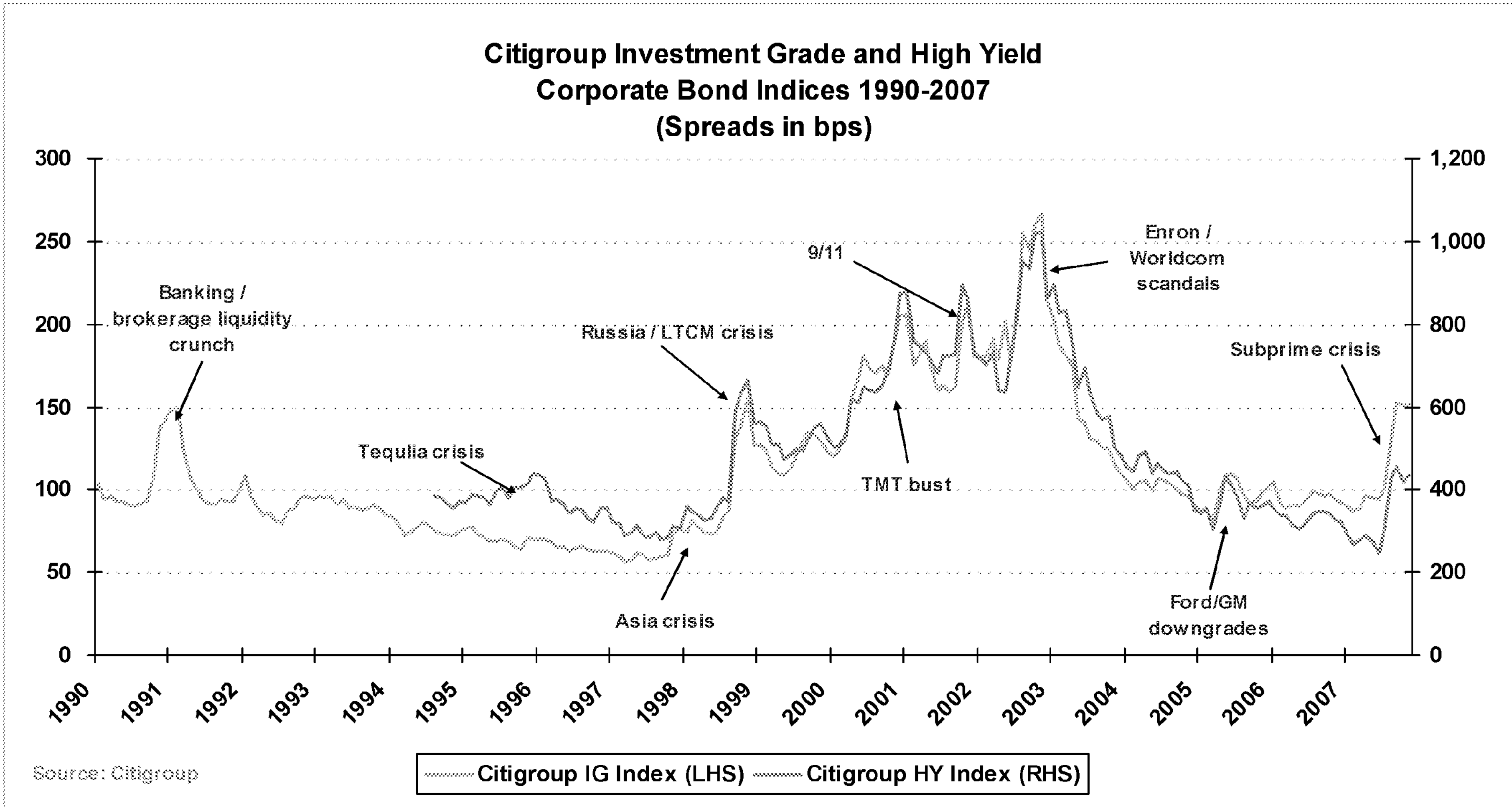
Review of Credit Markets for CMAC

Murray Barnes
CMB Market Risk Management

November 19, 2007

The 2007 Credit Crunch in an Historical Context

The summer's credit repricing was swift and severe, particularly in Investment Grade (IG), which had a move comparable to previous crises. High Yield (HY) spreads remain well below long-term average



