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A Pyramid of Little Golden Crumbs

> "Darling," said Judy, "Daddy doesn't build roads or hospitals, and he doesn't help build them, but he does handle the bonds for the people who raise the money."
>
> "Bonds?"
>
> "Yes. Just imagine that a bond is a slice of cake, and you didn't bake the cake, but every time you hand somebody a slice of the cake a tiny little bit comes off, like a little crumb, and you can keep that." …
>
> "Little crumbs?" she said encouragingly.
>
> "Yes," said Judy. "Or you have to imagine little crumbs, but a *lot* of little crumbs. If you pass around enough slices of cake, then pretty soon you have enough crumbs to make a *gigantic* cake."
>
> – Tom Wolfe, *The Bonfire of the Vanities* (1987)

Every major financial market dislocation generates a spill of ink and a scatter of pixels at least proportional to the damage in the marketplace. Over the past few weeks, as the credit contraction we've taken to calling the sub-prime lending crisis has unfolded, those following the story will have read a great deal about the pain of those holding securities related to sub-prime loans. We've read quite a bit about the pain of borrowers who may be about to lose the homes they bought with sub-prime mortgages they really couldn't afford. We've even seen some discussion of the mechanics by which sub-prime loans, collateralized debt obligations, hedge funds, German *Landesbanken*, and other entities combined to create the mess. But we haven't read much about the real engine driving the volume of loans, securities, and transactions that make up the sub-prime market – the fees that mortgage brokers, investment bankers, hedge fund managers, rating agencies, and many others were able to take out of every step of the process.

The mortgage market operates differently today from years ago. In the old days, a prospective homeowner would apply to a bank or savings and loan association for a mortgage to buy a particular house. The banker would look at the buyer's income, credit history, and other financial assets, and evaluate the ability of the buyer to make the contractual payments throughout the life of the loan. For an additional layer of safety, the banker would also inspect and evaluate the house, to make sure that if the homeowner ran into unexpected trouble and

couldn't pay the mortgage, the value of the property itself would be enough to provide adequate collateral for the loan, with foreclosure being the lender's last resort.

In the direct lending mortgage model, the bank or S&L making the loan would keep the mortgage on its own books. In the traditional model, the funding the bank used would come principally from customer deposits. The homeowner would make monthly payments in the usual way, and the banker would profit from the difference between the interest the borrower paid on the mortgage and the interest the banker paid depositors for the use of their money. The bank's funding, that is, its deposit base, limited its capacity to write mortgages. Because the loans remained on the bank's books, the bank bore and managed the credit risk. This is traditional "spread" banking, a simple enough business that bankers sometimes joked theirs was a 3-6-3 business: Borrow at 3%, lend at 6%, and be on the first tee by 3:00. While the model is almost charming in its simplicity, it did embody a key economic fact – mortgage borrowers had to be able to afford to pay their loans on the strength of their household income. A mortgage allowed a borrower to buy as much house as the family could afford, and the lender's earnings came from the economic productivity of the household.

Mortgage borrowing in the US no longer looks like a scene from *It's a Wonderful Life*. The consumer's experience is much the same as it used to be, but that's about all. A homebuyer looking for a mortgage will still usually go to a traditional lender and complete a traditional mortgage application. The lender, in turn, will usually evaluate the prospective borrower's credit and the value of the house the borrower intends to post as collateral on the loan. But just about everything else about the behind-the-scenes process has changed.

The Cast of Characters and Their Fees

Let's walk through a typical mortgage loan today, and see where the fees are.

Unlike the old 3-6-3 days, the mortgage market has taken on a level of complexity that many consumers find daunting. A perplexing variety of lenders offer an array of loan types, with varying maturities, interest rates that float on different schedules and against different rate indexes, and a profusion of other features. With so many choices, borrowers naturally wonder whether they have taken out the best possible loan. Enter the **mortgage broker**.

