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Research Spotlights

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FinTech as a Game Changer: Overview of Research Frontiers (p. 1)
Terrence Hendershott, Xiaoquan (Michael) Zhang, J. Leon Zhao, Zhiqiang (Eric) Zheng

Every new advancement in technology inevitably pushes forward the progress of individuals, organizations, economies, and societies. FinTech has demonstrated tremendous power in fundamentally changing how the financial market is run. With the fast development of FinTech in business applications, exciting research opportunities arise. This editorial review provides an overview of relevant technological, pedagogical, and managerial issues concerning FinTech research and teaching.

Mobile Money and Mobile Technologies: A Structural Estimation (p. 18)
Yan Dong, Sining Song, Sriram Venkataraman, Yuliang Yao

Mobile money is a service bundled with mobile technology and a social good that promotes financial inclusion for the underserved populations. Although the effect of mobile money has been examined in the past, we look at the supply side effects, as it is important for managers to understand the role of mobile money in both providing social good and making a profit. From 1G to 4G mobile technologies, mobile money consistently serves as a competitive advantage for mobile network operators (MNOs). However, this does not mean that the effect stays unchanged over the generations of mobile technology. Instead, when the 3G technology allows web browsing as a major upgrade of mobile functionality, MNOs with mobile money have a substantially larger set of options to differentiate from those without mobile money; and as a result, mobile money implemented with 3G and 4G leads to larger market shares than that with 1G and 2G.

Fake News, Investor Attention, and Market Reaction (p. 35)
Jonathan Clarke, Hailiang Chen, Ding Du, Yu Jeffrey Hu

Does fake news in financial markets attract more investor attention and have a significant impact on stock prices? The authors use the SEC crackdown of stock promotion schemes in April 2017 to examine investor attention and the stock price reaction to fake news articles. Using data from Seeking Alpha, the authors find that fake news stories generate significantly more attention than a control sample of legitimate articles. The authors find no evidence that article commenters can detect fake news, and they find that Seeking Alpha editors have only modest ability to detect fake news. However, the authors implement several well-known machine learning algorithms based on linguistic characteristics and show that machine learning algorithms can successfully identify fake news. In addition, the stock market appears to price fake news correctly. While abnormal trading volume increases around the release of fake news, the increase is less than that observed for legitimate news. The stock price reaction to fake news is discounted when compared with legitimate news articles.

Education Crowdfunding and Student Performance: An Empirical Study (p. 53)
Qiang Gao, Mingfeng Lin, D. J. Wu

Despite the growing popularity of online public funding for education (i.e., crowdfunding), controversy persists about whether teachers' efforts to use this channel are justified and whether donations thus received can actually make a difference in students' academic performance. We present the first empirical evidence of the positive influence of online education crowdfunding after teachers successfully raise funds. Using data from California public school teachers and their students, as well as the teachers' fundraising activities on DonorsChoose.org, we find significant academic performance improvements among students after their teachers receive donations through this platform. Such improvements in students' academic performance are stronger when more local donors participate in teachers' fundraising campaigns. Notably, teachers who attempt to raise funds online but are unsuccessful are still able to improve their students' performance. These findings not only document the positive impact of online education crowdfunding on students' academic performance, but also demonstrate that such impacts are at least partially attributable to the nonfinancial motivational

benefits on teachers from receiving such donations. Our study therefore contributes to the literature on crowdfunding, as well as the ongoing debates surrounding the financing of public education.

Crowds, Lending, Machine, and Bias (p. 72)
Runshan Fu, Yan Huang, Param Vir Singh

Can machines outperform crowds in financial lending decisions? Using data from a crowd-lending platform, we show that, compared with portfolios created by crowds, a reasonably sophisticated machine can construct financial portfolios that provide better returns while controlling for risk. Further, we find that the machine-created portfolios benefit not only the lenders, but also the borrowers. Borrowers receive loans at a much lower interest rate as the machine can weed out the riskiest loans better than the crowds. We also find suggestive evidence of algorithmic bias in machine decisions. We find that, compared with women, men are more likely to receive loans by machine. We propose a general and effective "debiasing" method that can be applied to any prediction-focused machine learning (ML) applications. We show that the debiased ML algorithm, which suffers from lower prediction accuracy, still improves the crowd's investment decisions in our context. Our results indicate that ML can help crowd-lending platforms better fulfill the promise of providing access to financial resources to otherwise underserved individuals and ensure fairness in the allocation of these resources.

