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Research Spotlights

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Research Spotlights

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Mispricing and Algorithm Trading (p. 21)
Lihong Zhang, Xiaoquan (Michael) Zhang

This study relaxes the efficient market hypothesis by introducing a model that accounts for initial mispricing and explores the effects of algorithmic trading. The research finds that algorithmic strategies can cause significant market volatility and affect financial stability, particularly when they amplify overpricing, leading to bubbles and crashes. Key insights include:

1. Initial mispricing is crucial for algorithmic trading to impact market prices.
2. Market reactions vary with the direction of the trading strategy relative to the asset's true value.
3. Informed traders can benefit from mispricing, whereas noise traders typically incur losses.

Policy implications suggest that algorithmic trading is not universally harmful; its effects depend on the alignment of trading strategies with accurate pricing. The study advises regulators to differentiate between stabilizing and destabilizing trading practices. For traders, the research highlights the importance of adaptive strategies that help correct mispricing to ensure long-term profitability and market health. This research advances our understanding of algorithmic trading's dual potential and informs the development of more nuanced financial regulations and trading strategies.

Making Lemonade from Lemons: A Transaction Cost Economics Perspective on Third-Party Disruptions in a Multivendor Information Technology Service (p. 41)
Haoyuan Liu, Wen Wen, Anitesh Barua, Andrew B. Whinston

In modern enterprise computing environments, multiple information technology (IT) services from first and third parties are often integrated to form coherent solutions for enterprise customers. In this study, we seek to understand how uncertainties introduced by third-party services shape enterprise customers' use of various IT services in these multivendor service settings. Specifically, we analyze a case of disruption caused by a third party that affects the multivendor service but does not directly affect the first-party services. We find a temporary increase in the use of first-party services that serve as similar-goal substitutes during the disruption; however, there is a net decline in the total use of services in the long run. To assess what actions the first party can take during such disruptions to turn the challenge into an opportunity, we analyze the first party's technical support log using deep learning techniques. We find that if the first party offers high-quality technical support that addresses product-related issues, it may be able to make lemonade out of lemons. Such technical support effectively boosts customers' use of first-party services in the long run. Curiously, however, similar efforts by the first party in the predisruption period are ineffective in achieving the same effect.

Strategic Content Generation and Monetization in Financial Social Media (p. 61)
Ding Li, Khim-Yong Goh, Cheng-Suang Heng

Financial social media, which relies on social media analysts (SMAs) to contribute content to investors, is a crucial channel for investors to gain financial information and for SMAs to monetize their content. The interactive nature of financial social media has given SMAs the opportunity to gain access to the investor preferences of their own audience base for financial content. Our study documents that SMAs would exploit this opportunity to strategically generate and monetize content by catering to investor preferences. Specifically, SMAs would increase the (negative) sentiment of the content if paid subscribers' preferences for (negative) sentiment grow. Additionally, an SMA is more likely to produce paid content when the expected free readership increases and is less likely to do so when the expected paid subscriptions increase. Our findings suggest that the sentiment of financial social media content is not a mere reflection or prediction of stock market movements but also a result of SMAs' reaction to investor preferences. We thus illustrate an approach to identify the SMAs who may amplify the investors' confirmation biases because of such catering behaviors so that platform managers and regulators alike can utilize this method to improve the content quality of financial social media.

How Recommendation Affects Customer Search: A Field Experiment (p. 84)
Zhe Yuan, AJ Yuan Chen, Yitong Wang, Tianshu Sun

The findings of this study have important implications for digital platform designers, managers, and regulators.

First, the large-scale field experiment provides valuable insights into the relationship between product recommendation and consumer search under different scenarios. It highlights the importance of understanding consumer demand states and previous interests. Platforms can use these findings to customize product recommendations at an individual level and foster channel complementarity between recommendation and search. Second, the study emphasizes the need to consider channel spillovers. Optimizing recommender systems without considering the impact of channel interactions with search engines may lead to suboptimal results. Platforms should aim for a more coordinated integration of recommendation and search channels, as our conceptual framework illustrates how customers in different demand states can be influenced and served by both systems. Third, the findings offer insights into the potential impact of data regulations on e-commerce platforms. The study demonstrates that data regulations have a greater impact on the recommendation channel compared with the search channel. Platforms should find a balance between recommendation and search when facing stringent data regulations. They may strategically focus on the search channel to gather revealed customer interests, leading to a deeper integration of both channels.

