

# THE 100-YEAR FLOOD

## An alum's perspective on the subprime mortgage crisis

Many Tuck alumni experienced the turmoil of the subprime mortgage crisis up close. But few had a vantage point quite like Mike Stockman T'85, who since graduation has been a trading and risk management professional with significant mortgage market expertise at some of the premier Wall Street investment banks. Stockman recently sat down with Tuck Senior Associate Dean Bob Hansen to discuss the subprime crisis, how certain elements were similar to other problem periods of the past, and how they may explain why so-called 100-year floods occur more often than the statistics would imply.

### THINGS BEGIN TO GET INTERESTING

**BOB:** Thanks for participating in this interview. I hope we can do our part to make sure people think about what happened and learn lessons to help avoid such issues in the future. How would you help historians put this crisis in perspective?

**MIKE:** I would want the historians to understand the key features of the subprime market in the early, stable stages from 2001 through 2004 when things began to get interesting, followed by a hypercompetitive lending environment from 2005 to 2007. It's important to



Since graduation, Mike Stockman T'85 has worked as a trading and risk management professional with significant expertise in the mortgage market.

understand the overall market conditions that served as a catalyst for the crisis. Furthermore, I noticed that certain elements of this crisis were not exactly the same but did rhyme with severe financial crises of the past. I had to ask myself how these 100-year floods appear to be happening every 10 years. Were there common themes that would help explain the similarities between these events? I would want the historians to understand the lessons learned. So with the benefit of hindsight, a desire to understand if there was a connection between this credit crisis and past market mishaps and learn the available lessons, I look forward to our discussion. It will be interesting to use this discussion as the backbone to explore these ideas in a paper in greater detail with you and some of the Tuck faculty.

**BOB:** What would historians writing about this in the future pick out as some of the key events and underlying conditions that define this crisis?

**MIKE:** The conditions in the marketplace leading up to the crisis can be overlooked but are what really set the stage. Lenders had deep sources of capital, were doing business in a hypercompetitive environment, and operating in near-perfect market conditions. Like most bubbles, there's a long steady buildup, an increase in confidence as if the conditions will last forever, and then a very quick decline. The backdrop before the summer of 2007 was one of very easy credit in nearly all marketplaces; especially for subprime borrowers, private equity, and LBO financing shops. Credit spreads—a metric that describes the overall ease or tightness of credit conditions—were tilted well into the borrower's favor. The pendulum had swung quite dramatically to easy credit conditions over the previous five years and was a major factor in contributing to this crisis. This backdrop set the stage for a series of key events that, in combination, took us from a cycle where all were making money and prospering to the toxic, negative cycle we are in now. The stage was set for not just a subprime crisis but really a full-blown credit crisis.

**BOB:** So this climate of easy credit was one of the main characteristics of this period?

**MIKE:** Yes. While difficult, if you wanted to try to pinpoint the origin, it would be right after the dot-com bust

and September 11 when the Federal Reserve orchestrated easy credit conditions in an attempt to ward off a recession in the economy. Easy credit also led to an unintended consequence of a buildup of leverage in the system. This came in a number of different forms; with credit spreads narrowing and returns declining, some investors leveraged to try to achieve the previous higher returns. This can work for a time as long as the underlying asset doesn't crack. Structured vehicles such as CDOs [collateralized debt obligations] that have inherent leverage added potential fuel to the woodpile. Leverage always seems to magnify the downside much more than it enhances the upside.

**BOB:** So we've got easy credit, tight credit spreads, and a leveraging of the system in pursuit of yields. Were there any big events that stand out in memory?

**MIKE:** When you mix these conditions together with unbounded enthusiasm and cook at 450 degrees for three to five years, we shouldn't be surprised by the outcome. The well-publicized collapse of some of the Bear Stearns funds in the early summer of 2007 was a watershed event. These funds were highly leveraged and contained significant amounts of subprime assets. This event revealed the illiquidity in the marketplace. The marketplace was flooded with supply and the buyers backed away. Here is an example of how markets appreciated very slowly over time and some investors leveraged to deliver the same or higher returns. Then, there tends to be an event or series of events that takes the bloom off the rose, which is almost always followed by a sudden, significant drop in asset prices as buyers disappear and sellers head to the exit at the same time.

