
**FALL JOIM CONFERENCE SERIES
OCTOBER 2–4, 2011
THE RITZ CARLTON, RITZ CARLTON
BOSTON COMMON, BOSTON, MASSACHUSETTS
CONFERENCE SUMMARIES**



Topics included “Market Microstructure”—the science of how and why the markets work with an emphasis on “High Frequency Trading” and “Neuroeconomics” the study of how economic behavior can shape our understanding of the brain and how neuroscientific discoveries can constrain and guide economic models.

Stephen Blyth, Harvard Management Company

Keynote Speaker

“The Quant Delusion: Financial Engineering in the Post-Lehman Dodd-Frank Landscape”

The collapse of Lehman Brothers triggered a number of market dislocations that shook the foundations of quantitative finance. Subsequent government intervention and ongoing regulatory reform have further reshaped financial markets. We discussed how the practice of financial engineering a discipline born largely over the last twenty-five years has had to evolve rapidly in this environment, and present

recent empirical examples. We draw analogies between the current state of financial engineering, and pure mathematics without fundamental axioms: doable but highly complex. We discussed how investors, risk-managers and quants can tackle the challenges posed by the new market landscape.

Robert Almgren, Quantitative Brokers
Speaker

“Optimal Trading with Stochastic Liquidity and Volatility”

We consider the problem of mean-variance optimal agency execution strategies, when the market liquidity and volatility vary randomly in time. Under specific assumptions for the stochastic processes satisfied by these parameters, we construct a Hamilton-Jacobi-Bellman equation for the optimal cost and strategy. We solve this equation numerically and illustrate optimal strategies for varying risk aversion. These strategies adapt optimally to the instantaneous variations of market quality.

Terry Burnham, Chapman University

Speaker

“Caveman Economics: The Biological and Evolutionary Logic of Human Nature”

The natural sciences provide the foundation for synthesis of neoclassical and behavioral economics. Neoclassical scholars see people as efficient and intelligent optimizers. In sharp contrast, behavioral scholars see imperfect people navigating the world using heuristics and biases. A consilient view, grounded in evolutionary theory and physiology, will unite the disparate schools within economics. The promise is a richer, and more accurate, economic science.

Jim Gatheral, Baruch College, CUNY

Speaker

“Optimal Order Execution”

We reviewed various models of market impact. We use variational calculus to derive optimal execution strategies, noting that in many conventional models, static strategies are dynamically optimal. We then present a model in which the optimal strategy does depend on the stock price and derive an explicit closed-form solution for this strategy by solving the HJB equation. We discussed price manipulation, indicating modeling choices for which this is unlikely to be a problem. We present a recent argument by Toth *et al.* that justifies the well-known square-root formula for market impact. Assuming price dynamics that are consistent with the square-root formula, we suggest likely properties of optimal execution strategies.

Terrance Hendershott, University of California, Berkeley

Speaker

“High-Frequency Trading and Price Discovery”

We examine the role of high-frequency traders (HFT) in price discovery. Overall, HFT appear

to increase the efficiency of prices by trading in the direction of permanent price changes and in the opposite direction of transitory pricing errors. This is done through their marketable orders. In contrast, HFT passive non-marketable orders are adversely selected in terms of the permanent and transitory components as these trades are in the opposite direction as permanent price changes and in the same direction as transitory pricing errors. HFT marketable orders' informational advantage is sufficient to overcome the bid-ask spread and trading fees to generate positive trading revenues. Non-marketable limit orders also result in positive revenues as the costs associated with adverse selection are smaller than the bid-ask spread and liquidity rebates. HFT predict price changes in the subsequent few minutes.

David Laibson, Harvard University

Speaker

“The Age of Reason: Financial Decisions over the Life-Cycle with Implications for Regulation”

Many consumers make poor financial choices and older adults are particularly vulnerable to such errors. About half of the population between ages 80 and 89 either has dementia or a medical diagnosis of “cognitive impairment without dementia.” We study lifecycle patterns in financial mistakes using a proprietary database that measures ten different types of credit behavior. Financial mistakes include suboptimal use of credit card balance transfer offers, misestimation of the value of one's house, and excess interest rate and fee payments. In a cross-section of prime borrowers, middle-aged adults make fewer financial mistakes than younger and older adults. We conclude that financial mistakes follow a U-shaped pattern, with the cost-minimizing performance occurring around age 53. We analyze regulatory

regimes that may help individuals avoid making financial mistakes. Some of these regimes are designed to address the particular challenges faced by older adults, but much of our discussion is relevant for all vulnerable populations. We discuss disclosure, nudges, financial driving licenses, advanced directives, fiduciaries, asset safe harbors, ex-post and ex-ante regulatory oversight. Finally, we pose seven questions for future research on cognitive limitations and associated policy responses.

Ananth Madhavan, BlackRock, Inc.

Speaker

“Exchange—Traded Funds, Market Structure and the Flash Crash”

The “Flash Crash” of May 6, 2010 saw sharp stock price declines beginning 2:40 PM ET, with the Dow Jones Industrial Average (DJIA) dropping almost 999 points, the sharpest intraday drop in history. The Flash Crash had a disproportionate impact on exchange-traded products (ETPs), with some trading at pennies. This paper argues that the Flash Crash was not the result of an unlikely confluence of market factors and a single futures trader, as suggested by regulators. Rather, the crash was systematically related to equity market fragmentation and can thus repeat itself, albeit with a different trigger. We provide empirical evidence to show that the impact of the Flash Crash was greatest in stocks experiencing fragmentation prior to May 6. While volume fragmentation is important, we highlight the importance of aggressive venue quote behavior as a risk predictor. Controlling for fragmentation and other factors, we find that ETPs were affected adversely by the inability to price the component securities. The results have implications for public policy proposals under discussion.

Martin Nowak, Harvard University

Speaker

“Evolution of Cooperation”

Humans are champions of cooperation (and defection). We help others even if costs are involved. We have established cooperative enterprises that span the entire globe. Such “altruistic behavior” should be at variance with natural selection. Why should we help potential competitors? I presented five mechanisms for the evolution of cooperation: kin selection, group selection, graph selection, direct reciprocity and indirect reciprocity. Direct reciprocity means there are repeated interactions between the same two individuals and my behavior toward you depends on what you have done to me. Indirect reciprocity means there are repeated interactions within a group and my behavior toward you also depends on what you have done to others. Direct and indirect reciprocity are the key mechanisms for understanding any pro-social behavior among humans. Indirect reciprocity has provided the selection pressure for the evolution of social intelligence and human language.

Joshua B. Tenenbaum, Massachusetts Institute of Technology

Speaker

“Modeling Human Learning and Common-Sense Reasoning as Probabilistic Inference”

This talk presented an overview of our efforts to “reverse engineer” human intelligence—that is, to understand human intelligence in computational terms, drawing on (and advancing) the state of the art in tools for engineering intelligent systems. The focus will be on two questions: What makes humans smarter than any form of artificial intelligence yet built? What makes the human brain such a powerful learning machine?

I discussed recent progress on these questions based on hierarchical Bayesian models and probabilistic programs—technical concepts recently developed at the interface of Bayesian statistics, computer science and cognitive science. I showed

examples of how these formal models can be tested in behavioral experiments, and time permitting will also discuss their relation to classic work in the judgment and decision making and behavioral economics literature.