Understanding Volunteer Crowdsourcing from a Multiplex Perspective (p. 107)
Yifan Yu, Xue (Jane) Tan, Yong Tan

Our study delves into the understudied realm of volunteer crowdsourcing activities. Analyzing 827,260 volunteers' participation in 183,445 projects initiated by 74,556 nonprofit organizations over nine years, the study unlocks insights into volunteers' collaboration relationships and their behaviors, vital for increasing nonpaid labor supply and enhancing platform performance. We introduce a multiplex perspective to reveal how multilayer network dynamics offer enabling and constraining effects on volunteers' continued participation, engagement, and interorganization movement. Practically, our findings equip crowdsourcing platforms with strategies to refine decision making and bolster volunteer engagement. By integrating novel network features such as tie multiplexity and relational pluralism, platforms can predict user actions more precisely. This fosters recommendation systems that not only elevate volunteer commitment but also facilitate productive interorganization transitions. At the macro level, tie multiplexity may lead to the "rich-get-richer" effect, enlarging the development inequality between large and small/new nonprofit organizations, whereas promoting relational pluralism is a potential remedy. For policymakers, our study offers a blueprint for nurturing volunteer networks and collaboration across organizations. Using a multiplex approach, they can adeptly manage the unpaid labor sector and invigorate nonprofit organizations. Our insights go beyond crowdsourcing as they could be applied to any digital context with multilayer networks, promising more tailored strategies to engage and mobilize users.

Regulating Powerful Platforms: Evidence from Commission Fee Caps (p. 126)
Zhuoxin Li, Gang Wang

Digital platforms have become increasingly dominant in many industries, bringing the concerns of adverse economic and societal effects (e.g., monopolies and social inequality). Regulators are actively seeking diverse strategies to regulate these powerful platforms. However, the lack of empirical studies hinders the progress toward evidence-based policymaking. This research investigates the regulatory landscape in the context of on-demand delivery, where high commission fees charged by the platforms significantly impact small businesses. Recent regulatory scrutiny has started to cap the commission fees for independent restaurants. We empirically evaluate the effectiveness of platform fee regulation by utilizing regulations across 14 cities and states in the United States. Our analyses unveil an unintended consequence: independent restaurants, the intended beneficiaries of the regulation, experience a decline in orders and revenue, whereas chain restaurants gain an advantage. We show that the platforms' discriminative responses to the regulation, such as prioritizing chain restaurants in customer recommendations and increasing delivery fees for consumers, may explain the negative effects on independent restaurants. These dynamics underscore the complexity of regulating powerful platforms and the urgency of devising nuanced policies that effectively support small businesses without triggering unintended detrimental effects.

Understanding Lenders' Investment Behavior in Online Peer-to-Peer Lending: A Construal Level Theory Perspective (p. 141)
Yi Wu, Weiling Ke, Yuelei Li, Zhijie Lin, Yong Tan

This study explores the decision-making process in online peer-to-peer (P2P) lending, a rapidly growing source of fixed income for investors. We examine how lenders' bidding amounts are influenced by interest rates and psychological distance, which is determined by the borrower's demographic attributes. Our findings, based on data from a popular Chinese P2P lending platform, reveal that geographic distance decreases bidding amounts, indicating a home bias effect. Conversely, social distance increases bidding amounts, suggesting a social distance effect. Interestingly, both types of psychological distance amplify the positive impact of interest rates on bidding amounts. Four controlled experiments further validate these relationships. This research not only contributes to the theoretical understanding of P2P lending but also offers practical insights for policymaking in the high-risk financial context.