**BOB:** And this started to happen in the fall of 2007?

**MIKE:** Correct. Note that it wasn't just the subprime market cracking. Other credit markets had their own similar issues. The leveraged loan and high-yield markets had been priced for perfection and, during this period, ceased to operate because there were no buyers and only sellers. The basic premise is that conditions were extremely favorable by many standards, and when they became unfavorable, liquidity almost ceased to exist. There is a good dose of investor behavior to review here. In terms of watershed events, there's the collapse of those funds.

It is also important to mention that the subprime asset is starting to visibly crack during this period. There was the dramatic increase in actual subprime delinquencies and defaults, the first-time decline in U.S. home prices since World War II, the collapse of the leveraged loan and high-yield markets, and the ensuing collapse of Bear Stearns.

## FOLLOWING THE MONEY TRAIL

**BOB:** Let's step back and focus on the money trail in the subprime market, from the borrower who's buying a home to the final securities investor. The subprime market seemed to go through at least two distinct phases. The first was characterized by relatively efficient processes; the second by hypercompetition and an abundance of available capital. Can you focus a little more on these phases and how they worked?

**MIKE:** The motivations and business models for all parties along the money trail in the first phase are key to understanding the issues that arise in the second phase. The money trail starts with the borrower and ends with the lender. As the numbers of parties involved in the trail increase, there tends to be a decline in transparency between the borrower and lender. To be clear, this is not a good thing. Additionally, one needs to think about the intermediary's profit motivation, the friction or cost that is created for the borrower, and whether this intermediary is really adding value or has skin in the game. One of the first parties touching the borrower is the originator. The originator looks to a number of sources for funding and also helps distribute the assets. Some of the main sources of originator funding are intermediaries such as Wall Street investment banks. These intermediary funding providers also structured these assets for distribution. Wall Street, in turn, during the first phase only held these assets for a short period of time before distributing them to the ultimate lenders—institutional asset owners, money managers, and hedge funds. In the early phase, the lenders understood the subprime borrowers and instilled lots of discipline. As we head into the second phase, some of those disciplined lenders were priced out of the market by the global pool of capital in search of greater returns. Intermediaries structured the debt to be attractive to the global pool. This pool paid a higher

price for the asset than the more disciplined early lenders. Business models drifted during the second phase, which led some financial intermediaries to move from an originate-to-distribute model to an originate-to-hold model. It was the holding of these assets—originally considered high quality by virtue of their ratings—that led to the significant write-downs we are now witnessing; of course hindsight has been helpful in understanding all of these points.

**BOB:** We had a lot of foreign lenders in this market as well who considered American mortgages low-risk, right?

**MIKE:** You can go around the globe and you'll find institutional investors—international and domestic—participating in this marketplace.

**BOB:** What does an originator do with a mortgage to get it to an institutional investor?

**MIKE:** An originator sells the loan and gets cash back to make more loans. The buyer of the loan either retains it and earns interest, sells it to an intermediary, or distributes it to an end buyer. In order to satisfy different end-buyer criteria, the intermediary can structure the cash flows. So you have hundreds of mortgage loans, you bundle them together and carve up the cash flows to satisfy end institutional buyers' needs. When you bundle these individual loans, you now have raw material to feed the securitization machine.

