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Optimal Auction Design for Wi-Fi Procurement

(p. 1)

Liangfei Qiu, Huaxia Rui, Andrew Whinston

The unprecedented growth of cellular traffic driven by the use of smartphone for web surfing, video streaming, and cloud-based services poses bandwidth challenges for cellular service providers. To manage the increasing data traffic, cellular service providers are experimenting the use of third-party Wi-Fi hotspots to augment its cellular capacity. A unique challenge in the Wi-Fi procurement auction is that the longer-range cellular resource introduces coupling among the shorter range Wi-Fi hotspots. We follow the paradigm of sharing economy and focus on offloading mobile traffic to third-party Wi-Fi hotspots owned by entities such as local restaurants, bookstores, and hotels. Offloading data traffic to third-party Wi-Fi hotspots is not purely a technology augmenting the existing cellular network. Considering the economic incentives of third-party Wi-Fi hotspots, Wi-Fi offloading is also a practical mechanism design problem. Therefore, effectively leveraging third-party Wi-Fi capacity requires the combination of both information technology and economic theory, which is in the spirit of designing smart markets. To implement the optimal mechanism, we also provide an efficient algorithm whose computation complexity is of the order of the number of Wi-Fi regions.

A Structural Analysis of the Role of Superstars in Crowdsourcing Contests

(p. 15)

Shunyuan Zhang, Param Vir Singh, Anindya Ghose

Should a participant compete with or avoid superstars in crowdsourcing contests? Past literature shows that in presence of superstar opponent a participant's performance goes down in a contest. For example, golfers used to underperform significantly when competing against Tiger Woods in his prime. In crowdsourcing contests, where an individual can choose which contest to participate in, he can avoid participating in contests where superstars are also participating. This study shows that that such a strategy ignores the potential positive effects of competing against superstars. Using a unique 50-month longitudinal panel data set on 1,677 software design crowdsourcing contests, this study illustrates a learning effect where participants are able to improve their skills (learn) more when competing

against a superstar than otherwise. It shows that an individual's probability of winning in subsequent contests increases significantly after she has participated in a contest with a superstar coder than otherwise. The results indicate that individuals with lower ability to learn tend to value monetary reward highly, and vice versa. Interestingly, individuals who greatly prefer monetary reward tend to win fewer contests, as they proactively avoid superstars and rarely achieve the high skills needed to win a contest. Counterfactual analysis suggests that instead of avoiding superstars, individuals should be encouraged to participate in contests with superstars early on, as it can significantly push them up the learning curve, leading to higher quality and a higher number of submissions per contest. Overall, this study shows that individuals who are willing to forego short-term monetary rewards by participating in contests with superstars have much to gain in the long term.

Who Wants Consumers to Be Informed? Facilitating Information Disclosure in a Distribution Channel

(p. 34)

Lin Hao, Yong Tan

Our study investigates a supplier's and a retailer's incentive to facilitate the disclosure of product information under two popular supply chain contracts: the agency pricing model and the wholesale pricing model. We have found that for products with moderate or high heterogeneity in consumers' valuation and with a mediocre existing level of disclosure, for example, apparels or shoes with product descriptions and consumer reviews hardly revealing the exact product fit to their consumers, two parties might have conflicting interests regarding disclosure. Specifically, the supplier benefits but the retailer suffers from more information disclosure in the agency pricing model whereas the retailer benefits, but the supplier suffers in the wholesale pricing model under commonly seen non-linear demand. To reconcile such potential misalignment of interests, two parties can seek to coordinate the channel, in which case their interests towards disclosure are always aligned. Nonetheless, the wholesale pricing model under linear product demand can also guarantee the alignment of interest even if the channel is uncoordinated. Hence, when channel coordination is difficult to achieve but the demand is

approximately linear, two parties may want to consider opting for the wholesale pricing model if product information disclosure is crucial for selling the product successfully.

Data-Driven Computationally Intensive Theory Development (p. 50)

Nicholas Berente, Stefan Seidel, Hani Safadi

Scientific knowledge takes the form of generalized theories of the world. Now that just about every human and organizational activity leaves digital traces, information systems researchers have a new opportunity to generate innovative and interesting theories to move scientific knowledge forward using computational analysis of this trace data. In this research commentary, we draw on different traditions of theory development to propose a “computationally intensive” approach to theory development.

