Comment on Franke & Krahnen: 
*The Future of Securitization*

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A Problem of Huge Dimensions

<table>
<thead>
<tr>
<th>Category</th>
<th>Outstanding (in billions)</th>
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</thead>
<tbody>
<tr>
<td>ABS</td>
<td>$1,100</td>
</tr>
<tr>
<td>ABS CDOs</td>
<td>$400</td>
</tr>
<tr>
<td>Prime MBS</td>
<td>$3,800</td>
</tr>
<tr>
<td>Subprime MBS</td>
<td>$780</td>
</tr>
<tr>
<td>CMBS</td>
<td>$940</td>
</tr>
<tr>
<td>Consumer ABS</td>
<td>$650</td>
</tr>
<tr>
<td>High-grade corporate debt</td>
<td>$3,000</td>
</tr>
<tr>
<td>High-yield corporate debt</td>
<td>$600</td>
</tr>
<tr>
<td>CLOs</td>
<td>$350</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$11,920</strong></td>
</tr>
</tbody>
</table>
Contrast Traditional Lending: Buy & Hold

- Bank originates loan
- Bank underwrites loan
- Bank funds loan
- Bank services loan
- Bank holds loan on b/s until repaid
- Performs workout if necessary
With New Model: Originate & Distribute

✓ Bank may originate (but so may another entity)
✓ Bank may underwrite (but so may another entity)
✓ Bank may assess credit risk and/or rating agency
✓ Bank may fund or may sell to a Trust
✓ Bank may hold or may buy & sell a securitized tranche
✓ Bank may service (but so may another entity)
Raise important questions re:

- Diseconomies of specialization
- Increasing agency costs
- Diminished transparency of risk-sharing
- Diminished transparency of incentives for risk-taking
- Diminished transparency of risks
My focus

- Why problems in a relatively minor sector of the $70 trillion world-wide fixed income market caused systemic crisis
  - Role of US housing bubble
  - How disaster myopia contributed to problem
- Financial Alchemy: How subprime mortgages were transformed into investment grade debt
- How the surge in delinquency rates led to the collapse of the 3 pillars of private securitization
  - Statistical Models
  - Ratings
  - Monoline Insurance
- Franke/Krahnen proposals
Definition

✓ A “bubble” is a sustained departure from long-run equilibrium (fundamental) prices

✓ Bubbles occur when people are willing to pay unrealistically high prices today *mainly because* they expect that they can obtain even higher prices when they sell in the future
  - Often have an aspect of mania – “I must buy now…”
  - More cynically: bubbles may arise when market participants apply a “greater fool” theory of asset valuation

✓ Unfortunately, it’s difficult to identify a bubble *ex ante*
Housing Bubbles Happen at Infrequent & Unpredictable Intervals

Example: 400 years of Amsterdam history
From 1628-1973 the annual, real price increase was only 0.2%

Source: Piet Eichholtz, with updates from Robert Shiller
What’s unusual about the current crisis is the role played by securitization & global capital markets
Securitizations Began with the GSEs

✓ Securitization of residential mortgages
  • Improved transparency
  • Enhanced diversification
  • Increased liquidity
  • Lowered costs
  • Permitted banks to use capital more efficiently, in an originate and distribute approach

✓ Relied on guarantees from GSEs to protect against credit risk
Private Securitizations

✓ Replaced GSE guarantee with
  1. Statistical models that determine the adequacy of
     1. Excess servicing
     2. Over-collateralization
     3. Subordination and residual tranching
     4. Performance triggers
  2. Ratings from SROs
  3. Monoline insurance

✓ Resulted in alphabet soup of innovations
  • RMBS, CDOs, CDO^2, ABCP, SIVs, SIV-Lites & CLOs

✓ Became an off-balance sheet banking system, but lost transparency of original model
Helped Feed the Demand for High Quality Assets

- Demand for investment-grade assets, much higher than supply from investment grade issuers
  - Portfolio regulations insurers, pensions funds and some mutual funds establish minimum acceptable ratings
  - Banks could reduce capital requirements by holding higher-rated debt
- Ability to synthesize investment grade securities helped fill the gap
Technique applied even to nonprime mortgages