2007 Credit Market Review Part I: a Tale of Two Halves?

1H07 saw a continued rally in corporate credit markets despite record new issuance and a further deterioration in debt underwriting standards

- Record M&A activity, particularly LBO-related, fuelled a boom in leveraged lending
  - A strong CLO "bid" enabled financing to be sourced by syndicated loan market rather than high yield bond market
    - CLOs were absorbing 60-70% of leveraged loan supply, capping loan and bond spreads
  - With traditional banks accounting for an ever-smaller share of credit risk, lending terms became increasingly aggressive
    - Leveraged loans with "covenant-lite" structures
    - HY bonds with Payment-in-Kind ("PIK") or Toggle tranches
- Credit markets were still supported by favourable fundamentals
  - Default rates at cyclical lows
  - Continued double-digit corporate earnings growth in US and Europe
  - Record levels of cash on company balance sheets
  - Solid global economic outlook
- The perception of "easy money" allowed corporates to pursue more aggressive shareholder-friendly actions
  - M&A / LBO frenzy
  - Debt-financed share buybacks / special dividends

2007 Credit Market Review Part II: Spillover from Subprime

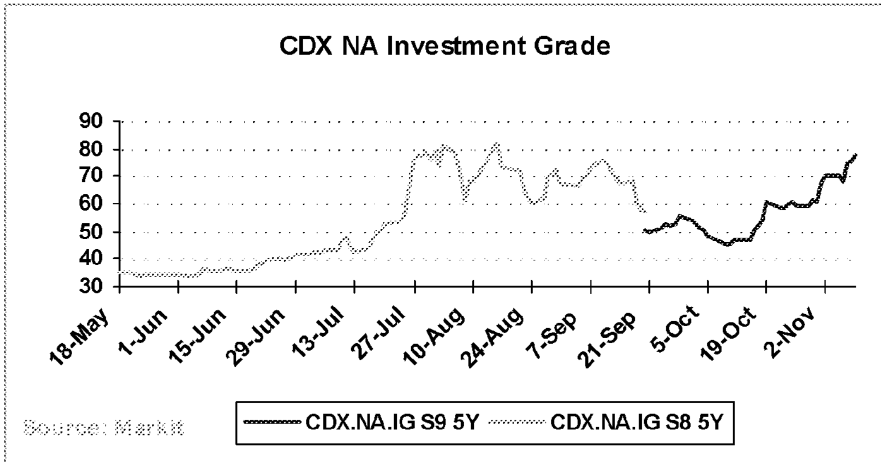
The period of excess liquidity came to a shuddering halt in July as subprime fears quickly spilled over into the corporate credit and, then, interbank markets

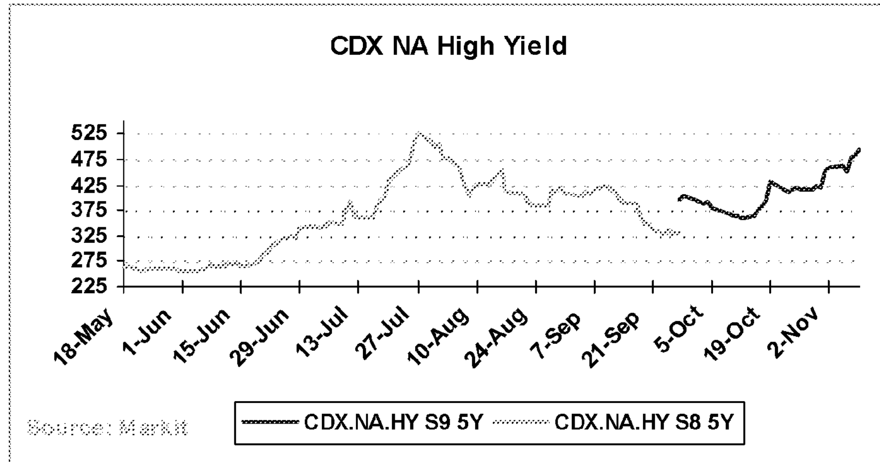
- Subprime meltdown triggered a loss in investor confidence in all structured finance product
  - Loss of CLO "bid" caused primary leveraged loan market to seize up, just as forward LBO pipeline approached a record $300bn
- Repricing of secondary credit markets triggered margin calls on all forms of asset-based financing
  - Which, in turn, forced additional asset sales, putting further pressure on asset prices
    - Repurchase agreements on corporate bonds
    - Margin calls on Credit Default Swaps (CDS)
    - Total Rate of Return Swaps (TRS) on leveraged loan portfolios
- "Delevering" effect spilled over into the Asset Backed Commercial Paper (ABCP) market
  - Investors shunned ABCP programs associated with structured finance, especially if backed by Residential Mortgage-Backed Securities (RMBS) and/or CDO assets
  - ABCP conduits and Structured Investment Vehicles (SIVs) were forced to liquidate assets, draw on liquidity backstops or extend the maturity of extendible CP
- After a brief Fed-induced relief rally, market sentiment has again turned for the worse
  - Reports of substantial subprime-related losses now outweighing the regulatory response
  - Fears of further losses particularly affecting key sectors
    - CDS spreads of Broker-Dealers, Banks and Bond Insurers ("Monolines") at multi-year wides

