Lending and Real Estate Bubbles: Known and Unknowns

Weil, Gotshal and Manges Roundtable on Assessing Dodd-Frank
Yale Law School
Center for the Study of Corporate Law

Susan M. Wachter
Richard B. Worley Professor of Financial Management
The Wharton School
University of Pennsylvania
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Macrofinancial Policy

• Combination of credit and asset boom matters for systemic failure
• Funding mechanisms that amplify and propagate the “mortgage credit shock” through the financial system
• Why: reduced supply of credit and higher price of credit when prices fall
  – Bust deepens with the reversal of a joint bubble
  – “Busts..[are] more costly when booms... financed through credit and leveraged institutions are directly involved.” IMF 2011
• Bubbles without leverage do not raise concerns
• Real estate markets susceptible because difficult to short sell and mortgage transactions rely on higher leverage than other assets
• Credit is mispriced
• How to detect?

Policy Alternatives

• “Benign Neglect”
  • Gertler and Bernanke (1989)

• Post-bust policy intervention
  • Post-crisis costs are large, options limited

• Macroprudential regulations

• Dynamic provisioning

• Discretionary or nondiscretionary changes in capital standards

• Information provision: what lessons can we learn?
Systemic Failure and Dodd-Frank: Macrofinancial Policies in Place

• Identify systemically-important nonbank financial companies for supervision by Financial Stability Oversight Council
• Office of Financial Research
• Push trades in CDS onto exchanges
  – Standardized instruments that trade
  – See prices and know how much debt is out there
  – React by appropriate changes in capital standards
• Securitization: 5% risk retention, except for “qualified residential mortgages” (QRM)s
What Is It About Securitization?

- Profits are volume-generated
- Short-term horizon players gain with volume
- Holder in due course rule
  - Originators need have no skin in the game
  - The securitization market has no liability
- In-the-money put option switching point
- Mispriced risk and misaligned incentives
- Moral hazard and uninformed investors, lack of knowledge or refusal to know
- Could risks involved in securitization have been known real or near time? What was known?

Investors Misprice Risk

• Information asymmetry
  – Difficult to know real-time what is happening to lending conditions and supply
• Moral hazard
• Principal-agent problems
• Did this happen?
US-SNA clearly signaled household sector’s transformation from a net supplier to a net user of credit.

**Gross debt by U.S. sector**

- **Financial Companies**
- **Households**
- **Nonfinancial Companies**
- **Government**

**Sectoral contribution to U.S. gross debt**

- Nonfinancial Companies
- Financial Companies
- Household
- Government

Source: U.S. Federal Reserve, Bureau of Economic Analysis
The log housing price to rent ratio from 1975:Q2 to 2009:Q2 in the US. Note the evident increase in the price to rent ratio from 2000 onwards.  

Figure taken from Xu et al. (2010). “On housing booms and credit market conditions: A non-linear dynamic asset pricing model”. 
Work in progress.
Interest Rates Decreased

The real mortgage rates (used to study the influence of the interest rates on the housing market) for the period 1991:Q4 – 2009:Q2. A sudden decline can be noted around 2000 followed by a more stable period.¹
Securitization Volume Increased

Increase in the share of outstanding home mortgages held by private issuers of asset backed securities (Securitization ratio) from 2000 onwards. ¹

Figure taken from Xu et al. (2010). “On housing booms and credit market conditions: A non-linear dynamic asset pricing model”. Work in progress.
Estimated vs. Actual log(PtR) for period 1983-2009

- Red line: Actual log(PtR)
- Blue dashed line: Estimated log(PtR)
Co-Integration

Table 4: Johansen trace tests for \((\hat{\rho}_t, r m_t, s_t)\)

<table>
<thead>
<tr>
<th>Lagged differences</th>
<th>(H_0)</th>
<th>Test statistic</th>
<th>(p)-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(r = 0)</td>
<td>41.12</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>(r = 1)</td>
<td>18.11</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>(r = 2)</td>
<td>2.37</td>
<td>0.70</td>
</tr>
</tbody>
</table>

Notes: Testing cointegration rank for the financial state \((\hat{\rho}_t)\), the real mortgage rate \((r m_t)\), and the securitization ratio \((s_t)\). A constant is included. The sample period is from 1991:Q4 to 2009:Q2, the available common sample period for all variables.

Given that the Schwarz Criterion (SC) is minimized for lag of order 1, only results for lagged difference of order 1 are presented.