Battle of the Internet Channels: How Do Mobile and Fixed-Line Quality Drive Internet Use? (p. 65)

Jiao Xu, Chris Forman, Yu Jeffrey Hu

Given the widespread digitization of economic and social activity, broadband access is an important public policy issue. For example, in the U.S. the 1996 Telecommunications Act requires the Federal Communications Commission to “determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion” (47 U.S.C. § 1302(b)). Given the rapid diffusion of mobile broadband services, an important question is whether users view the mobile Internet as a competing service when local fixed-line quality is low. Our results provide evidence that users view them as competitors. However, there are substantial differences in the extent to which users view these channels as competitors. Fixed-line Internet speed has no effect on the use of mobile offline services, such as taking photos or videos, that do not require a real-time Internet connection. Younger users and those who live in areas with lower fixed-line Internet speeds find the channels to be closer competitors.

Measuring and Managing the Externality of Managerial Responses to Online Customer Reviews (p. 81)

Wei Chen, Bin Gu, Qiang Ye, Kevin Xiaoguo Zhu

Managerial responses to online customer reviews not only affect customers who receive the responses but also influence subsequent customers who observe the responses. This externality arises due to the public nature of online interactions, and rarely exists in offline settings. Using hotel review data from two large online travel agencies, we show that managerial responses indeed increase the *volume* of subsequent customer reviews. Meanwhile, the impact on review *valence* is not evident.

Comparison to prior studies reveals that identity disclosure of reviewers might be essential for managerial responses to influence review valence. Further investigations suggest nuances in providing managerial responses. Responding to positive and negative reviews may have different effects, which hints that managerial responses influence future reviews mainly by *mitigating* the impact of negative reviews. Furthermore, when responding to positive reviews, managers should be brief because detailed responses may incorrectly emphasize the negative elements in already positive reviews. Meanwhile, managers should provide detailed responses to negative reviews since it is important to explain the details of the situation or improvement to mitigate the negative impact from such reviews.

When Algorithmic Predictions Use Human-Generated Data: A Bias-Aware Classification Algorithm for Breast Cancer Diagnosis (p. 97)

Mehmet Eren Ahsen, Mehmet Ulvi Saygi Ayvaci, Srinivasan Raghunathan

What is the optimal design of a classification algorithm that accounts for human bias in input data and what is its value? In the context of breast cancer diagnosis, clinical-risk information of a patient could bias a radiologist's assessment of the mammogram for that patient. A bias-aware classification algorithm has the potential to be of significant value if integrated into a clinical decision support system (CDSS) used by the referring physician, who decides on the final course of action based on clinical-risk information and the radiologist's assessment. We show that the optimal bias-aware algorithm can eliminate the adverse impact of bias if there is no variability associated with the bias-induced error in radiologist's assessment. In the presence of variability in the bias-induced error, the impacts of bias can be mitigated, but not eliminated, even if the algorithmic design is adjusted to account for the bias. Using point estimates obtained from mammography practice and the medical literature, we show that a bias-aware CDSS can significantly improve the expected patient life years or the accuracy of decisions based on mammography. Realizing the gains indicated by our study depends on (i) finding ways to incorporate proper weighting of clinical-risk information and mammogram information and (ii) reducing, eliminating, or properly adjusting for the bias due to clinical-risk information.

A Coevolution Model of Network Structure and User Behavior: The Case of Content Generation in Online Social Networks (p. 117)

Prasanta Bhattacharya, Tuan Q. Phan, Xue Bai, Edoardo M. Airolidi

Inter-organizational Communities of Practice (IOCoPs) bring together professionals from different organizations, and provide an important tool for knowledge

management and professional development. IOCoP participants are simultaneously embedded in two different social environments: the virtual community itself and organizations these participants are affiliated with. Therefore, it is important to carefully disentangle contextual motivating factors from online peers within the community as well as these individuals' work environment. Using a rich dataset from a virtual IOCoP on financial information exchange protocols, we theorize and empirically estimate the incentives to participate and contribute in virtual IOCoPs from a multilevel perspective. We find evidence for both endogenous and exogenous peer effects in our virtual IOCoP. The existence of endogenous peer effects suggests the positive spillover effects of individuals' efforts to participate in the virtual environment. At the same time, exogenous peer effects indicate that individuals' characteristics also matter to their online peers. At the organizational level, individuals' online behavior outside of organizational boundaries is still subject to influences from their work environment. Our multilevel framework focusing on interrelationships among individuals, network structures, and institutions provides a deeper and richer portrait of IOCoPs, an important form of digitally mediated collaboration.

