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Michael F. Gorman,

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Management Insights

Michael F. Gorman

School of Business Administration, University of Dayton, Dayton, Ohio 45469,
michael.gorman@udayton.edu

Engineering Trust: Reciprocity in the Production of Reputation Information (p. 265)

Gary Bolton, Ben Greiner, Axel Ockenfels

I like you, and you like me; does that make us both good? On eBay and in other online marketplaces, such reciprocity in feedback is common. Unfortunately, these reciprocal comments can distort the reliability of reputation information in a market, hampering trust and trade efficiency. The authors examine the feedback patterns observed on eBay and other platforms and demonstrate how reciprocity can be managed by changes in the way feedback information flows through the system. They suggest information management strategies that lead to more accurate reputation information, more trust, and more efficient trade. The insight for management: Managing the design of market trust systems can improve the veracity of information and improve market performance.

Earnings Effects of Entrepreneurial Experience: Evidence from the Semiconductor Industry (p. 286)

Benjamin A. Campbell

How should entrepreneurs be rewarded to maximize their effort levels? Entrepreneurs value both pecuniary and nonpecuniary aspects of their work. The author studies the effects of employee experience at a start-up on earnings across an individual's career in the context of California's semiconductor industry. The author finds that start-up experience has a persistent positive effect on earnings that extends outside the entrepreneurial environment. The insight for management: Entrepreneurs experience a short-term dip in income after joining a start-up but generally catch up after four quarters.

A Nonparametric Approach to Modeling Choice with Limited Data (p. 305)

Vivek F. Farias, Srikanth Jagabathula, Devavrat Shah

How should individual choice be modeled? There are many approaches to modeling individual deci-

sions, but real-world implementations of many of these models face the formidable stumbling block of simply identifying the "right" model of choice to use. A particular challenge is in fine-grained predictions; one must contend with the risks of mis-specification and overfitting/underfitting. With limited data on how consumers actually make decisions, how may one predict revenues from offering a particular assortment of choices? The authors outline an approach in which the data automatically select the right choice model for revenue predictions. With a data set consisting of automobile sales transaction data from a major U.S. automaker, the authors find a 20% improvement in prediction accuracy over state-of-the-art benchmark models, which can result in a 10% increase in revenues from optimizing the offer set. The insight for management: The authors make progress toward "automating" the crucial task of choice model selection for improved choice prediction.

The Role of Experience Sampling and Graphical Displays on One's Investment Risk Appetite (p. 323)

Christine Kaufmann, Martin Weber, Emily Haisley

Form or function: Do graphical displays have an effect on an individual's appetite for risk? Financial professionals have a great deal of discretion concerning how to relay information about the risk of financial products to their clients. The authors introduce a new risk tool to communicate the risk of investment products, and they examine how different risk-presentation modes influence risk-taking behavior and investors' recall ability of the risk-return profile of financial products. They analyze four different ways of communicating risk: (i) numerical descriptions, (ii) experience sampling, (iii) graphical displays, and (iv) a combination of these formats in the "risk tool." Participants receive information about a risky fund and a risk-free fund and make an allocation between the two in an experimental investment

portfolio. Greater risky allocations in the risk tool condition are associated with decreased risk perception, increased confidence in the risky fund, and a lower estimation of the probability of a loss. In addition to these favorable perceptions of the risky fund, participants in the risk tool condition are more accurate on recall questions regarding the expected return and the probability of a loss. The insight for management: Presenting fund performance graphically changes the perception of the desirability of the investment.

Robust Solutions of Optimization Problems Affected by Uncertain Probabilities (p. 341)

Aharon Ben-Tal, Dick den Hertog,
Anja De Waegenaere, Bertrand Melenberg,
Gijs Rennen

What methodological approach is most appropriate in problems in inventory control or finance that involve terms containing moments of random variables such as expected utility? The authors suggest a robust optimization methodology that extends the results to problems that are nonlinear in the optimization variables. The insight for management: An advanced methodology has been developed that can be used in several applications, including an asset pricing example and a numerical multi-item newsvendor example.

Optimal Decision Stimuli for Risky Choice Experiments: An Adaptive Approach (p. 358)

Daniel R. Cavagnaro, Richard Gonzalez,
Jay I. Myung, Mark A. Pitt

How are stimuli selected for discriminating among models of risky choice? The authors propose an approach, called adaptive design optimization, that adapts the stimulus in each experimental trial based on the results of the preceding trials. Collecting data to discriminate between models of risky choice requires careful selection of decision stimuli. Models of decision making aim to predict decisions across a wide range of possible stimuli, but practical limitations force experimenters to select only a handful of them for actual testing. The insight for management: A new approach for adaptively selecting stimuli for problems of expected utility, weighted expected utility, original prospect theory, and cumulative prospect theory has been developed.

