Li & Fung Supply Chain Institute Research Grants 2026

We are pleased to announce the funding results of Li & Fung Supply Chain Institute Research Grants 2026. 10 grants valued at about HKD 1,250,000 were awarded.

Programmable Supply Chain Finance: Where Should Payment Be Enforced?

Prof. Lijian Lu, Associate Professor in Department of Information Systems, Business Statistics and Operations Management at The Hong Kong University of Science and Technology

Supply chain finance (SCF) converts receivables and other transaction assets into working capital, yet financing effectiveness depends critically on whether designated funds remain on their intended route. Emerging programmable-payment technologies - including smart contracts and digital currencies - make it increasingly feasible to control cash flows at multiple points along a financing transaction. This project studies a fundamental but underexplored question: where should programmable payment enforcement be deployed, and how should enforcement across different supply-chain participants be coordinated?

We develop an analytical framework for factoring in which cash may be diverted at both the financing-disbursement and receivable-settlement stages. Programmable enforcement can therefore be implemented at the supplier, buyer, or both nodes. We characterize how enforcement architecture affects end-to-end funding, operational decisions, supply-chain value, and firms' adoption incentives. The research addresses three challenges. First, we determine where enforcement creates the greatest economic value, showing why the technologically strongest control point need not be the economically preferred location. Second, we characterize when controls at different nodes are complements or substitutes. Third, we examine fragmented implementation rights and identify conditions under which individually rational firms fail to complete a jointly valuable end-to-end architecture.

The project connects supply chain finance, operations, FinTech, and technology governance. Its findings will provide actionable principles for financial institutions, supply-chain firms, and technology providers designing programmable SCF systems, while informing policies aimed at improving SME financing, payment integrity, and digital financial infrastructure.

From Sales Conversations to Fleet Commitments: Dynamic Planning for Electric Commercial-Vehicle Leasing Networks

Prof. Sen Li, Associate Professor in the Department of Civil and Environmental Engineering at The Hong Kong University of Science and Technology

Electric commercial-vehicle leasing in China requires supply decisions while customer demand is revealed progressively through leads, qualified opportunities, deposits, and

contracts. Vehicle supply evolves as complete vehicles, batteries, motors, and other required components are ordered from different suppliers, assembled or prepared, and moved through transport, registration, inter-city relocation, lease returns, repair, and readiness. This project develops a dynamic planning model connecting these processes. Research Task 1 will use anonymized customer relationship management records, language-model features from sales conversations, supplier-delivery histories, and vehicle records to update probabilities for conversion, quantity, vehicle type, delivery timing, lease duration, return timing, and preparation needs. Research Task 2 will formulate a finite-horizon dynamic program for one city and one vehicle type. At each time step, it will decide how many vehicles and components to order from each supplier and when to wait, hold vehicles, assemble or prepare vehicles, and promise delivery. Lattice programming and discrete convex analysis will characterize decision rules and value jumps from complementary components and multi-vehicle orders; Lagrangian relaxation will provide performance bounds. Research Task 3 will extend the model to multiple cities and vehicle types. Date-specific charges will separate it into Task 2 models, while a time-expanded mixed-integer network will coordinate suppliers, compatible components, facilities, budgets, and transfers. Historical replay will be conducted evaluate lease revenue, component shortages, and turnaround, based on the large-scale real-world operational data provided by our industrial partner.

License to Withhold: Rare Earth Export Control and Supply Chain Disclosure

Prof. Allen Huang, Professor in Department of Accounting at The Hong Kong University of Science and Technology

This project examines how China's rare earth export controls affect U.S. firms' supply chain disclosures. Although many downstream firms are not directly subject to the licensing rules, their public disclosures may inform licensing decisions, creating incentives to withhold details that could jeopardize supply. Using corporate filings and earnings calls, we investigate whether firms dependent on rare earth inputs provide less specific supply chain information and whether this increases information asymmetry among investors. The study explores how regulation can reduce transparency beyond the firms it directly covers, revealing an informational cost of supply chain dependence.

