
Bright Minds, Big Theories

**A new generation of thinkers offers new ideas
about finance, markets, and management.**

By Nikos Valance

CAPITAL MARKETS ARE NOT EFFICIENT. Analysts will recommend a stock simply because other analysts have, and investors will buy a stock because other investors have—they're running with the herd. A division manager will act in ways designed to bolster his reputation first, rather than increase the value of the firm's assets.

No, this isn't what you learned in business school, but it is what's being taught there now. These are a few of the big ideas being vigorously researched and heatedly discussed by some of the brightest minds in academe. They represent a sea change in the way that questions in finance are being framed—away from the idea that markets and individuals always act rationally and toward a less rational and more psychologically rooted understanding of how managers, investors, analysts, and, ultimately, the markets they create will act.

To get a grip on how the theory of finance is changing and where it is heading, *CFO* magazine recently interviewed some of the leading thinkers in the field. None of the seven theorists we spoke with are No-

bel laureates, though several are assumed to be in the running for that honor. Some have contributed to the literature for decades, while others have recently arrived on the scene. Not all of them work strictly within the discipline of corporate finance; some have made their reputations in investment theory or asset pricing. Each theorist has his specialty or two, which tend to color his view of what the major unsolved problems in corporate finance are.

All are the intellectual heirs of such giants as Modigliani, Miller, Black, Sharpe, and Markowitz. But while they readily acknowledge their debt, these finance theorists have new and even startling views of what the future may hold.

IVO WELCH: FOLLOWING THE HERD

SO WHAT'S THE STATE OF finance theory today, and where is it heading? "A good analogy is physics," responds Ivo Welch,

professor of finance at Yale University's School of Management. "The old mechanical physics is like the efficient-markets theory. It gives a good first-order explanation of how the apple falls from the tree and hits the scholar on the head. Then, as with Einstein, everything is suddenly different. The puzzles are on scales we hadn't observed before." Welch pauses, then adds, "The good thing is that in finance we don't have to build [particle] supercolliders."

At 37, Welch is considered a rising star in finance theory. His research focuses on the pricing of initial public offerings, capital structure, and informational cascades, a branch of theory that attempts to explain herding in financial markets. The latter is "still a first-order problem," says Welch, who cites the recent drop in Internet stocks as an example. Why do some sectors of the economy fall into or out of favor? "Herding is the phenomenon that drives this," answers Welch. "Investors believe they learn from each other." Analysts and investors alike flock together to create a prevailing consensus; the safety of numbers overrides individual doubts. But when the

herd changes direction, investors can get hurt. “Lots of hedge funds went bankrupt because they thought Internet funds wouldn’t go down,” notes Welch.

Another issue that fascinates Welch is what drives the internal allocation of capital in corporations. “We have wonderful theories telling us which division should get capital,” he explains. “But to what extent is the personality of a division manager playing a role in getting capital, and to what extent does this explain the failures or successes of a particular division? Personality may be a great predictor.”

Generally, Welch views the internal workings of corporations as a fertile field for finance theorists. “Even with good description on capital budgeting, we don’t systematically know how the capital budget works in corporations,” he says. “We don’t know best practices.” The latter will come as more and more internal information is revealed to academics who advise the corporations, predicts Welch. “Usually it’s tit for tat,” he says. “They’ll give us the data, and we’ll tell them later what the best practices are.”

ROBERT SHILLER: MISSING MARKETS

THE STUDY OF HERDING phenomena in capital markets falls under the aegis of what has come to be known as behavioral finance, a controversial discipline that took root in the 1990s. “It’s a theory of finance that doesn’t want to rationalize human behavior,” explains Robert Shiller, who at age 54 is regarded as one of the godfathers of the field. The simple proposition that investors are swayed by psychological and sociological factors is radically subversive, since it undermines the dogma that capital markets are efficient. Heretical as this point of view seems today, it was commonsensical prior to the advent of the efficient-markets hypothesis in the 1960s and 1970s, points out Shiller, the Stanley B. Resor Professor of Economics at Yale University.

Shiller became something of a media figure with the publication last March of his book on the state of the stock market, *Irrational Exuberance*, and he has written several op-ed pieces on the dangers of what he sees as the enormous speculative bubble in the market. (See *CFO*’s interview with Shiller, “Start Making Sense,” October 2000.) But as an economist,

Shiller also sees the power of markets to do good, especially by enabling investors to hedge risks. To that end, he has become a prominent advocate for the creation of more markets—specifically, “macro markets.”

“One of the big unsolved problems in the field today,” says Shiller, “is that of missing markets. Why don’t we have securities markets for so many things that are important, such as GDP [gross domestic product] and single-family homes?” Currently, investors can diversify risk through equity markets, but corporate profits account for less than 10 percent of national income. “That figure suggests that about 90 percent of an average person’s income is sensitive to sectoral, occupational, and geographic uncertainty,” wrote Shiller in his 1999 article “Macro Markets and Financial Security” (co-written with Stefano Athanasoulis and Eric van Wincoop).

