Research Statement

HSU Ke Cheng

Quantitative Marketing · Empirical Industrial Organization · Digital Economics

My research is in **quantitative marketing** and empirical industrial organization. I study decisions that must be made before uncertainty is resolved, when later adjustment is costly. Because agents anticipate the cost of adjusting afterward, the initial commitment and the subsequent adjustment are determined together. This mechanism appears on both sides of the market. Consumers face uncertainty about match value, and sellers face uncertainty about demand. The questions I ask—return-policy design, product design under heterogeneous search, inventory under price commitment—are marketing decisions with measurable revenue and welfare consequences in digital and retail markets.

Consumers can resolve the match before paying, by searching, or after paying, by returning. Between purchase and return, my job market paper studies how a return policy sets the cost of returning, and how the return rate feeds back into the price, tying purchase efficiency to return efficiency. With Ce Bian and Liang Zhao, I follow the same feedback into pass-through and incidence. A calculation that keeps only the purchase margin can reverse the welfare conclusion. Between search and purchase, product design shapes the distribution of match value and directs which consumers search which products, a margin I study with Professor Pak Hung Au.

For sellers, inventory is chosen before demand is realized. If demand exceeds inventory, the product stocks out. If inventory exceeds demand, the seller returns the unsold units. With Professor Kohei Kawaguchi and Professor Kei Kawai, I study resale price maintenance in Japanese publishing. The retail price is set in advance, so unsold copies are returned upstream and discarded, at an environmental cost. The paragraphs below describe these papers, list current working papers, and then the questions I plan to take up next.

Job Market Paper

In my job market paper, "Designing Return Policy in E-Commerce: A Trade-off between Purchase and Return Efficiency," I study a core quantitative-marketing decision: how an online seller should design the return offer. A stricter return policy curbs inefficient ex-post returns, but the resulting lower return rates make higher product prices more attractive for sellers, leading to possible exclusion of ex-ante efficient purchases. I compare automatic coverage that reimburses return-shipping costs (RI) with optional coverage (CI) by estimating a structural model of purchase, insurance, and return decisions under monopoly pricing across six apparel categories. A lenient return policy like RI performs better in a category with a high margin, high net scrap value, and high uncertainty by expanding efficient purchases, whereas a stricter return policy like CI performs better in a category with the opposite attributes by curbing excessive returns. Partial RPD, a menu pairing a discounted price with a medium restocking fee as a penalty, performs better than RI and CI for most categories by better balancing the ex-ante efficiency of purchases and the ex-post efficiency

of returns.

Other Papers

In "Pass-Through and Incidence with Product Returns," we study pass-through and incidence with product returns. In contrast to the case without returns, a tax such as a platform commission fee or a sales tax can create negative pass-through and improve social welfare. When a high price significantly raises consumers' return probability, the seller reduces the quantity supplied because of a lower effective margin. This downward-sloping supply curve can lower the equilibrium price in response to a tax increase, raising social surplus by reducing the return rate.

In "Product Design with Heterogeneous Search Costs," we build on Wolinsky's (1986) sequential search model and introduce search-cost heterogeneity. Search costs shape not only whether consumers search but which products they search. In equilibrium, low-search-cost consumers seek niche products and high-search-cost consumers seek standardized products. The main result is that a fall in search costs can raise both prices when the endogenous shift in which product to search dominates the search-encouraging effect.

In "Too Much Unsold Stock?: Environmental Consequences of Price Commitment," we study resale price maintenance in the Japanese publishing industry, where publishers set retail prices and unsold books are returned upstream and discarded. Resale price maintenance is procompetitive because it encourages sellers to carry inventory in the low-demand state. When realized demand falls short of that inventory, however, the seller cannot lower the price to clear the market, so unsold units pile up at an environmental cost. We build a dynamic oligopoly model with demand uncertainty, estimate it on monthly bookstore data, and ask how much unsold stock is due to price commitment and how a deposit-refund tax can reduce waste.

Current Working Papers

- Hsu, Ke Cheng. "Designing Return Policy in E-Commerce: A Trade-off between Purchase and Return Efficiency." Job market paper.
- Au, Pak Hung, and Ke Cheng Hsu. "Product Design with Heterogeneous Search Costs." Working paper.
- Kawaguchi, Kohei, Kei Kawai, and Ke Cheng Hsu. "Too Much Unsold Stock?: Environmental Consequences of Price Commitment." Work in progress.
- Bian, Ce, Liang Zhao, and Ke Cheng Hsu. "Pass-Through and Incidence with Product Returns." Work in progress.

Future Research Agenda

In the next five years, I plan to carry out this agenda through the design of return policy and related quantitative-marketing questions in digital markets.

Search, purchase, and return jointly. My two consumer-side papers treat search and return in isolation, yet search resolves match value only partially, so the two margins interact. I plan to study search, purchase, and return jointly, asking how search technology such as personal recommendation changes return behavior and how return policy changes how consumers search.

Substitutes and complements under return. Allowing consumers to buy products of different sizes or colors creates a bracketing issue. A consumer orders several variants, keeps only one, and returns the rest, generating a large return loss. Bracketing is a special case of perfect substitutes, so I plan to study whether a policy that encourages the purchase of complements can solve the issue. Encouraging complements can make demand less elastic, which lets the seller extract more surplus. Because returning one product makes a return of the other more likely, the seller may cut the price to keep both from coming back, and that cut can offset part of the extraction.

Return policy on a two-sided platform. Different return policies select different compositions of sellers as well as buyers. A return policy changes which consumers join the platform and how each returns, which changes how much a seller can earn and in turn which sellers participate and what prices they set. I plan to study how composition on one side feeds into the other, and how return policy should be designed taking the cross-side network effect into account.