✓ Subprime: mortgages to borrowers with weak
  • Credit histories
  • Credit scores (repayment capacity)
  • Or incomplete credit histories
    • Low doc loans
    • No doc loans
    • Liar loans

✓ Alt-A: mortgages to borrowers w. non-standard features re:
  • Borrower,
  • Property or
  • Loan
Long-Term Trends in Single-Family Homes 1890-2005 in the US

Real Housing Prices, 1975-2006

Source: U.S. Office of Housing Enterprise Oversight
Subprime Mortgage into AAA Credits

Matryoshka — Russian Doll: Multi-Layered Structured Credit Products

Subprime mortgage loans

<table>
<thead>
<tr>
<th>Subprime mortgage bonds</th>
</tr>
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<tbody>
<tr>
<td>AAA</td>
</tr>
<tr>
<td>80%</td>
</tr>
<tr>
<td>AA</td>
</tr>
<tr>
<td>11%</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>4%</td>
</tr>
<tr>
<td>BBB</td>
</tr>
<tr>
<td>3%</td>
</tr>
<tr>
<td>BB - Unrated</td>
</tr>
<tr>
<td>2%</td>
</tr>
</tbody>
</table>

High-grade structured-finance CDO

<table>
<thead>
<tr>
<th></th>
<th>Senior AAA</th>
<th>Junior AAA</th>
<th>AA</th>
<th>A</th>
<th>BBB</th>
<th>Unrated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>88%</td>
<td>5%</td>
<td>3%</td>
<td>2%</td>
<td>1%</td>
<td>1%</td>
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</table>

Mezzanine structured-finance CDO

<table>
<thead>
<tr>
<th></th>
<th>Senior AAA</th>
<th>Junior AAA</th>
<th>AA</th>
<th>A</th>
<th>BBB</th>
<th>Unrated</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>62%</td>
<td>14%</td>
<td>8%</td>
<td>6%</td>
<td>6%</td>
<td>4%</td>
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</table>

CDO-squared

<table>
<thead>
<tr>
<th></th>
<th>Senior AAA</th>
<th>Junior AAA</th>
<th>AA</th>
<th>A</th>
<th>BBB</th>
<th>Unrated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60%</td>
<td>27%</td>
<td>4%</td>
<td>3%</td>
<td>3%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Source: IMF staff estimates.
Note: CDO = collateralized debt obligation.
Credit Enhancements

✓ Excess servicing
✓ Over-collateralization
✓ Subordination and residual tranching
✓ Performance triggers
✓ Monoline insurance
✓ Credit Default Swaps
  • CDOs are Synthetic if backed by CDSs
Who bought ABSs & CDOs?

(In percent, delta-adjusted basis)

By Type and Rating

Source: Citigroup.
Note: ABS = asset-backed security; CDO = collateralized debt obligation. Delta adjustment multiplies the holdings by the delta (i.e., leverage) of the tranche. Hence, it magnifies more junior tranches (i.e., equity) and thus gives a better picture of risk appetite.

Very Rapid Growth in Global issuance of Asset-Backed Securities(a)

Source: Dealogic.

(a) Quarterly issuance. ‘Other’ includes auto, credit card and student loan ABS.
(b) Commercial mortgage-backed securities.
(c) Residential mortgage-backed securities.

Became a dominant source of revenue for most LCFIs

Growth in Trading Profits, Commissions & Fees Largely Reflects Growth in Structured Credits

Because busts in real estate prices are subject to considerable uncertainty and may occur at long, unpredictable intervals.

- Banks and borrowers may
  - underestimate,
  - ignore or
  - simply fail to comprehend the risks in real estate investment.
Why have financial institutions been willing to assume such heavy concentrations of exposure to sub-prime related securitizations?