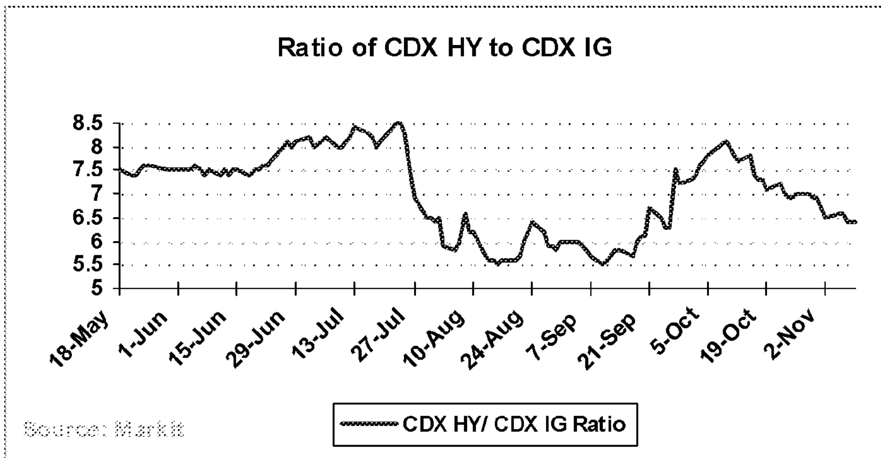
citi

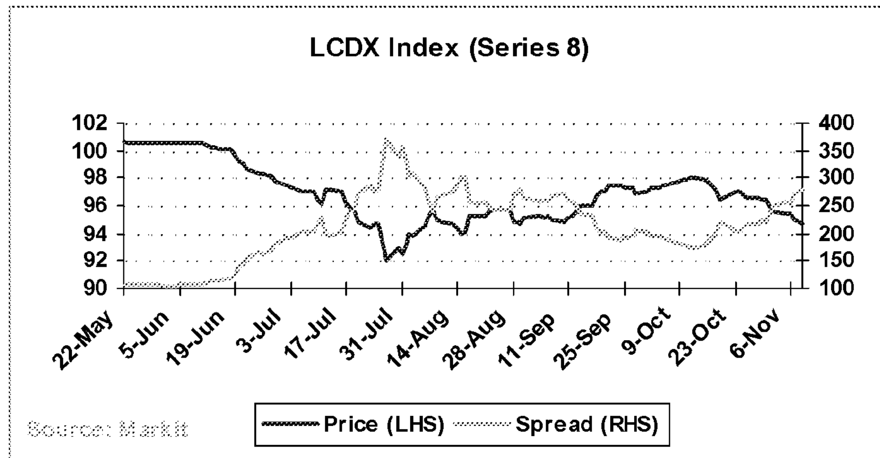
Current Conditions: Market Remains Under Pressure

After recovering somewhat following the initial sell-off, corporate credits have weakened again over the past month. IG has underperformed HY on a relative basis, primarily due to weak performance in Financials





