The Current Crisis in the Subprime Mortgage Market

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Overview

- Merrill's Market Economist, August 2006
- Morgan Stanley's Mortgage Finance, March 2007
- Citigroup's Housing Monitor, March 2007
- PIMCO's Housing Market Analysis, April 2007
- Overview of Prime Security Valuation
- Valuation of Subprime Securities

Merrill’s Market Economist

Real Estate Market Liquidity

- Supply of existing homes is at 7.5 months, double the level 18 months earlier (ratio of homes for sale to homes sold)
- Home owners are not willing to accept that their home is not worth what it was when they refinanced or cashed out the equity
- Prime borrowers used equity as an ATM whereas the subprime borrowers used it to consolidate their debt

Merrill's Market Economist

University of Michigan Housing Survey

- Home sales are down 11%
- Home buying intentions is at a 16 year low
- Survey also found that only 1 in 5 think the current property levels are affordable—previous surveys have shown that the market finally clears when the affordability ratio reaches 1 in 2

Merrill's Market Economist

Their Outlook…

- Home prices will slow sharply for the remainder of 2006 and then decline outright in 2007 by 5%
  - 2006 finished at 0%
  - 1Q 2007 will be published mid May
- Past experience has shown that a housing correction can last 2 years—the current correction has the added twist that homes are over valued by 20% and as much as 40% is some areas
  - A March 2007 report by Merrill states the level is 30%

Morgan Stanley's Mortgage Finance

Mortgage lenders loosened their standards

- The first analyses in the one-dimensional trends in FICO scores, combined loan-to-value (CLTV) ratios and percentages of low- and no-doc loans
- The risk in the securities is in the tails where these loosened credit standards are layered for a given borrower, e.g. low FICO, high CLTV and no-doc
- In today's market, the only securitizations that are clearing all of their bonds are the ones with no or very minimal layering of risks

Morgan Stanley's Mortgage Finance

Which lenders layered the risk, i.e. those with CLTV>90%, FICO<640 and low- or no-doc

- Prevalent in more than 20% of their mortgage pools
  - UBS, Goldman, HSBC, Wells Fargo
  - Long Beach (of WaMu) was at 19.9%
- Market average was 13%
- Lowest concentration of risk
  - Accredited and Lehman
- It's not surprising to see the highest delinquencies in the lenders with most layered risks
- Default to layered risk correlation is highest in Alt-A

