

Research Statement

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I am an empirical microeconomist specializing in industrial organization. I study the interactions between technology and market competition and explore policy designs that address societal challenges. Specifically, I pursue two research agendas. The first examines market power and regulation of digital platforms ([1]–[3]). The second examines the effects of intellectual property rights and technology on markets for creative goods ([4]). In my research, I use innovative methods to construct new datasets and combine them with empirical variation for causal inference and with equilibrium models for counterfactual market analysis. In addition, I develop empirical toolkits for incorporating unstructured data (e.g., images and text) into economic models, enabling quantitative analysis of high-dimensional attributes that shape human decision-making, such as consumer choice, and thereby strategic competition among firms.

Market Power and Regulation in the Digital Economy

In this research agenda, I focus on how digital platforms’ business conduct shapes competition and the distribution of economic gains. I study these questions through three aspects of Amazon’s business: logistics integration, warehouse automation, and recommendation algorithms.

In my job market paper, [1] **“The Effects of Service Integration on Platform Competition and Welfare: Evidence from Fulfillment by Amazon,”** I study e-commerce competition between Amazon and Walmart and measure the welfare effects of Amazon’s integrated logistics service, Fulfillment by Amazon (FBA). Digital platforms are increasingly extending their role beyond marketplace intermediation by integrating complementary services. Google and Apple, for instance, operate their own payment systems for their app stores, and Google offers ad tech tools alongside its ad exchange. Amazon and Walmart likewise run logistics services that store and deliver sellers’ products, and FBA has been central to Amazon becoming the largest logistics operator in the U.S. Such integration by large digital platforms raises concerns about competition and welfare and has prompted regulatory scrutiny worldwide (*Epic v. Google*, 2020; *Epic v. Apple*, 2020; EC, 2022; CMA, 2023; *FTC v. Amazon*, 2023; *United States v. Google*, 2023).

My paper clarifies the gains and losses from a platform’s vertical integration of complementary services and informs policies that target its anti-competitive effects. I combine a novel approach to data construction, empirical variation in Amazon’s fee policy, and an equilibrium model of platform competition. First, I collect, compile, and link extensive product and seller information across the two platforms, contributing a novel dataset to the literature. Specifically, I use details on web pages to construct seller IDs that reveal whether the same seller appears on both platforms. Second, I

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exploit a feature of Amazon’s logistics fee schedule: Amazon classifies products into discrete fee tiers. Using a regression discontinuity design, I find that sellers facing discontinuously higher fees are more likely to drop FBA and sell on Walmart. This evidence is consistent with the anti-competitive effects of Amazon’s logistics integration, which are central to the FTC’s case against Amazon. Third, I build an equilibrium model of competition between Amazon and Walmart. The platforms jointly set commission rates and logistics fees, accounting for consumer choice and for sellers’ multi-platform entry, logistics adoption, and pricing decisions. I estimate the model using the cross-platform dataset and use the model to conduct counterfactual analyses.

The results show that Amazon’s logistics integration benefits consumers on net despite its anti-competitive effects. I find large efficiency gains from integration, which eliminates the double marginalization arising from marketplace commissions and logistics fees. This elimination substantially reduces both the commission rates and the logistics fees that Amazon charges sellers, ultimately lowering consumer prices. Nonetheless, there remains room for policy intervention: I propose interoperability of integrated logistics services as a way to target the anti-competitive effects and further improve welfare.

Building on this paper, I will incorporate industry dynamics to examine whether vertical integration drives platform markets toward winner-take-all outcomes. Foreclosure through integration at an early stage of industry evolution can have substantial dynamic equilibrium effects and may be a key driver of such trajectories. Understanding how integration shapes dynamic competition between platforms is therefore a first-order question, and studying these dynamics can inform the design of appropriate regulation. In addition, I plan to apply the framework developed in this paper to study service integration in other important platform industries. These include app marketplaces with in-house payment systems and ad exchanges bundled with ad tech tools, where regulators have raised similar concerns (*Epic v. Google*, 2020; *Epic v. Apple*, 2020; *United States v. Google*, 2023).

Market power is central to regulatory concerns about the impact of technological progress on markets and society. A few technology firms, for example, lead the development and deployment of automation, a key feature of modern technological progress. In an ongoing project, [2] **“Automation with Market Power: Amazon’s Robotic Warehouses and the Distribution of Welfare,”** I study how market power shapes the distribution of welfare among consumers, workers, and the firm, focusing on Amazon’s adoption of robotic warehouses. I build a comprehensive dataset that combines rich characteristics of Amazon facilities, web-scraped Amazon job postings, local labor market outcomes, and retail expenditure data for heterogeneous consumers. I leverage both an event-study design that exploits the staggered introduction of Amazon’s robotic warehouses and an equilibrium model that captures Amazon’s dual role as a retail platform and as a labor market employer with market power.

Relatedly, a platform with market power may design and use algorithms in ways that do not align with social welfare. Given the substantial influence that digital platforms exert through their

algorithms, this possibility raises regulatory concerns. In a working paper with Michael C. Wang, [3] **“Censorship and Steering in Platform Duopolies,”** we ask what drives platforms’ incentives in designing recommendation algorithms, how cross-platform competition shapes these incentives, and whether they ultimately serve consumers. We develop a theoretical model and bring it to cross-platform data to examine these questions, including whether Amazon’s algorithmic design generates anti-competitive effects similar to those of most-favored-nation clauses.

Technology, Creative Markets and Unstructured Data

In the working paper [4] **“Copyright and Competition: Estimating Supply and Demand with Unstructured Data,”** Sukjin Han and I study the competitive and welfare effects of copyright in creative industries and examine how copyright policy interacts with technological advances such as generative artificial intelligence (genAI). A central concept in copyright policy is product similarity: copyright restricts the entry of products that are substantially similar to existing works, providing local protection in a high-dimensional space of unstructured attributes.

We develop a framework for evaluating copyright policy and apply it to a design product: fonts. Using data from the world’s largest font marketplace, we construct a space of visual characteristics and quantify product similarity with neural-network embeddings. We interpret each embedding dimension in terms of visual attributes (e.g., boldness and script style) and build a model of supply and demand that incorporates the embeddings and copyright-based similarity constraints. Counterfactual analyses show that stricter protection raises social welfare by encouraging the entry of designs that consumers value, but that the optimal level of protection depends on how genAI affects cost structures.

I plan to pursue two research directions building on this paper. First, I aim to develop a quantitative and scientific similarity-based standard for assessing copyright infringement that legal and policy practitioners can use. This direction requires methodological innovation that integrates unstructured data into economic models. Such methods would be useful beyond copyright policy and creative markets, since visual, textual, and other high-dimensional attributes affect human decision-making. A key challenge is establishing whether machine-learning representations capture the features that drive economically relevant outcomes, such as substitution patterns, while remaining interpretable. Second, I will examine how genAI reshapes production costs and market equilibrium in creative industries, and how property rights can be designed to address market inefficiencies and improve welfare. This direction needs to expand the focus beyond similarity to incorporate concepts such as fair use, and to consider richer market structures such as vertical relationships in creative industries.