Enhancing User Privacy Through Ephemeral Sharing Design: Experimental Evidence from Online Dating (p. 162)
Yumei He, Xingchen Xu, Ni Huang, Yili Hong, De Liu

In the dynamic world of online dating, a key challenge faced by platforms is the cold-start problem, where newly matched users are hesitant to engage due to privacy concerns. Our solution, ephemeral sharing, addresses this by balancing privacy with the need for personal information sharing. This feature allows personal photos to disappear and become untraceable soon after being viewed, reassuring users about their privacy. We conducted a large-scale randomized experiment with more than 70,000 users to evaluate the impact of ephemeral sharing. The results are compelling: users who could share ephemeral photos were more likely to send personal images alongside with their matching request, especially those with human faces, leading to more matches and higher engagement. Significantly, this effect was more pronounced among users who are more sensitive to their privacy. Furthermore, ephemeral sharing was found to reduce users' concerns related to data collection, dissemination, and identity misuse, thereby increasing the willingness to share personal information. This approach not only enhances user privacy but also stimulates more active engagement on the platform. For dating platforms and similar platforms, adopting ephemeral sharing can revolutionize user experience. It provides a strategic advantage by boosting user personal information sharing and enhancing privacy, crucial for maintaining meaningful communication in online dating. This feature represents a significant step forward in designing user-centric, privacy-conscious platforms.

Mobile Push vs. Pull Targeting and Geo-Conquesting (p. 184)
Dominik Molitor, Martin Spann, Anindya Ghose, Philipp Reichhart

Firms have two distinct options when delivering content to consumers' mobile devices: *mobile push* and *mobile pull*. Mobile push delivers firm-initiated (ad) content directly to consumers, while mobile pull requires consumers to initiate requests for (ad) content. This study tests the impact of mobile push and mobile pull on consumers' coupon redemption behavior in a large-scale randomized field experiment in a geo-conquesting setting, targeting customers located around competitor retail stores with mobile coupons to drive them to stores of the focal retailer. The results show that mobile push increases coupon redemption rates by 6.0%, with substantial heterogeneity based on app-specific use experience and store density: App-specific use experience negatively moderates the effect of mobile push delivery on redemptions, likely because both usage experience and push notifications reduce app-specific search costs, thereby acting as substitutes for one another. In areas with higher store density, the positive effect of mobile push delivery on the redemption likelihood is greater, suggesting that push notifications can highlight the focal coupon among alternative store choices, thereby reducing consumer switching costs. These findings have important implications for retailers and brands in creating competitive mobile targeting campaigns that effectively leverage both mobile push and pull delivery mechanisms.

Signaling Effects Under Dynamic Capacity in Online Matching Platforms: Evidence from Online Health Consultation Communities (p. 202)
Liwei Chen, Arun Rai, Wei Chen, Xitong Guo

Online health consultation communities (OHCCs) have emerged as vital platforms connecting patients with physicians for online consultations. However, finding the right match between patients and physicians can be tricky due to physicians' changing capacity to consult on the OHCC. Our study delves into how signals provided by OHCCs on physicians' professional status and behaviors can help make these matches successful, especially when considering their capacity fluctuations. We differentiate between two types of signals pertaining to physicians–*owned*, pertaining to their professional status, and *earned*, pertaining to their OHCC activity and patient reviews of the physician. Employing a hidden Markov model to analyze data from a large OHCC on physicians' voluntary online consultations with patients, we find the role of the signals in efficient matching to be contingent on the capacity state of the physician. Physicians' professional status is particularly important when they have less time available, and showing active participation in the community can make the status even more impactful. Conversely, when physicians have more availability, patient feedback becomes crucial, even diminish the importance of professional status. These insights suggest that OHCCs should tailor how information on physicians' professional status and patient feedback are presented depending on physicians' availability as this can help patients to make better choices. By being active in the OHCC and earning favorable patient feedback, physicians with more availability can improve their attractiveness to patients, even offsetting concerns that can stem from the lack of seniority of the physician. The findings underscore the need for OHCCs to develop signaling and matching mechanisms that consider the capacity of physicians, thereby fostering efficient and satisfactory patient-physician consultations.

Linking Clicks to Bricks: Understanding the Effects of Email Advertising on Multichannel Sales (p. 225)
Mi Zhou, Vibhanshu Abhishek, Edward H. Kennedy, Kannan Srinivasan, Ritwik Sinha

Businesses have widely used email ads to directly send promotional information to consumers. Whereas email ads serve as a convenient tool that allows firms to target consumers online, there is little evidence of their multichannel impact on consumer spending in both online and brick-and-mortar stores. In this paper, we utilize a unique high-dimensional data set from one of the world's largest office supplies retailers to link each consumer's online behaviors to item-level purchase records in physical stores. We employ a doubly robust estimator that incorporates nonparametric machine learning methods for causal estimation of observational data. Our results show that email ads significantly increase the retailer's sales across different channels. We also investigate the effects of email ads on diverse consumer behaviors along the purchase funnel and find that increased sales result from increased purchase probability and a wider variety of products purchased by consumers. Further, we examine several moderating factors, such as product types and consumer segments, that influence the multichannel effects of email advertising. Our study provides empirical evidence for the economic impact of email ads on consumer behavior across different channels and the underlying mechanisms thereof, offering direct implications for multichannel retailers seeking to improve their digital marketing strategies.

