

Cracking the code

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After the 2008 financial crisis hit, many people were startled to learn that the leaders of some investment banks knew little about the risks their firms had taken.

This fact should not have come as a surprise, says MIT assistant professor Vincent Lepinay. Indeed, it stems from the nature of contemporary investment banking, as he asserts in his new insider account of life at a major investment bank, *Codes of [Finance: Engineering Derivatives in a Global Bank](#)*, published this month by Princeton University Press.

After all, he notes, investment banks have spent the better part of two decades employing PhD-holding [mathematicians](#) and [physicists](#) to construct complicated financial instruments, usually known as derivatives, that exploit temporary inefficiencies in global markets. This push toward financial innovation means that the crucial knowledge about the state of a firm's finances is dispersed among financial engineers and traders, who themselves cannot realistically explain all the market movements affecting a firm's finances. Executives, let alone regulators, can easily fall out of the loop.

As Lepinay writes, that creates a core problem for many financial firms: “What happens to an institution that sells products that undermine its organization structure?” What has happened is that many investment banks, such as Bear Stearns and Lehman Brothers, have ceased to exist.

“Financial engineers have made a lot of money for the banks, but created a lot of problems,” says Lepinay, an assistant professor in MIT's Program in Science, Technology, and Society. “Derivatives have become more and more complicated, so they exhibit unexpected reactions. As an observer, that's fascinating, but many bankers find it dreadful. The last thing they want is to be surprised by their own products.”

Bespoke banking

Codes of Finance is based on Lepinay's fieldwork, including an arrangement where he spent 18 months working inside a prominent European investment bank based near Paris. In the book, he calls the firm General Bank, a pseudonym. The bank made headlines a few years ago when a rogue trader, whom Lepinay calls Kevin Voldevieille (also a pseudonym), lost billions and roiled world markets with his high-risk bets. Lepinay was situated in the same department as Voldevieille, but never worked with him.

Among other things Lepinay learned inside the bank: Even bankers who use derivatives don't have a concrete definition of them. Generally, a derivative is a kind of side bet on the performance of a market — usually involving stocks, bonds, currencies and commodities — or the relationship between markets, now or in the future. The specific structure of a derivative, however, can vary widely.

Indeed, Lepinay asserts, because derivatives are often personally tailored for clients, these financial tools have changed how investment banks work and helped make markets opaque.

As Lepinay relates, General Bank became heralded for its financial innovation in the 1990s, when it introduced, among other devices, the Capital Guarantee Product (CGP), a personalized investment tool for clients. The CGP is a contract, ranging from three to 15 years, usually guaranteeing clients a certain level of return on a complicated series of market plays, with the bank obtaining fees and profits as well. Each CGP is created in consultation with a client.

“The client is allowed to basically co-design his product, and he feels like he is the king,” Lepinay says. “It's like having a Porsche engineer asking if you will help design your own car.”

Whatever the benefits of the CGP, as Lepinay sees it, this personalization of investment instruments creates new problems. With a portfolio of stocks or bonds, investors simply need to make judgments about the value of their investments; if necessary, they can usually sell stocks, bonds, currencies or commodities in a routine fashion across world markets. But a client's CGP is a unique investment tool, and cannot be dumped if it performs badly. Like other derivatives, it can lack liquidity.

“With personalization, the virtue of a financial security is lost,” Lepinay

says. “The drawback is, there is no secondary market. The customer cannot decide halfway through, when the contract is not working, that he is going to sell the contract to a third party. He has to give it back to the bank, and only the bank can price it.”

‘Markets are more complicated than prices’

This wouldn’t be a problem if multipronged bets on world markets never failed. But General Bank and Voldevieille lost billions betting on the future direction of the European stock market, among other trades. When markets froze up in 2008, massive derivative trades, such as those made by the insurance firm AIG, were at the heart of the problem; most major investors could not even determine exactly which firms or funds were connected with each other through a complicated network of trades.

Indeed, because derivatives are often constructed by finding price discrepancies in world markets based on millions of data points, extending a bank’s range of investments makes it harder for traders to understand what is moving all these markets, and if the patterns of the past will hold up in the future.

Financial engineers, Lepinay says, “see markets as prices. But markets are much more complicated than prices, because you have all these products that react to each other in ways that are sometimes not captured in existing data. So they exhibit unexpected reactions.”

All told, Lepinay writes, hiring financial engineers to develop derivatives worked in the short term, but also “allowed bankers to get carried away and made them lose touch with the actual costs of financial innovation.”

Other scholars say *Codes of Finance* is a significant addition to a growing area of research, the sociological study of finance and

financiers. “It’s an excellent book,” says William Maurer, chair of the Department of Anthropology at the University of California at Irvine. “There are few people who’ve had the kind of access he was able to secure, at the moment of formation of a financial instrument that was central to the meltdown in 2008.”

And yet, as Maurer notes, Lepinay’s book is not just a blunt denunciation of financial innovation, but “a call for engagement with it, to think about how we might try to construct it differently.”

What is the future of derivatives and the [investment banks](#) that use them? The regulation of derivatives has been subject to debate in policy circles since the 1990s, but even under the Dodd-Frank financial reform bill passed into law in 2010, derivatives markets remain essentially nontransparent.

Investment bankers, Lepinay notes, like to say that derivatives “are completing markets because they are smart enough to see inconsistencies between markets, and that small investors should be thankful because banks make their lives more predictable.” While Lepinay refrains from taking a position on the regulation issue, his own experience inside a bank has made him skeptical of this argument; financial firms and investors are not looking for perfect, totally transparent markets, he thinks, so much as new opportunities to capitalize on imperfections. “If [derivatives](#) are completing markets, why is there so much innovation in financial products?” Lepinay asks. “What banks don’t want is to standardize.”

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