

## ***Will the Fat Tail of Sub-Prime Mortgages Dog the Market?***

While much has been written about the basic concept of market “risk” and virtually every investor questionnaire seeks to quantify a client’s “risk tolerance level,” little is mentioned about the “fat tails of investing,” those statistically rare events that mark extreme changes in market values. **Since standard finance theory generally assumes that stock price changes are random, neatly fitting into a bell-shaped curve, “fat tail” occurrences are often discounted as simply aberrations. Having just marked the 20-year anniversary of the October 1987 stock market crash, it is instructive to briefly revisit that event and at least consider whether the current conditions in the credit markets, triggered by the sub-prime mortgage meltdown, might ultimately cause another such perfect storm.**

To put the '87 crash in its proper statistical context (I apologize to those who hoped they were through with this topic in college), **the S&P 500 plummeted over 20%, a change that was 19 standard deviations from the mean, the “fattest of statistical tails.”** The magnitude of the event is perhaps better explained by Roger Lowenstein, noted author of *When Genius Failed: The Rise and Fall of Long-Term Capital Management*,

**Economists later figured that, on the basis of the market’s historical volatility, had the market been open every day since the creation of the Universe, the odds would still have been against its falling that much in a single day. In fact, had the life of the Universe been repeated one billion times, such a crash would still have been theoretically ‘unlikely.’**

Lest we become complacent thinking that our ultimate crisis is now behind us, we need only examine the last 30 years in the global markets. Unfortunately, that period is littered with six, seven and eight Standard Deviation events. Theoretically, a seven Standard Deviation event should statistically occur one time every three billion years, or approximately the lifetime of our planet. **Since the 1998 Russian debt crisis, financial markets around the world have experienced at least ten extreme shocks, none of which were supposed to occur more than once every few billion years. Our point is not to be a market “Chicken Little,” but to recognize the real world “fat tail” risks that have too often weighed down the rim of the bell curve while inflicting severe losses on the unwary.**

## ***Fair Warning or Prelude to a Bailout?***

Fast forward to mid-2007 and we were already hearing the sirens sounding from the financial capitals of the world. More than a month before the summer credit market meltdown, Bank of England (BoE) Governor Mervyn King acknowledged that **Collateralized Debt Obligations “have a distribution of returns which is highly sensitive to small changes in the correlations of underlying returns which we do not understand with any great precision.** The risk of the entire return being wiped out can be much greater than on simpler instruments. Higher returns come at the expense of higher risk.”

Both King and Federal Reserve Chairman Ben Bernanke attempted to avoid direct intervention with Bernanke stating, “It is not the responsibility of the Federal Reserve, nor would it be appropriate, to protect lenders and investors from the consequences of their financial decisions.” **Only days later, both the BoE and the Fed were busy injecting billions into**

**what had become a largely dysfunctional credit market.** The Federal Reserve then lowered the discount rate by half a percent, and strongly hinted at a Fed Funds rate cut to come which, together, performed their psychological magic, at least for the moment.

### ***The ABCs of Loan Slicing and Dicing***

In order to understand and properly assess the current credit market status, we must first take a step back to the **early 1990's when investment banks created a new investment vehicle called the Asset Backed Security (ABS).** By packaging various types of loans (car loans, home and commercial mortgages, business loans and credit card debt) into a single security and then selling slices of the pie to investors, an amalgamation of alphabet securities were introduced into the market: Residential Mortgage Backed Securities (RMBS), Commercial Mortgage Backed Securities (CMBS), Collateralized Loan Obligations (CLO), and Collateralized Debt Obligations (CDO) to name just a few.

In order to match the various investor appetites for risk (and to make higher fees), **the bankers performed a bit of financial alchemy by dividing the pool into tranches, and assigning different coupon interest rates and principal and interest repayment priorities to each of these securities.** For example, since the highest priority tranche will get first call on a high percentage of the payments from the underlying loans, this slice will also receive a lower interest coupon rate than the lower priority tranches.

To make these new products fit into a more traditional "bond-like" mold, **the investment bankers then paid the bond rating agencies (Moody's, Standard & Poor's, or Fitch) to have them assign a credit rating to each of the tranches.** These credit ratings could then be relied upon in

establishing relative risk/return parameters within the fixed income marketplace.

When the original packages of home mortgages were designed, 80% loan-to-value ratios (loan value equal to 80% of the appraised value of the home) and traditional employment and income verification were part of the underwriting process. Thus, it was reasonable that roughly 80% of these loan pools were given the top AAA rating. Even if 40% of the underlying borrowers defaulted and their homes fell 50% in value (40% x 50% = 20%), the remaining 80% AAA tranches would still be secure. So far, so good.

### ***Liar Loans, Exploding ARMs and Fools Gold***

Enter the era of "junk mortgages" or "sub-prime" as renamed by the brokers, packagers and purveyors. During the low interest rate years of 2005-06, some 80% of sub-prime mortgages were adjustable-rate (ARMs), often referred to as "exploding ARMs." **These were aptly named since the initial low "teaser" rates were tied to market rates, which would ultimately reset at dramatically higher levels, often increasing the borrower's monthly mortgage payment by 25% or more.** To make matters worse, fast-track mortgage brokers were offering 'no-doc' loans, meaning that no documentation of employment or income verification was required.

