classical economists in the same sense that Britney Spears and Christina Aguilera are classical opera singers, and that the real distinction that should be highlighted by scholars is between the young, humanistic (pre-Communist) Marx, and his older, more aggressively intolerant (Communist) self. Ultimately, Hollander's suggestion that Engels' calls for "open revolution against the ruling bourgeoisie" should not always be read literally, that they were sometimes mere rhetoric, is as unconvincing as the 1917 revolution was passionately real for Russian Marxists of the time.

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Donald MacKenzie, *An Engine, Not a Camera: How Financial Models Shape Markets* (Cambridge, MA: MIT Press, 2006) pp. x, 377, $40.00. ISBN 0-262-13460-8.

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Donald MacKenzie has been having conversations about markets, and he wants you to join him. Appendix H contains a list of most of the people he has talked to so far, mainly finance academics and finance practitioners, and the rest of the book is essentially an account of what he has learned from them. (The Acknowledgements include a further list, which includes me and my work referenced below.) Readers who are already part of that conversation will find that the book covers entirely familiar ground, but the account is nonetheless intriguing for the sociological lens through which MacKenzie views it. Readers who are new to the conversation will find the book tougher going, notwithstanding a helpful glossary and ruthless relegation of all mathematical details to appendices and notes. (One additional appendix on futures pricing might also have been helpful.)

MacKenzie's perspective is equal parts economic sociology and sociology of science. He sees financial theory production in academia as a social process of interaction between individuals located in institutions with their own specificity (such as the University of Chicago and MIT), and he sees financial practice in markets as a similarly social process of interaction between individuals located in different institutions with their own specificity (such as the Mercantile Exchange and Salomon Brothers). From this sociological perspective, the way that economists typically theorize about markets seems literally incredible, a spinning out of logical implications of assumptions that are demonstrably untrue. What fascinates MacKenzie is how these incredible theories get used, how they produce behaviors and institutions that change the world, sometimes in ways that make the world more like the theory.

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Here is the question that motivates the book:

> Has the practical use of finance theory (for example, as a guide to trading or in the design of the regulatory and other frameworks within which trading takes place) altered market processes toward greater conformity to theory? If the answer to that question is at least partially in the affirmative, we have identified a process shaping financial markets—and via those markets perhaps even the wider economies and societies of high modernity—that has not received anything like sufficient attention. If, on the other hand the practical use of finance theory sometimes undermines the market conditions, processes, and patterns of prices that are posited by the theory, we may have found a source of danger that it is easy to ignore or to underestimate if "reality" is conceived of as existing entirely independently of its theoretical depiction. (p. 24)

This is the kind of question commonly asked in social studies of science, and MacKenzie views his work to answer it as a contribution to a new branch of that field that he calls "social studies of finance."

Now, I take it to be uncontroversial that economists habitually conceive of reality as existing independently of its theoretical depiction. Bond and stock markets existed long before the capital asset pricing model (CAPM), and so did options before Black-Scholes. To an economist's sensibility, the existence of these markets is first of all a material fact that economics should try to explain. Just so, CAPM and Black-Scholes explained that these markets were pricing risk. But these new theories did more than interpret the world; they also changed it, and indeed that was also their point. Economists have always been engineers as much as scientists, interested not only in understanding how bridges work but also in using that knowledge to build better ones. By showing how markets price risk, CAPM and Black-Scholes showed how to price risk better, and, in doing so, they changed how markets work. In this respect, the goal of the new social studies of science is apparently rather well-aligned with economists' own conception of what they do. The only difference is that a sociologist is perhaps temperamentally more inclined to notice the new problems produced by the new engineering, and not just the old problems that it solves.

For the historian of economics, this alignment is at least potentially problematic. The historian wants to know where ideas came from and how they developed over time. A focus on how new ideas change market practice inevitably slights the way that changing market practice influences the development of new ideas. Just so, MacKenzie's account of the development of financial theory in the first half of the book (chs. 2–4) is largely the conventional story that economists tell themselves. It is a story about academic economists bringing the standard tools of their discipline to bear on phenomena and practices that had previously been the purview of practical men in business schools. It is a story about science replacing craft, first in academia and then eventually in practice. This story is familiar from Peter Bernstein's well-known *Capital Ideas: The Improbable Origins of Modern Wall Street* (1992). Like Bernstein, MacKenzie builds his account from interviews with academics, and so it is unsurprising that he gets much the same story. The exception is a more sympathetic treatment of Mandelbrot, whom MacKenzie pictures as a valiant scientist insisting on features of reality—to wit, fat tails—that the abstractions of economists leave aside.