Pricing and Hedging with Discontinuous Functions: Quasi-Monte Carlo Methods and Dimension Reduction (p. 376)

Xiaoqun Wang, Ken Seng Tan

What modeling approach can be used for pricing and hedging of complex financial instruments? Quasi-

Monte Carlo (QMC) methods are important numerical tools in the pricing and hedging of complex financial instruments. The effectiveness of QMC methods crucially depends on the discontinuity and the dimension of the problem. The authors show how the two fundamental limitations can be overcome in some cases. They first study how path-generation methods (PGMs) affect the structure of the discontinuities and what the effect of discontinuities is on the accuracy of QMC methods. The insight is that the discontinuities can be QMC friendly (i.e., aligned with the coordinate axes) or not, depending on the PGM. The PGMs that offer the best performance in QMC methods are those that make the discontinuities QMC friendly. The structure of discontinuities can affect the accuracy of QMC methods more significantly than the effective dimension. This insight motivates the authors to propose a novel way of handling the discontinuities. The basic idea is to align the discontinuities with the coordinate axes by a judicious design of a method for simulating the underlying processes. Numerical experiments demonstrate that the proposed method leads to dramatic variance reduction in QMC methods for pricing options. The insight for management: Advances in quasi-Monte Carlo methods can reduce variance in pricing options.

Vertical Differentiation with Variety-Seeking Consumers (p. 390)

Robert Zeithammer, Raphael Thomadsen

How should prices and quality levels be set when customers desire variety? The preference for variety is a consequence of diminishing marginal utility for repeated experiences with the same product. The authors find that consumer variety seeking can either soften or intensify price competition, depending on the difference in firm qualities and the strength of consumer preference for variety. When the qualities are similar (or the consumer preference for variety is strong), prices and profits are higher than would be obtained in the absence of variety seeking. On the other hand, if qualities differ enough (or the preference for variety is weak), stronger preferences for variety are associated with more intense price competition and lower profits. When firms set their qualities before competing on price and the range of feasible qualities is restricted such that variety seeking softens competition, competing firms choose to minimally differentiate themselves from each other. The insight for management: The preference for variety can drive the firms to offer multiunit discounts, and the greater price flexibility from these discounts does not necessarily reduce profits relative to simple unit pricing.

Industry Structure, Executive Pay, and Short-Termism (p. 402)

John Thanassoulis

How should executive contracts be structured to avoid short-termism behavior that can cause excessively risky behavior? The author outlines a new theory linking industry structure to optimal employment contracts and executive short-termism. Firms hire their executives using optimal contracts derived within a competitive labor market. To motivate effort, firms must use some variable remuneration. Such remuneration introduces a myopia problem: An executive would wish to inflate early expected earnings at some risk to future profits. To manage this short-termism, some bonus pay is deferred. Eventually, the optimal contract jumps from one deterring myopia to one tolerating myopia. The insight for management: Modeling helps structure executive pay to balance short-termism yet still create incentives for performance.

Services and the Business Models of Product Firms: An Empirical Analysis of the Software Industry

(p. 420)

Fernando F. Suarez, Michael A. Cusumano, Steven J. Kahl

Many technology product providers such as SAP and Oracle increasingly rely on service revenues as part of their business models. Is this shift good or bad for these companies? One possible explanation is that they turn to services to generate additional profits when their product industries mature and product revenues and profits decline. The authors explore this assumption by examining the role of services in the financial performance of firms in the prepackaged software products industry from 1990 to 2006. They find a convex, nonlinear relationship between a product firm's fraction of total sales coming from services and its overall operating margins. As expected, firms with a very high level of product sales are most profitable, and rising services are associated with declining profitability. They find, however, that additional services start to have a positive marginal effect on the firm's overall profits when services reach a majority of a product firm's sales. It is likely that changes in both strategy and the business environment lead product firms to place more emphasis on services. The insight for management: Beyond 56% of total revenues, additional service revenues can be detrimental to total profitability.

