

# **Observations on the Science of Finance in the Practice of Finance: Past, Present, and Future**

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**Abstract The Kolmogorov Lecture February 23, 2010**

For several decades, financial innovation has been a central force driving the global financial system toward greater efficiency with considerable economic benefit having accrued from those changes. The scientific breakthroughs in finance in this period both shaped, and were shaped by, the extraordinary innovations in finance practice that expanded opportunities for risk sharing, lowering transactions costs, and reducing information and agency costs. Today no major financial institution in the world, including central banks, can function without the computer-based mathematical models of modern financial science and the myriad of derivative contracts and markets used to extract price- and risk-discovery information as well as execute risk-transfer transactions. But also today, we are faced with the effects of a global financial crisis of a magnitude and scope not seen in nearly eighty years, which some attribute to the changes in the financial system brought about by financial innovation, derivatives, and mathematical models. The lecture will apply the tools of financial science to analyze and offer observations on the structural elements of financial crisis, on needed financial regulatory changes, and on the important role of financial innovation and science in the future beyond the crisis.