Shiller advocates the development of securities indexed to the GDP of countries, or macro securities. “People could invest in Japan,” he says. “Not in the Nikkei, but in the country itself.” He sees such a market as a possible way to avoid the financial crises that have recently occurred in less-developed countries (LDCs), such as the Asian financial crisis of 1997–98. “There’s a tremendous social benefit, especially for LDCs,” he says. “They really should be hedging their GDP risk.”

It’s the idea of risk management that intrigues Shiller, and that’s where he says the next revolution in finance is inevitable—particularly as markets develop for such things as catastrophe risks and shared-appreciation mortgages. The latter “are just beginning to come out,” explains Shiller. “You give up the upside potential on your house for a lower mortgage rate. It’s risk management because if your house doesn’t appreciate, as the owner you don’t lose, the lender does. The value of the security will move with the real estate market. The risk gets diversified. The risk of the single family is borne by the market—all over the world.”

STEPHEN ROSS: CONTROLLING RISK

THE ISSUE OF RISK CONTROL resonates also with Stephen Ross, the Franco Modigliani Professor of Finance and Economics at the Massachusetts Institute of Technology’s Sloan School of Management. Ross, 56, is one of the most widely

cited theorists in the field of corporate finance today; many *CFO* readers probably *did* study his work in business school. He is renowned for his invention of arbitrage pricing theory, resulting in a multiple-factor alternative to the beta-based capital asset pricing model; and for his role in the creation of the binomial model for pricing derivatives. And he is co-author of a standard textbook on corporate finance.

Ross is also known for his work in three areas: agency theory, where he has described how employees and managers of firms are agents of principals, the managers, and shareholders; signaling, where he has described how financial choices send information about a firm to the market; and incentive compensation as a substitute for corporate signaling.

Incentives also figure in Ross’s current research on risk control. Part of the revolution he sees on the horizon is the link between the incentives offered by a firm to employees and the amount and type of risk a firm is willing to take on. “No time has been spent on asking how incentives affect the willingness of the employee to take on risk,” says Ross. “More time is going to have to be spent on the reaction to the carrot, not just the stick.”

He argues that currently risk control is focused on trying to control employees by limiting the actions they are free to take and monitoring them to make sure they behave. Equally important, according to Ross, is to provide them with the proper incentives so that they are motivated to take on the very risks that the firm would have them take on if it were able to make the decisions for them. For example, he says, “Take the number two guy in a firm. Is he more interested in his level of compensation, or in the compensation of the number one guy?” Ross maintains that the bigger incentive for the number two guy is the compensation of the number one guy, because he sees it as potentially his own someday. “Everyone cares about the whole structure of compensation in the firm,” says Ross, “up and down the ladder, because there is potential for them to move in either direction. The way this might affect the firm’s ability to take on risk is relatively virgin territory.”

Ross says the issue of incentives raises the more basic question of how much risk companies should take on: “What is the firm trying to do? Maximize profit today? Or tomorrow? Or maximize value? “The answers to these questions “are still quite uncertain,” he says. The bottom line for Ross is that the connection between inter-

nal labor markets and corporate finance will become very important, with the biggest lever becoming the compensation schedule. The implication of this, says Ross, is that the human-resources department, where compensation structures are designed, should report to the chief risk control officer of the firm—often the CFO.

DAVID HIRSHLEIFER: EXPLOITING MISVALUATION

INTERNAL LABOR MARKETS are also a research interest of David Hirshleifer's, another widely published and highly regarded finance theorist. Hirshleifer, 42, is the Kurtz Chair in Finance at the Fisher College of Business at Ohio State University. His published work has looked at how managers' attempts to improve their own short-term reputation, or the short-term reputation of their firms, can cause inefficient investment decisions. He has also looked at takeovers and found that, on average, they improve value, and that the average gains from successful takeovers are much larger than previously estimated.

“IN ACADEMIC FINANCE, we're catching up with the practitioners in our way of thinking,” says Ohio State's Hirshleifer. “That's revolutionary.”

But the “great overarching debate” of corporate finance, says Hirshleifer, is whether securities markets are efficient or not. He is firmly in the inefficient camp, the group that “thinks that there are systematic psychological biases—for example, overconfidence—that cause problems” with securities pricing. The resolution of this debate is of paramount importance, since all of corporate finance is founded on asset pricing, says Hirshleifer.

His recent work deals with the effects of investor psychology on asset pricing, and how companies finance their investments to exploit market mispricing. He says his current work-in-progress will try to help managers measure the extent to which the market is misvaluing their firms, and whether this misvaluation can be exploited in a firm's trading or financing policy.

