Afterword

This book is the story of my journey through the gluttony and dysfunctionality of 1990s Wall Street. But it also is a story about the roots of the 2008 market crisis. Today, when I am asked if anyone saw this crisis coming, I think back to the people I worked with in the derivatives groups at Morgan Stanley and First Boston, and my answer is yes. We invented the products that ultimately blew up the banks. We created the instruments at the center of the subprime mortgage meltdown. We fostered a culture of epic greed, which nearly destroyed the financial system.

Yes, we saw it coming. How could we not?

The final months of 2008 marked the end of an unprecedented saga of excess. The mania, panic, and crash had many causes. But if you are looking for a single word to use in laying blame for the recent financial catastrophe, there is only one choice. Derivatives.

Without derivatives, leveraged bets on subprime mortgage loans could not have spread so far or so fast. Without derivatives, the complex risks that destroyed Bear Stearns, Lehman Brothers, and Merrill Lynch, and decimated dozens of banks and insurance companies, including AIG, could not have been hidden from view. Without derivatives, a handful of financial wizards could not have gunned down major mutual funds and pension funds, and then pulled the trigger on their

own institutions. Derivatives were the key; they enabled Wall Street to maintain its destructive run until it was too late.

In what follows, I will connect the dots from the mid-1990s through the end of 2008. I will describe how investors and regulators ignored repeated warnings about the hidden dangers of derivatives. I will show you how derivatives were at the heart of the collapse.

After quitting Morgan Stanley, I moved to Washington, D.C., where I practiced law for two years. Lawyering was considerably different from selling derivatives. I can honestly say that I would not have switched to shoveling manure, as my colleagues might have done for lesser jobs, unless a substantial raise were involved.

During the summer of 1996, Scarecrow tracked me down. He said he had a new job with Morgan Stanley's asset-management group. It had been difficult for him to get the job, and he had been forced to compete against numerous candidates outside the firm. The key question in his interviews had been, "What are the most important qualities a salesman can have?" The interviewer told Scarecrow the firm had recently conducted a survey about such qualities and asked him to pick his favorite among: product knowledge, intelligence, relationship ability, and integrity. Scarecrow said he had answered, "Without a doubt, integrity. This is a trust business, and we are selling our trust." That answer had clinched the job.

Later that summer, one of my ex-DPG colleagues was married, and the wedding reception served as a derivatives reunion. We traded stories about our various fiascos and the investors who had lost billions and billions of dollars on derivatives. Everyone looked on the two-year period as a once-in-a-lifetime experience, never to be relived, always to be savored. Most seemed to have mellowed. The Queen was there, but wasn't yelling at anyone. Late in the evening she began apologizing to the ex-members of her RAVs team for her periodic tantrums. We forgave her. Everyone kissed and reconciled. The scene was almost a last derivatives supper, except that not one of us would be punished, jailed, fined, or even sued.

I don't know how or when Morgan Stanley got a prepublication copy of this book. But someone at the firm discovered it, and by early October 1997, my old bosses were scrutinizing every word.

I had expected the following reactions to my book: from Morgan Stanley, a curt "no comment"; from my former colleagues, cries of betrayal; from derivatives outsiders, mild nausea and, perhaps, a little greater care in investing. I didn't have a stellar track record on expectations, though. I had been expecting the markets to crash for nearly a decade. I had been expecting the University of Kansas basketball team to win a national championship every year since the last time they won in 1988.

As for my book, my expectations were wrong, yet again.

Within a few weeks, Morgan Stanley started a press war. My former colleagues cried betrayal—not about my exposing their business as a fraud—but about my omitting the juiciest stories (as one early caller put it, I had "barely scratched the surface"). And derivatives outsiders howled they were sick, sick, sick—not about the excesses of the derivatives markets—but about not joining up sooner. During a particularly depressing period, several Irish business school students e-mailed me for job-hunting advice, and one derivatives wannabe wrote that *F.I.A.S.C.O.* was "actually the best book I have ever read." I felt I had created a monster.

These people might never have heard of the book if it weren't for a single propitious decision by Morgan Stanley's management. It was this decision that ignited the press war, the battle Hal Lux, senior editor of *Institutional Investor,* would later call Morgan Stanley's "public relations nightmare."

The nightmare began when the firm released the following statement, dated Monday, October 6, 1997:

The book is clearly a combination of inaccuracies and sensationalism. Our business is based on consistent and professional service to our clients and customers. We do not engage in conduct that would violate the trust that they place in us. We stand on our record.

I don't know whose idea it was to issue this statement. It certainly came as a surprise to me. I was teaching a few dozen law students at the University of San Diego, settling into the gentle purr of academia, sharpening my golf game, and preparing for several decades of comfortable, easy living tucked away in a sunny, seventy-degree where-is-he-now file. My days were quiet and contemplative. Receiving more than one call in a day was jarring.

During the next two days my phone rang several hundred times.

Peter Truell, a financial reporter at *The New York Times,* was among the first to call. Top financial journalists like Truell have thankless jobs. They understand markets better than most bankers, are better educated than most bankers, are more entertaining, erudite, and so forth, yet journalists' salaries are a pittance compared to the fat bonuses of Wall Street salesmen. Nevertheless, on a rare occasion, the journalist gets a priceless perquisite: the chance to saddle up his or her moral high horse and skewer a white-shoe firm such as Morgan Stanley. Truell seemed to savor the opportunity.