How Hospitals Differentiate Health Information Technology Portfolios for Clinical Care Efficiency: Insights from the HITECH Act (p. 239)
Jessica Pye, Arun Rai, John Qi Dong

Our research reveals the significant impact of evolving policy uncertainty on hospital strategies to mitigate cost-based performance deficits in clinical care processes through differentiation in search for health information technology (HIT). Key for hospital administrators and managers, our findings reveal the benefit of leveraging external benchmarks for performance feedback, enabling strategic, innovative approaches to HIT investments tailored to enhance clinical care efficiency and cost-effectiveness. Moreover, our findings have important implications for healthcare policymakers, highlighting the necessity to consider the varied responses of hospitals to policy fluctuations. Recognizing that hospitals proactively adapt their HIT portfolios in anticipation of new laws, and that these adaptations are most diverse under moderate policy uncertainty, is crucial. This nuanced understanding can guide policymakers in fostering an environment that encourages both the exploration of novel technologies and the widespread adoption of effective solutions across the healthcare spectrum. By bridging the gap between policy development and hospital administration, our work offers a road map for aligning strategic technological differentiation with policy objectives, ultimately enhancing healthcare delivery and outcomes.

Blessing or Curse? Implications of Data Brokers for Publisher Competition (p. 261)
Xin Zhang, Wei Thoo Yue, Ran (Alan) Zhang, Yugang Yu

The explosion of consumer data has spawned a burgeoning data broker industry, pivotal in targeted advertising. A recent media report estimates the worth of the data broker industry by 2030 at approximately $382 billion. Key players such as Oracle and Lotame gather data from diverse sources to create and sell valuable insights. Digital publishers often rely on these brokers to gain (i) *individual insights* drawn from their own data or (ii) *collective insights* drawn from both their data and those of their competitors, improving their targeting precision. This study develops an analytical model to explore the competitive implications of data brokers in a targeted advertising market with two competing publishers and a mass of advertisers. It reveals that the data broker might strategically price their insights to exclusively offer collective insights to one publisher, thereby altering market competition. Moreover, the broker's actions can either foster or hinder competition among publishers, depending on its strategic interests. Despite potentially reducing market competition through exclusive selling, the provision of collective insights can enhance aggregate welfare by enhancing publishers' targeting capability. This illustrates the nuanced interplay between data brokers, publishers, and advertisers in shaping the landscape of targeted advertising.

Punished for Success? A Natural Experiment of Displaying Clinical Hospital Quality on Review Platforms (p. 285)
Lianlian (Dorothy) Jiang, Jinghui (Jove) Hou, Xiao Ma, Paul A. Pavlou

The healthcare market struggles with information asymmetry, limiting patients' ability to make informed hospital choices. Aiming to bridge this gap, review platforms like Yelp have begun displaying hospitals' clinical quality data alongside consumer reviews. However, our research uncovers that Yelp's introduction of maternity care clinical quality measures unexpectedly resulted in lower subsequent Yelp ratings for high-quality hospitals with insufficient staffing. Employing precise foot traffic data and transfer deep learning, we discovered that high-quality, yet understaffed, hospitals experienced a surge in patient volume, which strained their resources and diminished patient satisfaction, leading to negative reviews. This finding has significant implications, signaling the unintended consequences of

revealing clinical quality measures, including potential financial losses for hospitals because of reduced federal funding. This research not only contributes to our understanding the dynamics of patient satisfaction but also, offers actionable insights for high-quality hospitals to mitigate the negative impacts of unexpected visibility on review platforms. Our research underscores the importance for patients to discern between objective clinical quality measures and self-reported subjective ratings in their decision-making process. This research applies machine learning and transfer deep learning techniques to healthcare analytics, offering a deeper understanding of the interplay between information disclosure, online reviews, patient satisfaction, and hospital management.

