation, media releases, CSR reports, grey papers, and an array of reports written by, and about, the respective firms. I intend to utilize the “constant comparison” technique throughout the analysis, thus supporting the “Grounded Theory” approach. The findings that this study generates will add new knowledge to the field of responsible leadership within a country specific, African context. Though the literature on the topic of leadership in an African context is plentiful, multiple gaps exist in the literature as it relates to corporate social responsibility. As such, the literature on corporate social responsibility will be augmented and a very much-needed diversity piece will be added, including related misconceptions in the field.

**Felzensztein, C. (2022)** [“The Path to Entrepreneurship and Economic Growth in Cuba.”](#) *Reh School of Business Sustainable Development Research Grant. The David D. Reh School of Business, Clarkson University.*



**Project Summary:** How does the family as a unit help eco-sustainable rural tourism in Cuba? Can this be successfully implemented in a country that faces external constraints? Are the individual eco-sustainable rural tourism initiatives collaborating among themselves to create an ecocultural rural tourism cluster?

The research seeks to answer the above questions. We focus on the geographical area of the Pinar del Rio Province (Viñales) in Cuba. Viñales Valley is a UNESCO World Heritage ecotourism Site. The province relies on tobacco farming, with Pinar Del Río producing 70% of Cuba's crop used to make the cigars that are so prized overseas, making it the only source of income for many rural families. I will conduct semi-structured interviews with at least 10 family-owned micro business including *casas particulares*. It is also expected to have other 5 to 10 extra interviews with other participants in the ecotourism rural activities. The interview excerpts and topics covered will be presented as qualitative results. Using this approach is fundamental to obtaining reliable, credible and in-depth information in the Cuban rural context. The interviews will be then subject to content analysis. This will help to understand *how* and in *what ways* these micro-family entrepreneurs launched their business, how they survived in this challenging economic context and the role played by family support in this particular regional ecotourism-rural context for sustainable development, with many of them operating in informal settings.

**Li, Q.,** Bird, S., Powers, S., Ortmeyer, T., Jiang, L. (2022) "[The Transition to a Sustainable and Reliable Electric Grid-Transportation System.](#)" *Team Science Project Planning Grant initiative, Clarkson University.*



**Project Summary:** This project addresses multiple technological and socio-economic challenges for the transition to a sustainable and reliable electric grid-transportation system with affordable economic costs and environmental benefits. The project will examine the dynamic interactions among these challenges, develop power grid algorithms and evaluate socio-economic policies under the changing scientific and institutional realities of the grid-transportation system of the future.

**Lin, G.** (2022) "[Blockchain Application in the Smart Car System.](#)" *Commercialization of Clarkson Technology Micro research Grant. Shipley Center for Innovation, Clarkson University.*



**Project Summary:** With the development of the automobile industry and the popularization of 5G networks, the Internet of Vehicles has ushered in rapid development, and the problems of data privacy and data reliability in the Internet of Vehicles have been exposed. Once the vehicle is connected to the Internet, it is easy to track the user's private data sent by the vehicle, such as name, location, whereabouts, etc. Once this data is leaked, it will cause great harm to car owners. However, once the user's privacy is protected or anonymous, they may publish false news without revealing their identity. Blockchain technology has developed rapidly in recent years and has been applied in many fields. In order to solve the current problems of data privacy and data reliability in the Internet of Vehicles, this project introduces the blockchain technology into the Internet of Vehicles, and uses the characteristics of blockchain decentralization and anonymity to solve the data privacy problems in the Internet of Vehicles. By designing a reasonable mechanism, problems such as data reliability in the Internet of Vehicles can be solved. However, due to the large number of Internet of Vehicles terminals and high mobility, the application of blockchain technology to the Internet of Vehicles faces problems such as poor scalability of the blockchain and the lack of incentives for users to share information, which makes the system difficult to operate continuously. For this reason, this project first introduces the subject background and research status of introducing blockchain technology into the Internet of Vehicles. Based on the analysis of the current data privacy and data trustworthy problems in the Internet of Vehicles, the project summarizes the state of the art of blockchain technology, analyzes the benefits and existing problems of using blockchain to solve the data privacy and data trustworthy problems of Internet of Vehicles, and summarizes the current existing solutions and problems that use blockchain technology to solve the data security and data trustworthy problems of Internet of Vehicles.

**Madrahi, G.** (2022) "[Mitigating Vaccine Hesitancy on Social Media among American Users in Communities Facing Health Disparities.](#)" *Reh School of Business Sustainable Development Research Grant. The David D. Reh School of Business, Clarkson University.*



**Project Summary:** The third sustainable development goal defined by the United Nations is to ensure "good health and well-being". Achieving this goal has become even more challenging since the global pandemic started. One of the major challenges to achieve this goal is related to vaccine hesitancy and anti-vax mindsets which has been threatening the global healthy lives. This project seeks to answer the question "What is the optimal way to mitigate the vaccine polarization on social media with minimum manipulation".

**Mahapatra, S. and Lin, G.** (2022) "[Factors Contributing to Carbon Footprint Reduction in Supply Chains.](#)" *2021-2022 Joel Goldschein '57 Chair in Supply Chain Management Research Grant. The David D. Reh School of Business, Clarkson University.*



**Project Summary:** This research aims to investigate the motivations, processes and approaches for carbon-footprint reduction efforts and their economic consequences based on the analysis of financials and supply chains of S&P 500 listed companies.