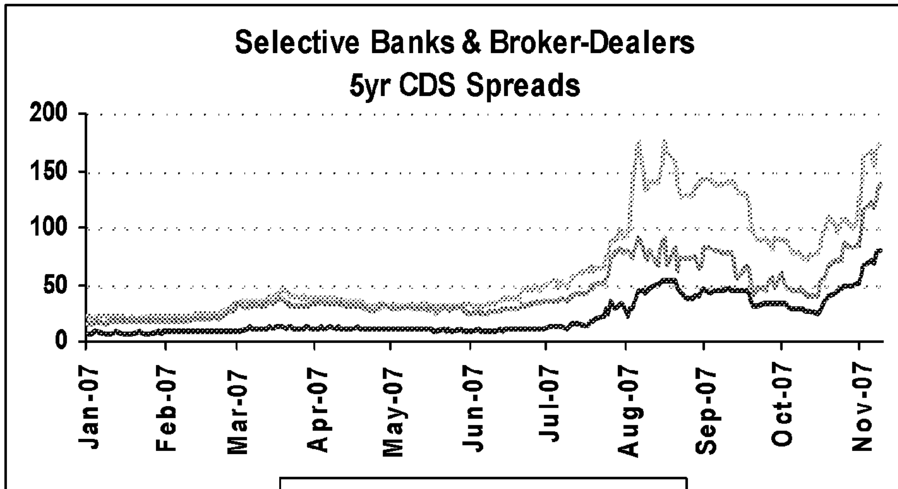




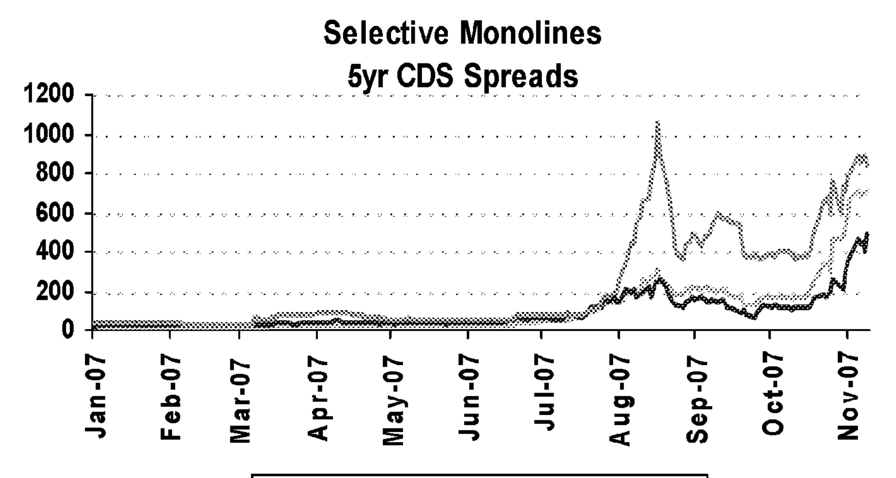
Re-assessment of Risk in the Financial Sector

CDS spreads on Banks and Broker-Dealers have hit multi-year highs as the subprime crisis has intensified. Elsewhere in the financial sector, Monolines have been particularly affected

- CDS spreads of Bear Stearns widened sharply after the failure of its two hedge funds
- Merrill Lynch followed suit as it disclosed $8bn in write-downs, mostly in super-senior tranches of ABS CDOs backed by subprime assets
- Since announcing an estimated 4Q markdown of $8-11bn, Citi has widened sharply relative to peers, such as BoA and JPM



Source: Bloomberg



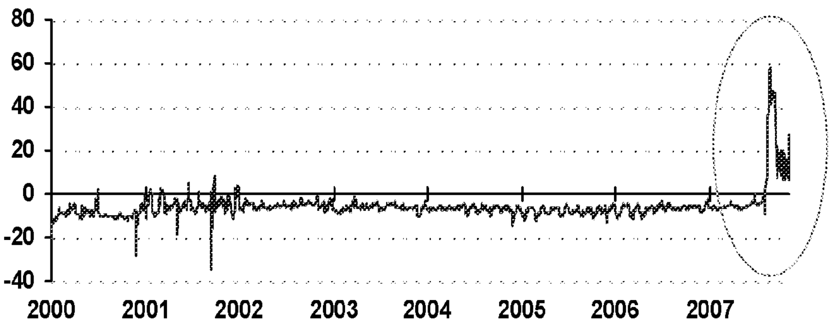
Source: Bloomberg

- CDS spreads for Monolines have widened dramatically on concerns that they lack sufficient capital to absorb losses on structured credit transactions, including
  - Credit “wraps” on structured finance
  - Default protection sold on various super-senior tranches
- CDS spreads of monolines are trading deep into “junk” territory despite their still high ratings