The Impact of Twitter Adoption on Lawmakers' Voting Orientations (p. 133)

Reza Mousavi, Bin Gu

Social media has been found to be influential in a variety of contexts. From mobilizing the crowd in social movements to helping refugees settle into a new country, social media has had a significant impact. This study examines the role of social media in Congressional representation in a democratic political system. The authors study the impact of U.S. Representatives' Twitter adoption on their voting orientations in the 111th U.S. Congress. The authors find that Representatives' adoption of Twitter causes them to vote more in line with their constituents. Furthermore, the effect of Twitter adoption is more salient when a Representative's party differs from the party affiliation of the constituent or when the Representative represents a Twitter-savvy state. The results also indicate that the volume of tweets directed at Representatives signals the importance of certain bills to constituents. When Representatives vote on bills that are the focus of a large volume of constituents' tweets, Representatives vote in a manner more aligned with their constituents' opinions. Interestingly, the opinions the tweets express do not significantly influence their votes, suggesting that Representatives are aware of the potential bias in opinions cascaded in tweets.

Seizing the Commuting Moment: Contextual Targeting Based on Mobile Transportation Apps (p. 154)

Anindya Ghose, Hyeokkoo Eric Kwon, Dongwon Lee, Wonseok Oh

Despite the average daily commuting time of commuters increasing by the day, the way marketers can benefit from our commuting behaviors has not yet been thoroughly examined. Commuting can serve as one of the most attractive contexts that mobile marketers can target not only because of commuters' high level of mobile engagement during long daily commutes but also because of its effortless and accurate identifiability. In collaboration with one of the largest global mobile service platform providers, this study investigates how contextual targeting with commuting is associated with responses to mobile coupons. The key findings indicate that commuters are about three times as likely to redeem their mobile coupon at a faster rate compared with noncommuters. However, multiple-coupon distribution strategy increases response rates more effectively among noncommuters than commuters. Moreover, the response rates of commuters and noncommuters are higher for coupons with shorter and longer expiration dates, respectively. The findings serve as useful guidance on who and which context to target, when to send mobile coupons, how many coupons to distribute, which coupons are more attractive, and what products should be advertised on mobile coupons.

The Dynamics of Online Consumers' Response to Price Promotion (p. 175)

Youngsoo Kim, Ramayya Krishnan

How does consumers' price sensitivity at an online retailer change over time? And can we predict their response to price promotion by identifying the latent states of the online consumer-retailer relationship? Our quantification of transits across the consumer-retailer relationship states provides unique insights. For example, price promotion can strengthen consumers' loyalty only for at least moderately loyal consumers whereas it is not effective at changing nonloyal consumers' attitudes toward an online retailer (i.e., from nonloyal to loyal). Being opposed to the results from the off-line market, the consumers even in the strong relationship state are likely to seek more coupons as they increase their online shopping experience. The switching behavior observed even after online consumers reach the strong relationship state shows one aspect of the fierce price competition in the online market. Managers in online retailers pay attention to the recent change in a consumer's buying behaviors rather than the long-term trend of the consumer's

purchase behavior. For instance, the increase of the recent purchase volume strengthens loyalty toward the retailer and/or the habit of buying without a coupon for the consumers in the strong relationship state.

Using User- and Marketer-Generated Content for Box Office Revenue Prediction: Differences Between Microblogging and Third-Party Platforms (p. 191)

Tingting Song, Jinghua Huang, Yong Tan, Yifan Yu

How to improve the predictive accuracy of box office revenue with social media data is a big challenge and is particularly important for movie distributors and cinema operators. In this research, we find that microblogging UGC (MUGC) is a significant predictor of box office revenue and has stronger predictive power than UGC on Douban! Movies (DUGC) based on our examination of 60 movies released in China in 2012. To increase the attendance rate of movies, cinema operators can consider previous valence and volume of MUGC before scheduling the current film screenings because these messages can quickly predict the future box office revenue of a movie. Besides, we find that the volume of enterprise microblogs (i.e., MGC) can predict both box office revenue and MUGC, indicating that movie distributors should optimize their online media strategy by shifting more resources to utilizing enterprise microblogging. Although rebroadcasting volume from microblogging platforms does not predict box office revenue directly, it can indirectly predict it via MGC. Accordingly, compared with third-party platforms, rebroadcasting as one of the key distinct functions of microblogging platforms also shows its usefulness in box office revenue prediction. Overall, metrics from microblogging platforms are more effective in predicting box office revenue than those from third-party platforms.