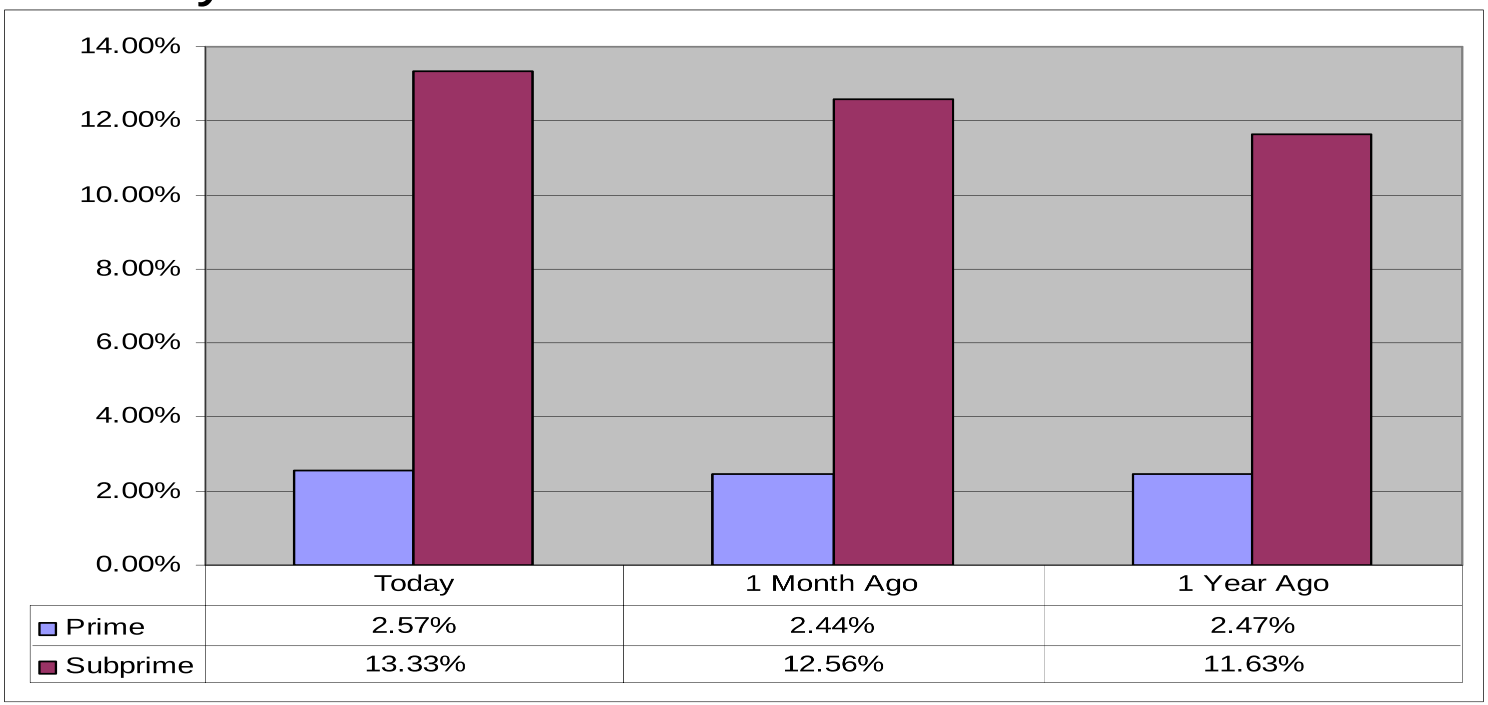
Citigroup’s Housing Monitor

What’s the story with home prices

- Year-over-year HPA measured by Case-Shiller is 0% for the first time since 1996—its 10 year high was 20% in mid 2004 (repeat, arm’s length transaction index not limited to conforming loans)
- Some cities have already dipped below 0—Boston, DC, New York, San Diego, San Francisco and Denver
- National median home price (NAR) is $216k compared to $224k a year ago
- MBA Refinance Index reached its highest level in 2003 and had a local maximum in 2004—since then it has been relatively flat and back to the level before the refinancing boom
- The percent of refinance originations in 2003 was near 80% and 62% in 2004, today it is 46%

Citigroup’s Housing Monitor

- Nationally, prime delinquencies have risen by 4%
- Subprime delinquencies have grown by almost 15% over the last year



	Today	1 Month Ago	1 Year Ago
Prime	2.57%	2.44%	2.47%
Subprime	13.33%	12.56%	11.63%

Citigroup's Housing Monitor

The Risk in California Could Be Higher

- Nationally, borrowers' mortgage payment is about 22% of their income
- In California, borrowers' are paying nearly 45% of their income for their mortgage
- Historically California has been higher than the national level, but only by 5-10 percentage points
- 1990 was the previous high spread at 14 points

PIMCO’s Housing Market Analysis

Market will worsen over the next couple years

- Housing inventories remain high
- Foreclosures are set to rise as homes purchased with teaser rates and adjustable rate mortgages are ready for resets
- Affordability is low
- Available credit is drying up as lenders tighten their credit standards
- Author’s anecdote

Overview of Prime Security Valuation

- Well developed, industry available prepayment models
- Homogeneous product—able to create representative samples of the pool with a few “engineered” loans
- Interest rates are the most dominate and perhaps only external driver
- Default risk is negligible

Valuation of Subprime Securities

Overview

- Industry has just begun offering 3rd party models
- At least two economic factors drive the performance: interest rates, home prices and unemployment
- Substantial credit default risk and subsequent severity
- The product is heterogeneous (layered risk factors and diverse geographic concentrations) making loan level analysis essential

Valuation of Subprime Securities

Borrower behavior models

- Must be linked to the economic environment (interest rates and home prices) in addition to the particular loan attributes
- Two stage models: one predicts the movements of the borrower in the delinquency state space and the other predicts the cash flow associated with these movements

Valuation of Subprime Securities

Simulation of the Economic Environment

- Term structure model calibrated to the market
- Home price model
  - Can we calibrate to the market?
    - Limited market to trade futures in regional home prices
      - Composite index of 10 major cities
      - Regional Indices for Boston, Chicago, Denver, Las Vegas, Miami, New York, San Diego, San Francisco and DC
  - Other significant regions not covered: Detroit, Indiana, Cleveland, Cincinnati
- Should we be concerned with correlation between interest rates and home prices?

Valuation of Subprime Securities

Simulation of Mortgage Cash Flows

- Apply the borrower behavior models to each economic scenario to generate monthly, loan level cash flow
- Aggregate the cash flows to the mortgage pool
- Distribute the aggregate pool cash flows to each tranche as described in the securitization structure
- Discount the cash flows for each tranche using the term structure giving each tranche a value
- Average, across all economic simulations, the tranche values to assign an aggregate value to each tranche