Leveraging the Numerosity Effect to Influence Perceived Expensiveness of Virtual Items (p. 93)
Yunhui Huang, Kai H. Lim, Zhijie Lin

Selling virtual items is one of the major revenue sources for online game operators. Therefore, the design of game currency systems is important. This research shows that the game currency exchange rate (e.g., \$1 = 1,000 game currency is a higher rate than \$1 = 10 game currency) affects price perception of virtual items. When the rate is not prominent in players' minds (e.g., the rate is not mentioned or players have sufficient game currency in their account), players consider a virtual item as more expensive if the rate is higher. In contrast, when the rate is prominent in players' minds (e.g., the rate is mentioned and no additional information indicates that players already have sufficient game currency, and thus it is irrelevant), players consider a virtual item as cheaper if the rate is higher. In the latter case, higher rate leads to stronger purchase intention of nonsocial, but not social, virtual items. Our findings show currency system design can affect players' willingness to spend on virtual items thus affecting the revenue of game operators. Moreover, reminders of the actual monetary value of virtual items might help to reduce players' overspending driven by the biasing effect of the game currency exchange rate.

On the Use of Probabilistic Uncertain Rewards on Crowdfunding Platforms: The Case of the Lottery (p. 115)
Jing Gong, Paul A. Pavlou, Zuyin (Alvin) Zheng

Crowdfunding aims to collect investments from many backers to support a project posted by fundraisers. This study examines how backers respond to the lottery—a type of probabilistic uncertain reward—and how their motivations shape their responses to probabilistic uncertain rewards. Using data collected from a reward-based crowdfunding platform, we find that although the lottery helps to attract a higher number of backers on a crowdfunding project, the lottery also reduces the total money raised by the project and thus the probability of reaching its funding goal. Specifically, although the lottery incentivizes individuals who would otherwise not fund the project to become (small) lottery backers, the lottery also cannibalizes regular prospective rewardees and donors by encouraging them to opt for the (cheaper) lottery option. Second, the effects of the lottery are stronger in the earlier stages of a project's fundraising cycle. Third, the lottery has larger effects on backers with higher prior tendencies to be donors than rewardees. Notably, from a practical standpoint, our study informs fundraisers on how to design strategies to attract the right type of backers and crowdfunding platform managers on how to leverage the lottery as a type of probabilistic uncertain reward on crowdfunding platforms.

Following the MAP (Methods, Approaches, Perspectives) in Information Systems Research (p. 130)
Nadège Levallet, James S. Denford, Yolande E. Chan

Information technology (IT) and systems continuously evolve and are increasingly embedded in organizational and social contexts. The grand, complex organizational, societal, and global challenges, in which IT permeates processes and systems, cannot be tackled with a single paradigmatic lens. We advocate for studying these phenomena by focusing our attention on a combination of research *methods*, analytic *approaches*, and theoretical *perspectives* (coined MAP). This extends past practices encouraging the use of multiple research methods (e.g., survey data or case study data), which is sometimes done without questioning the theoretical perspectives that underpin them. We use the variance-structural equation modeling-survey and systems-qualitative comparative analysis-survey multi-MAP approach to illustrate our reasoning and outline how the

approach can be applied to other MAPs. We demonstrate through illustrative examples how researchers can expand their reasoning from deductive and inductive modes to an abductive reasoning process, one that alternates between theory, data, and results. Finally, we encourage researchers to be explicit and transparent in their MAP choices, whether using a single MAP or multiple MAPs.

Axiomatic Theories and Improving the Relevance of Information Systems Research (p. 147)
Jae Kyu Lee, Jinsoo Park, Shirley Gregor, Victoria Yoon

This paper examines the fact that a significant number of empirical information systems (IS) studies engage in confirmative testing of self-evident axiomatic theories without yielding highly relevant knowledge for the IS community. The authors conduct both a horizontal analysis of 72 representative IS theories and an in-depth vertical analysis of 3 well-known theories (i.e., technology acceptance model, diffusion of innovation theory, and institutional theory) in order to measure how pervasive such testing of axiomatic theories is. The authors discovered that more than 60% of 666 hypotheses from the horizontal analysis could be regarded as axiomatic theory elements. In the vertical analysis, 68.1% of 1,301 hypotheses from 148 articles were axiomatic. Based on these findings, the authors propose four complementary IS research approaches: (1) identifying disconfirming boundary conditions, (2) measuring the relative importance of axiomatic causal factors, (3) measuring the stage of progression toward visionary goals when the nature of the axiomatic theory can be extended to future visions, and (4) engaging in the conceptual design of visionary axiomatic goals. They argue that these complementary IS research approaches can enhance the relevance of IS research outcomes without sacrificing methodological rigor.

Spillover Effect of Consumer Awareness on Third Parties' Selling Strategies and Retailers' Platform Openness (p. 172)
Wen Song, Jianqing Chen, Wenli Li

Global e-commerce sales have experienced unprecedented growth for the past years and have reached over $2 trillion annually. One interesting phenomenon along with this remarkable growth is that giant online retailers, such as Amazon.com in the United States and JD.com in China, open their platforms and allow third-party sellers to offer products there, thus inviting competition. We explore why an online retailer would open its platform and why a third-party seller would join the platform. We highlight the role of a spillover effect that, when the third-party seller joins the retailer's platform, more consumers become aware of the third-party seller's existence and its products which are not even listed on the retailer's platform. We characterize how the third-party seller's optimal selling strategies should vary with and how the retailer's openness decision should be determined by the extent of the spillover effect and the retailer's initial awareness advantage. Compared with the case without a spillover effect, the spillover effect makes the retailer less likely to open its platform, but it makes the third-party seller more likely to sell identical products on an open retailer platform; the spillover effect always (weakly) benefits the third-party seller, but it does not necessarily hurt the retailer.