In a report by the Mortgage Asset Research Institute, of the 100 loans surveyed for which borrowers merely stated their incomes on loan documents, **IRS documents obtained indicated that 60% of these borrowers overstated their incomes by more than half. No wonder these loans picked up the moniker 'liar loans.'** Perhaps the most staggering statistic is that nearly one-half of all mortgage loans issued in 2006 were 'piggyback' (combined first and second

mortgage loans), 'liar loans' and 'no doc' loans.

It is no surprise that **research by RBS Greenwich suggests that 20-23% of the subprime loans made in 2006 will ultimately go into default and foreclosure.**

Returning to the securitization side of the equation, the investment bankers were not to be outdone. While the mortgage originators were turning 'no-doc,' no credit borrowers into homeowners, the bankers were busy turning their junk mortgages into high yielding gold. Essentially, **the investment banks, with the aid of the friendly rating agencies, took the lowest "investment grade" (BBB-rated) tranches from within the larger mortgage pools and turned them into a 75% AAA-rated Collateralized Debt Obligation (CDO).**

Again performing the math, **a mere 5% loss in the RMBS (remember that this pool began as only sub-prime mortgages before being sliced and diced – TWICE) results in a 100% loss for everything but the AAA portion of the CDO.** Should RBS Greenwich's cumulative loss projection of 10%-11.5% prove to be accurate, a host of AAA-rated securities will be downgraded to fools gold and their holders will suffer monumental losses. (For a detailed exposé on such a real security, see Allan Sloan's "House of Junk" in the October 29 issue of *Fortune* magazine.)

The impact from the sub-prime meltdown has been devastating on the mortgage and housing industries. **So far in 2007, the graveyard of mortgage related companies shows 110 failed, 36 acquired, and an additional dozen classified as "struggling."** The financial press has been filled with stories of losses suffered with the list extending from Wall Street to Europe and even as far away as China.

On the housing front, the inventory of unsold homes has reached an all-time high and sales of new and existing homes continue to plummet. At the individual investor level, **home values, historically the single largest store of wealth, have started to shrink, not only reducing personal net worth but also eliminating an important source of liquidity via refinancing and home equity loans.**

**Even with all the bad news already released, there are clear indications that there is likely more to come.** Mark Zandi, chief economist for Moody's Economy.com recently stated that, **"Mounting mortgage delinquencies and defaults now pose the most serious threat to the global financial system and economy."** Jan Hatzuis and David Wyss, chief economists for Goldman Sachs and Standard & Poors have both reported that we are less than halfway through the housing correction and the mortgage crisis. **The fact that roughly \$27 billion per month of sub-prime loans will be hitting their first reset over the next 12 months would seem to bear them out.**

**Even given the vast exposure to losses within the sub-prime mortgage market, it is estimated that the total exposure will be between \$150 and \$200 billion, or a mere 1% of all outstanding mortgages. One would assume that the global economy could withstand a shock of this magnitude. That is undoubtedly true if the virus had not spread.**

### ***The Sub-Prime Virus Turns Contagious***

Probably the greatest contributor to the spreading of the sub-prime contagion has been the fear of the unknown and, as the *London Daily Telegraph* headline read on September 24<sup>th</sup>, "We don't understand the markets, BoE admits." Thus, **the failure of one market segment has caused a virtual freeze in the credit markets until a new consensus on the pricing of risk can be**

**agreed upon in the form of greater spreads (the differential between the yield on a bond and the corresponding yield on a government bond of similar maturity).**

The perception of risk in the sub-prime mortgage markets has clearly changed. While earlier this year, BBB-rated mortgage paper was trading in the mid-90s, **it has lost nearly two thirds of its value and now trades at approximately \$.38 to par (100). Similarly, the spread on high yield bonds has more than doubled from 209 basis points (2.09%) in February to over 500 basis points (5%) as of the beginning of August with the underlying value of the bond having fallen nearly 9%.** Even though corporate balance sheets are at their healthiest in years, with correspondingly low default rates, the market is demanding higher risk premiums.

According to Standard & Poor's Leveraged Commentary & Data, "Leveraged finance's cash engine – the CLO (Collateralized Loan Obligation) market – has ground to a halt." After recording a record \$57 billion in issuance during the first six months of '07, less than \$2 billion was sold in July. Similar to high-yield bonds, CLOs have been subject to a price adjustment with values down 6% with the spread more than tripling from just over 100 basis points to nearly 350. **This lack of investor appetite has placed nearly 50 leveraged buy out (LBO) transactions on hold, as banks have no buyers for the CLO paper.** Not only has the initial domino caused a chain reaction throughout the fixed-income markets, it has also brought the private equity acquisition market to a standstill.

### ***An Ounce of Prevention Beats a Pound of Cure***

With this understanding of the current and anticipated conditions in the credit markets, we return full circle to our opening question: **Is the credit crisis systemic to the point that it will cause a "fat tail" market**

**collapse?** Although substantial pain will be inflicted and we may see some level of retrenchment, **our short answer is probably not.** While it is certain that we will experience heightened volatility and emotions will run hot and cold with each corporate earnings announcement and sub-prime mortgage write-off, **the underlying health of the economy is strong enough to withstand the shock.**

This observation certainly does not mean that the situation can be ignored. As we have reported this quarter, we eliminated both the high yield and floating rate collateralized bank loan sectors from all portfolios and will continue to wait on the sidelines until we are convinced that the re-pricing of these bonds has stabilized. We also carved equity exposure in those categories that were most susceptible to loss due to their connection to the credit markets. **Just as we have taken defensive action to protect our clients from the risk of extraordinary loss, we are currently developing strategies in order to return to a fully invested position. Constant vigilance is our watchword for identifying both risk and opportunity.**

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