On-Demand, Long-Term, or Hybrid? An Economic Analysis of Optimal Rental Models on Sharing Platforms (p. 307)
Jianqing Chen, Nan Feng, Zhiling Guo, Wenyi Zhang

This study examines three rental models—*long-term*, *on-demand*, and *hybrid*—in the sharing economy and evaluates their impacts on social welfare and consumer surplus. Our analysis reveals the significance of consumers' setup and transaction costs in determining the optimal rental-model for platforms. We find that the relative setup cost and the relative transaction cost between owners and renters play a crucial role in shaping the equilibrium market price and optimality of the three rental models, whereas the total costs determine the equilibrium transaction volume and sustainability of the three models, with high costs posing barriers to the viability of on-demand and hybrid models. In practice, platforms can maximize consumer surplus by selecting an optimal rental model that narrows the gap in setup costs between renters and owners. Policymakers should implement favorable policies or subsidies to balance consumers' participation incentives on both sides of the market, leading to mutually beneficial social outcomes.

Gaining a Seat at the Table: Enhancing the Attractiveness of Online Lending for Institutional Investors (p. 326)
Ram D. Gopal, Xiao Qiao, Moris S. Strub, Zonghao Yang

This paper investigates the suitability of online loans as an investment through the lens of a portfolio optimization framework. We propose general characteristics-based portfolio policy (GCPP), a framework which overcomes unique challenges associated with building a portfolio of online loans. GCPP directly models the portfolio weight of a loan as a flexible function of its characteristics and does not require direct estimation of the distributional properties of loans. Using an extensive data set spanning over one million loans from 2013 to 2020 from LendingClub, we show that GCPP portfolios can achieve an average annualized internal rate of return of 8.86% to 13.08%, significantly outperforming an equal-weight portfolio of loans. To assess the attractiveness of online loans, we then compare the performance of the GCPP portfolio to traditional investment vehicles including stocks, bonds, and real estate. The results demonstrate that a portfolio of online loans earns competitive or higher rates of return compared to traditional asset classes with limited comovement. These results indicate that online loans are an attractive novel asset class for investors. Together, we demonstrate that GCPP is an approach that can help platforms better serve both borrowers and lenders en route to growing their business.

Growing Technological Relatedness to the ICT Industry and Its Impacts (p. 344)
Subrahmanyam Aditya Karanam, Deepa Mani, Rajib L. Saha

In today's rapidly evolving technological landscape, industries across various sectors are increasingly leveraging information and communication technologies (ICT) to drive innovation and gain a competitive edge. Our study reveals that, as industries become more closely connected to the ICT sector, they experience a significant shift in their innovation processes and outcomes. By analyzing 1.3 million U.S. patents granted between 1981 and 2010, we demonstrate that industries with stronger ties to the ICT sector (i.e., higher "ICT-closeness") exhibit a greater proportion of ICT technologies in their patent portfolios and enhanced complementarity between ICT and non-ICT patents. Furthermore, ICT-Closeness results in greater innovation efficiency (the number of patents per R&D capital), recombinant creation (the creation of new technological combinations), recombinant reuse (the refinement and reuse of known technological combinations), and the creation of new business models. These findings have important implications for practitioners. Specifically, our research highlights the importance of strategically integrating ICT into their technological innovations. Managers should actively seek opportunities to collaborate with and learn from the ICT sector to enhance their innovative capabilities, create new products, services, and business methods, and ultimately gain a competitive advantage. However, they must also be prepared for the heightened competition that comes with increased ICT-closeness, as it can lead to winner-take-all dynamics and market turbulence.

Guided Diverse Concept Miner (GDCM): Uncovering Relevant Constructs for Managerial Insights from Text (p. 370)
Dokyun "DK" Lee, Zhaoqi "ZQ" Cheng, Chengfeng Mao, Emaad Manzoor

The Guided Diverse Concept Miner (GDCM) is an innovative deep learning algorithm tailored for the extraction of managerially relevant concepts from textual data, emphasizing the autonomy in discovering insights without predefined labels or guidance. This tool stands out by embedding words, documents, and concepts within the same vector space, which simplifies the interpretation of unearthed concepts and ensures their alignment with managerial outcomes. Central to GDCM's methodology is its capacity to focus on concepts that are highly correlated with user-specified managerial outcomes, termed guiding variables, thereby enhancing the relevance and application of extracted insights in decision-making processes. The algorithm's design inherently promotes the diversity of the recovered concepts, ensuring a broad spectrum of insights. Through practical application in analyzing customer reviews related to online purchases, GDCM not only identified key concepts influencing conversion rates but also validated its findings against established theories and prior causal research. This validation underscores GDCM's utility in generating actionable, diverse insights tailored to specific managerial contexts, marking a significant advancement in how businesses leverage textual data for strategic decisions.

