Our planned Special Issue, *Physics and Financial Derivatives*, is proceeding to publication in early 2020. We have many submitted articles several of which have successfully completed review. We are extending our deadline for submissions to December 31 from September 1. Please continue to help us publicize the request for specialized article submissions.

Our Guest Editors for *Physics and Financial Derivatives* are Andrey Itkin (also a JoD Board member), Alexander Bogdanov, and Alex Lipton. You'll find further details in the announcement within these pages.

THE IDEAL IS OFTEN WRONG

The first decade of my career focused on physics, engineering, and mathematics. Learning, discovery, and the consequent accumulation of knowledge were key aspects of my personal growth in this first decade as they also were in my later decades on Wall Street. One of my primary tactics in learning and discovery has always been "idealization" of elements I could not observe directly. That is, I would imagine in my thoughts how some process *should* work, then take this assumption as a basis for derivations or interpretation of observations.

I found that idealization works well in the sciences. Yes, one makes mistakes. But finding and correcting the errors becomes part of the learning. One's judgment and intuition improve over time.

In the financial world, the ideal is often wrong! Considering diverse situations such as an investment fund publicly reporting values of assets it holds, or an investment bank projecting cash flows for a complex bond it is marketing, or a bank lender underwriting residential mortgages, nothing is ideal. In this context, "ideal" means "most logical and accurate method given all stated parameters." Less formally, "ideal" is "what you yourself would do if it were your money and reputation on the line."

LIBOR MANIPULATION

This lead-up brings me to the broad topic of "LIBOR scandals." Until the most recent years, it would have been a "wrong idealization" to imagine that the banks responsible for setting daily LIBOR (London Inter-Bank Offered Rate) values followed the simple, publicly stated procedure. This procedure required each "panel bank" to state its contemporaneous cost of borrowing in a hypothetical loan of prescribed size, currency, and tenor. Instead, some or all of the banks declared borrowing costs that would push the LIBOR setting to a desired value.

I recently read Oonagh McDonald's *Holding Bankers to Account: A Decade of Market Manipulation, Regulatory Failures and Regulatory Reforms*.[1] We've all heard the allegations of LIBOR manipulation over the past years. McDonald's book answers many questions including "how did it happen?" and "how do we know it happened?" I recommend *Holding Bankers to Account*. My first of two principal accolades is that the detail regarding falsification of LIBOR, FX, and precious metal "fixings" is encyclopedic. You'll find details for all court actions and regulatory proceedings, including monetary judgments, for all cases of these past ten years.

My second accolade is the book's role as historical record. Not only does this record preserve the knowledge of wrongdoing in readable form, it also teaches an unlikely lesson regarding how "idealization" can fail. What I mean here is that it may not be all that shocking that human beings would behave unethically for their personal gain. What is daunting is that these people often acted both unethically and stupidly. Some traders, for example, sought to exploit stop-loss orders their clients had given them by moving the market to trigger the orders and then front-running these orders. But the immediate gain of the (unethical) front-running was generally offset by the loss in their earlier market-moving positions.

Stated differently, many traders did not understand that their illicit strategies were, all aspects considered, neutral or losing strategies. The "all aspects considered" is the part the traders could not fathom. His or her personal book of positions might benefit from a desired LIBOR move while the broader bank suffered, for example.

How do we mitigate our risk of "idealization?" First, recognize the benefit of a diverse career. The more types of roles we hold during our careers in different firms and industries, the more valuable will be our direct experience. Second, network with people whose direct experience differs from yours. One form of "networking," if I can call it that, is reading the books of authors like McDonald.

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[1] See the details at this link: https://www.manchesteruniversitypress.co.uk/9781526119438/ (or also available on Amazon).

OUR NEW ARTICLES

The seven articles of this issue begin with a tribute to Professor Mark Rubinstein. Mark died this past May. The authors of our tribute, four friends and colleagues of Mark's, shared their memories and admiration. They are Menachem Brenner of New York University, Emanuel Derman of Columbia University, Robert Jarrow of Cornell University, and Eric Reiner of the University of California at Berkeley.

Dariusz Gatarek (Systems Research Institute of the Polish Academy of Sciences) and Juliusz Jabłecki (National Bank of Poland) extend recent efforts to develop a unified local volatility smile model applicable to all asset classes (interest rates, in particular). A closed-form, non-parametric local volatility formula characterizes this model. The authors employ several numerical examples to demonstrate the model.

Alberto Bueno-Guerrero of the IES Francisco Ayala generalizes the Black–Scholes and Heston models to stochastic interest rates and maturity-dependent volatilities. He creates, for example, semi-closed-form expressions for the value of a European call option under the Heston model with Hull–White and Cox–Ingersoll–Ross interest rate regimes. The author bases his approach on the theory of squared Bessel processes.

Julián Pareja-Vasseur (Centrum Catolica of Peru and EAFIT University) and Freddy Marín–Sánchez (EAFIT University) describe a numerical method with multiplicative quadrinomial trees. This technique is suited to value options for environments of stochastic volatility.

Pascal Létourneau of the University of Wisconsin-Whitewater proposes an improved estimation and calibration method for a family of GARCH models. One claim is that the method simplifies the inherent optimization aspect in parameter selection. A second claim is that optimization time falls by a factor of two.

Qianru Shang and Brian Byrne, both of the Technological University Dublin, introduce a lattice search algorithm to locate efficiently the optimal exercise boundary in American options under a continuous dividend yield assumption. The technique transforms and improves standard binomial trees through dynamic

memory allocation and "intelligent" search and truncation. The authors claim a speed improvement with typical parameters exceeding a factor of five.

Xinglin Yang, Peng Wang, and Ji Chen, all of the Southwestern University of Finance and Economics, develop a class of closed-form VIX futures pricing models. The models employ stochastic processes combining Gaussian diffusion and Poisson jumps. The authors show empirical results and claim improved performance over existing methods for fitting of asset returns and pricing of VIX futures.

Joseph M. Pimbley
Editor