Lessons from the Recent Housing Market Cycle

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1. Three Questions about the Recent Housing Cycle

1. What were the causes?
2. How did the housing cycle spill over to the broader economy?
3. Where is the housing market headed?
Model-Based Answers

- I will give some answers based on a quantitative dynamic stochastic general equilibrium model of the housing market.
- The model adds a rich housing sector to a well-established framework that is increasingly used in quantitative monetary policy analysis.
- The model is my discipline device.
- While I have control over the model workings, I try to learn from its predictions using a scientific method.
A Model of the Housing Market

- Model described in Iacoviello and Neri (2008) and Iacoviello, Kamenik, Kumhof and Laxton (in progress)
- Multi-sector structure with housing; Collateral effects on spending for a fraction of households:

\[ b_t = m V_t \]

\[ b_t \text{ mortgage debt} \quad m \text{ loan-to-value (90%)} \quad V_t \text{ value of the house} \]

- Model contains several sources of inertia (nominal rigidities, habits, investment adjustment costs) that allow a good fit to the data
2. The Model

- Sectors with different trend technological progress
  - $Y$—sector produces consumption, business investment, intermediate goods (using $K$ and $N$)
  - $IH$—sector produces new homes (using $K$, $N$, land and interm. goods)

- Two Types of Households
  - Patient Households work, consume, buy homes, rent capital and land to firms and lend to impatient households
  - Impatient/Credit Constrained Households work, consume, buy homes and borrow against their home

- Sticky prices in the non-housing sector, Sticky wages in both sectors
- Central Bank runs Monetary Policy following a Taylor rule
Model Estimated on 10 U.S. time series
3. RESULTS

1. Slow rate of technological progress in housing construction explains upward trend in housing values of the last decades.

2. Wage share of credit constrained households estimated around 20 percent
   These are the households who suffer the most from drops in housing values
   This fraction is large enough to amplify effects on consumption from fluctuations in housing values (especially for high values of the loan-to-value ratio)
Properties of the Estimated Model: Impulse Responses

Monetary Shock

Consumption

Residential Investment

Business Investment

GDP

Real House Prices

Nominal Rate

Estimated Model

Model w/o Collateral Effects
Properties of the Estimated Model: Impulse Responses

Housing Demand Shock

Consumption

Residential Investment

GDP

Real House Prices

- Estimated Model
- Model w/o collateral effects
Properties of the Estimated Model: Housing Investment Leads the Cycle

Cross I_H(t-j), I_K(t)
Properties of the Estimated Model: Housing Prices and Consumption are Positively Correlated
4.1. The Recent Cycle: What were the causes?

**House Prices**

**Housing Investment**

DATA  
Monetary Policy  
Non-H Technology shocks  
Housing demand shocks
4.2 Did the Housing Cycle Feed Consumption Spending?

![Graph showing real consumption and real house prices over years 2002 to 2009. The graph compares actual values with counterfactual values without collateral effect.](image-url)
## Did the Housing Cycle Feed Consumption Spending?

<table>
<thead>
<tr>
<th>Year</th>
<th>Model (Actual) Consumption Growth</th>
<th>Counterfactual Consumption Growth</th>
<th>Contribution of housing to C</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>2.5%</td>
<td>2.3%</td>
<td>0.2%</td>
</tr>
<tr>
<td>2002</td>
<td>2.9%</td>
<td>2.5%</td>
<td>0.4%</td>
</tr>
<tr>
<td>2003</td>
<td>2.8%</td>
<td>2.5%</td>
<td>0.3%</td>
</tr>
<tr>
<td>2004</td>
<td>3.7%</td>
<td>3.2%</td>
<td>0.5%</td>
</tr>
<tr>
<td>2005</td>
<td>3.0%</td>
<td>2.9%</td>
<td>0.1%</td>
</tr>
<tr>
<td>2006</td>
<td>3.0%</td>
<td>3.7%</td>
<td>-0.7%</td>
</tr>
<tr>
<td>2007</td>
<td>3.2%</td>
<td>4.3%</td>
<td>-1.1%</td>
</tr>
<tr>
<td>2008</td>
<td>1.7%</td>
<td>2.0%</td>
<td>-0.3%</td>
</tr>
<tr>
<td>2009</td>
<td>2.0%</td>
<td>2.0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
4.3. Where is the Housing Market Headed? Real Prices

![Graph showing real house prices from 1985 to 2015](image-url)
4.3. Where is the Housing Market Headed? Nominal Prices

Nominal House Prices (Ofheo index, 2005.IV=100)
4.3. Where is the Housing Market Headed? Quantities

Real Housing Investment, yoy

![Graph showing real housing investment from 2002 to 2014. The graph indicates a sharp decline around 2008, followed by a recovery.]
5. Conclusions

1. The Housing Boom of the late 1990s/early 2000s was mostly driven by demand-side factors in the housing market. Technological Progress in the non-housing sector and Monetary Policy might have contributed for about 15/20 percent each.

2. The Housing Boom has kept consumption growth strong (+0.3% p.a. b/w 2002-2005). The housing Bust has dragged consumption growth down (-0.8% p.a. in 2006 and 2007).

3. Real House Prices should return to their 2006 peak around 2012, if no further shocks hit the housing market.