The Return on Information Technology: Who Benefits Most? (p. 194)
Emmanuel Dhyne, Jozef Konings, Jeroen Van den bosch, Stijn Vanormelingen

Information and communication technology (ICT) has continuously reshaped the way in which businesses operate. Yet opinions among economists about the returns to ICT, especially at the aggregate level, are divided. We exploit business-to-business transaction panel data from ICT producers to construct ICT capital stocks for a large sample of Belgian firms. This allows us to estimate the returns to ICT at the firm level and to investigate how firm-level ICT investments affected aggregate gross domestic product and productivity. We find large returns to ICT—more precisely, a firm investing an additional euro in ICT—increases value added by 1 euro and 35 cents on average. This marginal product of ICT investment increases with firm size and varies across sectors. Although we find substantial returns to ICT at the firm level, returns are much lower at the aggregate level. This is due to underinvestment in ICT (ICT capital deepening is low) and because firms with especially high returns are underinvesting.

The Effects of Social Media Content Created by Human Brands on Engagement: Evidence from Indian General Election 2014 (p. 212)
Rakesh R. Mallipeddi, Ramkumar Janakiraman, Subodha Kumar, Seema Gupta

With human brands or individual celebrities in fields ranging from sports to politics increasingly using social media platforms to engage with their audience, it is important to understand the key drivers of online engagement. Using Twitter data from the political domain, we show that positive and negative-toned content receive higher engagement, as measured by retweets, than mixed or neutral toned tweets. However, less popular human brands generate higher social media engagement from positive-toned content

compared with more popular human brands. Therefore, we recommend that popular human brands (e.g., popular politicians or chief executive officers) keep their content objective rather than emotional. Furthermore, the tone of related brands (i.e., human brands who belong to the same political party) has a strong reinforcement effect; that is, social media engagement is higher when the tone of the focal human brand and related brands are the same and lower when the tones are different. Therefore, we prescribe that human brands actively coordinate their social media content with related brands to generate higher engagement. From human brands' perspective, our findings recommend a comprehensive social media strategy, which takes into account the tone of content, tone of related brands' content, and human brands' popularity.

Demand Effects of the Internet-of-Things Sales Channel: Evidence from Automating the Purchase Process (p. 238)
Panagiotis Adamopoulos, Vilma Todri, Anindya Ghose

The internet of things (IoT) is rapidly becoming one of the most popular emerging technologies in business and society. One of the major verticals that has recently begun to effectively use IoT technologies is the retail industry. Given the unprecedented opportunities IoT generates for brands and retailers, it is important to glean timely insights regarding the business value of IoT and understand whether the introduction of an IoT technology as an alternative purchase channel for consumers affects the sales of physical products. Using empirical data from a multinational online retailer who adopted an IoT technology that largely automates the consumers' purchases and employing a quasi-experimental framework, we study the effect of the introduction of IoT as an alternative sales channel on product sales. Our analyses reveal a statistically and economically significant increase in sales and demonstrate the business value of the IoT channel for retailers and brands. In addition, we conduct other analyses of IoT to delve into the effect of heterogeneity and empirically validate the underlying mechanisms by examining the impact of IoT for products in different price ranges, levels of substitutability, and product categories. For instance, our analyses reveal that less expensive and more differentiated products, as well as experience and utilitarian goods, can accrue higher benefits leveraging more effectively novel IoT technologies. This is the first paper to study the impact of an IoT technology on product sales, drawing important implications for devices and technologies largely automating the purchase process.

Do Fit Opinions Matter? The Impact of Fit Context on Online Product Returns (p. 268)
Yang Wang, Vandana Ramachandran, Olivia R. Liu Sheng

Product-fit uncertainty is one major reason for high online product return rates. We analyze the impacts of two types of user-generated fit information—fit valence (e.g., whether an apparel item is true to size or runs large/small) and fit reference (i.e., the apparel size the customer selected and her body size)—on product returns of apparel goods. The results indicate that, when either the fit valences among reviewers are inconsistent or far and few between, it is the combination of fit valence and fit reference that helps reduce product returns. Accordingly, we suggest online retailers implement product-review functions allowing customers to provide both a summary fit valence and their fit context (i.e., fit reference). Besides, shoppers can benefit from both positive and negative fit valences. Reviewers should thereby be encouraged to honestly report their fit evaluations. In addition, fit opinions from reviewers with similar fit reference are found to benefit the customers more. We suggest online retailers develop a personalized recommender to rank reviews by fit-related attributes to reduce consumers' fit-related search cost. Our findings can be generalized to a wide array of online product and service categories, including tools, furniture, video or games, and both in-person and online lessons.