Digital Certification and Supply Chain Financing: Operational and Financial Implications

Prof. Ying-Ju Chen, Chair Professor in Department of Information Systems, Business Statistics and Operations Management at The Hong Kong University of Science and Technology

The rapid adoption of digital technologies is changing how firms assess quality, share information, and finance upstream suppliers. This project studies how digital certification and information transparency reshape supply chain financing decisions. Many suppliers face

capital constraints and must choose between traditional bank financing and financing provided by buyers or platforms. At the same time, technologies such as blockchain, Internet-of-Things monitoring, and AI-enabled analytics can certify product quality, reduce information frictions, and create differentiated markets. Building on a game-theoretic framework, this research examines how a downstream firm's decision to provide digital certification interacts with suppliers' technology adoption and financing choices. The analysis will generalize the existing agricultural setting to broader supply chain contexts, including platform-based retailing, manufacturing, and quality-sensitive consumer goods. We will characterize when digital certification encourages suppliers to adopt quality-enhancing technologies, when they prefer bank versus buyer/platform financing, and how these decisions affect prices, supply, competition, and welfare. The project will also examine when technology-enabled financing and certification should be bundled or separated. Expected outcomes include analytically grounded insights on how digital transparency changes financing incentives, how buyer-provided financing affects supplier participation, and how firms can design technology adoption and financing policies that improve operational performance and supply chain resilience.

Can Trade Protection Help Local Suppliers Climb the Value Chain?

Prof. Ying-Ju Chen, Chair Professor in Department of Information Systems, Business Statistics and Operations Management at The Hong Kong University of Science and Technology

Governments increasingly use tariffs and subsidies to preserve domestic manufacturing and help local suppliers move from contract production into higher-value activities. Yet protection may also soften competitive pressure and encourage rent extraction rather than capability development. This project develops a two-period supply chain model with a global original equipment manufacturer (OEM), a local contract manufacturer (CM), and a competitive overseas CM. The local CM initially lacks the technological capability to produce independently but may acquire it through learning by supplying; the probability of learning rises with the OEM's first-period local order. Once capable, the local CM can enter the product market, changing both sourcing incentives and downstream competition. We characterize equilibrium sourcing, wholesale pricing, ordering, learning, and market entry, and then evaluate import tariffs, lump-sum sourcing subsidies, production-based subsidies, and sales subsidies. Preliminary analysis shows that protection which increases local sourcing need not increase learning. Tariffs and lump-sum subsidies can strengthen the local CM's pricing power, reduce the OEM's order, and lower capability acquisition, even while raising firm profits. In contrast, quantity-based production subsidies can expand local orders and facilitate learning; sales subsidies may backfire by intensifying future competition and discouraging current orders. The project identifies when protection supports genuine value-chain upgrading and when it merely preserves low-value production, providing guidance for China-related supply chains and other economies pursuing industrial upgrading.

AI-Enabled Store-Friendly Mixed-Case Palletization for Grocery Supply Chains

Prof. Guodong Lyu, Assistant Professor in Department of Information Systems, Business Statistics and Operations Management at The Hong Kong University of Science and Technology

AI-enabled smart warehousing allows retailers to optimize fulfillment at increasingly fine levels of detail, but warehouse efficiency can unintentionally shift labor downstream when outbound loads are difficult for stores to replenish. This project studies store-friendly mixed-case palletization in grocery retail, where daily store orders are packed into roll cages that are later used for shelf replenishment. Conventional packing methods emphasize cage utilization, stability, and transport efficiency, but often ignore the walking, searching, and handling effort created at the receiving store. We propose an AI-enabled optimization framework that incorporates store-layout information into carton assignment and three-dimensional placement decisions at the distribution center. Store planograms and aisle geometry are converted into walking-distance matrices, enabling the model to measure the spatial dispersion of shelf destinations within each cage. The framework balances warehouse consolidation with store replenishment effort while satisfying physical packing, support, stability, and retailer compatibility constraints. To support daily implementation, we develop efficient placement algorithms, LLM-assisted heuristic search, and an agentic AI decision-support prototype that helps managers compare trade-offs, tune store-specific distance thresholds, and generate interpretable packing recommendations. Using data from a Singapore grocery retailer, the project will evaluate when store-friendly packing reduces replenishment effort with minimal loss of consolidation and when it requires additional cages. Expected outcomes include a research paper, an AI-enabled decision-support system, and practical guidance for coordinating warehouse and store operations. The project contributes to AI for supply chain management by showing how intelligent systems can improve cross-stage coordination rather than optimizing warehouse performance in isolation.