1. Disaster myopia
2. Perverse incentives
3. Lack of transparency & inadequate analysis
1. Disaster Myopia

✓ Low-frequency shocks of unknown probability
  • Inadequate a priori knowledge
  • Inadequate empirical evidence
✓ Subjective probabilities depend on
  • Availability heuristic
    • Availability bias: a declining function of period since last shock
  • Threshold heuristic
  • Cognitive dissonance
Disaster Myopia

1.0
Probability of
a Disaster

Subjective

Actual

$\pi_t$

$\pi_{t+n}$

$\pi^*$

0 $t$ $t+n$ $t+n^*$
Institutional factors that encourage disaster myopia

- Managerial accounting systems that favor activities subject to low-frequency losses
- Recognition of fees upfront as income
- Bonuses tied to current revenues
- High job mobility among risk takers
- Intense competition in financial markets
  - Drives out participants who are not disaster myopic
  - Appearance of high profitability attracts new entrants
Media usually emphasizes returns, not risks.
2. Perverse Incentives: Examples of Law of Unintended Consequences

- High leverage and risk shifting
- Explicit deposit insurance
- Implicit deposit insurance
  - State-owned banks
  - Lender of last resort operations
  - Purchase and assumption transactions
- Pressure on Fannie Mae & Freddie Mac to increase flow of funding to low income housing
Analysis

✓ Baroque financial structures
✓ Reliance on rising housing prices to protect against default
✓ Ability to transfer credit risk through CDS market
✓ Inadequate appraisal techniques
✓ Inadequate measures of exposure
Deterioration in Subprime Raised Alarm
(Alt-A & Prime Also Troubling)

(60+ day delinquencies by Vintage Year)

Source: Merrill Lynch.
Undermined Confidence in the 3 principal supports for private securitizations

1. Statistical Models
   - Excess servicing requirements
   - Over-collateralization
   - Subordination & residual tranching
   - Performance triggers

2. Ratings

3. Monoline Insurance
Players Cast Doubt on Validity of Models

After two Bear Stearns Hedge Funds Blew-Up in June 2007…

Writedowns of Selected Financial Institutions, October 15, 2007–February 14, 2008

Source: Bank press releases.
Note: SIV = structured investment vehicle.

Source: IMFGFSR, 4/08, Figure 2.2, p. 68.
Undermined Confidence in Ratings

One-Year Cohort Rating Downgrades

2007–08 Subprime Residential Mortgage-Backed Securities

- B: 68%
- BB: 47% on Credit Watch*
- BBB: 47%
- A: 47%
- AA: 47%
- AAA: 47%

Downgrades from original issue rating (in percent)

Source: Standard & Poor’s

*As of 1/31/08

2001 Corporates

- B: 68%
- BB: 47% on Credit Watch*
- BBB: 47%
- A: 47%
- AA: 47%
- AAA: 47%

Downgrades from 2000 rating (in percent)

Source: IMFGFSR, 4/08, Box 2.3, p. 61.
Losses Threatened Solvency of Monoline Insurers

At yearend 2006 Monoline insurers supported about $800 bn in structured finance obligations

Source: IMFGFSR, 4/08, Figure 1.14, p.17.
Problem,
Crisis Decapitalized Key Institutions

✓ Direct losses from holdings of downgraded securities
✓ Losses from honoring implicit guarantees backing-up off b/s vehicles
  • Extensions of liquidity
  • Purchases of securities
✓ Losses from pipeline of assets that can no longer be securitized
✓ Loss of important continuing source of bank revenue
✓ Capital challenge
  • Replace lost capital
  • Stockpile capital as a precaution against loss of access to funding
  • Unknown: How much new capital to bring part of off-balance sheet banking system back onto the b/s
Uncertainty about size and location of losses raised concerns about credit & counterparty risk

Markets that relied on statistical models, ratings or monoline insurance ceased to function effectively
Disaster myopia becomes disaster magnification when a shock jars perceptions.
Volatility Spread from Subprime in ‘07II to Emerging Markets