Specifically, the project has the following objectives:

- to develop a comprehensive database of the investments, technologies, processes and approaches for carbon reduction based on the information available in the annual reports in Compustat and CDP (formerly known as Carbon Disclosure Project) databases
- to conduct supply chain theoretic analysis of the aforesaid data and financials to explain the cost-effectiveness of different approaches for carbon reduction, and
- to theorize the relationships between different types of supply chain management and operational practices, environmental initiatives and corporate performance keeping in view the emerging environmental regulations and institutional reforms across different industries.

The research will involve theory driven empirical analysis of the linkages among the contingencies, supply chain operations, management and control systems, and environmental and financial performance of the S&P 500 companies. We will use the secondary data from the Carbon Disclosure Project (CDP) to address this question. CDP data collection is consistent with the World Resource Institute's GHG emission calculation protocol (Lee, 2011). We will complement the environmental data from the CDP reports with the financial data from the

Compustat database. Given the legitimacy and authenticity of the CDP and Compustat databases, our dataset will have a high degree of reliability.

**Mette, J. and Lin, G. (2022)** "[Wind Energy Utilization and Consumer Food Prices: Evidence from the U.S. and China Energy Policy Shift.](#)" *Reh School of Business Sustainable Development Research Grant. The David D. Reh School of Business, Clarkson University.*



**Project Summary:** The Energy Act of 2005 and the Energy Independence Act of 2007 consolidated the U.S. orientation toward renewable energy sources. At the time, wind energy utilization surged by a factor of 15 over less than 20 years, and food prices increased as well. Similarly, China adopted the Renewable Energy Law in Feb 2005 to promote the transition from non-renewable to renewable energy. The law came into effect on January 1, 2006. This law mandates the power grid operators purchase a full amount of wind power generated by registered producers. The financial incentives include a national fund to promote renewable energy development and discounted lending and tax preferences for renewable energy projects. Since then, the power generation through wind energy has increased from about 2500 MW to 6000 MW in 2007.



Even though the abundant treatment of the link between these food prices increases and other renewable energy sources, the literature has said very little about the contribution of wind energy utilization. First, this paper hopes to provide evidence that wind energy consumption shocks have explained an increasing share of the variation in food prices since 2005 in the US and China. Consumers' and policymakers' decisions can be impacted by this finding, as wind is a growing share of the domestic primary energy consumption. Second, we also try to explore the relationship between wind energy consumption and consumer food price. We will carry out time series statistical analysis using Granger causality tests. Lastly, we will do the two Country comparison, and to see if Chinese policymakers can learn from wind energy policy in the US to help promote China's renewable energy.

**Mousavian, A. (2022)** "[Supply Chain of Electricity – From Cyber-Physical Systems Security to Integrated Energy Markets.](#)" *2021-2022 Joel Goldschein '57 Chair in Supply Chain Management Research Grant. The David D. Reh School of Business, Clarkson University.*



**Project Summary:** In this research, we study the load frequency control of a linearized two-area power system in the presence of EV fleets. Each area of the power system includes EV fleets, thermal, gas, and hydro units. Decentralized controllers are considered for each of these units, and the Kharitonov's theorem is used to identify the PI controller parameters of each unit. We investigate a hypothesis to design a controller based on

a linear system but utilize it for the load frequency control of the nonlinear system including physical constraints such as time delay and generation rate and evaluate the trade-off between the controller's performance and reducing the complexity of the design process. Then, the performance of the proposed method is investigated based on the load variation, attack on the communication of EV fleets, and variations in system parameters.

**Yu, D.** (2022) "[Optimal Pricing and Sourcing Strategies for an Online Platform with Access to Vendor Managed Inventory.](#)" 2021-2022 Joel Goldschein '57 Chair in Supply Chain Management Research Grant. The David D. Reh School of Business, Clarkson University.



**Project Summary:** The proposed research project will study an online platform's optimal pricing and sourcing decisions when the platform can purchase inventory from a manufacturer (e.g. OEM) who also provides vendor managed inventory (VMI) option to the platform by consignment contracts. We consider two competing distribution channels through the online platform. One is the platform's own online selling channel by using its own inventory or the manufacturer's VMI. The manufacturer can use the platform's online retailing services to sell its own inventory through an OEM direct channel. Both the platform and the manufacturer need to determine the retail prices to compete for the market demand with customers who have a diversified preference in retail channels. The customer heterogeneity is captured by a demand function of prices from the two substitutable distribution channels: the online platform's retail channel and the manufacturer's direct selling channel. We will study the platform and the manufacturer's optimal pricing decisions under two different scenarios with a cooperative dual-channel competition framework. Our study will take the online platform's perspective to evaluate the impact and effectiveness of consignment and wholesale price contracts when the platform can purchase its inventory or use the manufacturer's VMI.

## **Faculty Awards**

**Mahmoodi, F.** [2022 Clarkson University Lifetime Achievement in Research and Scholarship Award.](#)



**Milne, F.** [2022 Reh School of Business Research Award.](#)



**Xiang, C.** [2022 Reh School of Business Teaching Award.](#)



**Zebedee, A.** [2022 Reh School of Business Service Award.](#)