**BOB:** That's the way people describe it—as raw material?

**MIKE:** Yeah [laughing]. Well, that's how I describe it because, to a certain extent, you can throw any asset into a securitization machine. And don't forget, this raw material is actually a yielding asset. It is paying principal and interest even while it's sitting on your balance sheet prior to your selling it. This part of the process is called warehousing. In the early days it may have taken three to six months to build up a billion-dollar deal, get all the legal documents together, find the buyers, and fine-tune the structures. The warehouse did not look to hold the asset but rather to distribute it. As competition in the market increased, some warehouseers changed their

business model and moved from distributor to holder as I mentioned before. There was a comfort level that the asset was rated AAA and borrower due diligence was taken care of by someone else—the rating agencies. There was a prevailing understanding of “if it’s AAA, I’m OK.”

**BOB:** This raw material could be credit card receivables, car loans....

**MIKE:** Yes, exactly. The technology is broadly similar.

**BOB:** On the surface at least, this business model seems to be very reasonable. An innovation in capital markets allowed much more capital to flow to homebuyers. Sufficient checks and balances were in place. And lots of folks were buying houses they would not normally have been able to. But there are also those who say the whole market, even at this time, made no sense and that many of the parties should have known that no economic value was being created.

**MIKE:** I’d have to disagree with those who thought this market made no sense in the early phase. The marketplace was reasonably satisfied and well functioning for a number of years. From a capital markets perspective, there were many opportunities for investors to voice their concern via prices of debt, equity, and insurance for these assets.

**BOB:** You mentioned a lack of transparency between borrower and lender as well as declining clarity of risk ownership in the lending chain. What do you mean by that?

**MIKE:** This is an important point. As these markets developed, the cash flows from the underlying securities got carved up in more and more complex ways to feed the demand of the global pool of capital looking for higher yields. This was the beginning of SIVs [structured investment vehicles] and CDOs. These vehicles became complex and hard to price. This, combined with the AAA rating, took the borrower further from the lender—and the end result was that no one was really responsible for the due diligence. The lender really didn’t know the borrower. The end holders of this debt were relying on others essentially to do their due diligence. As we know,

there were instances of loan products being created that didn’t extract relevant information regarding the borrower’s credit worthiness. Rising home prices—they always rise, don’t they?—was the collateral for the debt. The rising home price assumption was one of the keys behind the no-income-verification and other no- or low-doc loans. The logic here was that the collateral for the debt was the home, whose price always rose, so there was no need to really understand the borrower’s ability to pay. Had home prices continued to rise, the loans may have worked—unfortunately this didn’t turn out to be the case. Given the historical house price data, it would have been a hard assumption to challenge at the time.

## **MORE RISK-TAKING, CHANGING MARKET CONDITIONS**

**BOB:** What changed in 2006? What forces caused the system to begin breaking down?

**MIKE:** A number of things started to happen and, of course, this is all with the advantage of hindsight. Recapping from the beginning of our discussion, there was a hypercompetitive business environment and market conditions that were favorable to the borrower. Separately, there were some bad assumptions about the subprime asset. Participants’ worst-case estimates of default rates were between 5 and 10 percent. Models are now estimating significantly higher default rates, some now predicting between 20 and 30 percent, others even higher. Another bad assumption revolved around housing prices. The widely followed method to gauge house prices was through the HPA. The HP, of course, stands for “house price” and the A for “appreciation.” They didn’t even have the letter I for “index” or D for “depreciation” in the acronym. The market simply assumed house prices would always rise.

Professor Kent Womack teaches a course on behavioral decision-making and Professor Sydney Finkelstein teaches on why leaders make mistakes. There are a lot of lessons to be learned on those fronts in the subprime crisis. One of many things I see is how comfortable people got after a long period of success and what they thought was a fair risk-return trade-off.