Effect on Global Liquidity Conditions

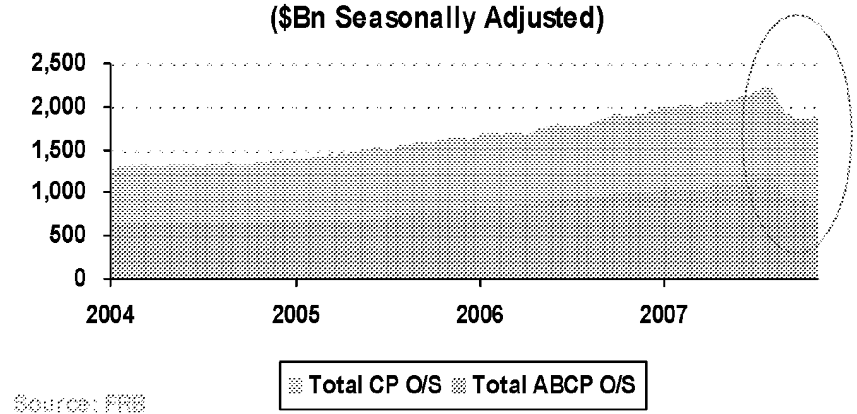
The liquidity squeeze triggered by the subprime crisis led to severe disruptions in the money markets, with ABCP spreads and Treasury-Eurodollar (TED) spreads widening to highest levels in recent memory

A1+/P1 30-Day ABCP Spread over LIBOR (in Basis Points)



Source: FRB

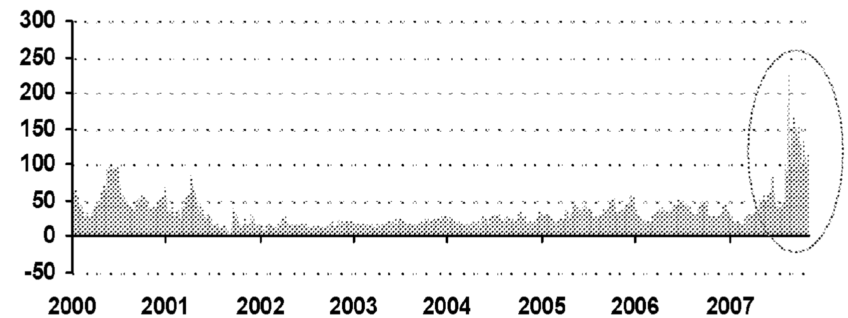
Total U.S. CP Outstanding ($Bn Seasonally Adjusted)



Source: FRB

- 30-day ABCP spreads for top tier, A1+/P1-rated issuers hit almost 60bps in mid-August
  - Since then, Total US ABCP outstanding has declined 29% from its peak of nearly $1.2bn
- Three-month TED spreads reached nearly 200bps versus their long-term average of 30bps
  - Treasury yields rallied from flight-to-quality, while LIBOR rates increased as banks became increasingly unwilling to lend to each other except on an overnight basis

Three-Month TED Spread (in Basis Points)