Mortgage brokers ostensibly help prospective borrowers sort through the complexities of choosing and obtaining a home loan. A given broker typically has a set of preferred providers (banks, savings and loans, or mortgage companies) and products to which he or she directs customers. The broker earns a commission – a golden crumb – at the time the loan closes. Most of the time, the broker's commission increases with the size of the loan. Because regulations don't set mortgage brokers' commissions, they aren't necessarily standard across products. A mortgage broker may have an incentive to steer customers toward loans that pay higher commissions – whether by encouraging customers to borrow more, or by choosing loans on

which lenders offer higher commission rates. The broker may not necessarily be watching out for the best interests of the customer.

Most US consumer mortgages permit borrowers to prepay any or all of the principal balance without penalty. This means that many borrowers can refinance their mortgages, simply to find better terms. It also means that aggressive mortgage brokers actively solicit business by promoting their mortgage products as refinancing opportunities.

Every time a mortgage broker facilitates a loan, the broker earns a commission. This is one of the reasons for the popularity of adjustable-rate mortgages with low "teaser rates," as well as interest-only (the borrower doesn't pay back any principal, at least at first), and even "neg-am" (negative amortization) loans, in which the borrower doesn't even pay all the interest – the unpaid portion just increases the principal amount owing. All these structures give borrowers lower initial monthly payments, which will increase, usually sharply, at some point in the future. The mortgage broker's game in these instances is to hope the borrower can refinance again – generating another commission – before that happens. This game continues so long as funding in the market remains plentiful and housing prices increase fast enough for borrowers to build equity even if they don't repay any principal.

Of course, mortgage brokers need products to sell, and these come from **mortgage lenders**. Mortgage lenders include traditional banks and savings and loan associations, which are subject to traditional banking regulation. But they also include other types of financial entities, including mortgage companies like Countrywide Financial and American Home Mortgage. The regulations governing these non-bank mortgage lenders are generally lighter than those on banks, giving them somewhat more room for questionable practices.

Today's mortgage lenders, particularly the non-bank lenders, have transformed the mortgage industry from a spread banking activity to a transactional business. If mortgage lenders seem to work hand-in-glove with mortgage brokers, that's because both lenders and brokers want more than anything to see new loans close, even if the new loans simply refinance existing ones. Lenders, like brokers, are in it for the fees. In most new loans the lender's golden crumb is some type of origination fee, often structured as "points," which increase the amount of the loan. And if you've ever taken out a mortgage, you know of the blizzard of fees, large and small, for inspections, appraisals, documentation, title insurance, and so forth. Some mortgage companies have subsidiaries that perform these services – and not always at the lowest cost to the borrower.

While we think of the mortgage provider, whether it's Bank of America, Countrywide, or the fictitious Bailey Building & Loan, as the lender, it's really more precise to call it the mortgage **originator.** These entities generally retain relatively few mortgage loans on their own books. Instead, they sell your loan, along with the lien on your house that goes with it, to another investor. Once the originator has sold your loan, your credit risk is no longer on its books, and it also has cash again, which it can use to originate another loan. No matter who buys your

mortgage, you still make your monthly payments to the same original lender. It verifies your payment, calculates your current loan balance, and passes the cash along to the party that purchased your loan. The originator receives another golden crumb, a fee, also usually proportional to the size of the loan, for this **loan servicing** activity. Since points and servicing fees vary with the size of the loan, and since the originator expects to sell your mortgage to another party, removing the risk from its books, even your lender wants you to borrow as much as possible, and refinance as often as you can.

Once the originator sells your loan to an investor, it enters the mysterious world of **mortgage securitization.** Mortgage securitization has been around for a long time. It's the principal business of the government-sponsored mortgage agencies, Fannie Mae and the Federal Home Loan Mortgage Corporation (FHLMC, or Freddie Mac), and in steadier times it has been a means to provide access for ordinary homeowners to the broad capital market, at reasonable cost. Done properly, mortgage securitization results in more uniform lending standards and lower rates for homeowners. In turn, the ultimate owners of the mortgage loans have claims on cash flows generated by real economic activity – the household earnings of homeowners. Here's how it works in the "conforming loan" world of Fannie and Freddie.