The Effect of Payment Schemes on Inventory Decisions: The Role of Mental Accounting (p. 436)

Li Chen, A. Gürhan Kök, Jordan D. Tong

Does the payment scheme have an effect on inventory decisions in the newsvendor problem? The authors

examine three payment schemes that can be interpreted as the newsvendor's order being financed by the newsvendor herself (scheme O), by the supplier through delayed order payment (scheme S), and by the customer through advanced revenue (scheme C). The authors find that inventory quantities exhibit a consistent decreasing pattern in the order of schemes O, S, and C, with the order quantities of scheme S being close to the expected-profit-maximizing solution. These observations are inconsistent with the expected-profit-maximizing model, contradict what a regular or hyperbolic time-discounting model would predict, and cannot be explained by the loss aversion model. Instead, they are consistent with a model that underweights the order-time payments, which can be explained by the "prospective accounting" theory in the mental accounting literature. A second study shows that the results hold even if all physical payments are conducted at the same time, suggesting that the framing of the payment scheme is sufficient to induce the prospective accounting behavior. The authors further validate the robustness of their model under different profit conditions. The insight for management: Modeling approaches contribute to the understanding of the psychological processes involved in newsvendor decisions and have implications for supply chain financing and contract design.

A Dynamic Level- k Model in Sequential Games

(p. 452)

Teck-Hua Ho, Xuanming Su

In sequential games, one can use "backward induction" to predict future behavior. In the classic example of the "centipede game," however, players frequently violate this principle. An alternative is a "dynamic level- k " model, where players choose a rule from a rule hierarchy. Players choose rules based on their best guesses of others' rules and use historical plays to improve their guesses. The model captures two systematic violations of backward induction in centipede games, limited induction and repetition unraveling. Because the dynamic level- k model always converges to backward induction over repetition, the former can be considered to be a tracing procedure for the latter. The authors also examine the generalizability of the dynamic level- k model by applying it to explain systematic violations of backward induction in sequential bargaining games. The insight for management: A new modeling approach resolves prior violations in backward induction.

Individual vs. Aggregate Preferences: The Case of a Small Fish in a Big Pond (p. 470)

Douglas W. Blackburn, Andrey D. Ukhov

Aggregate preferences determine the price of risk, yet individual biases characterize deviations from

rational financial models. How does aggregation affect financial market performance? The authors study the relationship between the risk preferences of individuals and the risk preferences of the aggregate economy. To emphasize the vast differences that can occur between individual and market preferences brought about through aggregation, the authors assume an economy consisting entirely of risk seekers. They show that such individuals can lead to an aggregate economy that is risk averse. The converse is also true. An aggregate economy that exhibits risk aversion does not imply an economy of individual risk averters. An economy demanding a risk premium can be formed from individuals who do not demand such compensation. The insight for management: Understanding the relationship between the preferences of individuals and the preferences of the aggregate economy is crucial for understanding the connection between the behavioral finance literature, which focuses on individual preferences, and the asset-pricing literature, which focuses on aggregate prices.

Solving Constrained Consumption–Investment Problems by Simulation of Artificial Market Strategies (p. 485)

[Björn Bick](#), [Holger Kraft](#), [Claus Munk](#)

How can consumption and investment strategy problems be solved efficiently? Utility-maximizing consumption and investment strategies in closed form are unknown for realistic settings involving portfolio constraints, incomplete markets, and potentially a high number of state variables. Standard numerical methods are hard to implement in such cases. The authors propose a numerical procedure that combines the abstract idea of artificial, unconstrained complete markets, well-known closed-form solutions in affine or quadratic return models, straightforward Monte

Carlo simulation, and a standard iterative optimization routine. The method provides an upper bound on the wealth-equivalent loss compared to the unknown optimal strategy, and it facilitates our understanding of the economic forces at play by building on closed-form expressions for the strategies considered. The insight for management: New approaches to solving consumption investment problems to near optimality allow for more efficient solution times.

Lens or Prism? Patent Citations as a Measure of Knowledge Flows from Public Research (p. 504)

[Michael Roach](#), [Wesley M. Cohen](#)

What constitutes knowledge flow? The authors assess the validity and accuracy of firms' backward patent citations as a measure of knowledge flows from public research by employing a newly constructed data set that matches patents to survey data at the level of the research and development lab. The authors identify sources of systematic measurement error associated with backward citations to both patent and nonpatent references. They find that patent citations reflect the codified knowledge flows from public research, but they appear to miss knowledge flows that are more private and contract based in nature, as well as those used in firm basic research. They also find that firms' patenting and citing strategies affect patent citations, making citations less indicative of knowledge flows. In addition, an illustrative analysis examining the magnitude and direction of measurement error bias suggests that measuring knowledge flows with patent citations can lead to substantial underestimation of the effect of public research on firms' innovative performance. The insight for management: Nonpatent references (e.g., journals, conferences, etc.), not the more commonly used patent references, are a better measure of knowledge originating from public research.