Results suggest there is AT LEAST one co-integration relation.\(^1\)

Table taken from Xu et al. (2010). “On housing booms and credit market conditions: A non-linear dynamic asset pricing model”. Work in progress.
Co-Integration

Table 5: Cointegration parameters: $\hat{\rho}_t = \beta_1 r_{mt} + \beta_2 s_t$

<table>
<thead>
<tr>
<th>Time period</th>
<th>$\beta_1$</th>
<th>$\beta_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991:Q4 - 2009:Q2</td>
<td>-0.029</td>
<td>0.018</td>
</tr>
<tr>
<td></td>
<td>(-4.396)</td>
<td>(17.009)</td>
</tr>
<tr>
<td>1996:Q1 - 2006:Q4</td>
<td>-0.0051</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>(-2.124)</td>
<td>(12.178)</td>
</tr>
</tbody>
</table>

Notes: A constant is included in the estimation, and $t$-statistics for the estimates are reported in parentheses.¹

Results on effect on long-term state of housing price to rent ratio:
- Real mortgages rates have a significantly negative effect
- Securitization ratio has a significantly positive effect

Table taken from Xu et al. (2010). “On housing booms and credit market conditions: A non-linear dynamic asset pricing model”. Work in progress.
As of 2005—what was known

- Fed economists estimated that houses were overvalued by ~20%
  - But interest rates could not address housing markets alone without destabilizing the broader economy
  - Higher prices, it was hoped, would curtail effective demand for housing
  - And it was assumed prices would level off
  - It was not anticipated that necessarily there would be a repricing of credit
  - MBS was not traded, pricing was not revealed near time or real time

- Quoting WSJ: “They also have started to discuss whether other tools, such as consumer regulations or supervision practices, should be employed to control bubbles before they become dangerous.”

Underpriced Lending Happens

- Asset in fixed supply (real estate)
- Non-recourse asset-backed lending
- Default spread compensates lenders for the put option they provide
- If lenders underprice the put option
  - Efficient *equity* markets incorporate this *debt market inefficiency* into the asset price
  - Asset price exceeds fundamental value

The default spread falls if:

• The asset price volatility falls
  – Commercial real estate asset prices do nothing *(because investors are diversified)*

• The lenders underprice the default risk
  – Commercial real estate asset prices go up

• Empirical implication:
  – Underpricing produces negative correlation between default spread and asset prices
  – Correct pricing produces no correlation between default spread and asset prices

Source: Pavlov and Wachter (2009), “Mortgage Put Options...,” JREFE
Volume Implications

- $Q = \text{volume of real estate transactions}$
  - $= \text{volume of mortgage issuance}$
  - $= \text{mortgage securitization volume}$

$$\frac{\partial Q}{\partial s} = \frac{\partial Q}{\partial P} \frac{\partial P}{\partial s} < 0$$

- Volume negatively correlated with spread
  - IF CORRECT PRICING or
  - IF UNDERPRICING

- Volume increases and lending spread falls
  - If mortgages priced correctly
  - If mortgages underpriced

- SAME OUTCOME!!!
Detect Underpricing

\[ \frac{\partial M}{\partial s} > 0 \]

• Securitization was designed to measure the value of the mortgage:
  – If underpricing and if underpricing is self-correcting
    • MBS spreads increase
    • Originators have to pass this cost to the borrowers
    • Mortgage spreads increase, price increases stop
  • BUT: it was impossible to short-sell MBS or detect signal

Directly observe the value of the mortgage...
(worry if it falls)
The Pricing of Risk

Financial intermediaries lowered PLS yields

The Composition of Mortgage Finance

Underwriting standards eroded as complex, heterogeneous mortgages were packaged into MBS.

According to the Fed’s Own Retrospective...

• Aggregate measures of leverage did not signal “imminent mortgage credit risks”
  – “Only anecdotal information regarding changes in mortgage products”
  – Did not contain “disaggregated data derived specifically from the mortgage origination process” that showed deterioration of underwriting standards

• Real-time data necessary on loan distribution

Going for Fees: Why Rational Lenders Make Bad Loans

• When the put option is in the money
• According to FCIC, Washington Mutual’s chief executive predicted the bubble and collapse
• Yet they persisted in risky behavior. Why?
  – They “wanted profits to rise rapidly,” and they “saw risky loans as a means to those ends.”
  – Stopping the bad loans “might have saved the bank in the long run. In the short run, it would have devastated profits.”

Known, Unknowns, and Unknowables

- Going Forward: Implications for What We Need to Know
- Significant increase in mortgage credit risk with lowered risk premia, but “not conveyed in aggregate financial statistics”
- The remedy is to collect data on mortgage origination standards and securitization thereof
- Need in place mortgage standards and data reporting standards
Selected Cited Research

• “Explaining the Housing Bubble,” Levitin and Wachter

• “Subprime Lending and Real Estate Prices,” Pavlov and Wachter,
  Real Estate Economics, Vol. 39, Winter 2010

• “Mortgage Put Options and Real Estate Markets,” Pavlov and Wachter,

• “The Inevitability of Marketwide Underpricing of Mortgage Default Risk,” Pavlov and Wachter,
  Real Estate Economics, Vol. 34, Winter 2006
Thank You

Susan M. Wachter
Richard B. Worley Professor of Financial Management
Professor of Real Estate and Finance
The Wharton School
University of Pennsylvania

wachter@wharton.upenn.edu