If you look up available interest rates on consumer mortgages, you'll see that many lenders post different rates for "conforming" and "non-conforming" loans. Conforming loans are those that meet certain standards and conditions that Fannie Mae and Freddie Mac place on loans they are willing to buy. Generally speaking, these loans can't be too big (the current limit is $417,000), and they have to have certain structural features (the agencies favor traditional, fixed-rate loans, though in recent years they have begun to buy some adjustable-rate mortgages), and meet their credit standards. Lenders can easily sell conforming loans to Fannie and Freddie, so they routinely offer them to borrowers at lower interest rates – a genuine consumer benefit.

Fannie and Freddie retain some mortgages on their own books, but they securitize by far the bulk of the loans they buy. The agencies arrange mortgages into pools containing a few, or a few dozen, individual loans. The loans in any given pool will generally be uniform in interest rate, credit quality, and structure (30-year fixed rate, for example); and will usually all be recent loans. Against the loans in this pool the agency issues a Mortgage-Backed Security (MBS) for sale in the public securities market. MBS are pass-through securities, meaning that when Fannie or Freddie receives monthly mortgage payments from the originator, it passes through those payments to the registered owner of the MBS. For many of their securities, Fannie and Freddie guarantee the timely payment of principal and interest on the MBS, giving those securities high credit ratings. Actually, Fannie or Freddie passes through any principal payments it receives, but only passes through interest at the stated coupon rate on the MBS, which is somewhat lower than the interest rate on the underlying loans – enough lower to pay the servicing fee to the originator, and provide a golden crumb for Fannie or Freddie.

High-quality mortgage-related securities have been a mainstay of the US fixed income market for a couple of decades now. But straight pass-through MBS are really only the beginning of the story. The success of MBS, and the desire in the marketplace for specific types of interest rate exposures, gave rise to **collateralized mortgage obligations**, (CMOs), representing the next level of complexity. Straight MBS just pass through principal and interest payments as they occur. To broaden the marketability of their product, the agencies (along with a number of other issuers) also package MBS into CMOs. To do this, they take a collection of MBS (generally more than a few dozen), and place them into a trust or other special-purpose vehicle, a legal entity formed specifically for the purpose of holding the MBS. This entity then issues a series of securities, called *tranches*, which parcel out the cash flows (interest and principal payments). The trick is that different tranches receive different payments. In the simplest such structure, one security (an IO, for "interest only") receives all the interest payments, and a second (a PO, for "principal only"), receives all the principal payments. But most CMOs are far more complex, and many have dozens of tranches.

Investors and journalists sometimes call CMOs mortgage derivatives, since CMO tranches are complex, difficult to evaluate, and the cash flows pass through at least two conduits before the holder receives them. But CMO tranches are clearly-defined claims against a specific collection of actual mortgage loans, and the payments they receive ultimately come from the monthly checks of specific borrowers. While the complexity of CMOs has tripped up some investors over the years, the market for CMOs backed by Fannie Mae and Freddie Mac MBS has generally functioned well, for the simple reason that the standards on the underlying loans are fairly high, and the agencies really don't have the incentive to relax credit standards on the loans underlying the securities they guarantee. Most important, these notes represent the basic economic activity of mortgage lending. Even so, CMOs provide plenty of golden crumbs for the issuers, the underwriters, and the brokers that trade them.

The Sub-Prime Mess

The sub-prime loan market is the mutant cousin of the market for high-quality mortgages and their related securities. It has all the same elements – mortgage brokers, lenders, purchasers of loans, and securitization – without the credit checks, quality, or guarantee from the government-sponsored entities, Freddie Mac and Fannie Mae. The economic basis is weaker, too. Recent data suggest that recent mortgage delinquencies have been disproportionately great among speculative homebuyers, rather than those intending to live in the houses they bought.[1] But the mechanics are similar, and so is the ultimate driver, the hunger for those golden crumbs.