It is both useful and interesting to know how the developers of financial theory understand their own work, but an historian wants more. For example, why did these

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ideas emerge at the time they did, and not earlier or later? And, if the new theories were merely applications of standard tools, then why was the new finance so strongly resisted, not just by the craft practitioners in business schools but also by the economics profession itself? These questions require historical contextualization of both economic theory and financial practice. In the 1960s, when both CAPM and then Black-Scholes emerged, private financial markets and institutions were rising in importance relative to the state-dominated financial system that had itself risen up as a consequence of depression and world war. These developments were not caused by CAPM or Black-Scholes, but were rather the material facts that CAPM and Black-Scholes were trying to understand. And, within academia, CAPM and Black-Scholes were resisted by many economists in part because academic economics had been built around the institutions of the state-dominated system that was passing from the scene.

From this perspective, MacKenzie's focus on options theory is fortunate, because the opening of the Chicago Board Options Exchange in 1973 did, in fact, follow after the academic development of options pricing theory, and that theory did, in fact, play an important role in overcoming regulatory obstacles. Chapters 5–7 of the book, comprising an extended case study of the impact of options pricing theory on market practice, are the core contribution of the book and well worth the price of admission. The pivot of MacKenzie's story is the market crash of October 19, 1987. The period before the crash he sees as a time of "enactment" or "performance" of Black-Scholes, when the use of the theory made the world more like the theory. The crash itself he sees as an instance when use of the theory made the world less like the theory. The "volatility skew" in options prices ever since the crash he interprets as a rejection of the unrealistic assumptions of Black-Scholes in favor of the more realistic assumptions of people like Mandelbrot.

The true heroes of MacKenzie's story are the traders who never believed the unrealistic academic theory, but rather used it as merely one among many inputs in their trading decisions. The traders at Dimension Fund Advisors and John Meriwether at Salomon Brothers make money because they are "good practical economic sociologists" (pp. 101, 217, 267) who go beyond the theory. The reason that Long Term Capital Management (LTCM) ultimately failed (Chapter 8) was essentially because its principals failed to appreciate what an economic sociologist can readily see; namely, the role of imitation in creating a "super-portfolio" of trading positions similar to those of LTCM. When external events induced liquidation of those imitation positions, prices moved against LTCM in a way that undermined its ability to continue to finance its position for the long term. Meriwether is quoted on his experience at LTCM: "If I had lived through the Depression, I would have been in a better position to understand events" (p. 233).

The moral of the tale is that financial practice would be better if the insights of sociology were included as inputs. In this regard, the rise of behavioral finance, which imports insights from psychology, provides an example of what might be achieved. Economist readers may not be entirely convinced of this conclusion, but they will nevertheless come away with a new appreciation of what their field looks like from the perspective of a sociologist who has taken the time and energy to learn modern financial theory and practice. MacKenzie wants to have a conversation about markets, and he has prepared himself to have that conversation at a high level. Social studies of finance is not for the faint of heart, and this book sets a high bar for future contributions.

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Lawrence H. White, *The Clash of Economic Ideas: The Great Policy Debates and Experiments of the Last Hundred Years* (New York: Cambridge University Press, 2012), pp. 428, $45 paperback. ISBN 978-1-107-62133-6.

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When Paul Krugman paints John Maynard Keynes as a pioneering critic of dominant free-market economics, he exaggerates wildly, both about the rigidity of orthodoxy and about the pioneering character of Keynes' critique. So says Larry White, and, speaking as a sometime historian of economic thought, I am inclined to agree. And yet, White himself goes on to paint his own picture of Manichean struggle between advocates of capitalism versus socialism, free markets versus government planning, spontaneous order versus deliberate design, and the Mont Pelerin Society versus the Fabian Society. It is a struggle epitomized for him by the clash between Hayek and Keynes, and he is always rooting for Hayek, as well as for Hayek's adoptive ancestry of Carl Menger and Adam Smith. White's account is the mirror image of Krugman's, exaggerated in the opposite direction.

Indeed, the best that White can bring himself to say in Keynes' favor is that Keynes, along with his Fabian fellow-travelers, was possibly just an unwitting dupe of the real enemy of freedom: Vladimir Ilyich Lenin. The worst that he is willing to hint is that Keynes may himself have been one of those enemies of freedom whose skill in wielding political power allow them to get ahead in a system where political power controls everything (pp. 166, 277). For White, following Hayek, *The Road to Serfdom* is a veritable sheet of ice, a slippery slope that can easily sweep the unwitting fellow-traveler off his feet and land him in servitude. Luckily, England pulled back from the edge in time, but other countries were not so fortunate. India's experience with central planning is an object lesson to all others who might be so tempted; Germany's miraculous post-war recovery is a lesson on the other side.

The book recounts, as its subtitle announces, *The Great Policy Debates and Experiments of the Last Hundred Years*. They are listed in the first sentence of the Introduction:

> the adoption of central banking in the United States and elsewhere; command economies during the First World War; communist central planning in the Soviet Union, Eastern Europe, and China; fascism in Mussolini's Italy; National Socialism in Hitler's Germany; the New Deal in Roosevelt's United States; the Bretton Woods international monetary

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