1 + 1 > 2? Information, Humans, and Machines (p. 394)
Tian Lu, Yingjie Zhang

Our study, conducted through a field experiment with a major Asian microloan company, examines the interaction between information complexity and machine explanations in human–machine collaboration. We find that human evaluators' loan approval decision-making outcomes are significantly enhanced when they are equipped with both large information volumes and machine-generated explanations, underscoring the limitations of relying solely on human intuition or machine analysis. This blend fosters deep human engagement and rethinking, effectively reducing gender biases and increasing prediction accuracy by identifying overlooked data correlations. Our findings stress the crucial role of combining human discernment with artificial intelligence to improve decision-making efficiency and fairness. We offer specific training and system design strategies to bolster human–machine collaboration, advocating for a balanced integration of technological and human insights to navigate intricate decision-making scenarios efficiently. Specifically, the study suggests that, whereas machines manage borderline cases, humans can significantly contribute by reevaluating and correcting machine errors in random cases (i.e., those without explicitly congruent feature patterns) through stimulated active rethinking triggered by strategic information prompts. This approach not only amplifies the strengths of both humans and machines, but also ensures more accurate and fair decision-making processes.

Firm-Sponsored Online Communities: Building Alignment Capabilities for Participatory Governance (p. 419)
Hani Safadi, Tanner Skousen, Elena Karahanna

Many organizations recognize the capacity of online communities to generate knowledge and create value. However, firm-sponsored online communities are composed of both community and firm stakeholders, where the goals and desires of each side can differ. This dichotomy of goals can create challenges when determining how best to govern a firm-sponsored online community, such as how much control the firm should exert on community behavior. Our work shows that community governance need not stem solely from the firm or the community. Rather, a successful and vibrant community that achieves the goals of all its stakeholders is achieved through *participatory* governance, which adopts both firm- and community-based governance modes. Drawing from a case study from Mayo Clinic Connect, a successful firm-sponsored online community that employs a participatory governance model, we discovered *governance alignment* as a capability that improves participatory governance. Governance alignment is an adaptive process that effectively balances the sponsoring firm's goals with the community members' needs and participation. In this paper, we present specific practices and actionable examples for governance alignment, such as standardizing organic community content, training community super users, and more. These actionable insights can enhance the value that firms hope to achieve when leveraging online communities.

Conversation Analytics: Can Machines Read Between the Lines in Real-Time Strategic Conversations? (p. 440)
Yanzhen Chen, Huaxia Rui, Andrew B. Whinston

This paper introduces machine learning–based methods designed to measure the evasiveness and incoherence of responses from more-informed individuals during real-time strategic conversations. It tests the efficacy of these methods using the question-and-answer segments of earnings conference calls, where managers are subjected to scrutiny by analysts. The article underscores the largely untapped potential for extracting valuable financial insights from the dialogues between managers and analysts during these calls—a data source that current fintech solutions have largely ignored. Furthermore,

the research breaks new ground by integrating machine learning with asset pricing, a promising avenue in light of rapid technological advances in artificial intelligence. From a practical standpoint, the study provides less-informed participants in strategic conversations with tools to identify when their more-informed counterparts are being evasive or incoherent. This ability allows them to pose more incisive questions, leading to better-informed decisions in various fields, including investing and hiring. Moreover, the paper contends that as AI technology continues to evolve, it will compel more-informed parties to adopt greater transparency. This shift will enhance both the efficiency and the transparency of markets and institutions, ultimately benefiting society as a whole.