**BOB:** So was it ignorance?

MIKE: When you step back, review the funding and profit trail and look at all the players involved, one of the themes I think emerges is that there was no one villain. In fact, for a significant period of time, the individuals and enterprises acted responsibly within their respective businesses in fulfilling their duties. The marketplace complicated the start-to-finish lender-to-borrower chain and had too many players committing small missteps that, when combined, reverberated into the credit crisis. An analogy from my days as an engineer comes to mind. Some of you may remember the film of the Tacoma Narrows Bridge shaking out of control and eventually collapsing. These small forces or perturbations can damp themselves out and cause no permanent harm for long periods of time. When they don't damp themselves out they can actually amplify, spin out of control, and cause significant damage given the right set of conditions—like unanticipated wind conditions hitting the bridge or the market conditions we had in 2006 and 2007. Additionally, each member of the chain operated independently under what I'm sure they felt were sound business practices, but there was no one sitting on top of the machine saying, "Hey, this actually may be spinning out of control." Bob, you reminded me of the analogy of soldiers being asked to march out of step when crossing a bridge so as not create a damaging shake like the one that sent the Tacoma Narrows Bridge into the bay. Small mistakes can end up compounding and causing catastrophic damage. Furthermore, no one soldier would be expected to be aware of the impact if they were marching in or out of step. It would take an independent general—in this case, possibly the regulators—to guide his or her troops' actions and keep them out of harm's way. Having said all this, I still believe there was no single villain.

BOB: The subprime model was clearly not set up perfectly, especially in regard to incentives of some of the players. What were some of the major incentive problems you see now?

MIKE: A number of the intermediaries had financial interest but no skin in the game. The players whose business model was based on volume but had no stake or interest in the creditworthiness of the borrower. They were certainly part of the problem. Borrower facilitators such as mortgage brokers, servicers, rating agencies, and other intermediaries who were volume-based but did

not participate in the downside should the loan default or go delinquent were a problematic part of the business model.

BOB: You mentioned there were significant fixed costs throughout the system, and once you set up the system with high fixed costs and low incremental costs, all the incentives are to create volume.

MIKE: To build up a billion-dollar deal, get all the legal documents together, find the buyers, and fine-tune the structures, you end up with a lot of moving parts. It's actually quite labor-intensive, so you need volume to cover your fixed costs. This is all in the context of shrinking margins and a hypercompetitive lending environment in 2006 and 2007. In retrospect, you can see how this scenario could end up in tears.

BOB: And we also had changing business models with other players, right?

MIKE: Right. An unfortunate example is that of the monoline insurers. Their traditional business line was to reinsure municipal borrowers. For many years, the marketplace demanded that municipals either be rated AAA on their own or insured up to this level by virtue of an outside insurer. This developed into a significant business—highly leveraged, mind you, but profitable because of the very low default rate. To make a long story short, in the past decade monoline insurers got into the structured credit arena to round out their business models, in particular the subprime market. Given the delinquency and default scenarios that are playing out, combined with a highly leveraged business model, it's unfortunately no surprise that some monolines are struggling significantly.

BOB: I know you've thought a lot about how to make the financial markets less prone to crises like this. What are your main ideas?

MIKE: The first thing that hit me was that these are recurring events. During my years in the business, I have seen significant financial crises occur with alarming frequency. The so-called 100-year flood appears to be happening every 10 years; the 50-year flood every 2 years. So you need to ask yourself what themes might explain



the frequency and depth of these events. During my 23 years in the business I have seen approximately four 100-year floods and eight or ten 50-year floods. Just to ensure that I hadn't seen it all during my tenure, my son Max enlightened me to an event from 171 years ago that shared some eerily similar characteristics with the recent subprime crisis. Max, a sophomore in high school, and I were driving up to Boston a couple of months ago and he asked me what I was working on. I talked to him about the subprime crisis and that I was trying to figure out what might explain the rhyme between all the financial crises that I've seen. All these kids are so smart nowadays—to my surprise, he explained that he had just finished studying the Financial Crisis of 1837 in his American history course. He mentioned that a contributing factor to the crisis included easy money from banks that

## Amid the crisis, some lessons

**Mike Stockman T'85 suggests business practitioners and academics ask themselves the following questions if they sense that 100-year floodwaters are rising:**