He didn't pull his punches, either. His article cited a less-than-spirited defense by Jean Marie McFadden, a spokeswoman at Morgan Stanley, that "I'm not saying it's a nunnery, but this is not the culture of the firm," and noted a lukewarm comment by Monroe R. Sonnenborn, chief lawyer at Morgan Stanley, that firm president John Mack had never said—as I claimed he did—"There's blood in the water. Let's go kill someone." (Another source later claimed Mack had indeed said those words but had been misinterpreted.) "Monty" Sonnenborn also asserted the economic defense that Morgan Stanley would lose clients if it fleeced them in the way the book described. That defense seemed odd, and I've often wondered since why Morgan Stanley doesn't lose more clients.

Other reporters soon joined the fray. Patrick McGeehan and Anita Raghavan of the *Wall Street Journal* described Morgan Stanley's efforts to "stamp out a brush fire" sparked by the book. Kimberly Seals McDonald, in vintage *New York Post* style, focused on the blow jobs and strippers and sexual escapades, in a full-paged piece entitled "Indecent Exposure." Amanda Grove of CNBC broadcast an interview, complete with footage of me writing "MARKET FAILURE" in large letters on the board while teaching my Latin American Financial Markets class.

Within a few days, word spread to trading floors in New York, London, and Tokyo, and the book sold out. Second and third printings were ordered. On October 8, 1997, *F.I.A.S.C.O.* was the third-best selling book on Amazon.com, in part because books were sitting in a warehouse somewhere in North Carolina, and the only way to get a copy fast was to order it online. October 8 was well before the planned publication date, and my publisher and I were still rubbing our eyes.

So much for the gentle purr of academia.

I took advantage of the media attention to warn anyone who would listen about the hidden dangers in financial markets. I gave speeches to industry groups and regulators. I wrote op-eds for major newspapers. People liked hearing about the face ripping and skeet shooting, but they weren't as interested in the details about AAA-rated wolves in sheep's clothing or hidden risks in mortgage derivatives. No one wanted to hear about the possibility of a systemwide collapse.

When the U.S. stock market fell 7 percent on Monday, October 27, 1997, I began preaching that the end was near. Market crashes always seem to happen in October, and it had been almost exactly ten years since the 1987 market crash, dubbed "Black Monday." A 7 percent drop alone wasn't much, but because of derivatives it sent shock waves through the markets.

One of the first victims was Victor Niederhoffer, a celebrated and often barefooted squash champion, financial maestro, and hedge fund manager extraordinaire. I thought his fall was a harbinger of doom. I wanted to be sure everyone knew and understood his story, so they wouldn't repeat it on a grander scale.

I met Niederhoffer shortly after the October decline, at the St. Regis Hotel in New York. We were there for the second annual Derivatives Hall of Fame, sponsored by *Derivatives Strategy* magazine, one of about a million new industry publications about derivatives, but the only one with a comic strip.

The conference included most of the biggest names in the derivatives business, including Robert Merton and Myron Scholes, two finance professors who had just won the Nobel Prize in Economics for their research on options. I had been invited to lead a discussion about dealer abuses in the market. Apparently, I was the only abuser willing to talk.

I was thrilled to meet Merton and Scholes, who were making their fortunes at a then-obscure multi-billion-dollar hedge fund called Long-Term Capital Management. But I was most interested in talking to Niederhoffer, who was the lunch speaker. I wanted to hear about the dangerous put option selling strategy that had destroyed his fund.

Just a few months earlier, Niederhoffer had been on top of the

world. His excellent autobiography, *The Education of a Speculator,* was selling well, and he was managing more than $100 million of investments, including much of his own considerable wealth. He was both popular and respected, and had an incredible track record: returns of 30 percent per year for fifteen years, with a 1996 return of 35 percent.

Unfortunately, Niederhoffer also had made a big derivatives bet on Thailand. Remember the mouth-watering Thai baht structured notes I had watched First Boston's salesmen hawk when I was a derivatives naif? Those notes, and similar investments linked to the Asian "tiger" currencies, were issued by highly rated corporations and government sponsored enterprises, such as General Electric Credit Corporation and the Federal Home Loan Banks. The notes looked safe and paid a deliciously high coupon if the baht stayed strong. That was the bet Niederhoffer had made.

On July 2, 1997, Thailand announced it no longer would peg the baht to a basket of foreign currencies. The baht plunged more than 17 percent against the U.S. dollar, just as the Mexican peso had collapsed on December 20, 1994. The effects were cataclysmic.

The rest of East Asia quickly devalued their currencies, too, and followed Thailand into the dumpster. Asian banks had been feasting, like the fat Mexican banks of the early 1990s, making leveraged bets on their own markets and currencies using swaps, options, forwards, and more complex derivatives. Now, they faced annihilation. Within months, the foreign currency value of investments in East Asia dropped by 50 percent or more.

Derivatives ensured that the ripple effects of the baht devaluation reached well beyond the Asian markets. If a butterfly flapping its wings in Thailand could affect weather in the U.S., imagine what a currency devaluation might do. Investors throughout the world were reeling.

Most of the derivatives causing the pain were traded "over-the-counter" rather than on any exchange. That meant, for example, that Asian banks doing swaps had a counterparty, typically a U.S. or European bank, who expected repayment, just as I would expect repayment if you and I had made a private bet. The Asian banks and companies hadn't lost money on any centralized exchange; they had lost money to other companies, primarily Western banks. The bottom line was that if

the Asian banks went bust, their counterparties might lose the entire amounts the Asian banks owed.