Hirshleifer also thinks innovative work will come in understanding how companies choose their financial policies. “We don't understand how firms choose their payout policy, their capital structure, or their debt/equity ratios,” he notes. “It's one problem where lots of variables are chosen at the same time. But we're working on it.”

As far as the coming revolution in finance goes, Hirshleifer says, “We're living through it. In academic finance, we're catching up with the practitioners in our way of thinking. That's revolutionary. Under the old paradigm, we assume rationality and work out how [companies] should do things and what they should tell managers. It's a good time to stay tuned. There are interesting things coming out.”

DOUGLAS DIAMOND: PRICING AND LIQUIDITY

DOUGLAS DIAMOND, Merton H. Miller Distinguished Service Professor of Finance at the University of Chicago's Graduate School of Business, has a different research focus from Hirshleifer's, and he also sees the coming revolution differently. “I don't think we're on the cusp of a revolution,” he declares. The closest thing to a revolution is behavioral finance, says Diamond, “but it hasn't made enough progress on how assets are priced.”

The 47-year-old Diamond is credited with important contributions in the area of financial intermediation. He works on banking, financial distress, and financial panics. His best-known paper, “Bank Runs, Deposit Insurance, and Liquidity” (1983), co-authored with Philip Dybvig, deals with how and why investors and banks will want to choose contracts that are subject to runs or panics. “Banks are an attempt to arbitrage away expected return differences between illiquid assets and low-return liquid assets,” comments Diamond. “Viewed in this light, LTCM [Long-Term Capital Management, the hedge fund that famously collapsed in 1998] was nothing but a New Age bank.”

As he sees it, some of the most interesting work in the near future will come from solving questions that deal with what determines the level of liquidity of a particular market and when markets become illiquid as a whole. “We have notions of linkages between liquidity and the bond markets, and between liquidity and different assets,” says Diamond. “But the big-

gest link is between the price of assets and corporate finance, or how liquidity affects asset pricing. That's one of the biggest unsolved problems.”

Another area of research interest for Diamond is the link between property rights and the development of financial markets in developing countries. “Where we're making progress right now,” he says, “is in how you help developing countries reform their financial system to attract outside capital. The foundations are there, the theory is there. The cutting edge is in figuring out how to apply it.”

RAGHURAM G. RAJAN: POWER STRUGGLES

A COLLEAGUE AND FREQUENT collaborator of Diamond's is Raghuram G. Rajan, the Joseph L. Gidwitz Professor of Finance at the University of Chicago. Rajan's work has also focused on financial intermediation, particularly the changing role of banks and the reasons why a country like the United States has such a well-developed financial system, while other developed countries, such as Germany, do not. His research showing that banks did not systematically gull the public into buying low-quality securities before passage of the Glass-Steagall Act played an important role in persuading regulators that doing away with the act would not lead to immediate disaster. Similarly, his work on small-business finance has contributed to the understanding of how credit constraints on such firms can be alleviated.

WHY DO SOME FIRMS measure every project against a companywide cost of capital, asks Rajan, when doing so goes against finance theory?

Rajan, 37, has also worked on theoretical questions related to understanding what determines the distribution of power in companies, using the theory to explore how the modern corporation, with human capital rather than physical capital as its primary asset, should be governed. In particular, due to the preponderance of equity claims on the firm on the part of managers

MORE STARS OF FINANCE

THE 7 ACADEMICS PROFILED ABOVE CERTAINLY RANK AMONG THE BRIGHTEST STARS IN FINANCE THEORY, BUT THE FIELD BOASTS PLENTY OF OTHER NEW LUMINARIES. HERE ARE 10 MORE THEORISTS TO KEEP AN EYE ON:

PETER TUFANO, 43, Harvard Business School.

Tufano's research focuses on financial innovation and the use of financial engineering techniques by corporations. He studies how firms can use strategic risk management practices and creative security design to achieve competitive advantage. His recent empirical work on risk management examines the determinants of firm hedging policies and their impact on firm exposures and stock prices.

JOSH LERNER, 40, Harvard Business School.

His research focuses on the structure of venture capital organizations and their role in transforming scientific discoveries into commercial products.

ZHI WU CHEN, 38, Yale University School of Management.

Chen's research is predominantly in the area of asset pricing, both theoretical and empirical. He has studied arbitrage-based models in a frictional economy, demonstrating the differences between a cost system and a price system. Chen has also worked on equilibrium-based asset pricing, with a focus on consumer/investor preferences, market frictions, and modeling structure. His current research focuses on stock valuation and empirical options pricing.

ANDREW W. LO, 40, MIT'S SLOAN SCHOOL OF MANAGEMENT.