The seeds of the sub-prime mess germinated in an environment of low interest rates, ample liquidity, and rising house prices. Mortgage originators easily found syndicators, eager to

[1] See, for instance, Michael Corkery and James R. Hagerty, "Investors Default on Outsize Share of Home Loans," *Wall Street Journal,* August 31, 2007. Also at http://online.wsj.com/public/article/SB118851838516214091.html

create securities from sub-prime mortgages, as buyers for their loans. The creators of the packaged securities, in turn, easily found buyers for them. And mortgage brokers and lenders were able to find plenty of customers to borrow, driven at least in part by the expectation (vain hope, really) that house prices would continue to rise, allowing them to build equity against even the sketchiest loans.

The parallel world of sub-prime lending starts out in the same way as the high-quality mortgage world. A mortgage broker helps a customer look for a loan. When the loan closes, the broker receives a commission, and the borrower receives the funds to buy or refinance a house. The more the customer borrows, the bigger the broker's commission, so many of these loans attract borrowers with features like low teaser rates and interest-only or negative amortization payment schedules, which defer pain by driving down the initial monthly payment as far as possible. Loans with these features sometimes appealed to customers who could barely afford them. With liquidity easy and house prices increasing, the idea was that the customer could refinance again soon anyway, deferring the real pain indefinitely. While many sub-prime loans carry unusually high prepayment penalties, making quick refinancing difficult, this detail somehow didn't deter either lenders or borrowers.

Just as in the high-quality mortgage market, originators of sub-prime loans generally plan to sell the loans to other buyers. As the market for sub-prime loans expanded, the cycle of reselling loans accelerated, and originators began to relax their credit standards, figuring that they could just sell the loans anyway, and wouldn't have to worry about the credit risk. As a result, for a time mortgage lenders energetically wrote large quantities of low-documentation loans, no-documentation loans, and the infamous "liar loans," in which lenders apparently made no effort to verify the information on the mortgage application.

As with high-quality MBS and CMOs, the originator sells the loan to an entity that pools them together into securities. In the sub-prime market these usually aren't pass-throughs, but securities that more closely resemble CMOs. In fact, the issuers generally call them collateralized loan obligations (CLOs) or collateralized debt obligations (CDOs). Unlike agency-based CMOs, which offer investors different schedules of interest and principal payments but generally uniform credit, CDOs usually have tranches that vary in seniority. As payments of principal and interest on the underlying loans come in, the most senior tranche receives its payments first, then the second tranche, and so forth until we reach the most junior slice, which receives its cash only if enough borrowers have made their payments to satisfy all the other tranches. In general, if some borrowers default, the most senior tranches are the most likely to receive their full payments, and the most junior are most likely to suffer shortfalls.

Packaging risky loans in such a way that some of the securities have first claim on the payments on *all* the loans in a pool is a form of credit enhancement. Even if some borrowers default, the senior tranches are likely to receive their full payments. Of course, if the overall

credit quality of the loans in the pool is poor, then to give some tranches high credit quality, the structure concentrates credit risk in the junior tranches.

Any business that generates large quantities of securities has to concern itself with their marketability. Even in a hot-money environment, buyers of securities representing sub-prime mortgages worry about their credit risk. To put these investors at ease, CDO issuers enlist the aid of **credit rating agencies**, particularly Moody's and Standard and Poors. Issuers pay these firms a fee (yes, there's a golden crumb for the rating agencies, too) to examine the credit risk of the securities they are selling. In many cases, the rating agencies gave the most senior tranches of CDO deals Aaa ratings, seemingly equating them with the highest-quality credits.

The basis for the high credit ratings on the senior tranches is that the structure has the effect of over-collateralizing the senior portions of the CDOs. Some fraction of the loans in the pool can fail to perform without impairing the senior tranches. This strategy has been effective in other parts of the market for asset-backed securities, and in the early stages of the sub-prime market, this over-collateralization may well have justified the high ratings.

Once the issuer sold the higher-quality tranches of CDO structures on the strength of over-collateralization and a high credit rating, the problem of marketing the junior tranches remained. To make these more palatable, in some instances issuers placed these junior securities into *another* pool, which issued securities against them, generating still more golden crumbs. The senior tranches of these second-order pools would have first claim on whatever cash flows trickled down to the securities they held. These structures, which carry nicknames like CDO^2, produce another series of highly-rated securities – and further concentrate the worst of the credit risk into junior securities that truly ended up as financial toxic waste.