The over-the-counter nature of these derivatives trades created enormous potential for loss. For example, U.S. banks had more than $20 billion of exposure to Korea. One Korean investment firm, SK Securities Company, had bet with J.P. Morgan that the Thai baht would rise relative to the Japanese yen, and when the baht collapsed, SK owed J.P. Morgan about $350 million. Other banks—including Citicorp, Chase Manhattan, and Bankers Trust—each disclosed more than a billion dollars of exposure to Asia. This exposure to a counterparty's inability or unwillingness to repay was called "credit risk." Credit risk is a banal nonissue irrelevant to a counterparty until a so-called credit event actually occurs; then, credit risk becomes the central issue mattering all too much. Credit risk was why major banks with Asian counterparties were so worried about the currency declines, even if they hadn't made bad currency bets. And credit risk was one reason why I thought Niederhoffer's predicament was an omen.

When the Thai butterfly flapped its wings, the currency crash triggered losses for Niederhoffer of about $50 million, almost half of his fund. Derivatives traders who lose $50 million, or more, seem to follow a pattern. I used to fall into that pattern playing blackjack in Las Vegas. Perhaps you've had a similar experience. You play a hand of blackjack for $25, thinking it wouldn't kill you to lose that much money. You lose the hand. Then, you play another hand, thinking it wouldn't be a big deal to lose $50. Besides, maybe you'll win the hand and get back to even. You lose that hand, too. Then, you lose another hand, and another hand, and another. Pretty soon, you're down $500, an amount of money you really would prefer not to lose. What do you do? Do you quit? Of course not. You do the opposite. You increase your wagers and start betting to get even. That's the pattern. You look up to the eye-in-the-sky, and a little voice in your head trembles, If only I could win that money back, I would stop gambling. Forever.

To imagine Niederhoffer's plight, add five zeros to that $500. Now what does the voice sound like? It might sound awfully depressing if the $50 million were your money. But what if the money were, in the words of Justice Louis Brandeis, "other people's money"? Suddenly betting to get even doesn't seem foolish at all. Wouldn't you double-

down, at least once, for $50 million of someone else's money? Why not? If you win, you're even and no one will ever care about your temporary loss. And if you lose, do you really think it matters much if you lose another $50 million? After the first $50 million, you've pretty much guaranteed that special someone else won't be inviting you to his holiday party.

So Niederhoffer, like others before him—Nick Leeson of Barings, Joseph Jett of Kidder, Peabody; Yasuo Hamanaka of Sumitomo; Toshihide Iguchi of Daiwa—began betting to get even, taking on additional risk in the hope that he could make back enough money to overcome his losses on the baht. Academics would refer to Niederhoffer, at this point, as a rogue trader.

By September, he had recovered a bit of the Thai loss, but was still down about 35 percent for the year. Going into October, he began doubling down by selling put options on S&P 500 futures contracts.

Remember that a put option is the right to sell some underlying financial instrument at a specified time and price. In the trader's parlance, or Corvette lingo, if you bought a put option, you might pay $1,000 today for the right to sell a Corvette for $40,000 some time during the next month. You would make money if the price of Corvettes dropped. If the price of a Corvette dropped to $30,000, you would make $10,000—the $40,000 you could sell a Corvette for, using the put option, minus the $30,000 you could buy a Corvette for in the market (less the $1,000 premium you had paid). Whereas the buyer of a put option wants the price to go down, the seller of a put option wants the price to stay the same or go up—but definitely, please, don't go down. The more the price goes down, the more the seller of the put option has to pay the buyer. In our example, if the price of Corvettes had dropped to $30,000, and we had sold put options on 100 Corvettes, we would have lost $900,000 ($1 million less the $100,000 premium we had received). The strategy of selling put options does not carry the one benefit Morgan Stanley touted for some of the riskier products it sold: "downside limited to size of initial investment." In this case, you could lose more than everything. A put seller's downside is limited only by the size of his or her imagination (and the fact that prices usually don't drop below zero).

Niederhoffer was looking okay through the weekend of October

25–26. October had not been an especially eventful month, the publication of my book notwithstanding. Niederhoffer was waiting, hoping the options would expire worthless so he could keep the premium and get back closer to even. Remember, he wanted the market to stay the same or go up—but definitely, please, don't go down.

For Niederhoffer, the seven percent stock market decline on Monday was a death blow. By noon, he was broke. By Wednesday, his funds had been liquidated. The

$100-million-plus of his investors' money was gone. One of his biggest investors was in my new hometown, the $3.3 billion San Diego public-employee pension fund. Well done, San Diego!

At the conference, Niederhoffer gave a dazzling speech, weaving his philosophical and financial expertise into an absorbing narrative. Merton and Scholes, and the other derivatives Hall-of-Famers, delicately side-stepped Niederhoffer's recent collapse. After lunch, I approached him, and we talked about his put options imbroglio. He told me some of the details of his losses, and I wished him the best in defending any lawsuits. He signed my copy of his book, which I had brought to the conference, writing somewhat cryptically, "To Frank Partnoy, How Close Fate Has Carried Me To Your Drift. Best, Victor Niederhoffer." He already had read *F.I.A.S.C.O.*

For me, Niederhoffer's story illustrated how derivatives could bring down the financial system. If enough people made enough losing side bets, and then kept doubling down, they could cause major institutions to collapse. Selling options was especially dangerous. Because the downside was potentially unlimited, employees who sold options could put an entire institution at risk. If the losing trades were in the over-the-counter market, not on an exchange, the collapse of one institution would expose others to credit risk. One defaulting bank could become a falling domino that would topple many others.

Indeed, the market declines that destroyed Niederhoffer brought down dozens of institutions that had bet secretly on currencies. However, the Asian crisis was not widespread enough to cause a systemwide collapse. The markets ultimately shrugged off the losses and by spring 1998 the derivatives markets were whirring again.