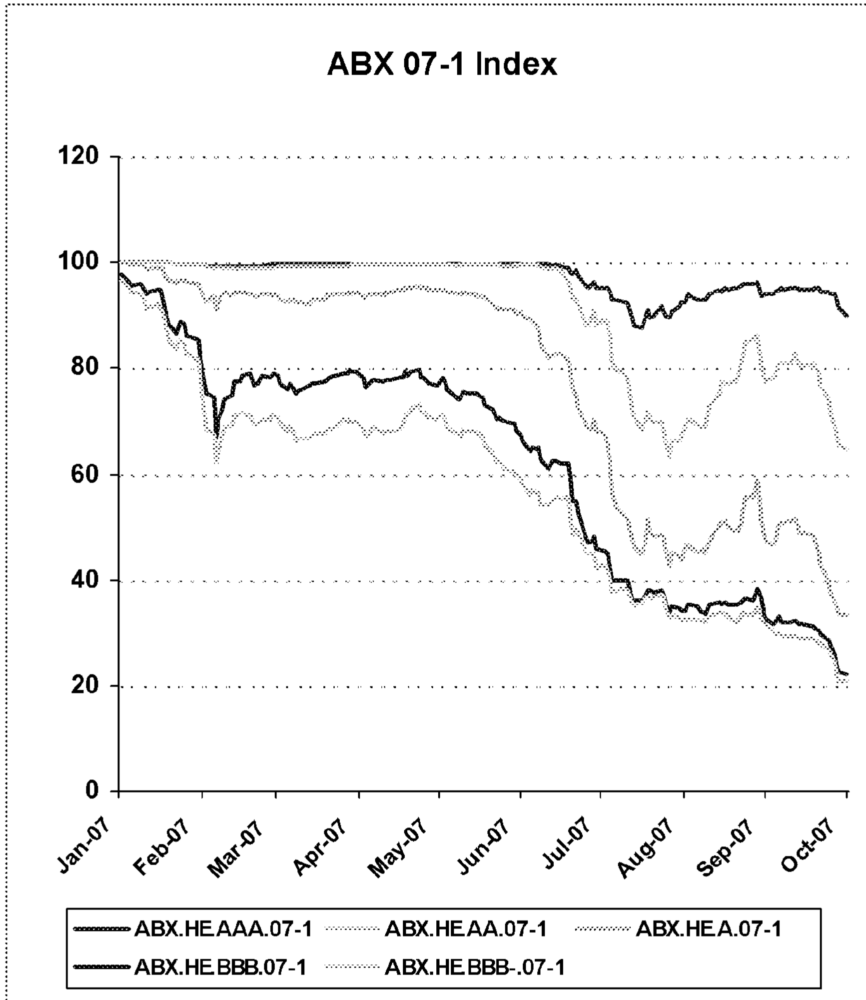


Source: Bloomberg

The Slide in Subprime

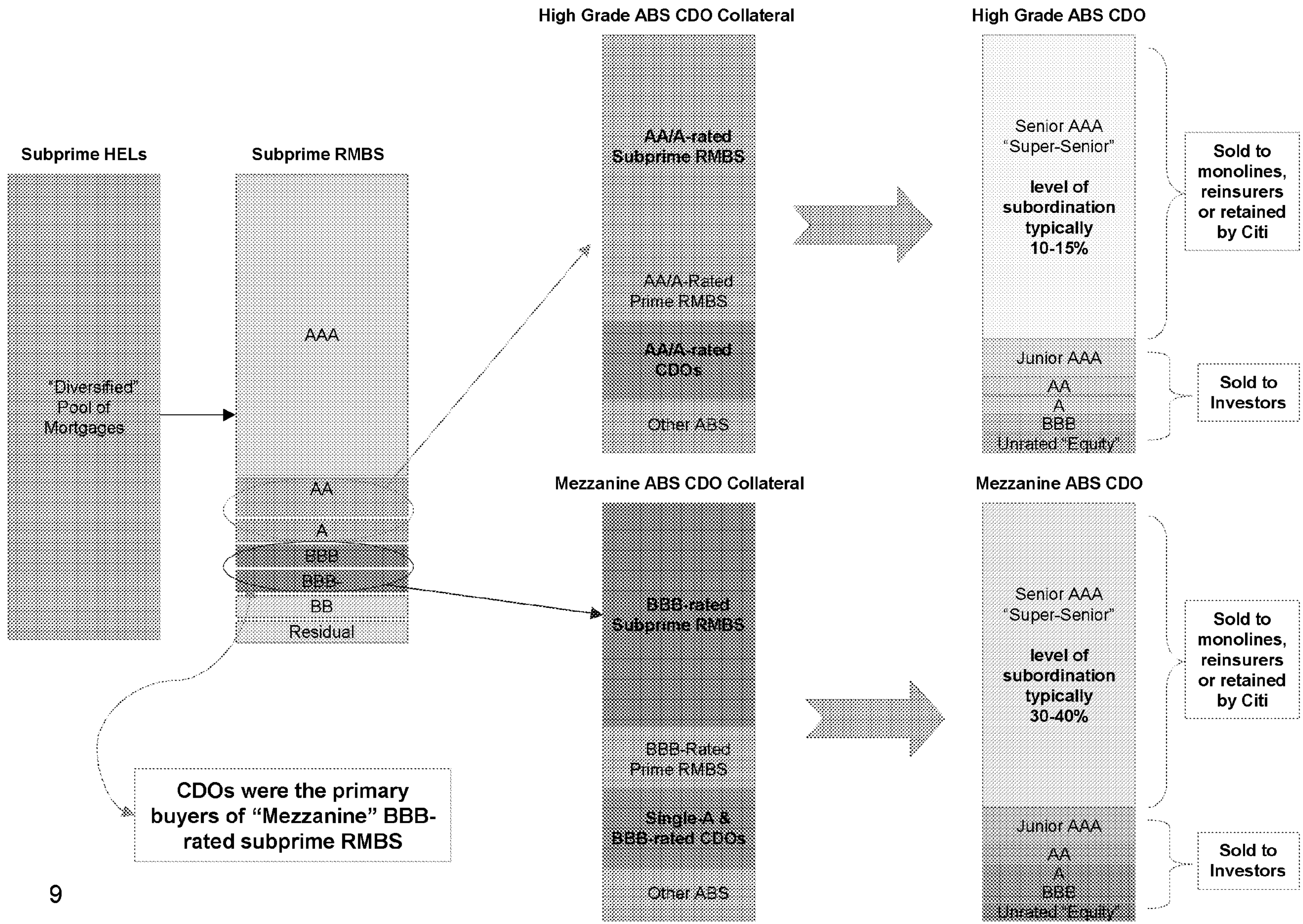
Subprime RMBS have experienced unprecedented price declines, particularly in more recent vintages. Weakness in the residential housing market is the key driver, although other factors have also contributed