Performance Consequences of Information Technology Investments: Implications of Emphasizing New or Current Information Technologies (p. 204)

Zachary R. Steelman, Taha Havakhor, Rajiv Sabherwal, Sanjiv Sabherwal

The dynamic information technology (IT) market—characterized by frequent new releases, designs, and changing options—requires senior IT executives to look closely at new technologies while deriving long-term benefits from the firm's current technologies. This study focuses on the allocation of IT resources to new or current technologies, which is becoming even more important with tighter IT budgets. The results indicate that a joint consideration of a firm's core business strategy and organizational commitment to IT provides insights into whether the firm should emphasize new IT or current IT when allocating IT investments. With an increase in organizational commitment to IT, firms

pursuing stable products/markets (i.e., defenders) benefit more from current IT, whereas firms seeking new products/markets (i.e., prospectors) benefit more from new IT. Finally, for firms seeking some stable products/markets and some new ones (i.e., analyzers), organizational commitment to IT does not influence the benefits from emphasizing new or current IT. This study initiates a line of inquiry on the factors influencing the value firms derive from new and current IT. Senior IT executives should carefully examine their firm's business strategy and organizational commitment to IT when prioritizing investments in new IT relative to the refinement of current IT.

The Digital Sin City: An Empirical Study of Craigslist's Impact on Prostitution Trends (p. 219)

Jason Chan, Probal Mojumder, Anindya Ghose

Do solicitation sites lead to an increase in prostitution trends in United States? We shed light on this issue by examining the impact that Craigslist (via its Erotic Service section) has on prostitution incidence using a data set consisting of 1,796 U.S. counties from 1999 to 2008. Our analysis shows that prostitution levels increased by about 17% on average upon the introduction of the Craigslist. We find that the Craigslist has led to the increase in both independent sex workers and workers operating under commercial vice groups. However, it is the latter that is growing at a greater rate, which bears important implications for policies concerning sex trafficking. Craigslist's entry increases prostitution in both counties that have existing prostitution trends and those that do not, although the former set of counties experience a larger growth relative to the latter. Finally, we also found evidence suggesting that efforts in utilizing Craigslist for prostitution arrests are not catching up with the growth in prostitution trends induced by the site. In sum, online platforms can be utilized in unintended manners that facilitate illegal activities. Policy makers and website owners need to be aware of such impacts to implement the proper guidelines.

How Do Recommender Systems Affect Sales Diversity? A Cross-Category Investigation via Randomized Field Experiment (p. 239)

Dokyun Lee, Kartik Hosanagar

Recommender systems appear all across the internet. For e-retailers, this represents an opportunity to get more and niche products before customers' eyes. However, we find that while implementing recommender systems does increase overall sales figures, it does not generally improve the relative sales for niche items, leading to a rich-get-richer situation. We find, across a wide range of product categories, that the use of traditional collaborative filters (CFs) is associated with a decrease in sales diversity relative to a world without product recommendations. The decrease in

aggregate sales diversity may not always be accompanied by a corresponding decrease in individual-level consumption diversity. In fact, it is even possible for individual consumption diversity to increase as aggregate sales diversity decreases. CFs help individuals explore new products, but similar users still end up exploring the same kinds of products, resulting in concentration bias at the aggregate level. There is one insight for management: Traditional collaborative filters carry the unintended consequence of increasing concentration bias. A firm interested in exposing consumers to a broader assortment of products may prefer a different design from another simply interested in maximizing sales.

An Empirical Study of Free Product Sampling and Rating Bias (p. 260)

Zhijie Lin, Ying Zhang, Yong Tan

Many electronic commerce platforms and retailers have increasingly adopted free product sampling to promote products and to attract product reviews. We conjecture that consumers who receive free samples may reciprocate by giving higher ratings as a return to retailers' beneficial action, which causes rating biases. Specifically, we are interested in understanding how free sampling promotion of a product affects the product's rating and the roles of important contingent factors, including product pricing (i.e., list price and price discount) and product popularity. Analyzing data collected from Taobao.com, we find that, on average, engaging in free product sampling increases product rating by 1.1%. Moreover, the bias would be larger with higher original price but smaller with larger price discount and higher product popularity. Our findings suggest that retailers could conduct free sampling promotions to improve their product ratings, but consumers should be cautious about the possible biases in ratings, and platform operators or rating system designers should offer solutions to correct the biases.