Regulators, especially Alan Greenspan, the Federal Reserve chair-

man, were elated that the derivatives markets seemed so resilient in the face of crisis. They agreed with bankers and their lobbyists that no rules were needed; the free markets worked fine on their own. When Brooksley Born, head of the Commodity Futures Trading Commission, suggested the government should at least study whether some regulation of derivatives might make sense, her colleagues, including Greenspan and Treasury Secretary Robert Rubin, admonished her to keep quiet. Arthur Levitt, the longest-serving chair in the history of the Securities and Exchange Commission, dutifully followed Greenspan's lead.

I thought Greenspan's laissez-faire zealotry clouded his judgment, and I said so publicly (not that he cared, or even heard). He saw no reason for any legal rules to govern the markets. Greenspan even boasted that there was no need for rules prohibiting fraud, because the markets inevitably would discover it. According to Greenspan, market competition alone, without any regulation, was sufficient, because no one would do business with someone who had a reputation for engaging in fraud. To me, Greenspan sounded a lot like Morgan Stanley's public relations department.

During fall 1998, Greenspan and other regulators learned that Long-Term Capital Management, or LTCM, the hedge fund that boasted the intellectual firepower of Merton and Scholes, was suddenly near bankruptcy. LTCM's mathematical models had seriously understated the firm's risks, as well as the degree of correlation among seemingly unrelated assets. LTCM had stacked a hundred billion dollars of debt and more than a trillion dollars of derivatives on top of a relatively thin sliver of a few billion dollars of equity from investors.

Like Niederhoffer, LTCM had sold massive amounts of options. It ultimately lost $1.3 billion from that strategy. It lost most of its remaining capital on "convergence" trades, bets that diverging prices of various financial assets would return to their historical relationships. LTCM's derivatives positions were so large that even a relatively small marketwide decline was enough to wipe out its capital. Yet LTCM's models had suggested such a decline was virtually impossible, and would occur perhaps once during the lifetime of several billion universes.

Regulators claimed they were shocked—shocked!—by these losses. Greenspan called the financial crisis surrounding LTCM the worst he had ever experienced. Rubin remarked that "the world is experiencing

its worst financial crisis in half a century." Merton and Scholes, the options gurus, were disgraced, and considerably poorer. I thought it was inevitable that, in response to LTCM, regulators finally would implement some rules.

Again, my expectations were dashed. The Federal Reserve engineered a private bailout of LTCM, but Greenspan resisted derivatives regulation. The derivatives lobby, led by Senator Phil Gramm and his wife Wendy, who initially had deregulated swaps in 1993 and had been a director of Enron since then, waited out the storm of criticism. Then, in late 2000, as the country rubbernecked at the Bush v. Gore election results, they and Greenspan persuaded President Clinton to perform his last official act, signing the Commodity Futures Modernization Act of 2000. Greenspan, Rubin, and Levitt all supported this sweeping deregulation of derivatives. It was one the greatest mistakes in the history of financial markets.

It didn't take long for another derivatives firm to hit the fan. When Enron collapsed into bankruptcy in 2001, I once again thought that, surely, this must be the end. The United States Senate invited me to testify as an expert at its first formal hearings on Enron, and I seethed about how the company had become an unregulated derivatives trading firm. I thought I was making some progress when Senator Fred Thompson reacted to questions I had raised about footnote 16 of Enron's annual report, which contained cryptic disclosures of some of the company's most opaque and horrific derivatives deals.

Thompson interrupted my rant to remark that he was familiar with footnote 16. But when I became uncontrollably excited about our apparent parallel understanding of the Enron fiasco, he interrupted me again and said, in his classic TV-drawl, that he was only joking. Since this was such a dramatic moment for me, and since most people don't believe this story when I tell them, here is the full, unedited official transcript:

MR. PARTNOY: I would draw your attention to footnote 16 of Enron's 2000 Annual Report.

SEN. THOMPSON: I'm very familiar with it.

MR. PARTNOY: If you can tell me what's going on—

SEN. THOMPSON: Just kidding.

When the dust settled after several more hearings, Congress decided to respond to the collapse of Enron, not, as a reasonable citizen might have expected, with rules that actually related to the collapse of Enron, but instead with a law called the Sarbanes-Oxley Act of 2002. SOX, as the law became known, was sweeping and highly controversial. It imposed costly governance reforms on public companies and had some positive impact. But it did nothing about derivatives.

In response to Enron, I wrote more articles and another book, *Infectious Greed,* in which I traced the thread running through dozens of financial scandals, and set forth a six-point regulatory blueprint for preventing future disaster. I continued to warn anyone who would listen that the derivatives markets were spinning out of control and could cause the collapse of the financial markets. But every year, my expectations were dashed. The derivatives business surged, profits skyrocketed, volumes increased tenfold, and regulators loosened any remaining rules.

The last chapter of *Infectious Greed* focused on credit derivatives, including collateralized debt obligations and new instruments called credit default swaps. It warned about the problems associated with the use of these derivatives to take on and hide risks, and focused on how people were abusing and mistakenly relying on inaccurate and unreasonable credit ratings. The new deals I described, as of 2003, were the progeny of FP Trust and risky AAA-rated mortgage-backed instruments described in this book. James Grant, the brilliant editor of *Grant's Interest Rate Observer,* bought copies for everyone who attended his 2003 spring investment conference. I gave a talk there entitled "Credit Derivatives: Be Afraid, Be Very Afraid." I testified as an expert again, this time on credit derivatives and credit ratings before the Senate and House, at the invitation of both political parties. This time, no one was kidding.