- Subprime delinquencies are dramatically exceeding even the most pessimistic forecasts
  - Latest 60D+: 22% of loans originated in 1Q06; 18% of 2Q06; 15% of 3Q06; 10% of 4Q06; 5% of 1Q07
- Some forecasts expect cumulative losses of 12-15%
  - With BBB tranches having <5% subordination, market is fully pricing in zero recovery of principal
    - BBBs being valued as Interest-Only ("IO") strips
- Events have exposed serious flaws in ratings methodology, which
  - assumed positive Home Price Appreciation (HPA) trajectory would allow borrowers to refinance almost indefinitely
  - failed to capture higher use of "teaser" rates and "piggy back" loans
  - failed to consider widespread fraud due to increasingly lax underwriting standards
- Belated ratings actions have been extensive and across all rating categories



How Subprime Mortgages ended up in CDOs?

Since their invention, ABS CDOs have included RMBS. ABS CDOs have absorbed much of the supply of subprime RMBS required to finance the rapid growth in subprime origination in recent years



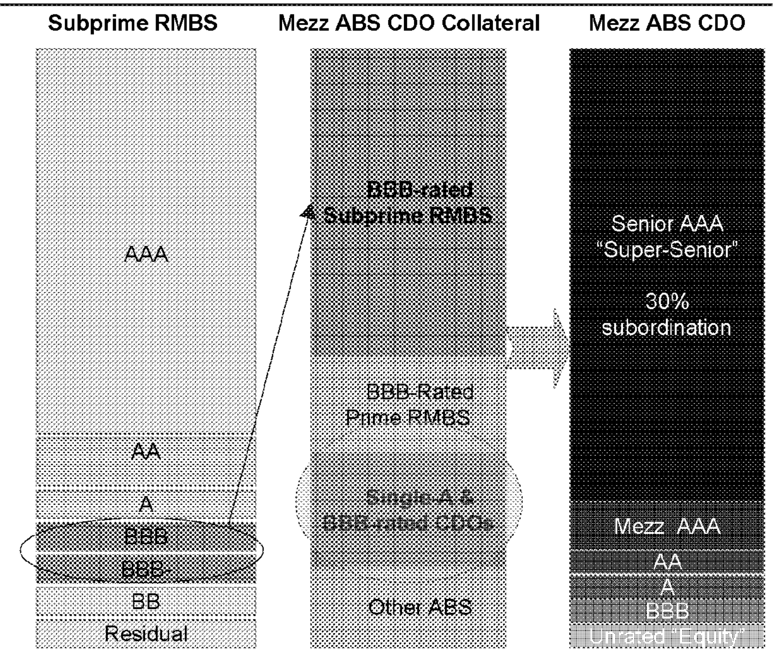
It's All About the Ratings, Right?