Financial Regulation and Supply Chain Managements

Prof. Yiwen Shen, Assistant Professor in Department of Information Systems, Business Statistics and Operations Management at The Hong Kong University of Science and Technology

This project examines how financial regulation affects supply-chain management through changes in bank provided financing. It combines theoretical modeling with empirical analysis to study how regulations faced by banks shape financial and operational decisions across multiple participants, including banks, buyers, and suppliers. The theoretical model will link banks' financing decisions to buyers' and suppliers' choices concerning financial flexibility, inventory, sourcing, and trade credit. It will characterize when financial and operational resources act as substitutes or complements. Changes in bank financing can lead firms to rebalance their use of inventory and sourcing flexibility, but can also change their capacity to finance operational adjustments. Trade credit can further transmit, offset, or reinforce these

effects across supply-chain relationships. The empirical analysis will exploit differences in banks' exposure to capital and liquidity regulations and firms' pre-existing banking relationships. It will combine bank regulatory and corporate financing data with firm level accounting data and, where feasible, international shipment data. The analysis will first examine changes in the availability and terms of bank financing and then assess associated changes in inventory composition, trade credit, supplier entry and exit, sourcing concentration, geographic configuration, and relationship stability. By integrating financial and operational decisions across banks, buyers, and suppliers, the project connects financial regulation with supply-chain management and advances the study of supply chain finance.

SC-HarnessEvo: Learning Reusable Harness Design for Reliable Supply Chain AI Agents

Prof. Jia Liu, Associate Professor in the Department of Marketing at The Hong Kong University of Science and Technology

Supply chain organizations increasingly use AI agents to investigate cross-system exceptions and follow standard operating procedures. Yet agents overlook linked orders, lose evidence, misuse tools, fail to recover, or stop early. Engineers therefore redesign instructions, memory, tool routing, recovery, verification, and stopping for each workflow and model. SC-HarnessEvo is proposed to adapt this engineering process automatically. A Harness Writer improves the operating software around a fixed Solver model without changing business rules, tools, hidden evaluation artifacts, or scoring. Two high-quality executable supply chain datasets cover multilevel order investigation and procedure-driven decisions in fulfillment, warehouse inspection, and dangerous goods handling. Trained and untrained Writers receive identical evidence and are evaluated on unseen cases and procedures. The project will determine whether such an adaptive harness design improves task success, procedural completeness, recovery, and cross-model transfer while reducing adaptation cost. The intended outcome is a tested method for reducing the time and expense required to build reliable, auditable supply chain agents.

From Observed to Anticipated Supply Chains: A Generative AI Framework for Network Simulation

Prof. Jia Liu, Associate Professor in the Department of Marketing at The Hong Kong University of Science and Technology

Global supply chains, which are reshaped continually by sourcing shifts and unexpected disruptions, are an important source of information for managerial and financial decisions, capturing what has already occurred and hence offer little view of what may come next. Thus, decisions that depend on future network conditions are made with little forward-looking information, leaving them slow to adapt and fragile under uncertainty. The resulting failures may cascade across tiers of firms and degrade operational and financial performance. This

project proposes a generative AI (GenAI) framework for data-grounded simulation of dynamic global supplychain networks, supporting decision makers with forward-looking and scenario-based views of the network. We formulate the network as a discrete-time temporal dynamic graph and develop a graph-neural-network-based simulator that jointly learns node and edge states, capturing how firm conditions and trade relationships coevolve over time. The simulator additionally infers latent relations between firms that are not directly observable in transaction records, and then uses them to generate distributions of plausible future trajectories and counterfactual scenarios under configurable network conditions. We will apply the GenAI framework to transaction-level records of the global semiconductor trade network, and validate it on structural fidelity and disruption propagation. By producing prospective and counterfactual representations of supply-chain conditions, the project aims to establish an upstream information infrastructure that supports lenders, investors, manager and policymakers in downstream decision-making, such as enterprise risk assessment, credit monitoring, and trade policy adjustment.

Robust Risk Classification for Small and Medium Enterprises in Supply Chain Finance

Prof. Jin Qi, Associate Professor in Department of Industrial Engineering and Decision Analytics at The Hong Kong University of Science and Technology

Accurate risk identification is essential for Hong Kong lenders seeking to finance Mainland small and medium-sized enterprises (SMEs) going global while maintaining portfolio quality. Traditional classifiers are generally evaluated using aggregate metrics such as AUC and F1, which do not reveal how confidently a model makes costly errors or how rapidly its performance deteriorates when borrower profiles, trade conditions, or data quality change. This project develops a cost-sensitive, fragility-aware classification framework for SME–transaction financing decisions. Building on robust satisficing and the Fragility Index (FI), we formulate KL- and Wasserstein-based models that minimize sensitivity to distributional perturbations while satisfying lender-specific loss targets. The framework will first be developed and tested using simulated and benchmark credit data and will then be estimated on real tradefinance. We will compare ERM, FI-based models using predictive, calibration, expected-loss, and fragility measures. Finally, the analysis will be extended to a dynamic supply-chain network linking SMEs with suppliers, buyers, and logistics providers. Degree, clustering, assortativity, counter-party concentration will be incorporated to identify hidden dependencies and risk propagation. The project aims to translate risk and fragility into risk identifications for SMEs.