Even as the chorus of derivatives critics grew, regulators did nothing. James Grant wrote in detail about the dysfunctionality of credit-rating driven derivatives. Warren Buffett denounced derivatives as "financial weapons of mass destruction," and George Soros exclaimed that derivatives would "destroy society." But Congress remained silent. Buffett and his second-in-command, Charlie Munger, put this book on their list of recommended reading, and Munger said *F.I.A.S.C.O* "will turn your

stomach." I suppose anyone in Congress who read the book must have had an iron constitution.

To add injury to my insult, throughout this period Kansas basketball repeatedly dashed my hopes as well. First, the team choked in the second round of the national tournament for three years in a row. Then coach Roy Williams left for North Carolina after a heart-breaking loss in the 2003 national championship game. Finally, the new coach, Bill Self, lost in the first round of the NCAA tournament for two straight years, first to Bucknell and then to Belmont, two schools I didn't even know had basketball programs. Bucknell and Belmont? Long-Term Capital Management and Enron? Fred Thompson and footnote 16? It was nearly too much for me to take.

Not long after I left Morgan Stanley in 1995, David Li, a thirtysomething math whiz from rural China, joined second-tier Canadian Imperial Bank of Commerce. Li was thinking about the same problem my derivatives colleagues and I had addressed with the FP Trust, PLUS, and MX deals: how can you repackage low-rated assets to create high-rated ones?

At Morgan Stanley, we had created dozens of collateralized debt obligations, or CDOs, and we had become quite skilled at persuading the rating agencies, and investors, that they should label an investment AAA, even if the underlying assets were risky. FP Trust was the classic example: a risky and high-yielding financial cake made of crap (Philippine National Power bonds) with a thin layer of attractive icing (U.S. Treasuries).

But FP Trust proved to be too brazen, which is why S&P ultimately branded it with a subscript "r." Even the unsophisticated analysts at S&P saw through the simple icing layer and figured out that they shouldn't be giving unadulterated AAA ratings to what was underneath. Wall Street needed a new way to mix crap together to make it look like real cake.

The mixing process was key. One might reasonably assume that crap would be toxic. But what if you could pool different types of crap, and then extract the unhealthy parts? What if the negative characteristics of some fecal material offset the negatives of others, magically canceling out any risks? Like matter and anti-matter. Crap and anti-crap.

Had I stayed at Morgan Stanley, the question of how to create a better mixing process would have captured my attention. Bankers everywhere were looking for ways to remodel the relationships among assets in a portfolio. The key variable everyone focused on was correlation, the extent to which assets might decline simultaneously. Just as crap might become safer if pooled, financial assets might become less risky when put together—especially if you could show persuasively that any expected declines or defaults on those assets would not be highly correlated. One bond might default, but if you held a hundred uncorrelated bonds, not very many would default at the same time.

Several people discovered good mixing models, but David Li found the best one. It had the most colorful history as well. Li reframed the mixing problem as an inquiry into death, something he knew a fair amount about, and not just because his father, a Chinese police official, had moved his family to the countryside to escape the purges of Mao's Cultural Revolution. Li knew that statistical research into what was known as the "broken heart" problem suggested that people died more quickly after their spouses died. In a not-very-touching move, insurance companies had tried to profit from this phenomenon by denying coverage and raising premiums for bereaved spouses.

Li saw a staightforward, though perhaps implausible, analogy to this insurance problem, through the use of a mathematical formula known as a "copula," a kind of skewed, bell-curve distribution that described the probability of death. A default by a company or an individual was like a death. Just as statisticians had modeled how people reacted when their spouses died using copulas, Li could use the same math to show how different assets reacted when one of them "died," or defaulted. As Li told the *Wall Street Journal,* "Suddenly I thought that the problem I was trying to solve was exactly like the problem these guys were trying to solve. Default is like the death of a company, so we should model this the same way we model human life."

At first, that idea sounded ridiculous, especially to the salesmen who would be charged with dumping the resulting CDO investments on clients. Human life? Broken heart? Who was David X. Li anyway? The first reaction of a typical salesmen, after they'd asked what the fuck the "X" stood for, would have been to note that "copula" sounded like "copulate."

But once the salesmen learned that the commissions for selling new CDOs were a hundred times higher than those for most other investments, they stood at attention. When they heard these CDOs had high yields and AAA ratings, all they could talk to their clients about was the genius of David X. Li and his new copulas.

Li moved up the ladder to J.P. Morgan Chase. He published his copula model in an academic journal. (If you want to read the article, it's called "On Default Correlation: A Copula Function Approach" and is in the *Journal of Fixed Income,* Volume 9 (2000), pp. 43–54. I can't recommend it as riveting bedtime reading, although I like his reference to the "Frank" copula—no blood relation, I assure you.)

According to the math, huge amounts of risk disappeared when you pooled risky assets together in a CDO. As a result, a large share of the pooled investment could be rated AAA. Word spread about this result like a game of telephone. Mathematicians explained the model to derivatives structurers, who explained the model to rating agency analysts, who explained the model to salespeople, who explained the model to investors. By the end, the message had warped from logarithmic functions and negative infinity symbols, to fat tails and low correlations, to simply "AAA, pass it on."

Wall Street derivatives arrangers trolled for risky assets to pool using the new methodology. Banks created hundreds of billions of dollars of new CDOs backed by low-rated corporate bonds, emerging markets debt, and subprime mortgage loans. They split the CDOs into levels, or tranches, based on the seniority of claims. The tranches were like the floors of a building built in a flood plain. The lowest floors were the riskiest and would be flooded with losses first. The middle levels were protected by the lower levels. The highest floors seemed very safe. It would take a perfect storm to flood them. Or at least that was what the mathematical models said.