- Severity of RMBS and CDO markdowns has highlighted serious faults in the ratings methodology for subprime and ABS CDO assets
  - Securitisation technology was built on premise that pools of assets are diversified
    - Only a portion of the pool may default: the portion that will not can achieve a AAA rating
- RMBS and CDO ratings methodology remained unchecked even as RMBS credit spreads widened sharply relative to other asset classes
  - This simply encouraged ever-larger subprime / CDO buckets to capture more excess spread, undermining the very foundation of the ABS/CDO model
- Investors historically viewed highly-rated tranches backed by any asset class to be relatively equal
  - Complacency of the "a AA is a AA is a AA" argument
- Despite clear signs of ratings arbitrage, dealers continued to use ratings as proxy for liquidity read: ability to distribute) even in a market that has never been liquid
  - "There'll always be demand for AAA tranches, it's just a matter of price"
- Amid the collapse of the two Bear Stearns Hedge Funds, failed "bid lists" provided some indication of what dealers were willing to pay on the most senior tranches
  - With that, the CDO "bid" was gone and dealers were left holding significant unsold inventory, with few effective hedging instruments available
    - Insufficient two-way activity in CDS on CDO tranches
    - Trading in standard ABX Tranches ("TABX") not sufficiently liquid
    - Shorting ABX directly prohibitively expensive ($20 price for BBB protection = 80pts upfront)
    - AAA ABX not necessarily effective hedge against AAA CDOs backed by mostly BBB subprime

How Could Senior CDO Tranches be so Severely Impacted?

Dealers with a large share of the ABS CDO market, including Citi, have disclosed substantial markdowns in senior, and even "super-senior" ABS CDO tranches. How's this possible given the level of subordination?

- Many CDOs are backed by A- and BBB-rated subprime RMBS that are not expected to recover their principal
  - Rising delinquencies will soon result in interest being redirected to more senior RMBS tranches under the "RMBS Waterfall"
- In addition, haircuts are applied to downgraded RMBS in Principal Coverage Tests on many CDO deals
  - If such tests fail, principal and interest are redirected to more senior tranches until test is cured under the "CDO Waterfall"
  - Examples (from initial Baa/BBB rating): 10% if Ba/BB; 20% if B/B; 50% if Caa/CCC; lower of MV or recovery if < Caa/CCC
- Recent downgrades have been so broad and so severe that haircuts are redirecting cash flows to the super-senior tranche
- While generally positive for ABS CDO super-senior note holders, it can be detrimental if the ABS CDO has a large CDO bucket (i.e. is part CDO^2)
  - AAA-rated CDOs backed by A-rated CDOs backed by BBB subprime RMBS can be worthless



- The value an ABS CDO tranche requires determining:
  - when it will stop receiving interest;
  - when it will receive principal, if any; and
  - how much principal it will recover

Opportunities and Challenges for CMB Credit Markets

The recent repricing in corporate credit and the subprime crisis has a number of implications for CMB's credit-related trading businesses

Positives

- Pricing of CLOs, albeit gradually, clearing the backlog of frozen warehouses
- "Seeing "first-loss" protection on warehouse agreements
  - Via cash collateral paid upfront or via pro-rata senior/junior structures
- Increased interest in TRS structures, even with higher haircuts, with loans trading at substantial discounts to par
- Growth in synthetic CLO tranches referencing the LCDX index after adoption of standard ISDA documentation
- Existence of arbitrage opportunities due to market dislocation / liquidity squeeze e.g. Cash-CDS "negative basis" structures
- Growing list of asset managers establishing dedicated distressed ABS and ABS CDO funds

Negatives

- What's the future of ABS CDOs in light of the subprime fall-out? Remember what happened to CBOs?
- Who will buy "super-senior" risk in the absence of the Monolines and ABCP conduits
  - Current impasse in Canadian ABCP market still affecting corporate super-senior pricing
- Declining investor demand for higher margin "bespoke" synthetic corporate CDO tranches since onset of credit squeeze
- Current balance sheet / capital constraints not conducive for a Structured Credit model reliant on warehouse financing, leveraged financing via TRS, other "SICT" structures (e.g. Reg 30 assets)
  - Also limits ability to take advantage of current arbitrage opportunities

citi