Based on both the level and 1-month volatility of the spreads, prices and total returns of each asset class in terms of deviation relative to the average during 2004-2006. Wider spreads, lower prices and total returns mean higher volatility. Focus on standard deviation. Green→σ<1; yellow→1≤σ≤4; red→σ>4
### Injections As of October 15, 2008

<table>
<thead>
<tr>
<th>Global Writedowns</th>
<th>Capital infusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>$592.1</td>
<td>$442.3</td>
</tr>
</tbody>
</table>
Policy interventions appeared \textit{ad hoc} and increasingly desperate

We may have witnessed a genuine attempt to implement constructive ambiguity, but lack of predictability undermined market confidence
Destructive ambiguity
Markets reacted sharply to uncertainty

✓ Massive flight to quality
  • Treasury bill rate became negative for a brief period
  • Differential between 3-month LIBOR and 3-month T-Bill reached 3.47%
  • 2-year swap spread between LIBOR and Treasuries reached record high of 1.66%

✓ Huge outflows from institutional money market mutual funds
  • Normally liquid markets seized up
  • Fears that problems at Reserve Primary Fund and Putnam would spread to retail market
A loss of confidence in the financial system

“Can I interest you in a faith-based account?”
Which began to show signs of panic
More broadly, problem is excessive leverage

✓ Aggregate debt rose from 163% of GDP in 1980 to 346% of GDP in 2007
  - Household debt rose from 50% in 1980 to 100% in 2007
  - Financial sector debt rose from 21% in 1980 to 116% in 2007
    - This does not include leverage embedded in derivatives

✓ With almost 1 year’s inventory of unsold homes, further downward pressure on prices is inevitable, leading to larger losses and greater needs for additional capital

✓ Deleveraging is never pleasant, but trying to dismiss it as a liquidity problem is an unhelpful act
With Latest Round of “Coordinated” Government Guarantees and Subsidies, Moral Hazard is Rampant

“Now we just have to sit back and wait for the Fed to bail us out.”
IMF Comparison with Past Crises

Sources: World Bank; and IMF staff estimates.
Note: U.S. subprime costs represent staff estimates of losses on banks and other financial institutions from Table 1.2. All costs are in real 2007 dollars. Asia includes Indonesia, Malaysia, Korea, the Philippines, and Thailand.
How to Restore Faith in Ratings Agencies
Undermined Credibility of CROs

✓ Old questions about conflicts of interest heightened
  • Played active role in facilitating origination of structured products
  • Revenue from securitizations accounted for roughly half of CRO’s fees
  • Reputation constraints not sufficiently strong
✓ Ratings slow to reflect deterioration in underlying pools of securities
✓ Past errors individual corporates or
“Bribe” sounds felonious. Let’s call it a “fee”.
Reliance on Ratings in Regulatory Process Contributed to Grade Inflation

✓ A sort of wink/wink, nod/nod equilibrium emerged at the expense of regulators & unsophisticated investors

• Sophisticated market participants knew that ratings were not equivalent for corporate or sovereign debt and structured credits and profited thereby

• Ratings not consistent across instruments*
• Corporate bonds rated Baa, 2.2% 5-year default rate (’83-2005)
• CDOs rated Baa, 24% 5-year default rate (’93-2005)
• Market perceived differences

200 bp spread on AAA-rated CDOs vs. 10/20 bp spread on AAA-rated corporates

Market Perceived Differences

Credit Spreads on AAA Mortgage-Backed Securities Versus AAA and BBB U.S. Corporate Bonds
(In basis points)

Source: IMFGFSR, 4/08, Box 2.3, p.62.

Source: JPMorgan Chase & Co.
How far will house prices fall?

- Average home equity has fallen to 50%
- May see a 3rd wave of defaults on prime mortgages and home equity loans
- And then the effects on the real economy set in
How can confidence in securitization process be restored? How long will it take?
Franke/Krahnen Remedies

1. Transparency with regard to tranche allocation, especially first loss tranche
2. Transparency regarding compensation systems
3. External validation of agency ratings by supervisors
4. Opacity-related capital charges
5. Aggregation of risk exposure