By the time we reach the CDO^2 stage, the securities are impossible to evaluate. After all, these are slices of cash flows from pools of securities, which themselves are the riskiest slices of cash flows from pools of loans, whose original credit quality is impossible to determine.

Who Buys All This Stuff, Anyway?

The multi-billion dollar question in the sub-prime mess is, who has ended up stuck with all that paper? From the press reports, it appears that sub-prime paper is all over the place, wherever investors have reached for yield in a low-rate environment. Mortgage-backed securities normally have higher yields than otherwise comparable government bonds, and high-quality agency issues have long been attractive for that reason. Apparently, many investors anticipated that the non-agency issues flooding the markets could well behave in the same way, particularly if they had high credit ratings. Only when the underlying loans began to become delinquent in large numbers did the troubles appear.

One group of energetic buyers appears to have been **hedge funds.** Not all hedge funds, but some that invest heavily in fixed income strategies, seem to have taken down CDOs in quantity. The strategy was simple – buy highly-rated CDOs, financing through what amounted to margin loans, and pay the interest from the cash flows on the CDOs. This trade apparently unraveled starting in June, when default rates on the underlying loans grew so high that some funds couldn't meet their margin interest requirements. In mid-June, Merrill Lynch seized $800 million worth of CDOs that two Bear Stearns hedge funds had posted as margin collateral, and the funds ultimately collapsed. Other funds have suffered sharp losses as well, and a number have closed.

Sub-prime paper has found its way into a number of other places as well. We don't know where it all is, but several other high-profile problems shed some light on the issue. One surprising investor was Sachsen LB, a Landesbank (state bank) in eastern Germany. Sachsen's losses were so large that it has agreed to be acquired by LBBW, the Landesbank based in Stuttgart, for a token sum around $400 million. At least one item in *Barron's* also suggested that Chinese financial interests had been large purchasers of mortgage-related instruments, and recently the Bank of China disclosed that it is holding $9.6 billion in sub-prime mortgage instruments and CDOs.

Not all the sub-prime loans make their way into CDOs. Two other forms of financing merit mention. One is the "SIV-lite" (SIV stands for *structured investment vehicle*), of which Barclays Capital was a major vendor. In fact, Sachsen's troubles seem largely to have involved SIV-lite structures that Barclays had set up. Generally speaking, SIV-lites are much like CDOs, but instead of issuing senior, long-term bonds, they fund themselves in the commercial paper market, issuing short-term securities, which corporate treasuries, bank portfolios, and money market funds buy. As credit market participants learned that the underlying assets, the mortgages, had credit problems, they stopped buying the commercial paper, raising the possibility that the SIV-lites would have to liquidate some of the loans.[2]

Other types of vehicles also purchased loan-related securities. These included listed structured credit vehicles, some in London, but also at least one, KKR Financial Holdings LLC (KFN), in New York. The *Financial Times* reports, "Many of these funds were big buyers of 'toxic waste,' the highest-risk tranches of CDOs, which could offer big rewards – and bore the brunt when things went wrong."[3]

Other Worrisome Hot Spots

It's hard to know where all the problem loans are now. The process of transforming newly-originated consumer mortgages into CDOs, SIV-lites, or other funding vehicles is not

[2] For a good summary, see Paul J. Davies, "SIV-lite sector raises fresh credit concerns," *Financial Times,* August 21, 2007. Also at http://www.ft.com/cms/s/0/d8ea9a64-5019-11dc-a6b0-0000779fd2ac.html
[3] James Mackintosh, "Listed vehicles suffer in the turmoil," *Financial Times*, August 31, 2007.

instantaneous. During July, when buyers of mortgage related securities began to realize that many had credit problems, they abruptly stopped buying. With buyers unwilling to cart away the end product as it finished its journey through the capital market's digestive system, the whole system clogged. Now market participants with loans still in inventory (yes, they call it that), were stuck with them. The first group affected in this way were the mortgage originators themselves. Probably the first big casualty was American Home Mortgage, a mortgage company in Melville, Long Island, whose funding sources dried up, driving the firm into a sudden bankruptcy. A much larger mortgage company, Countrywide Financial (CFC), stayed in business, but drew down its entire $11.5 billion of backstop bank funding (according to the relevant SEC filing, just over $9 billion came from JP Morgan, and just over $2 billion from Barclays), followed by an infusion of $2 billion from Bank of America (BAC) – on terms favorable to BAC.