Crowdfunding and the Democratization of Access to Capital—An Illusion? Evidence from Housing Prices (p. 276)

Keongtae Kim, Il-Horn Hann

Access to finance is arguably one of the most critical challenges in starting a new business. And people say that crowdfunding has the potential to democratize access to finance. In this study, we examine whether crowdfunding democratizes access to finance and, if so, how. To examine this, we obtained data on housing prices related closely to the cost of accessing bank loans and matched these data to a 2009–2013 novel data set from a leading crowdfunding market. We find an increased decline in housing prices leads to a significant increase in the creation of crowdfunding

projects. However, we did not find significant differential effects in housing price changes between successful and unsuccessful projects. Finally, the effect of housing prices on crowdfunding projects was more significant for areas with low socioeconomic status. Interestingly, the increase in crowdfunding projects in these low-status areas was driven wholly by a significant increase in unsuccessful projects, whereas the effect of housing prices on successful projects was significant only in areas of high socioeconomic status. Overall, our study suggests that crowdfunding can supplement traditional sources of funding although socioeconomic status may still prevent disadvantaged people from receiving its full benefits.

Relationships Between Information Technology and Other Investments: A Contingent Interaction Model (p. 291)

Taha Havakhor, Rajiv Sabherwal, Zachary R. Steelman, Sanjiv Sabherwal

Recent studies on the business impacts of information technology (IT) have examined these impacts in the context of either other organizational resources or contingency factors. In this study we integrate these perspectives to develop a contingent interaction model. This model examines how a firm's IT investment interacts differently with resources focusing on creating value (i.e., R&D) and resources focusing on value appropriation (i.e., advertising), depending on the environmental turbulence in the firm's industry. The results indicate that a firm's IT interacts differently with other organizational resources depending on (a) the resource's focus on value creation through innovation or value appropriation in the market; and (b) the extent of turbulence in the firm's industry. Thus, managers should consider IT's interactions with other resources while making IT investments. In turbulent and stable environments, managers should seek ways to use IT to complement R&D investments and advertising investments, respectively. Managers should also recognize that IT may erode some of the benefits of R&D and advertising investments in stable and turbulent environments, respectively. They should therefore exercise caution when making concurrent investments in IT and R&D in stable environments and exercise similar caution when making concurrent investments in IT and advertising in turbulent environments.

Do Electronic Health Records Affect Quality of Care? Evidence from the HITECH Act (p. 306)

Yu-Kai Lin, Mingfeng Lin, Hsinchun Chen

The 2009 Health Information Technology for Economic and Clinical Health (HITECH) Act is landmark legislation that places electronic health record (EHR)

technologies at the center of health system reform in the United States. This study leverages the meaningful use (MU) provisions of the HITECH Act to quantify different degrees of EHR use in a large and heterogeneous set of hospitals and investigates the impact of EHR use on quality of care. The results provide evidence of EHRs' positive quality effects and reconcile earlier mixed findings in the EHR evaluation literature by showing that their benefits vary according to different levels of use and hospital characteristics. The effect sizes were larger in disadvantaged (i.e., small and rural) hospitals, suggesting the potential of EHRs in mitigating the disparities in the quality of healthcare.

Why Do Stores Drive Online Sales? Evidence of Underlying Mechanisms from a Multichannel Retailer (p. 319)

Anuj Kumar, Amit Mehra, Subodha Kumar

Traditional retailers are closing down their brick and mortar stores and increasing investments in their

online channels. This may not be a beneficial strategy for retailers selling nondigital products, such as apparel, which customers prefer to physically evaluate to make the purchase decision. In such product categories, retailers' physical stores could influence the sales on its online channel. We utilize the event of store opening by a large apparel retailer and use customer-level data to examine the effect of store presence on the online purchase behavior of its existing customers. We find that the retailer's store openings resulted in an increase in online purchases from such customers for two reasons. First, higher store interactions engaged customers with the retailer's brand, which resulted in their higher online purchases. Second, customers could freely purchase apparel from the retailer's online channel, because they had the option to return it at a nearby store if it did not fit their expectations. Multichannel retailers should organize store events to engage customers and design lenient return policies to reduce the risk of purchase from online channel.