The rating agencies, primarily S&P and Moody's, were willing to rate many CDO tranches AAA, even though the underlying assets already carried much lower ratings—from them. In their eyes, the models could magically transform a pool of BBB-rated subprime mortgage loans into a somewhat smaller pool of AAA-rated CDO investments. These AAA ratings were nearly as preposterous as the AAA ratings for FP Trust, but the rating agencies' mathematical models, including a

version of Li's copula, better hid the dubious nature of the ratings. The crap had become cake. Investors either believed the ratings or ignored the ratings' unreasonable bases (as well as the fact that the banks paid the rating agencies triple their usual fees for these ratings). The CDO business boomed and became the most profitable part of Wall Street.

When mortgage lenders such as New Century Financial Corporation and Countrywide Financial saw the insatiable demand for risky loans, they began making too-good-to-be-true loan offers to anyone they could find. Many people have criticized these lenders for unscrupulous practices. Others have criticized borrowers for taking loans they couldn't possibly repay. Much of that criticism is fair, but it ignores the big picture. The driving force behind the explosion of subprime mortgage lending in the U.S. was neither lenders nor borrowers. It was the arrangers of CDOs. They were the ones supplying the cocaine. The lenders and borrowers were just mice pushing the button.

However, the new CDO mixing process had limits. The models could only convert certain kinds of risky assets into new AAA-rated instruments, and there simply weren't enough of those risky assets. As bankers structured more CDOs, they bought up all of the underlying assets that best fit the profile of the mathematical models. Once these assets were in CDOs, they were stuck there and couldn't be repackaged again. It was hard to believe, but the bankers were running low on risky assets. After low-rated bonds and loans had been pooled once, they were gone, and therefore no longer available to be pooled again.

It was truly incredible, but there simply wasn't enough crap on Wall Street.

This is where derivatives entered the picture. The major banks recently had begun trading credit default swaps. Credit default swaps are like life insurance: one party pays a premium and receives a benefit upon death, except that as with Li's model the death is not the death of a human being. Instead, the "death" that triggers payment is the default on some obligation, such as a corporate bond or mortgage loan.

There is no limit to the number of credit default swap side bets parties can make. If General Motors has a billion dollars of bonds outstanding, you can only get a maximum of a billion dollars' worth of fixed-income exposure to General Motors. But by using credit default swaps, you can increase your exposure to General Motors without limit.

If you want a trillion dollars of exposure, you simply enter into a credit default swap based on General Motors, and then multiply by a thousand. It doesn't matter whether the bonds exist or not. This is a side bet, like gambling on a sporting event. There might be a limit to the amount of exposure you can get to a professional sports team by investing directly in the team, but there is no limit to the exposure you can get from betting on its games.

Wall Street saw they could use credit default swaps to create an infinite amount of crap. They quickly engineered new repackaging transactions, using credit default swaps to clone risky subprime-mortgage-backed investments that, when pooled, generated more sky-high ratings. These new deals were known as "synthetic" CDOs, because they had been created artificially, through derivatives side bets. Instead of basing payoffs on subprime mortgage loans that actually existed in the real world, the banks created an Alice in Wonderland world and based payoffs on the multiple virtual realities that were down the rabbit hole.

If you were a homeowner with a risky subprime mortgage loan, CDO arrangers might put together a hundred side bets on whether you would default. Through credit default swaps, a hundred investors around the world could be exposed to the risk that you might not make your next monthly payments.

Soon, investors around the world were buying complex subprime-backed financial instruments: synthetic CDOs, structured investment vehicles, constant-proportion debt obligations, and even something called CDO-squareds (don't ask). The demand for these derivatives-backed investments was a tail wagging a very large dog.

Back when I worked at Morgan Stanley, credit default swaps did not even exist. Yet by 2008, the credit default swaps market had grown to $60 trillion. To put that number in perspective, the entire world's gross domestic product was $60 trillion. The value of all of the publicly traded stocks in the world was less than that. During the same time, the size of the derivatives markets overall had increased from $55 trillion of notional amount in the mid-1990s to an incredible $600 trillion. To paraphrase the late Senator Dirksen, $60 trillion here, $600 trillion there, and pretty soon you're talking about serious money.

By 2006, there were as many synthetic CDOs backed by credit

default swaps as there were actual CDOs backed by real mortgage loans. By 2007, insurance companies had joined the banks as major players in credit default swaps. AIG led this new pack; it sold half a trillion dollars of credit default swaps, including swaps based on CDOs. Because all of these derivatives were unregulated, no one could figure out who held what. No institutions disclosed details about their credit derivatives. Lehman Brothers was a typical example: it grouped credit default swaps along with other derivatives, so no one could accurately assess its exposure.

The banks bought staggeringly large amounts of so-called super-senior tranches of synthetic CDOs. That term referred to the top floors of CDO "buildings" filled with subprime mortgage loans. They were called "super-senior" and were rated AAA, because the mathematical models said they were senior enough to be safe from even a Noah's-era flood. The banks' positions were similar to those in the Corvette example earlier. The banks had sold put options, except that in this case the options were out-of-the-money, like a put option on a $40,000 Corvette that would not be triggered until the price fell to $30,000.

Essentially, the banks were selling put options based on subprime mortgage loans. They took in insurance premiums in the form of periodic swap payments from their counterparties. In return, they assumed the risks of a major increase in subprime mortgage defaults. But the trades were labeled super-senior and rated AAA. That was a marketing ploy. If they had been called put options instead, it would have been more apparent that they had real downside risk.