- Have borrowers and lenders stopped talking?
- Has there been a decrease in transparency and clarity of risk ownership in the lending chain?
- Do you understand the lenders', borrowers', and other intermediaries' business models and profit motivations? Is anyone asking the tough questions about where the money is coming from on the way up? Is it sustainable? Is there an obsessive drive for quarterly earnings and emphasis on short-term profit growth?
- Have business and market conditions changed and, if so, have the old assumptions been objectively evaluated?
- Has there been a drift in the business model? Is one of the responses, "Our competitors are doing it, so we have to keep up"?
- Is there independent oversight of the individual players or the overall industry? Would they be prepared to set off alerts if long-standing principles are ignored?
- Are the players overly confident? Have behavioral patterns changed such that the players believe in their own success and are without challenge?

led to poorly underwritten lending. There was reported wild speculation and fraud and it all ended very badly in 1837. “Dad, is that kind of what happened in the 2007 subprime crisis?” he asked. Of course, I was struck by the similarities and realized that my timeline was too short. These issues have been around for a very long time. If we dug further, I imagine we’d see the same disconnect between lender and borrower in 1837 that we have today. I said to Max, “You got it young man. Kind of embarrassing that these issues have been around for so long and we haven’t figured out a way to circumvent them, isn’t it?”

What are the common themes that might explain why these events keep occurring? If we understand these themes and watch out for them in the future, we might be able to make the financial world a little safer place. Bob, you and I are working on a longer paper that addresses the themes in greater detail. I don’t really know but think we might be on to something here.

**BOB: Are we seeing the end of this crisis? Did the fall of Bear Stearns mark its lowest point?**

MIKE: No. We haven’t talked in detail about subprime delinquencies and defaults. This thing could get worse. What if defaults instead of going to 20 or 30 percent went to 50 and suddenly we have this unexpected backlog of unsold homes. This puts a lot of friction into the pace of the recovery. Nor did we address commercial mortgages, which certainly haven’t been unscathed. But that’s another marketplace that could put some pressure on the economy and vice versa. The possible fallout of Freddie Mac and Fannie Mae are other almost unbelievable casualties. The crisis could be spreading to high-grade borrowers. It is hard to say what event will mark the bottom point of the crisis. Other consumer debt is showing signs of weakness at this point in the cycle. There is hope, but not comfort, in the marketplace that we are closer to the bottom, but we had a very difficult spring and early summer.

## **MAKING THE FINANCIAL WORLD SAFER**

**BOB: What do you see in the near term as this situation continues to play out?**

MIKE: In this turmoil is opportunity. The interesting part is what the next chapter will look like. I like to think about which businesses will survive or morph into the next generation and which will go away and never come back again, like lending to a C-minus borrower who couldn’t afford the debt service in the first place. The next generation of innovator is about to emerge. There is a fundamental need in our economy for people to finance and own real estate. The current model has many parts that are broken and I suspect a stronger and better one will emerge by those looking to pick up the pieces.

**BOB: Looking ahead, what are the financial markets and the mortgage market in particular going to look like?**

MIKE: I can’t tell you what exactly it’s going to be, but I can tell you the playing field’s a lot different than it was in the past. I think there will be significant opportunity on a number of different fronts.

**BOB: But there do seem to be good opportunities to come into this market and clean up the mess.**

MIKE: There are some terrific opportunities in the securities and whole-loan markets. The challenge is always about timing. There is a lot of scared money out there that doesn’t mind missing the first 5- to 10-percent rally. I suspect that when this market finds a bottom and starts to rally, it will rally hard. I just can’t tell you when that will be. If anyone out there knows, please tell us.

**BOB: You were at Tuck from 1983 to 1985. What would you recommend business schools do to ensure we don’t have crises like this too often?**

MIKE: There is information and knowledge to pass on. Part of our job as experienced practitioners and academics is to pass on the insight and experience we gained during these events to the next generation. We need to put these insights in the next generation’s toolkits; whether they pull them out when the next 50- or 100-year floodwaters are rising, we don’t know. But we are obliged to pass on our experience—whether in courses, papers, or other formal mechanisms—lest we be destined to repeat our mistakes.