Less clear is the exposure of the investment banking firms that deal heavily in mortgage-related paper. We do know that the stock of Bear Stearns (BSC) has lost about a third of its value this year, and that Lehman Brothers has announced the closure of a sub-prime mortgage unit, eliminating 1200 jobs. And both Bear Stearns and Goldman Sachs have committed billions of dollars to shore up some of their hedge funds (though the Goldman funds' problems may have been in areas other than sub-prime debt).

Banks like Barclays and JP Morgan may also have more exposure. Banks often extend backstop credit support – for a fee – for securities they are helping to create. Barclays in particular seems to have some hundreds of millions of dollars' worth of exposure to the SIV-lite structures it set up for Sachsen LB.[4] In the past week the bank has been at pains to reassure the markets that it has sufficient capital and collateral to weather any damage that exposure might create. State Street has also been reported to have substantial exposure through credit facilities it has provided to backstop commercial paper that may be sub-prime related, but reports indicate that the underlying paper is of good quality, and State Street has ample capital.[5] Nevertheless, banks that have provided credit backstops remain an area of concern.

Conclusion

I've concentrated here on the investor side of the sub-prime mortgage issue. Clearly there will be a great deal of pain on the consumer side as well, since many of those borrowers that have been unable to keep their loans current face foreclosure. Early indications are that a surprisingly large number of these people may turn out to have been speculators, trying to turn a quick profit on a second home, but no doubt many ordinary families will lose their homes as well. It's a situation that calls on us to balance our desire to limit suffering against one of the underpinnings of sound credit – the possibility that those that borrow foolishly can incur losses.

[4] Peter Thal Larsen, "Barclays faces scrutiny over Sachsen," *Financial Times*, August 28, 2007.
[5] Anuj Gangahar, "State Street hit by ABCP conduits exposure," FT.com, August 29, 2007. Available at http://www.msnbc.msn.com/id/20484976/

The sub-prime mess has also been a catastrophe for many investors. As with many investment crises, the genesis of the problem was the proliferation of large quantities of securities that represented, not economic activity that truly created value, but activity in a hot-money market driven by other factors. In the case of the sub-prime problem, those other factors included unusually low interest rates, which both provided ample credit and drove investors to reach for yield; rising house prices, which enticed marginal borrowers to overreach in taking out mortgage loans; and a financial market structure that lulled participants into expecting that they could always lay off any credit risk they took. Most of all, though, the driver was a market structure that generated rich fees for a number of agents – richer the more dollars they handled, and richer the faster the action moved.

At full flood, the sub-prime markets produced great heaps of golden crumbs for mortgage brokers, mortgage lenders, investment bankers, hedge funds, credit rating agencies, and commercial banks. Before the market ran into trouble, rising house prices begat more borrowing, allowing consumers to bid up houses. Successful CDO issuance begat more demand, allowing underwriters to raise ever-larger sums. High yields enticed investors from all over the world, ranging from hedge funds to the Bank of China, each hoping that they could participate in the gains they had seen others earn. But no real economic engine underlay this market. Borrowers hoped to pay off their loans from future gains, not from their household income. Every player in the chain expected another player to take the credit risk off its hands. Even the end purchasers of the paper were counting on subsequent consumer refinancing to provide them their return of principal. Without an underlying economic engine, the whole structure amounted to a pyramid scheme – a pyramid built of those golden crumbs the financial institutions cheerfully hauled away.

- Jonathan Tiemann
Menlo Park
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