The rating agencies' models said these super-senior tranches were so safe because they had a large cushion protecting them against losses, in the same way the top half of a ten-story building would be protected by the bottom five floors. According to these models, the probability that a mortgage market decline would go through that cushion, to damage the more senior tranches, was essentially zero.

What did the banks' managers and boards of directors think of these risks? Either they were comfortable with having shareholders bear the risk of major losses in the event of a subprime mortgage decline, or they had no idea what the risks were. Or perhaps some of both.

In any event, managers and directors did not warn shareholders about the massive losses they would incur if housing prices declined so that

defaults on subprime mortgage loans increased and became more highly correlated. They did not tell shareholders they had done the equivalent of selling put options based on housing prices. Because so many people had taken out risky mortgage loans—with low teaser rates, interest-only adjustable payments, and no money down—a decline in the price of their homes would put the homeowners deep underwater, with little incentive or ability to repay their debts. Many of them would default at the same time, which would flood even the top floors of a subprime-backed synthetic CDO. The banks' senior officials either hid, or did not understand, this risk.

As long as housing prices remained high, or even flat, the banks and their employees would earn large profits from the subprime CDO insurance premiums. But if housing prices collapsed, the banks would be like a million Victor Niederhoffers or a thousand LTCMs. Anyone who looked closely at the details and understood derivatives could see that the impact of a flood of defaults would be truly biblical. That was why, beginning as early as 2006, many sophisticated investors, including several hedge funds, placed big bets against both the subprime mortgage markets and the banks. Those bets would, almost overnight, make them some of the wealthiest people in the world.

For me, the first sign that my expectations might actually be proven right came during the evening of Monday, April 7, 2008. It had been exactly twenty years since Kansas had last won the national basketball title, when I was a student there studying math and economics. You might find my obsession with Kansas sports misplaced, irrelevant, or even unhealthy. You might find it a mere coincidence that my expectations about both a derivatives collapse and an NCAA basketball championship would be fulfilled in dramatic succession. But coincidence or not, 2008 was a time of vindication for anyone who was a derivatives critic and a Jayhawks fan.

I was in San Antonio, Texas, at the final game of the billion-dollar escapade that has become known as "March Madness." Coach Bill Self had quickly rebuilt the Kansas basketball program, and the team had lost just three games all season. The Jayhawks had easily won their first three games in the tournament, and had survived a scare against scrappy Davidson. In the semifinal game, they had pummeled a North Car-

olina team led by Roy Williams, the ex-Kansas coach. That set up another potential Black Monday for me, a game with Memphis, which was widely regarded as the best team in the country.

With just over two minutes remaining in the game, Kansas trailed by nine points. Many of the 43,000 spectators packed into the Alamodome headed for the exits. Yet I still genuinely expected victory. I won't dwell on the details, in case any Memphis fans are reading this, but when the ball left Mario Chalmers's hand with two seconds remaining, I simply knew Kansas would win. I got an eerie feeling, something I had not experienced in two decades. *I had been right.*

That week, New Century, the second-largest subprime lender in the United States, filed for bankruptcy. Soon after that, Countrywide, the leading lender, went into free fall. The savviest hedge funds increased their short positions and the value of subprime mortgage loans plummeted. Bank stocks began to decline.

In June, Moody's and S&P finally had to admit they had been terribly wrong. Moody's downgraded the ratings of $5 billion of subprime mortgage-backed securities and put 184 CDO investments on review for downgrade. S&P placed $7.3 billion of deals on negative watch. One by one, banks began announcing massive losses from investments backed by subprime mortgage derivatives.

Bear Stearns collapsed and was purchased by J.P. Morgan. Lehman Brothers filed for bankruptcy. Merrill Lynch sold itself to Bank of America, which also bought Countrywide. The U.S. government had to rescue AIG, the world's leading insurance company, and the handful of banks that were still standing. By the end of the year, most experts were calling the financial crisis the worst since the Great Depression.

Without derivatives, the total losses from the spike in subprime mortgage defaults would have been relatively small and easily contained. Without derivatives, the increase in defaults would have hurt some, but not that much. The total size of subprime mortgage loans outstanding was well under a trillion dollars. The actual decline in the value of these loans during 2008 was perhaps a few hundred billion dollars at most. That is a lot of money, but it represents less than 1 percent of the actual market declines during 2008.

Instead, derivatives multiplied the losses from subprime mortgage

loans, through side bets based on credit default swaps. Still more credit default swaps, based on defaults by banks and insurance companies themselves, magnified losses on the subprime side bets. As investors learned about all of this side betting, they began to lose confidence in the system. When they looked at the banks' financial statements, all they saw were vague and incomplete references to unregulated derivatives. By the time banks voluntarily disclosed some additional information about their complex positions, it was too late. The dominos already had fallen.

This story was Victor Niederhoffer's writ large. Banks effectively sold trillions of dollars of put options based on subprime mortgage loans. They used credit default swaps to make huge leveraged side bets that the holders of those loans would not default. Because derivatives were largely unregulated, most of those side bets were hidden from view. Without derivatives, the risks associated with subprime mortgages could not have multiplied and propagated in such sweeping ways.

The 2008 crisis might seem complex and inaccessible, but if you've made it through this book it is easy to understand. As with the options sold by Robert Citron of Orange County, or Nick Leeson of Barings, or Niederhoffer, the strategy appeared to generate profits with little downside risk. Until it didn't.