Lo is well known for his research refuting the random-walk hypothesis, which claims that stock market prices are unpredictable. By demonstrating that recent U.S. stock prices are predictable to some degree, he reopened the case for active portfolio

management. Through other research contributions, he has helped to establish the field of financial econometrics, which has become part of the canon of modern empirical finance. Most recently, Lo has made significant contributions in the psychophysiology of risk perception.

DAVID SCHARFSTEIN, 40, MIT'S SLOAN SCHOOL OF MANAGEMENT.

Scharfstein's research focuses on capital market frictions, which lead to less than efficient types and levels of investment; it has implications for risk management, pricing, and internal resource allocation. Scharfstein has also analyzed pricing strategy when companies are financially constrained. His recent research focuses on understanding why some firms are able to nourish innovative, entrepreneurial activity, while in other firms employees are prone to leave and take their innovative ideas and technologies with them.

QIANG DAI, 35, New York University's Stern School of Business.

Dai's primary areas of research include term-structure modeling and fixed-income pricing, the expectations theory, and dynamic theories of portfolio choice and asset pricing. He has studied the empirical performance of a rich class of term-structure models, laying the foundation for applying such models to the analysis of economic theories of asset-return generation and macroeconomic behavior. Dai's current research centers in part on the determination of labor income and the valuation of human capital.

RENE M. STULZ, 48, Fisher School of Business, Ohio State University.

Stulz has analyzed how total risk affects firm value and how risk management can be used to increase shareholder wealth. This research is widely referred to as the foundation for best practice in corporate risk management. Additional research by Stulz has shown that a firm's investment decisions have to take into account the

impact of projects on total firm risk, and that a firm's optimal capital structure depends on the firm's ability to manage its total risk.

STEVEN GRENADIER, 34, Stanford University, Graduate School of Business.

Grenadier's research focuses on applying option-pricing theory to real investment analysis, or real-options theory. One area of application has been real estate investment analysis, with a focus on finding rational, structural explanations for real estate cycles. Grenadier has also analyzed firms' investment in technological innovations. His current research deals with combining real-options analysis with game theory, where he takes into account strategic interaction across firms.

HERSH SHEFRIN, 52, Santa Clara University, Department of Finance.

Shefrin's specialty is behavioral finance. His recent book, *Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing*, examines the psychological factors that impel corporate executives to be overly optimistic when they develop capital budgets, to be reluctant to terminate losing projects, to overvalue the stock of their own companies, and to ignore negative information about companies they seek to take over. Shefrin's current research is concerned with the development of techniques to help corporate executives deal more effectively with psychologically induced errors.

EDUARDO SCHWARTZ, 60, Anderson Graduate School of Management, UCLA.

Schwartz's past research has focused on different dimensions in asset and securities pricing. His more recent interests include interest-rate models, asset-allocation issues, evaluating natural-resource investments, pricing Internet companies, and the stochastic behavior of commodity prices.

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and employees, he says today's firm frequently looks more like a partnership.

The unanswered questions Rajan would like to see addressed begin with the process of capital budgeting and why corporations build a capital budget in ways that

financial theory says is wrong. For example, "To develop a companywide cost of capital and to measure every project against it goes against finance theory," he says. Another question is why companies insist on building a safety margin before

deciding to proceed with a project, rather than after doing the necessary calculations.

Rajan expects the next revolution in finance theory to come from a better understanding of how managers make decisions. "The Modigliani-Miller theorem gave us a

first-order good understanding,” he says. “But a second-order understanding is exciting and important now. It’s more important to understand how managers behave. The models we have are very crude right now.”

JEREMY STEIN: REPUTATIONAL MATTERS

THE SEVENTH theorist in our survey is Jeremy Stein, a 40-year-old professor of economics at Harvard University. Stein has written on herd behavior and short-termism, laying out a theory of why managers concerned with their reputations may want to copy one another’s decisions, ignoring their own information in the pro-

cess. “It turns out,” says Stein, “that the job market may be harsher in evaluating a manager who makes a mistake when his actions differ from those of the herd.” He has also written extensively on corporate risk management, outlining how specific risk management strategies can be used to increase shareholder value.

Most recently, Stein has been working on the general topic of how internal capital markets allocate funds to different projects inside companies. This research is closely related to questions having to do with the pros and cons of diversification versus spin-offs. “For example,” he says, “if there is a tendency toward socialism in the internal capital market, with weak divisions getting a more than efficient share of the company’s overall capital budget, a spin-

off that eliminates the cross-subsidization can be value-enhancing.”

For Stein, the next revolution will come in behavioral finance, to which he has devoted more and more of his time and energy. “Behavioral finance is where there is the highest demand for good theory,” says Stein. “If people succeed on that dimension, it will be one of the greatest successes of the next 10 or 15 years. I mean, what if markets aren’t as efficient as we’ve been saying? What do we tell CFOs?”

NIKOS VALANCE IS A CONTRIBUTING EDITOR OF *CFO*.

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