The Impact of "Retail Media" on Online Marketplaces: Insights from a Field Experiment (p. 456)
Vibhanshu Abhishek, Kinshuk Jerath, Siddhartha Sharma

A part of retail media wherein sponsored product listings are interleaved with organic product listings in the search results is a large and growing phenomenon. In this paper, we study the impact of displaying sponsored listings at top positions for the platform. Analyzing data from a large-scale field experiment at a leading online marketplace in India, we find nuanced results that substantially vary across product categories. In the electronics category, the sponsored listings receive fewer clicks than the organic listings that they replace. Surprisingly, this effect is reversed in the clothing category, in which the ads perform better than the displaced organic listings, suggesting that sponsored listings might help the platform identify new high-relevance products and improve search rankings for these categories. At the search level, we find that increasing the fraction of sponsored listings (by about 10% points) in the search results does not affect the performance in any product category. This implies that ads bring in additional revenue for the marketplace yet do not hurt overall consumer response (in the short run). We theorize that the variation across categories occurs because of differing degrees of information asymmetry on product relevance between the marketplace and the sellers.

Improving Students' Argumentation Skills Using Dynamic Machine-Learning–Based Modeling (p. 474)
Thiemo Wambsganss, Andreas Janson, Matthias Söllner, Ken Koedinger, Jan Marco Leimeister

This study explores the potential of dynamic, machine learning (ML)-based modeling to enhance students' argumentation skills—a crucial component in education and professional success. Traditional educational tools often rely on static modeling, which does not adapt to individual learner needs or provide real-time feedback. In contrast, our research introduces an innovative ML-based system designed to offer dynamic, personalized feedback on argumentation skills. We conducted three empirical studies comparing this system against traditional methods such as scripted and adaptive support modeling. Our results show that dynamic behavioral modeling significantly improves learners' objective argumentation skills across domains, outperforming all established methods. The results further indicate that, compared with adaptive support, the effect of the dynamic modeling approach holds across complex (large effect) and simple tasks (medium effect) and supports learners with lower and higher expertise alike. This research has important implications for educational policy and practice; incorporating such dynamic systems could transform learning environments by providing scalable, individualized support. This would not only foster essential skills but also cater to diverse learner profiles, potentially reducing educational disparities. Our work suggests a shift toward integrating more adaptive technologies in educational settings to better prepare students for the demands of the modern workforce.

Addressing Online Users' Suspicion of Sponsored Search Results: Effects of Informational Cues (p. 508)
Honglin Deng, Weiquan Wang, Kai H. Lim

Online searches are often accompanied by sponsored content (e.g., targeted ads), which sometimes seem irrelevant but could be good alternatives to expand users' consideration space. The sponsored search results (SSRs) often trigger suspicions among users. This study examines the potential of customer ratings and reviews of the SSRs to mitigate such suspicion and enhance user engagement with the SSRs. The research reveals that when SSRs for well-known brands are paired with positive customer ratings, users' suspicion toward the SSRs can be reduced. However, for lesser-known brands, only ads with high ratings can effectively reduce users' suspicion. This study further reveals that addressing users' uncertainty in evaluating SSRs and concerns about the platform's intentions in providing them is paramount to minimizing users' suspicion. Our study holds significant practical implications for online platforms seeking to optimize the presentation of SSRs either with famous or unknown brands alongside organic search results. The findings underscore the importance of strategically integrating user-generated content and ratings to reduce the suspicion of users navigating SSRs. It offers actionable insights for e-commerce platforms aiming to enhance users' decision-making processes by better utilizing SSRs with positive customer ratings.

Customer Acquisition via Explainable Deep Reinforcement Learning (p. 534)
Yicheng Song, Wenbo Wang, Song Yao

Effective customer acquisition is crucial for digital platforms, with sequential targeting ensuring that marketing messages are both timely and relevant. The

proposed deep recurrent Q-network with attention (DRQN-attention) model enhances this process by optimizing long-term rewards and increasing decision-making transparency. Tested with a data set from a digital bank, the DRQN-attention model has proven to enhance clarity in decision making and outperform traditional methods in boosting long-term rewards. Its attention mechanism acts as a strategic tool for forward planning, pinpointing crucial ad marketing channels that are likely to engage and convert prospects. This capability enables marketers to understand the dynamic targeting strategies of the proposed model that align with customer profiles, dynamic behaviors, and the seasonality of the markets, thereby boosting confidence and effectiveness in their customer acquisition strategies.