Ironically, the banks that had prided themselves on ripping the faces off their clients ended up bearing the largest losses. Morgan Stanley was right there, announcing billions of dollars of write-offs. The subprime risks that originally had appeared to move away from the banks returned, like a financial boomerang. This time, the biggest victims were not the banks' clients. They were their own shareholders.

As with previous fiascos, many market participants misunderstood the complexity of derivatives. But don't blame this mess on David Li. He understood the limitations of his mathematical copula model and the downside risks of subprime mortgage loans. And he warned everyone, too. Li told the *Wall Street Journal* in 2005 that using his model could be treacherous: "The most dangerous part is when people believe everything coming out of it."

Where were the regulators? By 2008, Alan Greenspan was long gone. He had helped plant the seeds of the crisis and then stepped down. When Congress called Greenspan to testify about his role, he admitted to some

of his mistakes and was publicly disgraced, his once-great reputation soiled forever. Robert Rubin also suffered searing criticism, in part because he denied responsibility and defended his earlier decisions, but especially because he had been a director and senior executive at Citigroup through the crisis, and had pocketed $115 million in pay even as Citigroup crumbled. In contrast, Arthur Levitt, the former SEC chair, admitted his errors and called for reform. No one mentioned Brooksley Born, the woman all of them should have listened to.

Meanwhile, the men on the job struggled in response to the turmoil. Federal Reserve chair Ben Bernanke and Treasury Secretary Hank Paulson lost credibility as they felt their way through various responses in fits and starts. SEC chair Christopher Cox was criticized for early inaction, even after he embraced regulation of credit default swaps. As of this writing, in early 2009, it appeared that the Obama administration planned to implement sweeping financial reforms, but details were not available. When they consider new legislation, I hope they think about derivatives.

Ultimately, what lessons should anyone draw from my experience? I believe derivatives are the most recent example of a basic theme in the history of finance: Wall Street bilks Main Street. Since the introduction of money thousands of years ago, financial intermediaries with more information have been taking advantage of lenders and borrowers with less. Banking, and its various offshoots, has been a great business, in part because bankers have an uncanny knack for surviving century after century of scandal. In this way banking resembles politics. Just as political scandals will continue as long as we have politicians, I believe financial scandals will continue as long as we have bankers. And, despite several bank failures, massive pain, and much consolidation, there is no evidence of the banking profession disappearing anytime soon.

It might seem inconceivable, but in a few years the banks will recover and reemerge. Memories of the egregious excesses will fade, as they always do. Bankers will return to recapture their informational and regulatory advantages. The government's "Troubled Asset Repurchase Program" engineered by Bernanke and Paulson ensured that banks will survive to fight another day. And when they do, the cycle will repeat.

The main reason Wall Street will return is that we will want it to. Our financial culture is infused with a gambling mentality. Even in the midst of crisis, we don't seem to think we deserve a better chance. We continue to play the lottery in record numbers, despite the 50 percent cut. We flock to riverboat casinos, despite substantial odds against winning. Las Vegas remains the top tourist destination in the U.S., narrowly edging out Atlantic City. The financial markets are no different. Our culture has become so infused with the gambling instinct that we afford investors only that bill of rights given a slot machine player: the right to pull the handle, the right to pick a different machine, the right to leave the casino, but not the right to a fair game.

Gamblers are not steady hands. They either play too much, or not at all. When they lose faith in the markets, as they did in 2008, they will not lend or invest. Instead, they swear "never again," and sell at the bottom, when they should be buying. Investment choices oscillate between the financial equivalents of stuffing cash in a mattress and betting on the ponies. That is not an efficient way to allocate capital, but that cycle will continue. It always has. Cash can remain stashed away for only so long. Eventually, what economist John Maynard Keynes called the "animal spirits" will return, and the gambling will begin again.

In this book, I have tried to describe for you how the most sophisticated part of Wall Street works. These are the people, the products, and the activities that have dominated our financial system. Morgan Stanley is a central player and is one of the survivors. The bank will do everything it can to rebuild its tarnished reputation: intensive lobbying, tear-jerking television ads about our children's future, elaborate investments in corporate social responsibility, and unprecedented charitable and political contributions. Eventually, that strategy will work. Morgan Stanely will remain among the most prestigious banks, and derivatives will return to dominate global finance. In a few years, some young rocket scientist from the firm might be ripping your face off.

As the derivatives markets have grown, it has become more volatile and dangerous. At the same time, lobbyists for investment banks have persuaded our elected representatives to reduce the amount of derivatives regulation, arguing that derivatives are used primarily for "hedging" and "risk-reduction purposes." These arguments—plus healthy campaign contributions—have worked. The result is that the regulators

lack both power and money, and are doomed to remain several steps behind the finance industry. Could a $100,000-a-year SEC investigator ever catch a $2,000,000-a-year derivatives salesman?

At the end of the original edition of this book, published in 1997, I wrote the following:

Given the dearth of regulation and proindustry balance of power, you don't need a psychic to predict that there will be another Orange County-like fiasco some time soon. The current path seems clear. The financial services industry will continue to pay tens of millions of dollars to lobbyists and congressional campaigns to fend off regulation. Derivatives will continue to cause billions of dollars in losses by hundreds of derivatives victims, along the way destroying reputations, twisting lives, and emptying bank books. Young salesmen will, as I did, continue to join the derivatives business and become rich beyond their wildest dreams. And Wall Street will continue to argue that there is no compelling reason to regulate derivatives. So far, this argument has persuaded Congress and the investing public not to worry too much about derivatives.

After reading this book, what do you think?

I have just one last thing to add, for anyone who doubted my claim that obscure financial instruments called derivatives could cause the collapse of the global financial system. *I told you so.*

San Diego
January 2009