Fast Forecasting of Unstable Data Streams for On-Demand Service Platforms (p. 552)
Yu Jeffrey Hu, Jeroen Rombouts, Ines Wilms

The success of on-demand service platforms crucially hinges upon their ability to make fast and accurate demand forecasts so that its workers are always at the right time and location to serve customers promptly. Yet demand forecasting is challenging for several reasons. First, demand data are typically released as high-frequency streaming time series, which requires an algorithm that has a fast processing time. Second, a digital platform often operates in many different geographic regions, thereby giving rise to a large heterogeneous geographical collection of high-frequency demand streams that need to be forecast and requiring a scalable algorithm. Third, a platform business usually operates in an unstable, rapidly changing environment and faces irregular growth patterns, which requires agility when forecasting demand because slow reactions to such instabilities causes forecast performance to break down. We offer a novel forecast framework called fast forecasting of unstable data streams that is fast and scalable and automatically assesses changing environments without human intervention. We test our framework on a unique data set from a leading European on-demand delivery platform and a U.S. bicycle sharing system and find strong (i) forecast performance gains, (ii) financial gains, and (ii) computing time reduction from using our framework against several industry benchmarks.

KETCH: A Knowledge-Enhanced Transformer-Based Approach to Suicidal Ideation Detection from Social Media Content (p. 572)
Dongsong Zhang, Lina Zhou, Jie Tao, Tingshao Zhu, Guodong (Gordon) Gao

Suicide is a major cause of death among 15- to 29-year-olds globally, claiming more than 50,000 lives in the United States in 2023 alone. Despite governmental efforts to provide support, many individuals experiencing suicidal thoughts do not seek help but are increasingly turning to social media to express their feelings. This trend offers a critical opportunity for timely detection and intervention of suicidal ideation. We develop an innovative transformer-based model for suicidal ideation detection (SID) that combines domain knowledge with dynamic embedding and lexicon-based enhancements. Our model, which is tested on social media data in two languages from different platforms, outperforms existing state-of-the-art models for SID. We have also explored its applicability to detecting depression and its practical implementation in real-world scenarios. Our research contributes significantly to the field, offering new methods for timely and proactive intervention in suicidal ideation, with potential wide-reaching effects on public health, economics, and society. Methodologically, our approach advances the integration of human expertise into AI models to enhance their effectiveness.

Monitoring and the Cold Start Problem in Digital Platforms: Theory and Evidence from Online Labor Markets (p. 600)
Chen Liang, Yili Hong, Bin Gu

In the realm of online labor platforms, addressing moral hazard is crucial. Reputation systems have been the conventional solution, yet they pose a cold-start problem for newcomers. Alternatively, monitoring systems provide real-time oversight to employers, directly tackling moral hazard. This study combines theory and empirical analysis using data from a leading online labor platform. We find that monitoring systems effectively reduce the cold-start problem, leading to a 27.8% increase in bids on projects, primarily from inexperienced workers. We further find that following the introduction of the monitoring system, employers' preference for experienced workers diminishes, accompanied by an average reduction of 19.5% in labor costs, whereas we observe no significant decrease in project completion and review rating. Our results collectively suggest that monitoring systems alleviate the cold-start problem in online platforms and contribute to fostering a more inclusive online labor market.

A Nudge to Credible Information as a Countermeasure to Misinformation: Evidence from Twitter (p. 621)
Elina H. Hwang, Stephanie Lee

As people increasingly rely on social media to obtain healthcare information, misinformation, such as myths, rumors, and false information on healthcare, is posing a grave threat to public health. This paper investigates a potential remedy for such infodemic by examining a unique countermeasure that Twitter implemented.

Instead of resorting to outright censorship, Twitter has taken a more nuanced approach: The platform has been nudging its users toward reputable sources whenever they seek out topics susceptible to misinformation. By analyzing the propagation of news articles that contain misinformation about health topics, we find that misinformation is less likely to initiate a diffusion process on Twitter since the inception of the policy. Moreover, tweets that include a link to misinformation articles are less likely to receive retweets, quotes, or replies. Furthermore, we find that the observed reduction is primarily driven by a decline in diffusion activities by human-like accounts rather than bot-like accounts. Our findings suggest that a misinformation policy that nudges platform users to a credible information source can help effectively curb misinformation diffusion. This approach may serve as a model for other platforms grappling with the challenge of misinformation in the digital age.